SUPPLEMENTAL INVESTIGATION REPORT
AK STEEL
KANSAS CITY, MISSOURI

EPA ID# MOD007118029

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Prepared for

AK Steel

Burns & McDonnell Project No. 46619
Burns & McDonnell Engineering Company
Engineers-Architects-Consultants
Kansas City, Missouri

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LIST OF ACRONYMS AND ABBREVIATIONS

American	American Properties LLP
AOC	Area of Concern
AST	Above Ground Storage Tank
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BMcD	Burns & McDonnell Engineering Company, Inc.
BMWCI	Burns & McDonnell Waste Consultants, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CBB	Compass Big Blue LLC
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cis-1,2-DCE	cis-1,2-Dichloroethene
COC	Chain-of-Custody
Continental	Continental Analytical Services, Inc. of Salina, Kansas
DAF	Dilution Attenuation Factor
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene (Total)
DQI	Data Quality Indicator
EP Toxicity	Extraction Procedure for Toxicity
Facility	AK Steel Facility, Kansas City, Missouri
ft	feet
GC	Gas Chromatography
GPS	Global Positioning System
GST	GST Steel Company
Hansen	Hansen Property Development, Inc.
HSP	Health and Safety Plan
HSWA	Hazardous and Solid Waste Amendments
I-435	Interstate Highway 435
IM	Interim Measures
ITS Richardson	Intertek Testing Services of Richardson, Texas
KCT	Kansas City Terminal Railway Company
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MDNR	Missouri Department of Natural Resources
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

mg/L	milligrams per liter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
NFGI	*Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*
NFGO	*Contract Laboratory Program National Function Guidelines for Organic Data Review*
PAH	Polynuclear Aromatic Hydrocarbon
PCE	Tetrachloroethene
Permit	HWSA Part B Post-Closure Permit, Part II
QA	Quality Assurance
QA SAP	Quality Assurance Sampling and Analysis Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RFI Report	*RCRA Facility Investigation Report, Armco Kansas City Facility*
RFI Workplan	*RCRA Facility Investigation Work Plan, Armco Kansas City Facility*
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SSL	Soil Screening Level
STL Burlington	Severn Trent Laboratories of Colchester, Vermont
SVOC	Semivolatile Organic Compound
SW-846 Methods	*Test Methods for Evaluating Solid Waste*
SWMU	Solid Waste Management Unit
1,1,1-TCA	1,1,1-Trichloroethane
1,1,2-TCA	1,1,2-Trichloroethane
TCE	Trichloroethene
Terracon	Terracon Environmental
TEP	Toxicity Extraction Procedure
TestAmerica Pensacola	TestAmerica, Inc. of Pensacola, Florida
TestAmerica Valparaiso	TestAmerica, Inc. of Valparaiso, Indiana
TPH	Total Petroleum Hydrocarbons
trans-1,2-DCE	trans-1,2-Dichloroethene
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WCC	Woodward-Clyde Consultants
XRF	X-Ray Fluorescence Spectroscopy

DOCUMENT DISTRIBUTION

USEPA Region 7 - Stephanie Doolan

Missouri Department of Natural Resources – Julie Pearson

AK Steel Corporation – Carl Batliner

Burns & McDonnell Engineering Company, Inc. – Sharon Shelton

* * * * *

1.0 INTRODUCTION

Burns & McDonnell Engineering Company, Inc. (BMcD) has prepared this Supplemental Investigation Report on behalf of AK Steel (formerly Armco Inc.[1]) to describe activities that were performed as part of a Supplemental Investigation to add to information obtained during a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) at its former Kansas City, Missouri Works (Facility). The planned activities for the Supplemental Investigation were outlined in the *Quality Assurance Sampling and Analysis Plan, Supplemental Investigation, AK Steel Kansas City, Missouri* ([QA SAP] BMcD, 2007). AK Steel previously conducted an RFI at the Facility to satisfy the "Special Permit Conditions" presented in Part II of AK Steel's final Hazardous and Solid Waste Amendments (HSWA) Part B Post-Closure Permit (Permit), which was issued by the United States Environmental Protection Agency (USEPA) Region 7 on November 30, 1994 (USEPA ID# MOD 007118029). The results of the RFI were summarized in the *RCRA Facility Investigation Report, Armco Kansas City Facility* (RFI Report) (Burns & McDonnell Waste Consultants, Inc. [BMWCI], 1999).

1.1 PURPOSE AND SCOPE

As indicated in the RFI Workplan (BMWCI, 1996), the purpose of the RFI that was completed at the Facility was to gather the data necessary to meet the following objectives:

- characterize the environmental setting
- define sources of contamination
- define the nature and extent of contamination
- identify actual or potential receptors

The results of the RFI and data supporting achievement of these objectives were presented in the RFI Report (BMWCI, 1999). The RFI Report summarized investigation findings for solid waste management units (SWMUs) and areas of concern (AOCs) defined in the Permit and other SWMUs identified to USEPA and the Missouri Department of Natural Resources (MDNR). Subsequent to the RFI Report, USEPA conducted an investigation of the primary analytical laboratory for the RFI, Intertek Testing

[1] Effective September 30, 1999, Armco Inc. was merged with and into AK Steel Corporation, a Delaware Corporation with headquarters in West Chester, Ohio.

Services of Richardson, Texas (ITS Richardson). While the accusations charged by USEPA did not address data generated specifically for the AK Steel Facility, USEPA alleged that data generated by ITS Richardson were not usable for decision-making purposes without supplemental historical data, field analytical data, and/or additional investigative data (See Exhibits 1-1 and 1-2).

An overview of relevant historical data, field analytical data, and/or data from non-ITS Richardson analytical laboratories was provided in the QA SAP (BMcD, 2007) to supplement the RFI data. Based upon this review, additional investigation (i.e., Supplemental Investigation) was conducted for the following SWMUs and AOCs to provide data to further support conclusions made in the RFI Report:

- SWMU 2 – Old Blue River "W" Landfill
- SWMU 3 – South of Bar Fab Landfill
- SWMU 6 / AOC 4 – RCRA Permitted Baghouse Dust Storage Tanks / Boiler Furnace Area
- SWMU 7 – No. 1 Melt Shop Baghouse Dust Tanks
- SWMU 9 – No. 1 Melt Shop Baghouse Dust Conveyor
- SWMU 12 – AMOCO Landfarm
- SWMU 13 – Pickle Liquor Tank
- SWMU 17 – Wire Mill Rinsewater Neutralization Tank
- SWMU 24 – Waste Hydraulic Lubricating Oil Storage Tanks
- SWMU 33 – Nail Mill Degreasing Area
- AOC 8 – "Owl Gun Club" Shooting Park

This Supplemental Investigation Report presents the results of Supplement Investigation sampling activities conducted in 2007. In addition, the Supplemental Investigation data are compared to results of previous data collection efforts to determine whether the data sets are similar. The intent is to support or update conclusions made in the RFI Report (BMWCI, 1999) or elsewhere regarding the sources and/or nature and extent of contamination in the SWMUs and AOCs where additional investigation was conducted.

1.2 BACKGROUND

1.2.1 Facility Location

Figure 1-1 presents a Facility location map. The Facility is located in northeast Kansas City, Missouri within the Blue River and Missouri River floodplains. Portions of the Facility are located both east and west of Interstate Highway 435 (I-435). Industrial activities were performed exclusively in the area west of I-435, north of 12th Street, and east of Ewing Avenue. Figure 1-2 depicts the Facility, and presents ownership and operational changes that have occurred since issuance of the Permit.

The current physical address for the AK Steel Kansas City Facility is:

AK Steel
7000 Winner Road
Kansas City, Missouri 64125

The current mailing address for the AK Steel Kansas City Facility is:

AK Asset Management Company
5050 Section Avenue
Cincinnati, Ohio 45212

1.2.2 Facility History

The Kansas City Bolt and Nut Company first occupied the property in 1888. Iron bolts and nuts were manufactured from purchased iron until the early 1920s when open-hearth furnaces were installed. The company's name was changed in 1925 to Sheffield Steel Corporation, and the company became a subsidiary of Armco Steel Corporation in 1930. The steel maker pioneered the production of carbon steel products from 100-percent recycled scrap iron and steel in the 1950s.

Armco's Kansas City operations included the production of steel from iron ore and scrap in open hearth furnaces and from 100 percent scrap in the electric arc furnaces. Additionally, production included steel ingots that were then rolled to produce billets used primarily as feed stock for the other plant operations. Production of steel in open-hearth furnaces was discontinued in 1959, and these furnaces were later demolished. By 1977, production operations included six electric arc furnaces in two melt shops, a blooming mill, and a continuous caster. Other semi-finished and finished products were also produced. By 1983, production was limited to semi-finished steel products and a minor amount of finished steel products.

Historically, the plant operations and property owned by Armco (now AK Steel) totaled approximately 860 acres. However, certain property and operations were sold to GS Technologies Operating Company, Inc., doing business as GST Steel Company (GST) in November 1993. Armco retained ownership of approximately 560 acres, of which GST leased approximately 100 acres. GST had operations on property that they either owned or leased until they ceased operations and filed for bankruptcy in April 2001. As part of the bankruptcy proceedings, GST sold the majority of their holdings to Compass Big Blue LLC (CBB). In the intervening years, portions of the CBB tracts have been sold to House of Burgesses LLC, CTE Properties LLC, and/or Smorgon Steel Grinding Systems LLC. Additionally, approximately 20 acres of GST's property were sold to American Properties LLP (American), and this property has subsequently been sold to Hansen Property Development, Inc. (Hansen). The ownership and operation of these former GST tracts are now the responsibility of CBB, Hansen, House of Burgesses LLC, CTE Properties LLC, and/or Smorgon Steel Grinding Systems LLC. The property ownership and operational changes since the initial permit application and issuance are shown on Figures 1-2 and 1-3.

1.2.3 Environmental Setting

The environmental setting for the Facility was previously described in Section 2 of the RFI Report (BMWCI, 1999). Relevant sections of the RFI Report, including Section 2, are presented on CD in Appendix A for the ease of the reader.

1.3 REPORT ORGANIZATION

This Supplemental Investigation Report has been prepared by BMcD and consists of one volume. Discussion of the Supplemental Investigation activities and results for SWMUs and AOCs is organized geographically. This document is organized as follows:

- Section 1.0 – Introduction
- Section 2.0 – Introduction to the Data Presentation

SWMUs / AOCs East of I-435

- Section 3.0 – SWMU 2 – Old Blue River "W" Landfill
- Section 4.0 – SWMU 12 – AMOCO Landfarm
- Section 5.0 – AOC 8 – "Owl Gun Club" Shooting Park

SWMUs West of I-435 and South of Highway 24

- Section 6.0 – SWMU 3 – South of Bar Fab Landfill
- Section 7.0 – SWMU 7 – No. 1 Melt Shop Baghouse Dust Tanks
- Section 8.0 – SWMU 9 – No. 1 Melt Shop Baghouse Dust Conveyor

SWMUs / AOCs West of I-435 – Former Tank Farm Area

- Section 9.0 – SWMU 6 / AOC 4 – RCRA Permitted Baghouse Dust Storage Tanks / Boiler Furnace Area
- Section 10.0 – SWMU 24 – Waste Hydraulic Lubricating Oil Storage Tanks

SWMUs West of I-435 – Nail Mill Area

- Section 11.0 – SWMU 13 – Pickle Liquor Tanks
- Section 12.0 – SWMU 17 – Wire Mill Rinsewater Neutralization Tank
- Section 13.0 – SWMU 33 – Nail Mill Degreasing Area
- Section 14.0 - References
- Tables
- Figures
- Exhibits
- Appendices (Submitted on CD)

Additional documents have been prepared during the course of the corrective action process at the AK Steel Facility. These documents provide useful background information regarding the SWMUs and AOCs discussed in this Supplemental Investigation Report and provide more detailed information regarding previous investigation activities:

- *Annual Groundwater Monitoring Reports, Kansas City Facility Emission Control Dust Landfill* (BMcD, 1982-1997).
- *Part B Post-Closure Permit Application for the Emission Control Dust Landfill at Armco, Inc.* (BMcD, 1987).

- *RCRA Facility Investigation Workplan, Armco Kansas City Facility* (RFI Workplan) (BMWCI, 1996)

- *Addendum No. 1 to the RCRA Facility Investigation Workplan, Armco Kansas City Facility* (BMWCI, 1997a).

- *Addendum No. 2 to the RCRA Facility Investigation Workplan, Armco Kansas City Facility* (BMWCI, 1997b).

- *Addendum No. 3 to the RCRA Facility Investigation Workplan, Armco Kansas City Facility* (BMWCI, 1997c).

- *Phase 1 Data Package, RCRA Facility Investigation, Armco Kansas City Facility* (BMWCI, 1997d).

- *RCRA Facility Investigation Report, Armco Kansas City Facility* (RFI Report) (BMWCI, 1999). [Note: Relevant sections of the RFI Report have been provided on CD as Appendix A for the ease of the reader.]

- *Quality Assurance Project Plan for Groundwater Sampling at the Nail Mill Degreasing Area, AK Steel Kansas City Facility* (BMcD, 2000).

- *RCRA Part B Post-Closure Permit Renewal Application for the Emission Control Dust Landfill at AK Steel Kansas City Facility*. (BMcD, 2003).

- *RCRA Corrective Action Site Health and Safety Plan, AK Steel Facility, Kansas City, Missouri* (HSP) (BMcD, 2006a).

- *Quality Assurance Sampling and Analysis Plan, Supplemental Investigation, AK Steel Kansas City, Missouri* (QA SAP) (BMcD, 2007)

* * * * *

2.0 INTRODUCTION TO THE DATA PRESENTATION

During the Supplemental Investigation, samples were collected for chemical analyses in accordance with the QA SAP. Sections 3.0 through 13.0 present the findings for each of the investigated SWMUs and AOCs. A summary of the soil and groundwater Supplemental Investigation samples and analyses is provided in Table 2-1. Over the course of the Supplemental Investigation, approximately 64 soil, 7 direct-push groundwater, and 27 monitoring well groundwater samples were collected and submitted for laboratory analysis, resulting in more than 300 chemical analyses. Based on previous investigations and site history, chemical analyses were conducted primarily for cadmium, lead, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons (TPH). Other chemical analyses performed during the Supplemental Investigation included RCRA metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), pH, and hexavalent chromium. A summary of the analytical methods and parameters is provided on Table 2-2.

General supporting information for the data and text provided in this Supplemental Investigation Report is provided in the following Appendices:

- Appendix A – Relevant Information from the RFI Report (Submitted on CD)
- Appendix B – Historical and/or Additional SWMU/AOC Information (Submitted on CD)
- Appendix C – Comprehensive Analytical Result Tables
- Appendix D – QA/QC Review of Analytical Data
- Appendix E – Drilling Logs
- Appendix F – Monitoring Well Construction Diagrams
- Appendix G – Monitoring Well Development Records
- Appendix H – Field Groundwater Sampling Forms
- Appendix I – Survey Data
- Appendix H – Chemical Data Analytical Laboratory Reports (Submitted on CD)

2.1 DATA ANALYSIS

2.1.1 Quality Control Evaluations

TestAmerica of Valparaiso, Indiana (TestAmerica Valparaiso) provided laboratory services for the Supplemental Investigation. Due to the sample load in the laboratory during field activities, TestAmerica Valparaiso subcontracted a limited number of analyses to the TestAmerica laboratory in Pensacola, Florida. In addition, split samples were collected as part of groundwater sampling activities at SWMU 33. The split samples were analyzed by Continental Analytical Services, Inc. of Salina, Kansas (Continental). All three analytical laboratories are certified as part of the National Environmental Laboratory Accreditation Program (NELAP).

The laboratory data were reviewed for achievement of quality assurance (QA) and quality control (QC) criteria. Field QC samples included field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), an equipment rinsate blank, and trip blanks. In addition, field QA samples include split samples collected from Monitoring Wells 33MW10S and 33MW10D which were submitted to a secondary laboratory (i.e., Continental) for confirmation analyses. The QA/QC data review is presented in Appendix D.

Data quality indicators (DQIs) that were evaluated include: precision, accuracy, representativeness, comparability, and completeness. Data verification and validation were performed following procedures outlined in the QA SAP. Data qualifiers, when appropriate, were added to the data in accordance with *USEPA's National Functional Guidelines for Organic Data Review* ([NFGO] USEPA, 1999) and *USEPA's National Functional Guidelines for Inorganic Data Review* ([NFGI] USEPA, 2004). A description of data qualifiers assigned by the analytical laboratories and during data verification and validation are provided on Table 2-3.

Based upon the results of the data verification and validation, the data are considered valid to use in reporting the results of the Supplemental Investigation. As indicated in the QA/QC Review of Analytical Data (Appendix D), the objectives for precision, accuracy, representativeness, completeness, and comparability were met. Only one data point was rejected, and corrective action reanalysis provided acceptable replacement data.

2.1.2 Screening of Data

Table 2-4 presents the soil and water generic screening levels. These screening levels were used to screen the data for the purpose of defining the nature and extent of contamination. The screening levels do not represent site-specific corrective action objectives or replace a site-specific risk assessment.

The discussion in Sections 3.0 through 13.0 includes a comparison of sample results to the screening levels. Constituents that exceed screening levels are highlighted in the data summary for each media of interest. Important details regarding the screening include:

- Non-detect results are not included in the screening for purposes of the nature and extent of contamination discussion.

- Exceedences of screening levels are color-coded on the summary tables. If a constituent's concentrations exceeded more than one of the screening levels, then the color associated with the highest screening level was used for highlighting that constituent on the data summary tables.

2.1.2.1 Soil Screening Criteria

In the RFI Report, contaminants in soil samples were screened against generic soil screening levels (SSLs) as established in the *Soil Screening Guidance* (USEPA, 1996). SSLs established for migration to groundwater were selected for purposes of the RFI Report since these values were typically more conservative than SSLs based on ingestion or inhalation. Generic SSLs for migration to groundwater are provided in the guidance using a default attenuation factor (DAF) of 20 (20 DAF SSL). The DAF accounts for natural processes (dilution and attenuation) that reduce contaminant concentrations in the subsurface. Section 4.2.6.1 of the RFI Report (See Appendix A) provides further information regarding the soil screening criteria. Screening using the 20 DAF SSL was carried forward into this Supplemental Investigation Report to assist with comparison of the RFI and Supplemental Investigation data.

Since screening using the 20 DAF SSL only evaluates potential exposure based upon contaminant migration to groundwater, additional soil screening was performed to evaluate exposures related to inhalation, ingestion, or dermal absorption of compounds by an industrial worker population. Because the Facility is zoned M2A Heavy Industrial by the city of Kansas City, Missouri, industrial worker screening levels were deemed appropriate. Soil screening levels for the industrial worker population were obtained from the *USEPA Region 6 Human Health Medium-Specific Screening Levels for 2008* (USEPA, 2007), and both Industrial Indoor Workers and Industrial Outdoor Workers were evaluated.

2.1.2.2 Groundwater Screening Criteria

Even though water from the site is not used for either drinking water or process water, maximum contaminant levels (MCLs) established as part of the National Primary Drinking Water Standards

(USEPA, 2003) were selected as a conservative measure for groundwater screening purposes. This represents a continuation of the groundwater screening process used in the RFI Report (BMWCI, 1999).

2.2 DATA PRESENTATION

Analytical data are presented throughout Sections 3.0 through 13.0 in analytical results data tables, on figures, and in the nature and extent of contamination discussions. A table summarizing the samples collected during the Supplemental Investigation is provided in each section. These investigation activity summary tables provide the sample locations, sample depth intervals, and chemical analyses performed. Following investigation activity summary tables are analytical result data tables. Analytical result data tables in most cases have been condensed to show only the constituents detected in one or more of the samples for the SWMU or AOC. Comprehensive analytical result tables that provide results for both detected constituents and reporting limits for undetected constituents are provided in Appendix C.

Figures are provided to indicate the sampling locations in each SWMU or AOC. Sampling locations from the previous RFI are also indicated on the sampling location figures. In addition, each Section contains figure(s) that present results for constituent(s) of interest at the particular SWMU or AOC.

Each section contains a general description of the SWMU or AOC, a summary of any previous investigations, the scope of the Supplemental Investigation activities, a summary of the Supplemental Investigation Results, and a comparison of the Supplemental Investigation results to any previous data collection efforts. In addition, the impact that the Supplemental Investigation data have upon any previously drawn conclusions regarding the nature and extent of the contamination at a particular SWMU or AOC is presented.

* * * * *

3.0 SWMU 2 – OLD BLUE RIVER "W" LANDFILL

3.1 SWMU BACKGROUND

The Old Blue River "W" Landfill (SWMU 2), located on AK Steel property (see Figure 1-2) east of Interstate I-435, is a closed landfill previously utilized to manage emission control dust and solid waste. This W-shaped portion of the Old Blue River channel was used to dispose of emission control dust generated in the No. 1 and No. 2 Melt Shop electric arc furnaces. In addition, general plant and office trash was disposed in this SWMU. SWMU 2 covers an area of approximately 15 acres and is estimated to contain approximately 185,000 cubic yards of material.

The landfill was closed through construction of a soil cap (approximately three feet [ft] of compacted soil) and a vegetative (fescue grass) cover. The soil cover and vegetative stand remain in good condition. This site has been classified as a Class III Site on the Missouri Registry of Confirmed Abandoned or Uncontrolled Sites. Class III is defined as "does not present a significant threat to public health or the environment – action may be deferred."

3.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, groundwater samples were collected around SWMU 2 and analyzed for dissolved cadmium and lead, VOCs, and/or SVOCs. On-site field gas chromatography (GC) was also used for VOC analysis of groundwater samples collected from borings 02B04A and 02B10 through 02B17. Section 5.0 of the RFI Report (See Appendix A) presents additional discussion and data tables related to SWMU 2.

Dissolved cadmium was not detected at any of the SWMU 2 sampling locations during the RFI. Dissolved lead was detected in 11 of 18 groundwater samples. Dissolved lead detections in seven of the groundwater samples exceeded the MCL of 0.015 milligrams per liter (mg/L) that was used for nature and extent screening during the RFI. Four of the seven samples with dissolved lead concentrations above the MCL were collected from perched groundwater, and dissolved lead concentrations in the saturated zone ranged up to 0.069 mg/L.

VOCs were detected in five out of nine groundwater samples, but only three samples had one or more VOC detections that exceeded screening levels. One detection each of benzene (5.79 micrograms per liter [µg/L]), ethylbenzene (4,140 µg/L), total xylenes (22,100 µg/L), and methylene chloride (33.7 µg/L) exceeded groundwater screening MCLs (5, 700; 10,000; and 5 µg/L, respectively). All VOC exceedences

occurred in perched groundwater samples, and samples from the saturated zone were either non-detect for VOCs or VOC detections were below groundwater screening MCLs. SVOC analysis was performed on one groundwater sample and only one detection each of 2,4-dimethylphenol and isophrone occurred (no MCLs exist for these compounds). Results of the field GC generally confirmed VOC detections noted in the laboratory data (See Appendix R of the RFI Report, which is located in Appendix A to this SI Report.)

3.3 SCOPE OF ACTIVITIES COMPLETED

For the Supplemental Investigation, direct-push sampling techniques were used to collect groundwater samples in the vicinity of SWMU 2, Old Blue River "W" Landfill on September 12, 2007. The sample collection plan is outlined on Table 3-1, and the sampling locations are presented on Figure 3-1. Four direct-push borings were placed around SWMU 2. Two of these borings (i.e., 02B18 and 02B19) were placed in the general vicinity of locations that previously exhibited elevated concentrations of one or more of the target analytes, with location 02B18 representing the upgradient location. The remaining two boring locations (i.e., 02B20 and 02B21) were placed in the downgradient direction of groundwater flow. Emphasis was placed on collecting groundwater samples within 10 ft of the water table surface. Groundwater samples were submitted to TestAmerica Valparaiso for analysis of VOCs, cadmium, and lead. Due to elevated turbidity resulting from using direct-push sample collection techniques, samples for analysis of cadmium and lead were field filtered. Field QC samples included a field duplicate and MS/MSD pair. SWMU 2 is located approximately 600 to 700 ft south of the Blue River, and groundwater is expected to flow in a north-northeast direction toward the Blue River.

3.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 2 are presented on Table 3-2. Groundwater detections were screened against MCLs. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table C-1 in Appendix C.

Dissolved cadmium and lead results are presented on Figure 3-2. Dissolved cadmium was not detected in any of the Supplemental Investigation samples. Dissolved lead was detected in samples collected from locations 02B19 (0.012 mg/L) and 02B21 (0.057 mg/L). Lead detections for the groundwater sample and field duplicate collected from location 02B21 (0.057 and 0.021 mg/L, respectively) exceeded the MCL of 0.015 mg/L.

VOCs were not detected in the groundwater sample from the presumed upgradient location, 02B18. VOCs were detected in all groundwater samples collected in the presumed downgradient direction (i.e.,

locations 02B19, 02B20, and 02B21). The sample collected from location 02B21, which was placed in closest proximity to the landfill, exhibited the highest VOC concentrations.

At location 02B19, the groundwater sample contained detections of 1,1-dichloroethane (1,1-DCA), acetone, benzene, carbon disulfide, ethylbenzene, methylene chloride, toluene, and xylenes. However, only the methylene chloride detection of 8.9 µg/L exceeded the 5 µg/L MCL. Carbon disulfide, ethylbenzene, toluene, and xylenes were detected in the sample collected from location 02B20, and all detections were less than the 5 µg/L laboratory reporting limit (i.e., J qualified). Benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in the sample and/or field duplicate collected from location 02B21. The detections of benzene (7 J µg/L) and ethylbenzene (830 and 880 µg/L) exceeded the MCLs of 5 and 700 µg/L, respectively. Results for Total BTEX are presented on Figure 3-3.

3.5 COMPARISON TO PREVIOUS DATA

RFI locations in close proximity to Supplemental Investigation locations include:

Sampling Locations in Close Proximity	
Supplemental Investigation	**RFI**
02B18	02B04A and 02B04
02B19	02B06
02B21	02B08

3.5.1 Dissolved Metals

Dissolved cadmium was not detected in samples collected during the RFI or the Supplemental Investigation. Therefore, the results of the two investigations are comparable.

Dissolved lead results were similar for samples collected during the Supplemental Investigation and RFI. In particular, the data suggest that dissolved lead is largely non-detect at locations on the presumed upgradient southeast side of the landfill (i.e., location 02B18). Dissolved lead was detected in groundwater samples from presumed downgradient locations 02B19 and 02B21. Results for groundwater samples collected from Supplemental Investigation locations 02B19 and 02B21 were similar in magnitude to previous RFI groundwater data collected from locations 02B08 and 02B06.

3.5.2 VOCs

Supplemental Investigation samples were collected from the saturated zone at depths ranging from 14 to 28 ft below ground surface (bgs). During the RFI, most samples were collected from the saturated zone at

depths ranging from 13 to 24 ft bgs. However, groundwater samples collected from RFI locations 02B04A and 02B15 through 02B17 were collected at much shallower depths ranging from 1 to 8 ft bgs. The highest VOC concentrations at SWMU 2 during the RFI were encountered in these shallow samples. The groundwater present at these shallow depths during the RFI is believed to be perched and seasonal, and groundwater was not encountered this shallow during the Supplemental Investigation. For example, groundwater collected in the 4 to 8 ft bgs interval at RFI location 02B04A exhibited a Total VOC concentration of approximately 785 µg/L. In contrast, the corresponding sample 02B18 for the Supplemental Investigation was collected from 24 to 28 ft bgs, and VOCs were not detected.

Data collected during the RFI indicated the presence of VOCs in groundwater in the vicinity of SWMU 2. BTEX were the predominant constituents detected with limited other detections of 1,1-DCA, 1,1-dichlorethene (1,1-DCE), acetone, methylene chloride, and trans-1,2-dichloroethene (trans-1,2-DCE). Supplemental Investigation data support these findings, and the highest concentrations of VOCs were detected at the downgradient sampling locations 02B19 and 02B21 that were in closest proximity to the landfill cap.

* * * * *

4.0 SWMU 12 – AMOCO LANDFARM

4.1 SWMU BACKGROUND

SWMU 12 (see Figure 1-2) was utilized by Amoco from 1975 through 1979 for the landfarming of petroleum refining waste generated at the Amoco Sugar Creek Refinery. SWMU 12 is located on AK Steel property that is east of I-435 and was leased to Amoco from December 1973 through September 1980. SWMU 12 covers an area of approximately ten acres.

Amoco hauled petroleum refining waste to SWMU 12 by truck from the refinery, which is located east of SWMU 12. The waste was incorporated into the soil by surface spreading and discing. Based upon information provided by Amoco, approximately 30,000 tons of petroleum refining waste was placed in SWMU 12 during its five years of operation. It has been estimated that 3 to 8 inches of petroleum refining waste were incorporated into the soil each year (Woodward-Clyde Consultants [WCC], 1980). An estimated total of 24 inches of waste, having a wet weight of 30,000 tons and a dry weight of 15,000 tons, was managed at SWMU 12. Water decanted from the sludge material and precipitation falling on the SWMU was controlled by a dike that surrounds the SWMU. Two culverts were located through the dike so that surface water could be discharged from the area, as necessary. No information is available regarding the quality or quantity of water discharged from SWMU 12 during operation. The culvert gates appeared to be closed during a visit by Armco and BMWCI personnel to the SWMU in early 1995; however, one of the culverts had been silted in and was not visible from the ground surface.

The only known waste activity conducted by Armco at SWMU 12 involved a one-time land application of liquid and sludge sediment generated during the cleaning of a No. 2 fuel oil tank. This activity is believed to have taken place in 1976 or 1977. Although the exact quantity of material associated with this activity cannot be determined, it is anticipated that the quantity was much less than 10,000 gallons of liquid. The capacity of a No. 2 fuel oil tank was 10,000 gallons, and it is known that the product was removed from the tank long before this activity took place. The material transported to SWMU 12 was limited to the residual material remaining at the bottom of the tank. The material was transported to SWMU 12 in a single trip by a vacuum truck. Although the actual quantity of material is unknown, it is not anticipated to have exceeded a few hundred gallons.

In a 103(c) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) notification to USEPA, Amoco classified the materials disposed in SWMU 12 under hazardous waste codes K048, K049, K050, and K051 (Helffrich, 1981). The basis for the listing of these waste codes is

the presence of lead and hexavalent chromium. At the time that the petroleum refining waste was managed at SWMU 12, it was not classified as hazardous waste. Samples taken from sludge-incorporated soil passed the EP-Toxicity testing for chromium and lead, two of the constituents for which such waste was subsequently listed by USEPA (WCC, 1980).

During the flood of 1993, SWMU 12 was covered by floodwaters. The SWMU may have been affected by water and silt carried in during the flood conditions. The surface of SWMU 12 does not appear to be eroded; however, the presence of approximately 6-inches of sediment deposited during the flood conditions of 1993 is evident.

In November 1998, Armco personnel observed deterioration of the dike located around SWMU 12. Armco and BMWCI personnel performed an engineering evaluation of the dike failure. A slope failure occurred on the southern portion of the dike, directly north of the relocated Rock Creek and the Independence Sewage Treatment Plant outfall location. The failure was approximately 140 ft long and extended back into the bank approximately 40 ft from the toe of the slope at its deepest point. It appeared that the failure was a result of extensive erosion on the supporting toe of the slope and scouring of the dike due to Rock Creek flow combined with discharge from the Sewage Plant outfall. Based on the site evaluation, it did not appear that contents of the SWMU have been released due to this condition. USEPA was notified of these conditions in Armco's Fourth Quarter 1998 Progress Report dated January 11, 1999. ThermoRetec Corporation completed repairs to the levee in November 1999.

4.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Surface soil, subsurface soil, and groundwater samples were collected for metals (hexavalent chromium, trivalent chromium, and lead), VOCs (Skinner's List), and SVOCs (Skinner's List) during an Interim Measures (IM) investigation. Surface soil samples (0 to 0.5 ft bgs) were collected as a composite of five discrete locations collected at the corners and center of a sampling grid. Subsurface soil samples were collected from discrete soil borings that were advanced using direct-push techniques or during monitoring well installation. Section 14.0 of the RFI Report (See Appendix A) presents additional discussion and data tables related to SWMU 12.

Soil

All soil analyses for samples collected from SWMU 12 during the IM activities were performed by ITS Richardson. Hexavalent chromium was not detected in any of the soil samples. Total chromium was detected at concentrations up to 1,330 milligrams per kilogram (mg/kg). Trivalent chromium was

determined mathematically by subtracting total chromium results from hexavalent chromium results. Due to the lack of hexavalent chromium detections, it was concluded that trivalent chromium was the only form of chromium present at SWMU 12. No 20 DAF SSL exists for trivalent chromium. Lead detections exceeded the 20 DAF SSL (400 mg/kg) for six of the 14 surface and subsurface soil samples, at concentrations ranging up to 6,080 DJ* mg/kg. These exceedences were all contained within the SWMU 12 dike boundary and limited to the upper four ft of soil sampled. Lead results for the surface soil sample collected outside of the dike boundary near the culvert outfall (i.e., grid 12G04) were below the 20 DAF SSL. Therefore, the vertical and horizontal extent of lead detections was well defined by the sampling locations.

Skinner's List of VOCs were not detected in any of the soil samples collected at SWMU 12. PAHs were the only Skinner's List of SVOCs detected. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were the only SVOCs with detections above their 20 DAF SSLs (2,000, 8,000, 5,000, and 2,000 micrograms per kilogram [µg/Kg], respectively); the highest concentrations of these compounds were 6,740, 14,200, 15,700, and 17,300 µg/Kg, respectively, in samples collected from Grid 12G01. All detections were limited to surface soil samples collected within the dike boundary below the 6-inch layer of silt. No 20 DAF SSL exceedences were noted in samples collected from the 4 to 7 ft bgs depth interval. Therefore, the vertical and horizontal extent of SVOCs in soil was adequately characterized at SWMU 12.

In 1980, Toxicity Extraction Procedure (TEP) analyses were performed on two surface soil samples, and samples were determined to be non-hazardous. The results of this testing were presented on Table 4 in *AMOCO Sludge Landfarm, Armco Site* (WCC, 1980), which is presented in Appendix B-3.

Groundwater

Four monitoring wells were installed during IM activities. Six groundwater samples were collected from the four newly installed monitoring wells and two monitoring wells already in place around SWMU 12. ITS Richardson performed the laboratory analyses. The common laboratory contaminant bis(2-ethylhexyl)phthalate (BEHP) was the only SVOC compound detected, and it was detected above the groundwater screening MCL (6 µg/L) in the sample from Well 12MW1 (26.5 µg/L). Dissolved metals and VOCs were not detected. Therefore, the nature and extent of dissolved metals, VOCs, and SVOCs in groundwater at SWMU 12 was adequately characterized by the sampling locations.

Results for samples collected from Wells OWA-5 and OWA-6 during 1996 IM activities were compared to groundwater data collected during sampling events in June 1980, August 1980, and October 1994. These historical results were comparable with data obtained in the 1996 IM sampling event. The data for the historical sampling events is provided in Appendix B-3.

4.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, direct-push techniques were used to collect soil samples at SWMU 12, AMOCO Landfarm. The intent of this sampling was to verify results of soil samples collected during the RFI. Table 4-1 outlines the sample collection, and Figure 4-1 presents the sampling locations. Two discrete borings were placed within SWMU 12. These borings (i.e., 12B01A and 12B03A) were placed at the approximate location of their associated RFI borings (i.e., 12B01 and 12B03). Soil samples were collected from four depth intervals: 0 to 2 ft bgs, 2 to 4 ft bgs, 4 to 6 ft bgs, and 6 to 8 ft bgs. The sampling included an additional interval from the QA SAP specifications, which outlined sample depth intervals of 0-2 ft bgs, 2 to 4 ft bgs, and 4 to 8 ft bgs. Soil samples were submitted to TestAmerica Valparaiso for analysis of total chromium, total lead, hexavalent chromium, VOCs, SVOCs, volatile TPH, extractable TPH, and pH. Field QC samples included a field duplicate and MS/MSD pair.

4.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 12 are presented on Table 4-2. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers. A comprehensive data table that presents both constituent detections and the reporting limits for undetected constituents is provided as Table C-2 in Appendix C.

Samples collected from the 0 to 2 ft bgs interval exhibited the highest concentration of target constituents. Chromium, lead, PAHs, and extractable TPH were the primary constituents detected. This observation is consistent with historical reports that up to 24 inches of waste were managed at SWMU 12. Constituent concentrations were lower or non-detect in samples collected from depth intervals below 2 ft bgs. A summary of the analyses and screening level exceedences is provided in the following paragraphs.

Chromium and lead results are presented on Figure 4-2. Hexavalent chromium was not detected in any of the Supplemental Investigation samples. Chromium and lead were detected in all of SWMU 12 soil samples. Chromium concentrations ranged from 1,100 mg/kg in the 0 to 2 ft bgs interval at location 12B01A to 7.2 mg/kg in the 6 to 8 ft bgs interval at the same location. None of the chromium detections

exceeded the soil screening levels. Lead concentrations ranged from 4,400 mg/kg in the 0 to 2 ft bgs interval at location 12B01A to 10 mg/kg in the 6 to 8 ft bgs interval at the same location. The lead results for samples collected from the 0 to 2 ft bgs interval at locations 12B01A and 12B03A exceeded all three soil screening levels. No other screening level exceedences were noted for lead.

Detected VOCs included 2-butanone, acetone, benzene, carbon disulfide, ethylbenzene, methylene chloride, toluene, and xylenes. VOCs were detected at all sample depth intervals, and the highest VOC concentrations occurred from 0 to 4 ft bgs. None of the VOC detections exceeded the soil screening levels. Since BTEX are the primary constituents of interest for a landfarm, Total BTEX results are presented on Figure 4-3. The highest concentration of benzene (11 J* µg/kg) and toluene (7.3 J* µg/kg) were noted in the 0 to 2 ft bgs interval at location 12B01A. In addition, the highest concentration of ethylbenzene (10 µg/kg) and xylenes (15 J µg/kg) were noted in the 2 to 4 ft bgs interval at the same location.

PAHs were the primary SVOC fraction detected. The sample from the 0 to 2 ft bgs interval at location 12B01A also exhibited a detection of dibenzofuran. No other SVOCs were detected. The following table summarizes the SVOC concentrations that exceeded one or more screening levels. Detailed information regarding the screening results can be obtained from Table 4-2. Samples where no constituents were identified at concentrations exceeding a screening level are not included below:

Samples with SVOC Results above Screening Levels

	Units	12B01A 0-2 ft bgs	12B01A 2-4 ft bgs*	12B03A 0-2 ft bgs
Benzo(a)anthracene	µg/kg	3,700	-	-
Benzo(a)pyrene	µg/kg	17,000	530	3,100
Benzo(b)fluoranthene	µg/kg	15,000 J	-	2,700
Dibenz(a,h)anthracene	µg/kg	7,300	550	2,100
Indeno(1,2,3-cd)pyrene	µg/kg	2,700	-	-

Notes:

- = Indicates constituent either was not detected or does not exceed a screening level

* = Represents result for field duplicate sample. SVOCs were not detected in the primary sample.

µg/kg = milligram per kilogram

J - Analyte was detected below reporting limits

Unknown hydrocarbons in the extractable TPH fraction were the only TPHs detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10

to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. Similar to other constituents, the highest unknown hydrocarbons detection (13,000 mg/kg) occurred in the 0 to 2 ft bgs interval at location 12B01A and the lowest concentration (18 mg/kg) occurred in the 6 to 8 ft bgs interval at the same location. In addition, elevated TPH concentrations correlated with elevated SVOC results. A comparison of Total SVOC and extractable TPH data is provided on Figure 4-4.

4.5 COMPARISON TO PREVIOUS DATA

Two borings were placed within SWMU 12 as part of the Supplemental Investigation. These borings (i.e., 12B01A and 12B03A) were placed at the approximate location of their associated RFI borings (i.e., 12B01 and 12B03). Section 14.0 of the RFI Report (See Appendix A) presents data tables and figures for comparison to the Supplemental Investigation. In addition, Appendix U of the RFI Report (See Appendix A) contains the RFI TPH data.

Supplemental Investigation data support the findings of the RFI. During the RFI, the primary constituents detected in soil samples from SWMU 12 were chromium, lead, PAHs, and extractable TPH. Similar constituents were detected in samples collected during the Supplemental Investigation. Due to the use of narrower depth interval increments (i.e., 2 ft increments used during the Supplemental Investigation versus 4 ft increments used during the RFI), the vertical extent of contamination was decreased to the upper two feet of the soil column based upon the Supplemental Investigation data versus the RFI data.

4.5.1 Metals

Hexavalent chromium was not detected in samples collected during the RFI or the Supplemental Investigation. In addition, similar concentrations were noted for total chromium and lead. Therefore, the metals results of the two investigations are comparable.

4.5.2 VOCs

During the RFI, the Skinner's List of VOCs was analyzed at SWMU 12. VOCs were not detected in any of the RFI soil samples. VOC detections in the Supplemental Investigation samples were generally less than 15 µg/kg for each constituent, and BTEX were the primary VOCs detected. The difference in the low level detections for the Supplemental Investigation samples as compared to the RFI soil samples may be due to the use USEPA Method 5035 sample collection techniques. Method 5035 was employed by USEPA subsequent to the RFI and was developed to minimize known soil sample volatilization and biological losses present in the previous USEPA Method 5030 technique. The difference may also be attributed to different depth intervals analyzed between the RFI and Supplemental Investigation.

4.5.3 SVOCs

SVOC detections for both the RFI and Supplemental Investigation samples were primarily limited to PAHs. The magnitude of the PAH detections were similar for both investigations. Therefore, the SVOC results of the two investigations are comparable.

4.5.4 TPH

The extractable TPH analysis used for the Supplemental Investigation provided more detailed information regarding individual TPH fractions than the analytical method used during the RFI. Due to the difference in reporting, a qualitative comparison was performed for the TPH analyses. Extractable TPH was the predominant fraction detected in both the RFI and Supplemental Investigation samples collected at SWMU 12. In addition, elevated concentrations of extractable TPH were noted at similar depth intervals during both investigations. These similarities indicate that conclusions made regarding TPH contamination for both investigations would be comparable.

* * * * *

5.0 AOC 8 – "OWL GUN CLUB" SHOOTING PARK

5.1 SWMU BACKGROUND

AOC 8, located on AK Steel property (see Figure 1-2), was a clay pigeon shooting park known as the "Owl Gun Club" which was located south of the Old Blue River "W" Landfill (SWMU 2) and immediately north of Rock Creek on the portion of the property east of I-435. The specific dates of operation of the Owl Gun Club are unknown. From a review of aerial photos, the AOC first becomes visible in 1955 and is no longer visible in 1974. Prior to use as the shooting range, the area was used for agriculture. Stationing posts and two trap buildings are visible on a 1955 aerial photograph. The western trap building is no longer present by 1964. By 1974, all evidence of the shooting range has been removed, and the area is again used for agriculture. Because little information is available about the dates the gun club was active or the amount of activity at the club, it is not possible to estimate how much lead shot might be present. The original defined AOC area was approximately 2.5 acres in size. During the RFI, the AOC 8 area expanded in size, primarily to the north, to approximately 6 acres.

Samples were collected in this area in 1994 as part of a Phase II site assessment related to a proposed roadway alignment, known as the South Riverfront Expressway, in the vicinity. Lead, associated with the presence of lead shot, was noted in the samples. Lead concentrations for these soil samples ranged from 1,050 to 9.750 mg/Kg in the surface interval (0 to 1 ft bgs). The results of this sampling is presented in *Phase II Site Assessment Report, South Riverfront Expressway* (WCC, 1994), which is presented in Appendix B-5.

5.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, ten soil samples were collected for pH, and 122 surface soil and subsurface soil samples were collected for lead analysis. Section 24.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to AOC 8. ITS Richardson was the primary analytical laboratory; however, Severn Trent Laboratories of Colchester, Vermont (STL Burlington) provided analysis for 17 samples collected from Borings A08B41 to A08B48. X-ray fluorescence (XRF) spectroscopy was used to field screen for lead in samples from Borings A08B05 to A08B40.

RFI laboratory data indicated that soil pH was neutral to slightly basic (pH 7.8 J* to 8.9). The horizontal extent of lead contamination was well defined by borings on the perimeter of the AOC 8 area, but shifted north of the initial AOC definition. Borings around the perimeter of the impacted area generally had lead

concentrations less than 100 mg/kg. Concentrations of lead in soil samples throughout the central portion of the sampling area varied significantly, ranging from concentrations just above the SSL of 400 mg/kg to concentrations as high as 55,200 mg/kg. The sporadic nature of the data is likely attributable to sample homogeneity issues related to the lead shot and the distinct, localized nature of the contamination. That is, some samples may have contained a piece of lead shot, while others samples from the same area may not have contained this material. All but two of the SSL exceedences (and thus the vertical extent of contamination) were limited to the upper two ft of the soil. In the west-central portion of the sampling area, an exception was noted at Boring A08B11 that was located in an area of fill material and contained a lead detection of 11,200 mg/kg from 4 to 5 ft bgs.

Figure 5-2 provides the results of the XRF field screening for lead that was performed during the RFI at AOC 8. Results in excess of the 400 mg/kg SSL are highlighted in red. Additionally, a tabular summary of the XRF results is provided in Appendix S of the RFI Report (See Appendix A). Similar areas of soil with lead concentrations in excess of 20 DAF SSLs were noted whether using the ITS Richardson or XRF data; therefore, the RFI Report conclusions were corroborated by the XRF data. Insufficient XRF and/or STL Burlington data were available to define the extent of lead contamination at the southern portion of AOC 8 (near grid A08G02) and in the vicinity of Boring A08B26. Therefore, additional sampling was conducted during the Supplemental Investigation.

5.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, surface soil samples were collected at AOC 8, "Owl Gun Club" Shooting Park. The intent was to close data gaps in existing field XRF data from the RFI such that the extent of lead contamination at AOC 8 was verified. The sample collection plan is outlined on Table 5-1, and the sampling locations and presented on Figure 5-1. Three borings were placed within AOC 8. One boring (i.e., A08B26A) was placed at the approximate location of its associated RFI boring (i.e., A08B26) to verify results of soil samples collected during the RFI. Two borings (i.e., A08B49 and A08B50) were placed at locations needed to verify the extent of lead contamination at AOC 8 in the vicinity of RFI soil grid A08G02. Soil samples were collected from two depth intervals: 0-0.5 ft bgs and 0.5 to 2 ft bgs. Samples were visually examined for the presence of lead shot, and lead shot was not observed in any of the samples. Samples were collected and submitted to TestAmerica Valparaiso for analysis of total lead.

5.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for AOC 8 are presented on Table 5-2. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers.

Lead results are presented on Figure 5-3. Lead was detected in all of AOC 8 soil samples collected during the Supplemental Investigation; however, none of the detections exceeded screening levels. The highest concentrations of lead were noted for the samples collected at locations A08B26A, with lead detected at 150 mg/kg in the sample collected from the 0 to 0.5 ft bgs interval and 200 mg/kg in the sample collected from the 0.5 to 2 ft bgs interval. Samples collected from locations A08B49 and A08B50 exhibited similar lead concentration in both depth intervals.

The intent of sampling at AOC 8 was to verify the extent of lead contamination at AOC 8 as defined in the RFI. Results of the Supplemental Investigation samples and samples previously analyzed using field XRF or by STL Burlington during the RFI (See Figure 5-2) provide a comprehensive data set for delineation of the extent of lead contamination at AOC 8. Since the results of the Supplemental Investigation samples were less than the screening levels, the extent of lead contamination in the southern portion of AOC 8 near RFI grid A08G02 and in the vicinity of Boring A08B26 was defined.

5.5 COMPARISON TO PREVIOUS DATA

RFI locations in close proximity to Supplemental Investigation locations include:

Sampling Locations in Close Proximity	
Supplemental Investigation	**RFI**
A08B26A	A08B26
A08B50	A08G02C and A08G02D

Lead results for samples collected from RFI sampling locations A08B26, A08G02C and A08G02D were similar to Supplemental Investigation samples that were collected in close proximity. Results for both the RFI and Supplemental Investigation samples were less than the screening level, which indicates comparability of the data and confirms delineation of horizontal and vertical extent in these areas.

The sample collected from the 1 to 2 ft bgs interval at RFI location A08B48 contained lead at 55,200 mg/kg. The elevated concentration was likely due to the presence of small piece of lead shot in the sample. Supplemental Investigation location A08B49 was slightly offset from RFI location A08B48, and the results are not directly comparable. Lead shot was not observed during the Supplemental Investigation, and the analytical results indicate that the horizontal and vertical extent of contamination was defined by offset location A08B49.

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6.0 SWMU 3 – SOUTH OF BAR FAB LANDFILL

6.1 SWMU BACKGROUND

The South of Bar Fab Landfill (SWMU 3) is located partially on AK Steel property (see Figure 1-2) and partially on property owned by the City of Kansas City, Missouri. SWMU 3 is a closed landfill that was previously used to manage emission control dust and various solid waste materials. SWMU 3, which covers an area of just over 1-acre, was closed in 1980 through construction of a soil cap (approximately three ft of compacted soil) and a vegetative cover (fescue grass). A portion of the area in the general vicinity of the SWMU, including a portion of the landfill itself, was deeded to the City in 1983 for completion of channelization work on the adjacent Blue River. The cap was subsequently upgraded on the western side of the landfill to a concrete cover, which was also extended across a drainage culvert located along the northern edge of the landfill. In the spring of 1998, modifications were made in the SWMU 3 area when a paved access road was constructed over the top of the closed landfill. The landfill was found to encompass approximately 44,000 square ft and with a maximum thickness of 17 ft. Total volume of the landfill was estimated to be approximately 14,000 cubic yards (Remcor, 1988).

6.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Remcor conducted a site investigation of this area in 1988. The results of this investigation were summarized in *Site Investigation, Former Waste Disposal Area South of Bar Fabrication Building, Armco Kansas City Works, Kansas City, Missouri* (Remcor, 1988). A copy of this report is provided in Appendix B-1. This report presented information regarding the following:

- horizontal and vertical extent of waste materials
- chemical characterization of waste within the landfill (i.e., results for total lead and extraction procedure for toxicity [EP Toxicity] metals for samples of the waste materials)
- site surface features, including integrity of the soil cap

During the RFI, groundwater samples were collected around SWMU 3 for dissolved cadmium and lead analyses. Dissolved cadmium was not detected. Dissolved lead was detected in four of the six samples, and all detections were below the groundwater screening MCL (0.015 mg/L). Section 6.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 3.

6.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, direct-push sampling techniques were used to collect groundwater samples in the vicinity of SWMU 3, South of Bar Fab Landfill. The intent of this sampling was to verify results of groundwater samples collected during the RFI in the downgradient direction of groundwater flow. Table 6-1 outlines the sample collection, and Figure 6-1 presents the sampling locations. Four direct-push borings were placed at selected locations at SWMU 3. These borings (i.e., 03B01A, 03B02A, 03B03A, and 03B08A) were placed at the approximate location of their associated RFI borings (i.e., 03B01, 30B02, 03B03, and 03B08). Emphasis was placed on collecting groundwater samples within 10 ft of the water table surface. Three of the borings (03B01A, 03B02A, and 03B03A) were dry and could not be sampled for groundwater parameters. Multiple offsets for these locations were attempted and borings were advanced to bedrock (approximately 40 ft bgs); however, groundwater was not encountered at any of these locations. It is likely that infiltration in this area is minimal since the area is paved and the adjacent banks of the Blue River are also paved. After consultation with the USEPA and MDNR project managers, additional attempts to sample groundwater at SWMU 3 were not made.

Groundwater samples collected from 03B08A were submitted to TestAmerica Valparaiso for analysis of cadmium and lead. Due to elevated turbidity resulting from using direct-push sample collection techniques, samples for analysis of cadmium and lead were field filtered. A field duplicate was collected for a field QC sample.

6.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 3 are presented on Table 6-2. Groundwater detections were screened against MCLs. Dissolved cadmium was detected in the groundwater sample (0.0010 mg/L) and field duplicate (0.0014 mg/L) collected from location 03B08A. Both results were less than the 0.005 mg/L MCL. Dissolved lead was not detected in the sample or field duplicate collected from location 03B08A.

6.5 COMPARISON TO PREVIOUS DATA

Supplemental Investigation location 03B08A was co-located with RFI location 03B08. A comparison of the data sets is provided below:

Comparison of RFI and Supplemental Investigation Results				
Sample	**Date**	**Depth (ft bgs)**	**Dissolved Cadmium**	**Dissolved Lead**
03B08	3/20/1997	18-20	Not Detected (< 0.005)	0.005
03B08 – Duplicate	3/20/1997	18-20	Not Detected (< 0.005)	0.008
03B08A	9/13/2007	23-27	0.0010	Not Detected (< 0.0005)
03B08A – Duplicate	9/13/2007	23-27	0.0014	Not Detected (< 0.0005)

- Results are presented in mg/L.

Results for both sampling events were similar and indicate comparability of the data sets. Results from groundwater samples collected during the RFI and Supplemental Investigation indicate that the nature and extent of metals in groundwater has been adequately characterized. The data indicate that groundwater is only sporadically present above bedrock in this area. In addition, detections of cadmium and lead in groundwater, when encountered, were less than the MCLs.

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7.0 SWMU 7 – NO. 1 MELT SHOP BAGHOUSE DUST TANKS

7.1 SWMU BACKGROUND

The No. 1 Melt Shop Baghouse Dust Tanks (SWMU 7), located on AK Steel property (see Figure 1-2), consisted of two former tanks used for temporary storage of emission control dust. The total storage capacity of the tanks was approximately 75 cubic yards. Prior to their demolition in 1991, the tanks were cleaned by a remediation contractor, and emission control dust was removed from dust handling equipment. No evidence of SWMU 7 remains. The original defined SWMU area was approximately 50 ft by 25 ft (less than 0.05 acres) in size. During the RFI, the SWMU 7 area expanded in size west and south of the former tanks to approximately 2 acres.

7.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, a total of 198 surface soil and subsurface soil samples were collected for cadmium and lead analyses, and 6 subsurface soil samples were analyzed for soil pH. Section 10.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 7. XRF spectroscopy was used to field screen for lead in samples from Borings 07B09 to 07B35. Additionally, analytical services for samples collected from Borings 07B36 to 07B37 and Test Pits 07TP01 to 07TP18 were provided by STL Burlington.

RFI laboratory data indicated that soil pH values were basic (pH 9.1 J* to 11.5 J*). Additionally, cadmium and lead were detected throughout the sampling area (highest concentrations 281 DJ* and 14,300 J* mg/kg, respectively) at concentrations exceeding the SSLs (8 mg/kg for cadmium and 400 mg/kg for lead) that were used for nature and extent screening during the RFI. In many locations, samples were collected until physical restrictions were reached (i.e., No. 1 Melt Shop foundation to the north and bank of the Blue River to the south). The horizontal extent of cadmium and lead was defined by Boring 07B23 to the east of SWMU 7. Along the north, south, and west, the horizontal extent was defined by either sampling locations (Test Pits 07TP01 through 07TP06 to the west) or physical restrictions (No. 1 Melt Shop on the north and the Blue River on the south). The majority of the cadmium and lead contamination was limited to the upper 4 ft of soil.

Figure 7-2 provides the results of the RFI XRF field screening for lead. Results in excess of the 400 mg/kg SSL are highlighted in red. Additionally, a tabular summary of the XRF results is provided in Appendix S of the RFI Report (See Appendix A). Similar areas of soil with lead concentrations in excess

of 20 DAF SSLs were noted whether using the ITS Richardson or XRF data; therefore, the RFI Report conclusions were corroborated by the XRF data. Since cadmium and lead associated with emission control dust are expected to be co-located, review of the XRF lead data provides an acceptable surrogate for cadmium. Use of the field XRF and STL Burlington data provides sufficient data to support the conclusions made regarding SWMU 7 in the RFI Report.

During the RFI, groundwater was not sampled because compacted slag fill in the area caused refusal during direct-push probing before groundwater was encountered. The RCRA Landfill is a monofill of electric arc furnace dust, which contains elevated concentrations of cadmium and lead. Similar electric arc furnace dust contamination was encountered at SWMU 7 in subsurface soils. Groundwater data is available from extensive monitoring that was undertaken for the Emission Control Dust Landfill (i.e., RCRA Landfill). Over 10 years of groundwater monitoring was conducted at the RCRA Landfill and the lack of mobility of the electric arc furnace dust was demonstrated. Summaries of lead and cadmium groundwater data for the RCRA Landfill monitoring wells are provided in Appendix B-6.

The RCRA Landfill, which is located on the floodplain of the Blue and Missouri Rivers, was constructed in naturally occurring soil. Although no construction records are available, two parallel but unequal length trenches 10 feet deep were excavated into previously deposited soil. This soil had been excavated during construction of the No. 2 Melt Shop. Therefore, the subsurface conditions at the RCRA Landfill are expected to be similar to SWMU 7. The slag present at SWMU 7 provides a barrier to infiltration in much the same way as the cap of the RCRA Landfill. Due to the similarities between the two locations, lead and cadmium in the subsurface are expected to behave similarly. Since groundwater has not been impacted at the RCRA Landfill, groundwater impact is not anticipated at SWMU 7.

7.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, surface soil samples were collected at SWMU 7, No. 1 Melt Shop Baghouse Dust Tanks. The intent of this sampling was to verify results of RFI surface soil samples that were collected in the immediate vicinity of the former baghouse dust tanks. Table 7-1 outlines the sample collection, and Figure 7-1 presents the sampling locations. Discrete surface soil samples were collected from three locations (i.e., 07B01A, 07B02A, and 07B03A) that were placed in the approximate locations of their associated RFI borings (i.e., 07B01, 07B02, and 07B03). Surface soil samples were collected from two depth intervals: 0 to 6 inches bgs and 6 to 12 inches bgs. Soil samples were submitted to TestAmerica Valparaiso for analysis of total cadmium and total lead.

7.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 7 are presented on Table 7-2. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers.

Cadmium and lead results are presented on Figure 7-3. Cadmium and lead were detected in all of the SWMU 7 soil samples collected during the Supplemental Investigation. The highest concentrations of cadmium (40 mg/kg) and lead (1,000 J+ mg/kg) were noted for the sample collected from the 0.5 to 1 ft bgs interval at location 07B02A.

Cadmium concentrations ranged from 5.3 to 40 mg/kg. Cadmium detections from all samples except the 0 to 0.5 ft bgs interval at location 07B01A exceeded the 20 DAF SSL screening level used during the RFI, and all cadmium concentrations were below the USEPA Region 6 human health screening levels for industrial workers. Lead concentrations for samples collected from the 0.5 to 1 ft bgs interval at locations 07B02A and 07B03A exceeded the USEPA human health screening levels for industrial workers and the 20 DAF SSL. The lead concentration for the sample collected from the 0 to 0.5 ft bgs interval at location 07B03A only exceeded the 20 DAF SSL.

7.5 COMPARISON TO PREVIOUS DATA

The intent of the Supplemental Investigation sampling was to verify results of RFI surface soil samples that were collected in the immediate vicinity of the former baghouse dust tanks. RFI locations in close proximity to Supplemental Investigation locations include:

Sampling Locations in Close Proximity			
Supplemental Investigation		**RFI**	
Location	Depth (ft bgs)	Location	Depth (ft bgs)
07B01A	0 - 0.5 0.5 - 1	07G01	0 - 0.5 0.5 - 1
07B02A	0 - 0.5 0.5 - 1	07G02	0 - 0.5 0.5 - 1
07B03A	0 - 0.5 0.5 - 1	07G03	0 - 0.5 0.5 - 1

Samples collected during the RFI were composites of five samples collected across the sampling grid noted on Figure 7-3. In contrast, Supplemental Investigation samples were collected as discrete samples using direct-push sampling equipment. Results for the RFI samples are provided in Table 10-2 of the

RFI Report and are included in Appendix A. Comparison of the Supplemental Investigation and RFI data sets indicates that the magnitude of the cadmium and lead detections and screening level exceedences are similar.

Results of the Supplemental Investigation samples (See Figure 7-3) combined with samples previously analyzed using field XRF or by STL Burlington during the RFI (See Figure 7-2) provide a comprehensive data set for delineation of the extent of cadmium and lead contamination at SWMU 7. The horizontal extent of cadmium and lead was defined by Boring 07B23 to the east of SWMU 7. Along the north, south, and west, the horizontal extent was defined by either sampling locations (Test Pits 07TP01 through 07TP06 to the west) or physical restrictions (No. 1 Melt Shop on the north and the bank of the Blue River on the south). The majority of the cadmium and lead contamination was limited to the upper 4 ft of soil.

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8.0 SWMU 9 – NO. 1 MELT SHOP BAGHOUSE DUST CONVEYOR

8.1 SWMU BACKGROUND

The No. 1 Melt Shop Canopy Baghouse Dust Conveyor (SWMU 9), located on AK Steel property (see Figure 1-2), operated between 1977 and 1988 as a part of the Secondary Emissions Control System for the No. 1 Melt Shop. The purpose of this system was to help manage emission control dust generated by the electric arc furnaces installed at the No. 1 Melt Shop. The conveyor consisted of a steel screw approximately 12 inches in diameter and 65 ft long. The conveyor was used to transfer emission control dust from the adjacent baghouse to a transfer truck for transport to and management at other on-site locations. The conveyor was removed in November 1993. The equipment was cleaned and was observed to be free of emission control dust prior to removal. No evidence of SWMU 9 remains. The defined SWMU area is approximately less than 0.1 acres in size.

8.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, six surface soil samples were collected for cadmium and lead analyses. Section 12.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 9. Cadmium and lead were either non-detect, or detected at concentrations below the 20 DAF SSLs (8 and 400 mg/kg, respectively).

8.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, surface soil samples were collected at SWMU 9, No. 1 Melt Shop Baghouse Dust Conveyor. The intent of this sampling was to verify the results of surface soil samples that were collected during the RFI. Table 8-1 outlines the sample collection, and Figure 8-1 presents the sampling locations. Surface soil samples were collected from two locations at SWMU 9 – two composite samples from the southern portion of SWMU 9 and two discrete samples from the northern portion of SWMU 9 (see Figure 8-1). Surface soil samples were collected from two depth intervals: 0 to 6 inches bgs and 6 to 12 inches bgs. In the southern portion of SWMU 9, discrete surface soil aliquots were collected from seven locations within grid 09G04, which was a combination of RFI grids 09G02 and 09G03 (see Figure 8-1), and composited to create a single sample for laboratory submission for each depth interval. In the northern portion of SWMU 9, one discrete sample was collected from each depth interval at the approximate center of RFI grid 09G01. Soil samples were submitted to TestAmerica Valparaiso for analysis of total cadmium and total lead.

8.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 9 are presented on Table 8-2. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers.

Cadmium and lead results are presented on Figure 8-2. Cadmium and lead were detected in all of SWMU 9 soil samples collected during the Supplemental Investigation; however, none of the detections exceeded screening levels. The highest concentration of cadmium (2.5 mg/kg) was noted in the sample collected from the 0.5 to 1 ft bgs interval at location 09B01. The highest concentration of lead (150 J+ mg/kg) was noted in the sample collected from the 0 to 0.5 ft bgs interval at grid 09G04.

Results of the Supplemental Investigation samples provide a comprehensive data set for delineation of the extent of cadmium and lead at SWMU 9. Since the results of the Supplemental Investigation samples were less than the screening levels, the extent of cadmium and lead were considered defined by the SWMU boundaries indicated on Figures 8-1 and 8-2.

8.5 COMPARISON TO PREVIOUS DATA

The intent of the Supplemental Investigation sampling was to verify results of RFI surface soil samples. RFI locations correlated to Supplemental Investigation locations as follows:

Comparison of Supplemental Investigation and RFI Sampling Locations			
Supplemental Investigation		**RFI**	
Location	Depth (ft bgs)	Location	Depth (ft bgs)
09B01	0 - 0.5 0.5 - 1	09G01	0 - 0.5 0.5 - 1
09G04	0 - 0.5 0.5 - 1	09G02	0 - 0.5 0.5 - 1
		09G03	0 - 0.5 0.5 - 1

Samples collected during the RFI were composites of five samples collected across the sampling grids noted on Figure 8-2. In contrast, Supplemental Investigation samples were collected as discrete samples using direct-push sampling equipment at location 09B01 and as a composite of discrete aliquots collected across RFI grids 09G02 and 09G03 for location 09G04. Results for the RFI samples are provided in Table 12-2 of the RFI Report and are included in Appendix A. Comparison of the Supplemental Investigation and RFI data sets indicates that the magnitude of the cadmium and lead detections are similar. Neither data set exhibited results in excess of screening levels.

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9.0 SWMU 6 / AOC 4 – RCRA PERMITTED BAGHOUSE DUST STORAGE TANKS / BOILER FURNACE AREA

9.1 SWMU BACKGROUND

SWMU 6 and AOC 4 are located adjacent to each other in an area often referred to as the "tank farm area." Due to their proximity, they are presented together in this section for the sake of brevity and ease of understanding. The combined area of the defined boundaries of SWMU 6 and AOC 4 is approximately 3 acres.

SWMU 6

The RCRA Permitted Baghouse Dust Storage Tanks (SWMU 6), located on AK Steel property (see Figure 1-2), were four aboveground storage tanks (ASTs), known as Tanks 1, 2, 3, and 5. The ASTs were originally constructed for fuel oil storage, but were later used to store emission control dust. Tanks 2, 3, and 5 were approximately 100 ft in diameter with a height of approximately 40 ft, and each had a capacity of approximately 2,350,000 gallons. Tank 1 was approximately 100 ft in diameter with a height of 30 ft and had a capacity of approximately 1,750,000 gallons.

During their use for fuel oil storage, the ASTs stored No. 2 and No. 6 fuel oil. A central aboveground pipeline connected each of the tanks with the pumphouse which was located south of Tanks 1 and 2. Tanks 1, 2, and 3 were installed sometime between 1947 and 1953, and Tank 5 was installed in 1975. At some point, a new pumphouse was installed to the northwest of Tank 3 to replace the old pumphouse. The old pumphouse was cleaned in 1994 and removed in 1997/1998. The new pumphouse was demolished along with the tanks in 1998.

In January of 1983, landfill closure activities began at the RCRA Landfill, and the emission control dust generated at the No. 1 and No. 2 Melt Shops began being stored in the ASTs at SWMU 6. A hazardous waste permit issued to Armco in February 1985 allowed the storage of K061 waste (i.e. emission control dust) in these ASTs. On July 15, 1986, Armco ceased adding K061 to the tanks. Between 1987 and June 1991, the tanks were emptied and emission control dust was transported off site for reclamation using the Dust Railcar Loading Area – Bar Joist Building (SWMU 10). On November 19, 1990, certifications of closure were submitted to MDNR for Tanks 3 and 5, and on August 2, 1991, certifications of closure were submitted to MDNR for Tanks 1 and 2. The ASTs were not used for any other purpose after they

were cleaned and closed. The hazardous waste permit expired in February 1992. A renewal application for a hazardous waste permit was submitted in January 1992 but was subsequently withdrawn.

As part of the closure activities, emission control dust was removed from the tanks and the interior walls were vacuumed. A high-powered wash followed the vacuum procedure. Post-cleaning wipe samples were collected and analyzed for cadmium. Results of this analysis for the tanks and limited adjacent soil sampling are provided in Appendix B-3 to this report.

AOC 4

The Boiler Furnace Area (AOC 4), located on AK Steel property (see Figure 1-2), represents an area containing boilers that were supplied with natural gas supplemented by on-site fuel oil. In the past, fuel oil burned in the boilers was supplied from Tank 4 at the Fuel Storage Tank Farm and transported by aboveground piping to the boilers. During this time, waste oil accumulated at SWMU 24 and was pumped to Tank No. 4 for inclusion in the fuel oil. This practice was performed until 1991 when Armco began transporting waste oil off site for fuel blending. In 1993, the boilers were shut down and the transfer of fuel oil from Tank 4 ceased. The associated equipment was thoroughly cleaned in 1994.

Various records indicate that for a brief time in the 1980s, 1,1,1-trichloroethane (1,1,1-TCA) may have been mixed into the waste oil and subsequently mixed with the fuel oil and used in the boiler furnaces. There was no mechanism at the boilers to incorporate the addition of any material to the fuel oil supply. As such, it was assumed that the only mechanism for incorporation of the 1,1,1-TCA into the fuel oil would have occurred at Tank 4. Therefore, Tank 4 was designated as AOC 4 rather than the boilers themselves.

Information Pertinent to both SWMU 6 and AOC 4

In early 1998, modifications were made in the SWMU 6 and AOC 4 area. These modifications involved the removal of Tanks 1, 2, 3, and 5 (SWMU 6) and Tank 4 (located near AOC 4) along with the associated piping formerly used to supply fuel oil to the tanks. These tanks were demolished, the associated steel was cut up, and the materials were sold as prepared scrap for resmelting. The bases of Tanks 1, 2, 3, and 4 have been partially backfilled. The base of Tank 5 has been filled with approximately 1-foot of slag. Armco notified USEPA of these modifications in a letter dated January 20, 1998, and USEPA and MDNR acknowledged the modifications in a letter dated January 29, 1998.

In a letter dated March 9, 1999, Armco advised USEPA that a strip of land adjacent to the Kansas City Terminal Railway Company's (KCT's) right-of-way was transferred by deed to the KCT for construction of the Flyover Project to relieve rail transportation congestion and public safety issues in the area. Armco also granted ingress/egress easements to KCT in the tank farm area (SWMU 6 and AOC 4) for surface use during the construction phase of the Flyover Project. As indicated on Figure 1-2, the easement parcel 3A contained parts of SWMU 6 and AOC 4.

9.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Surface soil, subsurface soil, and groundwater samples were collected at SWMU 6 and AOC 4 during the RFI. Tables 9-1 and 9-2 in the RFI Report (See Appendix A) present the investigation activities. Section 9.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 6 and AOC 4. ITS Richardson provided analytical services for some of the samples; however, analytical services were also provided by STL Burlington. Additionally, XRF spectroscopy was used to field screen for lead in 52 soil samples, and these samples were not duplicative of samples submitted to STL Burlington. Groundwater was collected at four locations, and samples were analyzed for VOCs. These samples are more appropriately discussed with the groundwater data at adjacent SWMU 24 (See Section 10.2).

During the RFI, surface soil and subsurface soil samples were collected and analyzed for RCRA metals, VOCs, SVOCs, and/or PAHs. During RFI Phase 2, demolition activities were occurring at Tanks 1 through 5. Material with an appearance similar to emission control dust was observed on the remaining metal base of demolished Tank 5. Based upon the analytical results of surface soil samples collected from the base of former Tank 5, Armco contracted EnviroKlean, Inc. of Kansas City, Kansas to remove visible dust contamination using a vacuum truck. Three confirmatory surface soil samples were collected following the dust vacuuming activities, and cadmium and lead were detected at concentrations above their respective 20 DAF SSLs (highest concentrations 342 D mg/kg and 12,700 mg/kg, respectively). The Tank 5 area has been backfilled with approximately one foot of slag.

Subsurface soil samples were collected from direct-push borings and exploratory trenches. Sampling was primarily focused around the vicinity of Tanks 4 and 5 for cadmium, lead, and SVOC analyses. Due to the discovery of paint-related materials during the installation of Trench 06T03A, RCRA metals and VOC analyses were also performed on a portion of the samples. Samples with exceedences of 20 DAF SSLs were typically encountered in the vicinity of paint-related materials between Tanks 4 and 5 and occurred to depths of 20 ft bgs. Lead and cadmium or RCRA metals analyses were performed on 118 subsurface soil samples, of which results for 43 samples were provided by STL Burlington and results for

75 samples were provided by ITS Richardson. 20 DAF SSL exceedences were primarily of cadmium and lead (highest concentrations 112 D and 8,210 D mg/kg, respectively), with more limited exceedences (5 or fewer samples each) of the other RCRA metals such as arsenic, mercury, selenium, and silver.

XRF analysis for lead was performed on 52 of the soil samples. This XRF analysis occurred solely on samples that were also submitted to ITS Richardson; therefore, approximately 70 percent of the ITS Richardson sample load has corroborating field XRF data. A tabular summary of the field XRF results is provided in Appendix S of the RFI Report (See Appendix A to this report). Since metals associated with emission control dust and/or painting operations are expected to be co-located, review of the XRF lead data provides an acceptable surrogate for the RCRA metals. That is, elevated results for RCRA metals are expected to be located in the same place as elevated results for lead. Use of the field XRF data in conjunction with the data provided by STL Burlington, provides a sufficient data set to support the conclusions made regarding metals contamination at SWMU 6 and AOC 4 in the RFI Report.

Forty (40) subsurface soil samples were analyzed for PAHs or SVOCs. STL Burlington provided analysis of 21 of these samples. Only limited detections of benzo(a)anthracene (two detections at 4,100 and 7,800 µg/kg) and benzo(b)fluoranthene (one detection at 7,800 µg/kg) exceeded 20 DAF SSLs (2,000 and 5,000 µg/kg, respectively). Since 52 percent of the PAH or SVOC data was provided by STL Burlington, these results are acceptable to use in supporting the conclusions of the RFI Report.

VOCs were analyzed for in 61 subsurface soil samples, and 43 of these results were provided by STL Burlington. Only four detections of methylene chloride (ranging up to 53.6 J* µg/Kg) exceeded the 20 DAF SSL (20 µg/Kg). The extent of VOCs was limited to a smaller area between Tanks 4 and 5, which was associated with paint materials. During exploratory trenching activities, encountered paint drums and surrounding soil were removed from the subsurface and properly disposed at an off-site facility. Since 70 percent of the existing VOC data was provided by STL Burlington, the VOC results are acceptable to use in supporting the conclusions of the RFI Report.

9.3 SCOPE OF ACTIVITIES COMPLETED

Rotosonic drilling techniques were used to collect soil samples in the vicinity of Tanks 1 through 5 at SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks and AOC 4, Boiler Furnace Area. Seven borings were advanced in the vicinity of Tanks 1, 2, 3, and 5 (SWMU 6) and three borings were advanced in the area surrounding Tank 4 (AOC 4). The sample collection is outlined on Table 9-1, and the sampling locations are presented on Figure 9-1. The northernmost location 06B23 was moved within the footprint of Tank 5. As presented in the QA SAP, location 06B23 would have been placed on a slag road

bed, which sat approximately 8 ft above grade. After consulting with the USEPA project manager, who was on-site on the day of sampling, the sample location was moved into Tank 5 footprint so that the sampling intervals would be more representative of the underlying soils. Soil samples were collected from two depth intervals: 0 to 2 ft bgs and 4 to 8 ft bgs. Soil samples were submitted to TestAmerica Valparaiso for analysis of total cadmium, total lead, PAHs, and extractable TPH. Field QC samples include a field duplicate and MS/MSD pair.

SWMU 24 is immediately adjacent to Tanks 1 and 2. Soil samples collected to provide information for SWMU 24 from location 24B11 and 24B12 were also analyzed for parameters relevant to SWMU 6/AOC 4 (See Section 10.2). At SWMU 24, soil samples were collected from four depth intervals: 0 to 2, 2 to 4, 4 to 6, and 6 to 8 ft bgs.

9.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 6 are presented on Table 9-2, and results for AOC 4 are presented on Table 9-3. In addition, results for SWMU 24 soil samples that are relevant to SWMU 6 are presented on Table 9-4. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers. Comprehensive data tables that present both constituent detections and the reporting limits for undetected constituents are provided in Tables C-7 through C-9 in Appendix C.

In general, minimal exceedences of the screening levels were noted in the soil samples, and the extent of metals, PAHs, and TPH was well defined by the collected samples. The cadmium results for one sample exceeded the 20 DAF SSL. In addition, two samples exhibited lead results in excess of the 20 DAF SSL and human health screening levels for industrial workers. Benzo(a)pyrene exceeded the screening levels for Industrial Indoor Workers in four samples, for Industrial Outdoor Workers in nine samples, and the 20 DAF SSL in one sample. The remaining screening level exceedences were noted for PAHs in samples collected at location A04B07.

A summary of the results for borings placed around each Tank is provided in the following paragraphs. Cadmium and lead results are provided on Figure 9-2, and results for PAHs and extractable TPH are provided on Figure 9-3.

Tank 1 (SWMU 6)

Samples collected from locations 06B15, 06B16, 06B17, and 24B12 were used to characterize the nature and extent of contamination surrounding Tank 1 at SWMU 6. Cadmium and lead were not detected in the

sample collected from the 0 to 2 ft bgs interval at location 06B17. In addition, cadmium and lead were not detected in the samples collected from the 0 to 2, 2 to 4, and 6 to 8 ft bgs intervals at location 24B12. Cadmium detections ranged from 0.42 mg/kg to 5.4 mg/kg, and none of these detections exceeded the screening levels. Lead detections ranged from 8.4 to 160 mg/kg, and none of these detections exceeded the screening levels. The horizontal and vertical extent of cadmium and lead was well defined by the sampling locations (See Figure 9-2).

At least one of the PAH constituents was detected in each of the samples collected surrounding Tank 1. With limited exceptions, these PAH detections were flagged as estimated (J) by the laboratory to indicate results between the method detection limit (MDL) and reporting limit (RL). The only PAHs detected above the analytical reporting limit were noted at location 24B12 and included: 2-methylnaphthalene (380 µg/kg in the 4 to 6 ft bgs interval), fluoranthene (630 µg/kg in the 2 to 4 ft bgs interval and 680 J- in the 4 to 6 ft bgs interval), phenanthrene (500 µg/kg in the 2 to 4 ft bgs interval and 620 J- in the 4 to 6 ft bgs interval), and pyrene (480 µg/kg in the 2 to 4 ft bgs interval and 520 in the 4 to 6 ft bgs interval). Total PAH concentrations ranged from 47 J+ µg/kg in the 4 to 8 ft bgs interval at location 06B16 to 4,178 J µg/kg in the 4 to 6 ft bgs interval at location 24B12. None of the PAH detections exceeded the screening levels, and the horizontal and vertical extent of PAHs was well defined by the sampling locations (See Figure 9-3).

Unknown hydrocarbons was the predominant extractable TPH fraction detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10 to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. The highest unknown hydrocarbon detection (170 mg/kg in the 0 to 2 ft bgs interval at location 06B16) was associated with low PAH results. No clear correlation pattern existed between the PAH and extractable TPH results for the other sampling locations (See Figure 9-3).

Tank 2 (SWMU 6)

Samples collected from locations 06B17, 06B18, 24B11, and 24B12 were used to characterize the nature and extent of contamination surrounding Tank 2 at SWMU 6. Cadmium and lead were not detected in the sample collected from the 0 to 2 ft bgs interval at location 06B17. In addition, cadmium and lead were not detected in the samples collected from any of the depth intervals at location 24B11 and the 0 to 2, 2 to 4, and 6 to 8 ft bgs intervals at location 24B12. Cadmium detections ranged from 0.42 mg/kg to 4.5 mg/kg, and none of these detections exceeded the screening levels. Lead detections ranged from 8.4 to

160 mg/kg, and none of these detections exceeded the screening levels. The horizontal and vertical extent of cadmium and lead was well defined by the sampling locations (See Figure 9-2).

At least one of the PAH constituents was detected in each of the samples collected surrounding Tank 2. Most PAH detections were flagged as estimated (J) by the laboratory to indicate results between the MDL and RL. Total PAH concentrations ranged from 43 J µg/kg in the sample from the 2 to 4 ft bgs interval at location 24B11 to 8,610 J µg/kg in the 0 to 2 ft bgs interval at location 06B18. The benzo(a)pyrene result for the sample collected from the 0 to 2 ft bgs interval at location 06B18 (820 µg/kg) exceeded both the Industrial Indoor and Outdoor Worker screening levels. In addition, the benzo(a)pyrene result for the sample collected from the 4 to 8 ft bgs interval at location 06B18 (390 µg/kg) exceeded only the Industrial Outdoor Worker screening level. No other PAH results exceeded the screening levels, and the horizontal and vertical extent of PAHs was well defined by the sampling locations (See Figure 9-3).

Unknown hydrocarbons were the predominant extractable TPH fraction detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10 to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. Unknown hydrocarbon detections ranged from 21 mg/kg in the sample from the 2 to 4 ft bgs interval at location 24B12 to 1,100 mg/kg in the sample from the 4 to 8 ft bgs interval at location 06B18. The highest unknown hydrocarbon detection was associated with one of the highest Total PAH results. However, no clear correlation pattern existed between the PAH and extractable TPH results for the other sampling locations surrounding Tank 2 (See Figure 9-3).

Tank 3 (SWMU 6)

Samples collected from locations 06B19, 06B20, and 06B21 were used to characterize the nature and extent of contamination surrounding Tank 3 at SWMU 6. Cadmium and lead were detected in samples collected from all locations and depth intervals. Cadmium detections ranged from 0.34 mg/kg to 7.5 mg/kg, and none of these detections exceeded the screening levels. Lead detections ranged from 16 to 1,300 mg/kg, and only the highest lead result for the sample collected from the 4 to 8 ft bgs interval at location 06B20 (1,300 mg/kg) exceeded the screening levels. The extent of cadmium and lead was well defined by the sampling locations (See Figure 9-2).

PAHs were detected in each of the samples collected surrounding Tank 3. Individual PAH constituents detected were similar throughout the sampling locations. Total PAH concentrations were higher at Tank 3 than previously observed at Tanks 1 and 2, and Total PAH concentrations ranged from 3,021 J µg/kg in

the sample from the 4 to 8 ft bgs interval at location 06B19 to 7,064 J µg/kg in the 0 to 2 ft bgs interval at location 06B20. Benzo(a)pyrene was detected in all of the samples collected surrounding Tank 3, and the results exceeded the Industrial Outdoor Worker screening level of (230 µg/kg). Benzo(a)pyrene concentrations ranged from 240 J µg/kg to 550 µg/kg. No other PAH results exceeded the screening levels, and the horizontal and vertical extent of PAHs was well defined by the sampling locations (See Figure 9-3).

Unknown hydrocarbons were the only extractable TPH fraction detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10 to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. Unknown hydrocarbon detections ranged from 81 mg/kg in the sample from the 0 to 2 ft bgs interval at location 06B19 to 350 mg/kg in the sample from the 4 to 8 ft bgs interval at location 06B20. There was no clear correlation pattern between the magnitude of PAH and extractable TPH results (See Figure 9-3).

Tank 4 (AOC 4)

Samples collected from locations A04B05, A04B06, and A04B07 were used to characterize the nature and extent of contamination surrounding Tank 4 at AOC 4. Cadmium and lead were in samples collected from all locations and depth intervals. Cadmium detections ranged from 0.14 mg/kg to 2.3 mg/kg, and none of these detections exceeded the screening levels. Lead detections ranged from 5.5 to 260 mg/kg, and none of these detections exceeded the screening levels. The extent of cadmium and lead was well defined by the sampling locations (See Figure 9-2).

PAHs were detected in each of the samples collected surrounding Tank 4. The highest Total PAH concentrations encountered in the tank farm area were noted in the 4 to 8 ft bgs interval at location A04B05 and at both depth intervals at location A04B07. Total PAH concentrations for samples collected surrounding Tank 4 ranged from 37 J µg/kg in the sample from the 0 to 2 ft bgs interval at location A04B06 to 256,100 µg/kg in the 4 to 8 ft bgs interval at location A04B07. The following table summarizes the PAH concentrations that exceeded one or more screening levels. Detailed information regarding the screening results can be obtained from Table 9-3. Samples where no constituents were identified at concentrations exceeding a screening level are not included below:

AOC 4 Samples with PAH Results above Screening Levels				
	Units	**A04B05 4-8 ft bgs**	**A04B07 0-2 ft bgs**	**A04B07 4-8 ft bgs**
Benzo(a)anthracene	µg/kg	-	-	22,000
Benzo(a)pyrene	µg/kg	1,100	1,900	17,000
Benzo(b)fluoranthene	µg/kg	-	2,600	22,000
Dibenz(a,h)anthracene	µg/kg	-	-	3,900
Indeno(1,2,3-cd)pyrene	µg/kg	-	-	8,400

Notes:

- = Indicates constituent either was not detected or does not exceed a screening level

µg/kg = milligram per kilogram

Unknown hydrocarbons were the only extractable TPH fraction detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10 to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. Unknown hydrocarbon detections ranged from 53 mg/kg in the sample from the 0 to 2 ft bgs interval at location A04B05 to 620 mg/kg in the sample from the 4 to 8 ft bgs interval at the same location. There was no clear correlation pattern between the magnitude of PAH and extractable TPH results (See Figure 9-3).

Tank 5 (SWMU 6)

Samples collected from locations 06B22 and 06B23 were used to characterize the nature and extent of contamination surrounding Tank 5 at SWMU 6. Cadmium and lead were in samples collected from all locations and depth intervals. Cadmium detections ranged from 0.27 J mg/kg to 23 mg/kg, and the results for the sample collected from the 0 to 2 ft bgs interval at location 06B22 (23 mg/kg) exceeded the 20 DAF SSL. Lead detections ranged from 57 to 830 mg/kg, and the results for the sample collected from the 0 to 2 ft bgs interval at location 06B22 (830 mg/kg) exceeded the 20 DAF SSL and the Industrial Indoor and Outdoor Worker screening levels. The extent of cadmium and lead was well defined by the sampling locations (See Figure 9-2).

PAHs were detected in each of the samples collected surrounding Tank 5. Individual PAH constituents detected were similar throughout the sampling locations. Total PAH concentrations ranged from 901 J µg/kg in the sample from the 4 to 8 ft bgs interval at location 06B22 to 4890 J µg/kg in the 0 to 2 ft bgs

interval at the same location. None of the PAH detections exceeded the screening levels, and the horizontal and vertical extent of PAHs was well defined by the sampling locations (See Figure 9-3).

Unknown hydrocarbons were the only extractable TPH fraction detected. The laboratory indicated that the unknown hydrocarbons did not elute in any one category (i.e., diesel, kerosene, mineral spirits, fuel oil, etc.) and contained hydrocarbons chains with 10 to greater than 40 carbon atoms (i.e., C10 to > C40). These unknown hydrocarbons would be consistent with fuel and oil mixtures that have been weathered. Unknown hydrocarbon detections ranged from 1,200 mg/kg in the sample from the 0 to 2 ft bgs interval at location 06B23 to 8,400 mg/kg in the sample from the 0 to 2 ft bgs interval at location 06B22. The unknown hydrocarbons detected in sample collected at Tank 5 were an order of magnitude higher than extractable TPH concentrations for other samples in the SWMU 6/AOC 4 area, and the source of the difference is unclear. There was no clear correlation pattern between the magnitude of PAH and extractable TPH results (See Figure 9-3), especially in comparison to other samples collected in the SWMU 6/AOC 4 area.

9.5 COMPARISON TO PREVIOUS DATA

The intent of the Supplemental Investigation sampling was to verify results of RFI surface soil samples. RFI locations generally correlated to Supplemental Investigation locations as follows:

Comparison of Supplemental Investigation and RFI Sampling Locations			
Supplemental Investigation		**RFI**	
Location	Depth (ft bgs)	Location	Depth (ft bgs)
06B15	0-2 4-8	06B01	0.8-2.8 4-5.5
06B16	0-2	06B04	1-3
06B17	0-2	06B03 06B05	1.4-3.4 1.5-3.5
06B18	0-2	06B08	1-3
06B19	0-2 4-8	06B09 06B12	2-4 5-7
06B20	0-2	06B10	1-3
06B21	0-2	06B11	1.2-3.2
A04B06	0-2 4-8	A04B02	2-4
A04B07	0-2 4-8	A04B04	2-4 4-6

Figures 9-1 through 9-3 present the RFI sample locations as well as the Supplemental Investigation sample locations. In many instances, the samples were not co-located and were collected at different

depth intervals. In addition, physical changes that include tank removal and grading have occurred in this area subsequent to the RFI sampling activities. Therefore, the data comparison focused on identifying whether the results of the Supplemental Investigation impacted any conclusions made regarding this area based upon the RFI data.

9.5.1 Metals

During the RFI, the results for soil samples collected in the vicinity of Tanks 1, 2, and 3 indicated minimal contamination in this area with cadmium and lead. The only exceedence of the 20 DAF SSL was noted for cadmium at location 06B10 in the 1 to 3 ft bgs interval with a concentration of 8.02 mg/kg (20 DAF SSL = 8 mg/kg). Similarly, the only exceedence of screening levels for the Supplemental Investigation samples collected in the vicinity of Tanks 1, 2, and 3 was noted for lead at location 06B20 in the 4 to 8 ft bgs interval. This sampling location was placed in close proximity to RFI location 06B10.

During the RFI, the results for soil samples collected in the vicinity of Tank 4 also indicated minimal detections of cadmium and lead. During the RFI, the highest cadmium concentration at AOC 4 was noted in the 4 to 6 ft bgs interval at location A0B03 (12.3 J* mg/kg) and a similar low level exceedence was noted in the 2 to 4 ft bgs interval at location A04B04 (9.6 J* mg/kg). Similarly, the highest lead concentrations at AOC 4 were noted in 4 to 6 ft bgs interval at RFI location A0B03 (1,070 mg/kg) and a similar low level exceedence was noted in the 2 to 4 ft bgs interval at location A04B04 (732 mg/kg). These results correlated with the Supplemental Investigation samples, which exhibited no exceedences of screening levels in samples collected from the 0 to 2 ft bgs and 4 to 8 ft bgs intervals.

During the RFI, the results for soil samples collected in the vicinity of Tank 5 at location 06B13 and 06B14 exhibited the highest cadmium and lead concentrations. Cadmium concentrations ranged from 10.2 mg/kg in the sample collected from the 0 to 2 ft bgs interval at location 06B13 to 62.6 mg/kg in the sample collected from the 2 to 4 ft bgs interval at location 06B14. Likewise, lead concentrations ranged from 456 J* mg/kg in the sample collected from the 0 to 2 ft bgs interval at location 06B13 to 3,620 mg/kg in the sample collected from the 2 to 4 ft bgs interval at location 06B14. A similar trend was noted during the Supplemental Investigation for locations 06B22 and 06B23; however, exceedences of screening levels were only noted at one location.

9.5.2 PAHs

During the RFI, the results for soil samples collected in the vicinity of all of the tanks indicated minimal contamination of this area with PAHs. None of the RFI sample exhibited results in exceedence of the 20 DAF SSL, and Total PAH concentrations ranged from 467 to 10,910 µg/kg. Similar PAHs were detected,

and similar PAH concentrations were noted for the Supplemental Investigation samples. With the exception noted below, none of the Supplemental Investigation soil samples exceeded the RFI 20 DAF SSLs. Benzo(a)pyrene was noted for both the RFI and Supplemental Investigation samples, and exceedences of the Industrial Worker screening levels occurred in both data sets. An exception was noted at Supplemental Investigation location A04B07, which exhibited much higher PAH results than the corresponding samples collected from RFI location A04B04, and the source of this discrepancy is unclear. With the exception of the immediate area surrounding this AOC 4 location, the lack of screening level exceedences for both the RFI and Supplemental Investigation samples indicate adequate characterization of PAHs in the area surrounding the tanks.

9.5.3 TPH

The extractable TPH analysis used for the Supplemental Investigation provided more detailed information regarding individual TPH fractions than the analytical method used during the RFI (See RFI Report Appendix U, which is provided in Appendix A to this report.). Due to the difference in reporting, a qualitative comparison was performed for the TPH analyses. Extractable TPH was the predominant fraction detected in both the RFI and Supplemental Investigation samples collected at SWMU 6 and AOC 4. In addition, elevated concentrations of extractable TPH were noted at similar depth intervals during both investigations. These similarities indicate that conclusions made regarding TPH contamination for both investigations would be comparable.

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10.0 SWMU 24 – WASTE HYDRAULIC LUBRICATING OIL STORAGE TANKS

10.1 SWMU BACKGROUND

The former Waste Hydraulic and Lubricating Oil Storage Tanks (SWMU 24), located on AK Steel and KCT property (Figure 1-2), functioned between 1975 and 1993 as a waste oil collection system for the entire Facility. Waste oil of various types was brought to the area in drummed containers or 600-gallon waste oil "tote boxes". Until 1991, the waste oil from SWMU 24 was incorporated into the heating oil supply; however, after November 1991, waste oil was sent off site for fuel blending. The defined SWMU area is approximately 1 acre in size.

When the SWMU was removed from service in 1993, its components were cleaned and subsequently dismantled and removed. The two ASTs at SWMU 24 were cut up and recycled in 1996.

Various records indicated that for a brief time in the 1980s, 1,1,1-TCA might have been mixed into the waste oil, subsequently mixed with the fuel oil, and utilized in the boiler furnaces. There was no mechanism at the boilers to incorporate the addition of any material to the fuel oil supply. If 1,1,1-TCA was added to the fuel oil system, it most likely would have been added in the waste oil area (SWMU 24), and have been subsequently transferred to Tank No. 4 (AOC 4) at the Fuel Storage Tank Farm.

As reported to USEPA and MDNR in a letter dated March 9, 1999, Armco sold a portion of its property, totaling less than one (1) acre, to KCT for construction of an overhead Railroad Bridge known as the Flyover Project to relieve transportation congestion and public safety issues in the area. These parcels of land (i.e., 10A, 10, and 11) contained a significant portion of SWMU 24. As part of the Flyover Project, the low-lying area at the center of SWMU 24 has been partially filled by KCT.

10.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Surface soil, subsurface soil, and groundwater samples were collected at SWMU 24 during IM activities and the RFI. Samples were collected and analyzed for RCRA metals, pH, VOCs, and PAHs. ITS Richardson provided the analytical services. Field screening TPH analysis was performed during the IM, and field XRF was performed for lead during Phase 2 of the RFI. Section 18.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 24. Appendix Q of the RFI Report presents the field TPH data, and Appendix S of the RFI Report presents the field XRF data (See Appendix A).

Soil

Subsurface soil samples were collected from direct-push borings and exploratory trenches, and composite surface soil samples were collected from grids placed at the former tank location. Soil pH values were neutral to slightly basic (pH 7.8 to 9.3) in the 14 samples analyzed. A total of 51 surface and subsurface soil samples were analyzed for RCRA metals. Of these, field XRF screening for lead was performed for 8 samples (approximately 16 percent of the sample load). Cadmium and lead were detected throughout this area at concentrations exceeding their 20 DAF SSLs (8 and 400 mg/kg, respectively), and the detections extended to 15 ft bgs. The highest concentrations of cadmium and lead were 55.1 FJ* and 1,730 mg/kg, respectively. Only one detection each of arsenic and chromium and two detections of selenium exceeded 20 DAF SSLs. These limited exceedences of arsenic and selenium occurred primarily in a small area in the immediate vicinity of the former tank location and extended no deeper than 5 ft bgs.

Additionally, 51 surface and subsurface soil samples were analyzed for PAHs. Of these, TPH field screening by immunoassay was performed for 25 samples (approximately 50 percent of the sample load). PAH detections of benzo(a)anthracene (2.02 DJ and 7.13 mg/kg) and benzo(b)fluoranthene (11.4 mg/kg) exceeded 20 DAF SSLs (2 and 5 mg/kg, respectively). These limited exceedences of PAHs occurred primarily in a small area in the immediate vicinity of the former tank location and extended no deeper than 5 ft bgs.

VOCs were analyzed for in 29 surface and subsurface soil samples; however, VOCs were not detected.

Groundwater

During the IM and RFI, groundwater samples were analyzed for RCRA metals (2 samples), pH (1 sample), VOCs (10 samples), and PAHs (2 samples). RCRA metals analyses were performed on perched groundwater samples collected from Trench 24T06 (unfiltered, therefore analyzed for total metals) and Boring 24B04 (dissolved metals). The unfiltered sample from Trench 24T06 had detections of cadmium and lead that exceeded groundwater screening MCLs; however, it is likely these were caused by suspended particulates in the sample rather than dissolved metals present in the groundwater. In the sample from Boring 24B04, dissolved metals detections were below groundwater screening MCLs. The groundwater pH in this sample was slightly basic (pH 9.5).

VOCs were detected in five of the ten samples collected. VOC exceedences of MCLs occurred in a sample collected from perched groundwater encountered in the immediate vicinity of the former tank location (Boring 24B04); the sample had detections of cis-1,2-dichloroethene ([cis-1,2-DCE] 295 µg/L),

trichloroethene ([TCE] 149 µg/L), and vinyl chloride (5.34 µg/L) that exceeded the groundwater screening MCLs (70, 5, and 2 µg/L, respectively). The horizontal extent of VOCs was defined by the nine surrounding groundwater samples collected from the saturated zone, which were non-detect for VOCs or exhibited concentrations below MCLs. Two groundwater samples were analyzed for PAHs; however, no PAHs were detected.

10.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, rotosonic drilling techniques were used to collect groundwater samples in the vicinity of SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks. The intent of this sampling was to verify results of groundwater samples collected during the RFI. Table 10-1 outlines the sample collection, and Figure 10-1 presents the sampling locations. Since portions of SWMU 24 were sold to KCT in 1998 (see Figure 10-1 and Section 10.1), care was taken to place borings on property currently owned by AK Steel. Two borings were placed in the vicinity of SWMU 24. One boring (i.e., 24B11) was placed as near as practicable to RFI Boring 24B04, which previously exhibited elevated concentrations of VOCs in groundwater. The second boring (i.e., 24B12) was placed in the presumed downgradient direction of groundwater flow, which is expected to be to the west toward the Blue River. Emphasis was placed on collecting groundwater samples within 10 ft of the water table surface. Samples were submitted to TestAmerica Valparaiso for analysis of VOCs. Field QC samples included a trip blank.

Soils samples were also collected from the two sampling locations noted previously (Figure 10-1). The sample collection plan is outlined on Table 10-1. Soil samples were collected from four depth intervals (i.e., 0 to 2 ft bgs, 2 to 4 ft bgs, 4 to 6 ft bgs, and 6 to 8 ft bgs). Soil samples were submitted to TestAmerica Valparaiso for analysis of VOCs, PAHs, RCRA metals, and pH. In addition, the samples were analyzed for volatile TPH and extractable TPH to support information being collected for adjacent Tanks 1 and 2 (i.e., SWMU 6). Field QC samples included a field duplicate and MS/MSD pair.

10.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 24 are presented on Table 10-2 for soil samples and Table 10-3 for the groundwater samples. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers, and groundwater samples were screening against MCLs. Comprehensive data tables that present both constituent detections and the reporting limits for undetected constituents are provided in Tables C-9 and C-10 in Appendix C.

10.4.1 Soil Results

In general, soil samples were collected to provide additional information regarding the nature and extent of contamination in the vicinity of Tanks 1 and 2 at SWMU 6 (See Section 9.4). In particular, the discussion of the cadmium, lead, PAH, and TPH results for soil samples collected from location 24B11 and 24B12 are more relevant to the Tank 1 and Tank 2 discussion for SWMU 6 and have been previously presented in Section 9.4. Additional discussion related to these parameters is not presented here, and this section is limited to a discussion of the pH, arsenic, barium, chromium, mercury, selenium, silver, and VOC results. Only one exceedence of the screening levels was noted in the SWMU 24 soil samples, and the extent of pH, metals, and VOCs was well defined by the collected samples.

Soil pH values were slightly basic to basic (pH 7.91 to 11.9) in the soil samples. There was a distinct difference in the magnitude of the pH results between samples collected from location 24B11 (pH 11.3 to 9.2) and 24B12 (pH 8.84 to 7.91), and pH results for both samples decreased with increasing sample depth. The higher pH results for samples collected from location 24B11 likely indicate the presence of more slag fill at that location.

Arsenic and barium were only detected in the sample collected from the 4 to 6 ft bgs interval at location 24B12. The arsenic result (11 BJ* mg/kg) exceeded both the Industrial Indoor Worker and Outdoor Worker Screening levels. This result was flagged "B" by the laboratory to indicate contamination present in the laboratory blanks. The blank contamination was not high enough to completely discount the data point as false positive, but the result is likely biased high. The barium result (110 J* mg/kg) did not exceed any of the screening levels.

Chromium, mercury, selenium, and silver were detected in each of the soil samples collected. The following ranges of detections were noted:

Range of Metal Concentrations in mg/kg	
Chromium	11 J* - 1,300 J*
Mercury	0.0078 J+ - 0.14 J+
Selenium	0.053 J* - 0.68 J*
Silver	0.084 J - 1.2

None of the results exceeded screening levels, which indicates adequate characterization in this area.

Total VOC results are presented on Figure 10-2. With the exception of the sample collected from the 6 to 8 ft bgs interval at location 24B11, VOCs were detected in each of the soil samples collected. Many of

these detections were flagged as estimated (J) by the laboratory to indicate a low level result between the MDL and RL. None of the VOC results exceeded the screening levels, which indicates adequate characterization of VOCs. A summary of the detected VOCs in provided below:

Range of VOC Concentrations in µg/kg	
Acetone	7.2 J - 38
Benzene	1.6 J+ - 5.8 J*
Carbon disulfide	2.5 J+ - 12
Ethylbenzene	1.4 J*
Methylene chloride	8.7 J+ - 13 J+
Toluene	1.3 J+ - 5 J*

10.4.2 Groundwater Results

VOCs were not detected in the groundwater samples collected from locations 24B11 and 24B12 (See Figure 10-2). Groundwater flow in this area is expected to be toward the Blue River which is directly west of the tank farm area (See Figure 1-2).

10.5 COMPARISON TO PREVIOUS DATA

Figures 10-1 and 10-2 present the RFI sample locations as well as the Supplemental Investigation sample locations. Sampling locations 24B11 and 24B12 were not co-located with specific RFI locations. The borings were placed such that data gathered could be used to provide information regarding Tanks 1 and Tanks 2 at SWMU 6. In addition, location 24B11 was placed as near as practicable to RFI Boring 24B04, which previously exhibited elevated concentrations of VOCs in groundwater. Location 24B12 was placed in the presumed downgradient direction of groundwater flow. Physical changes that include tank removal and grading have occurred in this area subsequent to the RFI sampling activities. Therefore, the data comparison focused on identifying whether the results of the Supplemental Investigation impacted any conclusions made regarding this area based upon the RFI data.

10.5.1 pH

Soil pH values were neutral to slightly basic (pH 7.8 to 9.3) in the 14 samples analyzed during the RFI. Higher pH values (pH 7.91 to 11.9), especially in samples collected from location 24B11, were noted during the Supplemental Investigation. The higher values are likely related to the presence of slag fill at the sampling locations.

10.5.2 Metals

Limited exceedences of the soil screening levels were noted for arsenic, chromium, and selenium in soil samples collected during the RFI. Only one arsenic result exceeded screening levels in the soil samples

collected during the Supplemental Investigation. The lack of screening level exceedences for both RFI and Supplemental Investigation samples indicates adequate characterization for metals in this area.

10.5.3 VOCs

VOCs were analyzed for in 29 surface and subsurface soil samples during the RFI; however, VOCs were not detected. This is similar to Supplemental Investigation soil samples, which exhibited only low level VOC detections below screening levels for acetone, benzene, carbon disulfide, ethylbenzene, methylene chloride, and toluene. The lack of screening level exceedences for both RFI and Supplemental Investigation samples indicates adequate characterization for VOCs in soil at SWMU 24.

VOCs were detected in five of the ten groundwater samples collected during the RFI. VOC exceedences of MCLs occurred in a RFI sample collected from perched groundwater encountered in the immediate vicinity of the former tank location (Boring 24B04). The horizontal extent of VOCs was defined during the RFI by the nine surrounding groundwater samples collected from the saturated zone. VOCs were not detected in samples collected during the Supplemental Investigation, which supports findings from the RFI.

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11.0 SWMU 13 – PICKLE LIQUOR TANKS

11.1 SWMU BACKGROUND

The pickle liquor tanks (SWMU 13), located on AK Steel property (see Figure 1-2), were operated from May of 1971 to 1989 and were removed in 1992. As part of the steel rod cleaning operation, sulfuric acid was used to clean iron oxide from steel rods prior to the production of nails, fence, and wire. The term used to describe this process is pickling, and the waste sulfuric acid generated by these pickling activities is referred to as spent pickle liquor.

In 1980, spent pickle liquor became a RCRA-listed hazardous waste with the waste code K062. Prior to 1981, the spent pickle liquor accumulated at this SWMU was sent off site for treatment and disposal. In 1981, Armco installed a recycling system for the spent pickle liquor that remained in use until 1989 when the steel rod cleaning operation ceased and the Cleaning House closed.

Spent pickle liquor was stored in three tanks at different times during the operational life of SWMU 13. These tanks were of varying capacities and dimensions and were located on the east side of the Cleaning House, also known as the Rod Cleaning Building. The spent pickle liquor was transferred from brick-lined acid tubs in the production line by means of overhead piping. Regeneration was accomplished by cooling the spent pickle liquor in a 3,000-gallon, rubber-lined, steel, above-ground cooling tank located adjacent to the AST. The cooling caused ferrous sulfate heptahydrate to precipitate from the spent pickle liquor. From the cooling system, regenerated acid was returned to the tubs in the production line. The ferrous sulfate heptahydrate precipitate was sold to chemical supply companies for a number of uses. The most significant use was as a wastewater treatment chemical. The amount of spent pickle liquor generated during cleaning activities varied with the amount of rod cleaned.

The defined SWMU 13 area is approximately less than 0.1 acres in size. In August 1998, modifications were made in the vicinity of SWMU 13 as Armco extended Wilson Avenue in an east-west direction. As part of this modification, various concrete basement walls near SWMU 13 were lowered to below the ground surface. The concrete from the walls and other imported aggregate materials were used to fill any voids in the subsurface.

11.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, subsurface soil samples and groundwater samples were collected for pH, VOC, and/or SVOC analyses. ITS Richardson provided the analytical services. Section 15.0 of the RFI Report (See

Appendix A) presents additional discussion, data tables, and figures related to SWMU 13.

Soil

During the RFI, soil samples were collected and analyzed for VOCs (34 samples), SVOCs (2 samples), TPH (34 samples), and pH (40 samples). Soil pH values ranged from acidic to neutral (pH 3 to 7.1) in the soil samples near the former tank locations (at 12 to 16 ft bgs). Soil pH exhibited neutral to basic conditions (pH 8 to 12.3) in shallow soil samples collected above the former tank locations and in soil samples around the perimeter of the SWMU area. Soil VOC detections were limited to acetone (detected in 11 of 34 samples), 4-methyl-2-pentanone, 2-butanone, and methylene chloride (each detected in three or fewer of the 34 samples). SVOCs were analyzed in two soil samples, and detections were limited to the PAH compounds of anthracene and fluoranthene. None of the detected VOC or SVOC compounds exceeded their respective 20 DAF SSLs.

Groundwater

Thirteen (13) direct-push groundwater samples were collected in the vicinity of SWMU 13 for pH and dissolved RCRA metals analyses. In addition, groundwater samples were collected from SWMU 33 Monitoring Well Clusters 33MW5S/5I/5D, 33MW11S/11D, 33MW12S/12D, and 33MW13S/13D, which were located in the surrounding area. Acidic pH values (pH 3.9 to 5.9) were typically encountered in the groundwater toward the center of the sampling area, and increased to more neutral pH values (pH 6.1 to 8.2) for sampling locations toward the perimeter of the SWMU 13 area. Each of the RCRA metals except dissolved mercury was detected in at least one groundwater sample. Dissolved arsenic exceeded its groundwater screening MCL (0.05 mg/L at the time of the RFI Report) in five samples, ranging up to 0.138 mg/L. Dissolved cadmium, lead, and selenium exceeded their groundwater screening MCLs (0.005, 0.015, and 0.05 mg/L, respectively), in six samples each, ranging up to 0.0543, 0.177, and 0.187 mg/L, respectively. The horizontal extent of dissolved metals was adequately defined by surrounding groundwater sample locations. The eastern extent of dissolved arsenic was less clearly defined; however, further sampling could not be implemented to the east due to direct-push refusal and physical restrictions caused by the Blue River.

Groundwater VOC detections were limited to chloroform in two of the 11 samples, and neither detection exceeded the groundwater screening MCL (100 µg/L at the time of the RFI Report). Groundwater SVOC detections were limited to PAH compounds (benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene) in one of the five samples. All

of these compounds were detected below the laboratory reporting limit (J qualified). The benzo(a)pyrene result (11.2 J µg/L) exceeded the 0.2 µg/L groundwater screening MCL. The horizontal extent of VOCs and SVOCs was adequately defined by surrounding groundwater sample locations in which these constituents were not detected.

11.3 SCOPE OF ACTIVITIES COMPLETED

For the Supplemental Investigation, direct-push sampling techniques were used to collect soil samples at SWMU 13, Pickle Liquor Tanks. The intent was to verify soil data collected during the RFI. The sample collection plan is outlined on Table 11-1, and the soil sampling locations are presented on Figure 11-1. One soil boring was placed within SWMU 13. This boring (i.e., 13B09A) was placed in the approximate location of an associated RFI boring (i.e., 13B09). Soil samples were collected from four depth intervals (i.e., 0 to 2 ft bgs, 2 to 4 ft bgs, 4 to 6 ft bgs, and 6 to 8 ft bgs). Soil samples were submitted to TestAmerica Valparaiso for analysis of VOCs, SVOCs, volatile TPH, extractable TPH, RCRA metals, and pH. The chain-of-custody (COC) form submitted to the lab was unclear regarding the requirement for extractable TPH analysis. Therefore, the need for extractable TPH analysis was explained to the laboratory via phone call and email; however, the laboratory neglected to perform the analysis.

Groundwater samples were collected from monitoring wells that are located in the vicinity of SWMU 13, Pickle Liquor Tanks. The intent of the sampling was to verify results of groundwater samples that were collected during the RFI. In particular, RFI groundwater concentrations of dissolved arsenic, cadmium, lead, and selenium exceeded the screening levels. The sample collection plan is outlined on Table 11-1, and the well locations are presented on Figure 11-2. Groundwater samples were collected from four of the SWMU 33 monitoring well clusters that surround SWMU 13 (i.e., 33MW5S/5I/5D, 33MW11S/11D, 33MW12S/12D, and 33MW13S/13D). The samples were submitted to STL Valparaiso for analysis of RCRA metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Samples were collected using low-flow sample collection techniques. For comparison with data collected during the RFI, samples for analysis of RCRA metals were submitted to the laboratory both unfiltered and field filtered. Field QC samples included a field duplicate and MS/MSD pair.

11.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 13 are presented on Table 11-2 for soil samples and Table 11-3 for the groundwater samples. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers. Groundwater results were screened against MCLs. Comprehensive data tables that present both constituent detections and reporting limits for undetected constituents are provided in Table C-11 for

the soil samples and Table C-13 for the groundwater samples in Appendix C. In addition, results of multiple rounds of sampling for each of the monitoring wells are provided in Tables C-14 through C-40 of Appendix C.

11.4.1 Soil Results

Soil pH values were slightly basic to basic (pH 8.58 to 10.4) in the soil samples. pH results decreased as sample depth increased.

With the exception of selenium and silver, each of the RCRA metals was detected in soil samples collected from all depth intervals at location 13B09A. The following range of concentrations was noted for the RCRA metals:

Range of Metal Concentrations in mg/kg	
Arsenic	2.3 – 19
Barium	240 – 330
Cadmium	0.96 – 7.5
Chromium	17 – 1,600
Lead	34 – 280
Mercury	0.048 – 0.67
Silver	Not Detected – 0.68 BJ
Selenium	Not Detected

Arsenic was the only metal that exhibited exceedences of screening levels. The arsenic result for each of the samples collected from location 13B09A exceeded the Industrial Outdoor Worker screening level (1.8 mg/kg). In addition, the arsenic results for samples collected from the 2 to 4, 4 to 6, and 6 to 8 ft bgs depth intervals also exceeded the Industrial Indoor Worker screening level (3.8 mg/kg). Arsenic results increased as sample depth increased. The remainder of the metals results were below screening levels.

PAHs were the predominant SVOC fraction that was detected in samples collected at location 13B09A. The only non-PAH constituents that were detected in soil samples included: dibenzofuran (2 to 4 ft bgs interval), dimethylphthalate (0 to 2 ft bgs interval), and di-n-butylphthalate (2 to 4 ft bgs interval). The majority of the PAH detections were flagged as estimated (J) by the laboratory to indicate a detection between the MDL and RL. Exceedences of screening levels were only noted for benzo(a)pyrene in samples collected from the 0 to 2 ft bgs interval (570 J µg/kg) and the 2 to 4 ft bgs interval (250 J µg/kg), and these detections only exceeded the Industrial Outdoor Worker screening level (230 µg/kg). The lack of screening level exceedences indicates adequate characterization for SVOCs at this location. Total SVOC results are presented on Figure 11-3.

Samples were collected for extractable TPH analysis, but the laboratory neglected to analyze the samples. The error was not caught until the analytical holding time had expired. Consistent with other data collected during the Supplemental Investigation, the presence of elevated levels of extractable TPH would likely coincide with elevated levels of PAHs. Since elevated levels of PAHs were not encountered, the presence of elevated levels of extractable TPH is unlikely.

Gasoline range organics were detected in samples collected below 2 ft bgs, and concentrations ranged from 1,100 µg/kg in the sample collected from the 2 to 4 ft bgs interval to 30,000 µg/kg in the sample collected from the 6 to 8 ft bgs interval. As noted in the following paragraph, minimal detections were noted for individual VOC constituents. Due to a lack of corresponding benzene, ethylbenzene, and xylenes detections, gasoline is not believed to be the source of the gasoline range organics detections.

Acetone, carbon disulfide, methylene chloride, and toluene were the only VOC constituents detected in the soil samples collected from location 13B09A. VOCs were not detected in the sample collected from the 0 to 2 ft bgs interval, and none of the VOC detections exceeded screening levels. A slight increase in VOC concentrations was noted as sample depth increased. A similar trend was noted with the volatile TPH analysis. The lack of screening level exceedences indicates adequate characterization for VOCs at this location.

11.4.2 Groundwater Results

Samples were collected from nine SWMU 33 monitoring wells that surrounded SWMU 13, and these samples were analyzed for total and dissolved RCRA metals. (Note: Discussion of VOC results for these wells is presented in Section 13.0.) Well cluster 33MW13S/13D is in closest proximity to SWMU 13 (Figure 11-2). In addition, groundwater elevation maps for the monitoring wells (Figures 13-2 and 13-3) indicate that well cluster 33MW12S/12D is generally upgradient of SWMU 13, and well cluster 33MW11S/11D is generally downgradient of SWMU 13. Well cluster 33MW5S/5I/5D is located at a side-gradient position relative to well cluster 33MW13S/13D.

Mercury and silver were not detected in any of the groundwater samples. The following range of concentrations was noted for the remaining RCRA metal detections:

Range of Metal Concentrations in mg/L		
	Total	**Dissolved**
Arsenic	0.0012 J - 0.014	0.00021 J - 0.013
Barium	0.038 - 1.5	0.031 - 1.3
Cadmium	0.000084 J - 0.00049 J	0.00056 J
Chromium	0.00073 J - 0.0049 B	0.00021 J - 0.00028 J

Range of Metal Concentrations in mg/L		
	Total	**Dissolved**
Lead	0.00069 - 0.0033	Not Detected
Selenium	0.00032 J - 0.014	0.00038 J - 0.010

The only exceedence of MCLs was noted for total and dissolved arsenic in samples collected from Monitoring Wells 33MW5I and 33MW5D. No other exceedences were noted. The lack of exceedences of MCLs indicates adequate characterization of metals in groundwater. In particular, a lack of exceedences for cluster 33MW13S/13D, which is located within the SWMU 13 boundary, indicates that the former Pickle Liquor Tanks are not acting a source of metals to groundwater in this area.

11.5 COMPARISON TO PREVIOUS DATA

11.5.1 Soil Results

One boring, 13B09A, was placed within SWMU 13 as part of the Supplemental Investigation. The boring was placed at the approximate location of an associated RFI boring 13B09. Section 15.0 of the RFI Report (See Appendix A) presents discussion, data tables, and figures for SWMU 13 for comparison to the Supplemental Investigation. In addition, Appendix U of the RFI Report (See Appendix A) contains the RFI TPH data. As noted in the following paragraphs, the data between the two events correlated well.

During the RFI, soil samples were collected from the 0 to 4 ft bgs and 4-8 ft bgs intervals from boring 13B09. The RFI samples were only analyzed for pH, VOCs, and TPH. pH values were similar for both sampling events, and the trend of decreasing pH values as sample depth increased was noted for both events.

VOCs were not detected in any of the RFI soil samples. Low levels of VOCs were detected in samples collected during the Supplemental Investigation. The difference in the low level detections for the Supplemental Investigation samples as compared to the RFI soil samples is likely due to differences in sample depths and/or the use USEPA Method 5035 sample collection techniques. Method 5035 was employed by USEPA subsequent to the RFI and was developed to minimize known soil sample volatilization and biological losses present in the previous USEPA Method 5030 technique.

Samples collected during the RFI exhibited volatile TPH results of 81 µg/kg for the sample collected from the 0 to 4 ft bgs interval and 8,270 µg/kg for the sample collected from the 4 to 8 ft bgs interval. These results correlated with Supplemental Investigation findings.

11.5.2 Groundwater Results

During the RFI, samples were collected from nine monitoring wells in the vicinity of SWMU 13 and were analyzed for dissolved RCRA metals[1] (See Table 15-4 of the RFI Report, which is provided in Appendix A). None of the dissolved metals results from these monitoring well samples exceeded the MCLs promulgated at the time of the 1999 RFI Report. However, dissolved arsenic results for samples collected from Monitoring Wells 33MW5I and 33MW5D exceeded the current MCL of 0.010 mg/L. These same findings were made regarding samples collected from the same wells during the Supplemental Investigation. The lack of exceedences of MCLs indicates adequate characterization of metals in groundwater.

* * * * *

[1] Samples from wells 33MW5S/5I/5D, 33MW11S/11D, 33MW12S/12D, and 33MW13S/13D were also analyzed for VOCs. Discussion of VOCs is relevant to SWMU 33 and is presented in Section 13.0 of the Supplemental Investigation Report and Section 22.0 of the RFI Report.

12.0 SWMU 17 – WIRE MILL RINSEWATER NEUTRALIZATION TANK

12.1 SWMU BACKGROUND

The Wire Mill Rinsewater Neutralization Tank (SWMU 17), located on AK Steel property (see Figure 1-2), consisted of an open-topped 18,000-gallon concrete underground storage tank (UST) with an acid-proof brick lining. During its operation, the tank received acid rinse waters from the hydrochloric acid wire cleaning operations and the sulfuric acid rod cleaning operations. The SWMU 17 tank was cleaned and closed in place in 1991 as part of the closure activities at the Wire Mill. The defined SWMU area is approximately 50 ft by 80 ft (less then 0.1 acres). In August 1998, modifications were made in the area as Wilson Avenue was extended in an east-west direction across SWMU 17. As part of this modification, the concrete walls of SWMU 17 were lowered to below ground surface. The concrete from the walls and other imported aggregate materials were used to fill the void left by the former tank.

12.2 SUMMARY OF PREVIOUS INVESTIGATIONS

During the RFI, subsurface soil and groundwater samples were collected for pH, RCRA metals, and/or VOCs. ITS Richardson provided the analytical services. Section 16.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 17.

Soil

The majority of the 15 soil samples exhibited neutral to slightly basic pH values (7.8 J* to 9.3 J*), and one sample exhibited a basic pH of 11.9 J*. Two soil borings were completed during RFI Phase 2 to determine if a source of VOC groundwater contamination was present in the soil at SWMU 17. VOCs were detected in all three subsurface soil samples analyzed. TCE exceeded its SSL (60 µg/Kg) for all three samples, ranging up to 655 D µg/Kg. Vertical extent of subsurface soil VOCs could not be pursued further due to the presence of subsurface voids, obstructions, and/or the groundwater table. The horizontal extent of VOCs in soil in the immediate SWMU area could not be defined by additional direct-push borings due to subsurface obstructions. However, it is anticipated that the horizontal extent of VOCs in soils is not widespread outside the area of the former acid tank based on PID monitoring and visual observations made during installation of Phase 1 soil borings at the SWMU. Since VOCs (primarily TCE) were detected in these borings, the potential for leaching of VOCs from soil to groundwater exists as a source of VOCs in groundwater. However, the SWMU 17 groundwater concerns are part of a larger plume of VOCs whose source area is primarily at SWMU 33.

Groundwater

Eight direct-push groundwater samples were analyzed for pH and RCRA metals. All pH results were neutral (pH 6.6 to 6.9). With the exception of dissolved selenium, all of the RCRA metals were detected in at least one groundwater sample; however, only one dissolved lead result (0.115 mg/L) exceeded the groundwater screening MCL (0.015 mg/L). The horizontal extent of dissolved lead in groundwater is assumed to be a localized occurrence and was defined by sampling locations immediately south and east of the one exceedence and by monitoring wells located to the north and west. A discussion of the organic constituents (i.e., VOCs and SVOCs) in groundwater is presented with the SWMU 33 groundwater data in Section 13.0.

12.3 SCOPE OF ACTIVITIES COMPLETED

During the Supplemental Investigation, soil samples were collected at SWMU 17, Wire Mill Rinsewater Neutralization Tank. The intent of this sampling was to verify results of soil samples that were collected during the RFI. SWMU 17 is located in the vicinity of SWMU 33. A groundwater plume with VOC contamination was noted in this area during the RFI. Based upon the results of soil samples collected at SWMU 17, it was unclear if a source of VOCs to groundwater existed in the soil at SWMU 17 or if elevated groundwater concentrations of VOCs were related to a potential subsurface connection with SWMU 33. The sample collection plan is outlined on Table 12-1, and the sampling locations are presented on Figure 12-1. One soil boring was placed within SWMU 17. This boring (i.e., 17B08B) was placed in the approximate location of an associated RFI soil boring (i.e., 17B08A). Soil samples were collected from four depth intervals: 0 to 2 ft bgs, 2 to 4 ft bgs, 4 to 6 ft bgs, and 6 to 8 ft bgs for comparison to previously collected data. Due to refusal encountered in the 6 to 8 ft bgs interval, a sample could not be collected from this interval on the first day of sampling at SWMU 17. Different sampling equipment was used on the following day to advance a slightly offset boring, and soil was collected from the 4 to 6 and 6 to 8 ft bgs intervals. Soil samples were submitted to TestAmerica Valparaiso for analysis of VOCs.

12.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 17 are presented on Table 12-2. Soil detections were screened against 20 DAF SSLs and USEPA Region 6 human health soil screening levels for Industrial Indoor Workers and Industrial Outdoor Workers. Comprehensive data tables that present both constituent detections and the reporting limits for undetected constituents are provided in Table C-12 for the soil samples.

BTEX and chlorinated hydrocarbons were the primary VOC constituents detected in the soil samples collected from location 17B08B. VOCs were detected in samples collected from all depth intervals, and VOC concentrations were highest in the samples collected below 4 ft bgs. Methylene chloride and TCE were the only constituents that exhibited results in excess of screening levels. Methylene chloride was only detected in the sample collected from the 4 to 6 ft bgs interval for the offset location. This detection (310 HJ- µg/kg) exceeded the 20 µg/kg 20 DAF SSL, but was below industrial worker screening levels. TCE concentrations ranged from 82 to 650 HJ- µg/kg, and exceeded the 20 DAF SSL (60 µg/kg) for samples collected from all depth intervals. In addition, the industrial worker screening levels (92 and 100 µg/kg) were exceeded for four of the five samples. TCE results are presented on Figure 12-2.

12.5 COMPARISON TO PREVIOUS DATA

One boring, 17B08B, was placed within SWMU 17 as part of the Supplemental Investigation. The boring was placed at the approximate location of its associated RFI soil borings 17B08A. Table 16-2 16.0 of the RFI Report (See Appendix A) presents results for soil samples collected from boring 17B08A for comparison to the Supplemental Investigation. During the RFI, soil samples were collected from the 0 to 4 ft bgs and 4-8 ft bgs intervals. Supplemental Investigation samples were collected from 0 to 2, 2 to 4, 4 to 6, and 6 to 8 ft bgs. Chlorinated hydrocarbons were detected in the samples collected during both events, and the concentrations between the events correlated well. A TCE concentration of 350 µg/kg was noted in the sample collected in the 0 to 4 ft bgs interval during the RFI, which correlated with concentrations up to 140 µg/kg in the Supplemental Investigation samples collected from 0 to 2 ft bgs and 2 to 4 ft bgs. Similarly, a TCE concentration of 655 µg/kg was noted in sample collected in the 4 to 8 ft bgs interval during the RFI, which correlated with concentrations up to 650 HJ- µg/kg in the Supplemental Investigation samples collected from 4 to 6 ft bgs and 6 to 8 ft bgs.

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13.0 SWMU 33 – NAIL MILL DEGREASING AREA

13.1 SWMU BACKGROUND

The Nail Mill Degreasing Area (SWMU 33), located on AK Steel property (see Figure 1-2), was used for the removal of residue during the production of nails. The degreasing operation was located in the northwest portion of the Nail Mill at the current location of Monitoring Well Cluster 33MW2S/2/3 (see Figure 13-1). The presence of chlorinated VOCs in the surrounding area was discovered and reported in 1991 while Armco was preparing for the closure and conversion of the mill into a warehouse. The nail mill was subsequently demolished and a wood block floor contaminated with TCE was removed and properly disposed. The area currently consists of rubble over the concrete floor of the former building. The defined SWMU 33 area is approximately 2.5 acres in size.

During preparation for the closure of the nail mill, Remcor collected samples of the wood block floor, concrete floor, and soil from beneath the floor in June 1990. All samples were analyzed for VOCs. TCE, 1,1,1-TCA, tetrachloroethene (PCE), 1,1-DCE, and benzene were detected in the samples (Remcor, 1990a). A copy of Remcor's *Draft Report, Idled Facilities Environmental Investigation, Kansas City Works, Kansas City, Missouri* is provided in Appendix B-4.

In July 1991, Terracon Environmental (Terracon) conducted a Phase I and Phase II soil vapor survey of the area for TCE, 1,1,1-TCA, and total volatile organics. Terracon concluded that degreasing materials remain sorbed onto the shallower soils underlying the degreaser area and that a groundwater plume of VOCs was present in the area (Terracon , 1991a). A copy of Terracon's *Armco Phase I and Phase II Soil Vapor Survey* is provided in Appendix B-4.

Terracon conducted a Phase II Investigation in September 1991 and collected soil and groundwater samples for VOC analysis (Terracon, 1991b). TCE, Total 1,2-Dichloroethene (1,2-DCE), 1,1,1-TCA, and chloroform were detected in soil samples. In addition, TCE and 1,2-DCE were detected in groundwater samples. Terracon concluded that TCE was present in soil near the degreaser location and decreased with depth and distance from the degreaser. Terracon also concluded that existing data were too limited to provide precise delineation of groundwater contamination. Four monitoring wells were installed during the Phase II Investigation. Monitoring Well MW1 was located northeast of the previous degreaser location but was destroyed during demolition activities completed in that vicinity. Wells MW2 through MW4 (now labeled 33MW2 through 33MW4) still exist at the SWMU. A copy of Terracon's *Nail Mill*

Phase II Investigation Report, Worldwide Grinding Systems, Armco, Inc., Kansas City, Missouri is provided in Appendix B-4.

Due to the close proximity of SWMU 17 to the east of SWMU 33 and the related nature of groundwater contamination in the area, SWMU 17 groundwater information is also discussed in this section.

13.2 SUMMARY OF PREVIOUS INVESTIGATIONS

Subsurface soil and groundwater samples were collected and analyzed for VOCs and SVOCs during the RFI. ITS Richardson provided the analytical services. Section 22.0 of the RFI Report (See Appendix A) presents additional discussion, data tables, and figures related to SWMU 33. The area investigated for SWMU 33 groundwater included the entire area north of the Wire Mill Building to the Blue River, and encompassed SWMUs 13 and 17.

Soil

Fifty-eight subsurface soil samples were analyzed for VOCs during the RFI. Total VOC detections ranged from 2.01 to 24,423 µg/Kg. The primary compounds detected were chlorinated VOCs, including 1,1,1-TCA, 1,1,2-trichloroethane (1,1,2-TCA), 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-dichloroethene, TCE, methylene chloride, and vinyl chloride. Total VOC concentrations greater than 1,000 µg/Kg (15 samples) were located nearest the former degreaser location (i.e., location of Monitoring Well cluster 33MW2S/2/3), and chlorinated VOCs were the predominant fraction detected. Total VOC concentrations decreased around the perimeter of the SWMU area. The horizontal extent of VOC contamination in soil was well defined by borings south, west, and east of the former degreaser location, but was less clearly defined to the north. At sampling locations in the immediate vicinity of the former degreaser, VOC contamination was encountered at all depth intervals (down to 20 ft bgs). The vertical extent of contamination was delineated down to the water table. In areas surrounding the former degreaser location, VOC contamination was generally limited to soil depths below 8 ft bgs. These findings were comparable to those presented within the historical documents (See Appendix B-4), as follows:

- *Idled Facilities Environmental Investigation* (Remcor, 1990) – Samples were collected in the immediate vicinity of the degreaser. Matrices included the wood floor, concrete subfloor, and soil beneath the concrete subfloor. These sampling locations most closely corresponded to RFI monitoring well 33MW2S.

- *Phase I and Phase II Soil Vapor Survey* (Terracon, 1991a) – During the Phase I investigation, 15 soil gas probes were advanced in a radial pattern that extended approximately 60 feet from

the former degreaser location. Soil gas samples were collected from two depth intervals: 5-6 ft bgs and 9-12 ft bgs or 10-15 ft bgs. During the Phase II Investigation, 10 additional soil gas borings were placed outside of the Nail Mill Building and to the east along the driveway. Results of the soil gas indicate the presence of chlorinated VOCs and associated degradation products in the subsurface soils and groundwater.

- *Nail Mill Phase II Investigation Report* (Terracon, 1991b) – The Phase II investigation involved the installation and sampling of four monitoring wells. Soil samples were collected during the installation of the monitoring wells. Chlorinated VOCs were present in both the soil and groundwater samples. Soil samples from Phase II Well MW-2 exhibited similar results to soil samples collected during the installation of RFI Well 33MW2S.

The historical evaluations concluded that a source of chlorinated VOCs existed in soils under the former degreaser location. Soil concentrations decreased moving radially outward from the former degreaser. In addition, a groundwater plume of chlorinated VOCs and associated degradation products was identified. These historical conclusions support conclusions made in the RFI Report regarding the type and magnitude of constituents present in the subsurface and their apparent distribution. Table 2-4 in the QA SAP provided a comparison of ITS Richardson samples collected during the RFI to historical soil samples at locations nearest to the former degreaser. Table 2-5 in the QA SAP provided a comparison of ITS Richardson samples collected during the RFI to historical sample locations that were collected in the surrounding area. These tables are provided in Appendix B-4 for the ease of the reader.

Two subsurface soil samples were collected from one boring and analyzed for SVOCs during the RFI. 2-Methylnaphthalene (15.4 D mg/kg) was detected in the sample collected from 13-15 ft bgs. A 20 DAF SSL has not been established for this compound. No other SVOCs were detected in soil.

Groundwater

During the RFI, groundwater in this area was initially investigated using direct-push sample collection techniques. These initial groundwater samples were analyzed for VOCs on-site using a field GC (See Appendix R of the RFI Report which is provided in Appendix A of this report) and then submitted to ITS Richardson for confirmation. Both field and ITS Richardson data sets were comparable, and the results of the direct-push groundwater sampling were used to select locations for monitoring wells. Twenty wells were installed during the RFI, and groundwater samples were collected from these wells and three existing wells. VOCs were detected throughout the SWMU 33 area. The highest concentrations were typically located around the SWMU 33 former degreasing pit (Monitoring Wells 33MW2S, 33MW2, 33MW3), and decreased radially outward from this location. TCE, which was most likely a source product, and the related degradation products cis-1,2-DCE and vinyl chloride were the primary VOCs

detected. The following table summarizes the RFI Phase II groundwater results for monitoring wells located at the degreaser and in closest proximity to the degreaser:

RFI Phase II Groundwater Data for Wells in Vicinity of Degreaser		
Well	**Location**	**Total VOCs (µg/L)**
Shallow Wells		
33MW2S	Degreaser	127,847
33MW4S	Northwest of Degreaser	Non-Detect (5)
33MW5S	East-Northeast of Degreaser	432
33MW7S	South of Degreaser	Non-Detect (5)
33MW8S	West of Degreaser	71.7
Intermediate Wells		
33MW2	Degreaser	9,042
33MW5I	East-Northeast of Degreaser	1,991
Deep Wells		
33MW3	Degreaser	512
33MW4	Northwest of Degreaser	Non-Detect (5)
33MW5D	East-Northeast of Degreaser	Non-Detect (5)
33MW7D	West of Degreaser	Non-Detect (5)
Value in parentheses for non-detect results is the reporting limit.		

Total VOC results for samples collected from each of the monitoring wells and depth intervals at the former degreaser location (i.e., Monitoring Wells 33MW2S/2/3) exhibited significantly greater VOC results than wells in the surrounding area. At the Monitoring Well 33MW2S/2/3 cluster, VOCs appeared to have migrated from the shallow saturated zone to the deep saturated zone. This hydraulic connection between the saturated zones is supported by the results of the pump test conducted at this location. The horizontal extent of VOCs in the upper saturated zone and the lower saturated zone were defined by samples collected from the perimeter of the SWMU 33 area. The extent of VOCs in the lower saturated zone was less clearly defined to the north due to chlorinated VOC detections in excess of MCLs in the sample from Well 33MW10D. The source of VOC detections in deep Well 33MW10D was unknown, and it was unclear if these detections are part of the larger plume of VOC detections centered around the former degreaser.

In addition, direct-push groundwater sampling at SWMU 17 suggested the presence of a second source area. Total VOC concentrations ranged from 42.4 µg/L up to 22,364 µg/L in groundwater samples collected from 11.5 ft to 18 ft bgs (i.e., shallow zone). TCE and related degradation products of cis-1,2-DCE and vinyl chloride were the predominant VOCs detected at this location. Table 22-4 and Figures 22-3 and 22-5 of the RFI Report (See Appendix A) provide additional details regarding this area.

Eight groundwater samples were collected from the upper saturated zone and analyzed for SVOCs. 4-Chloroaniline, 4-methylphenol, and naphthalene were detected at low concentrations in the sample collected from Boring 33B47 (no MCLs exist for these compounds). However, SVOCs were not detected in the sample collected from Well 33MW5S which was installed at the approximate location and depth of Boring 33B47. Therefore, the nature and extent of SVOCs in groundwater was adequately characterized at SWMU 33.

Wells in the SWMU 33 area were also sampled in February 2001. Groundwater samples were collected and analyzed by Pace Analytical for VOCs. Results of the February 2001 were consistent with data obtained from ITS Richardson during the RFI. The results of the February 2001 groundwater sampling are provided in Appendix B-4.

13.3 SCOPE OF ACTIVITIES COMPLETED

For the Supplemental Investigation, additional monitoring wells were installed in the northwest portion of the SWMU 33, Nail Mill Degreasing Area. These wells were placed to assist with determination of the source of vinyl chloride in deep monitoring well 33MW10D, which is located near the bank of the Blue River. Four monitoring wells (two shallow/deep clusters) were installed. Monitoring Wells 33MW15S/D were installed south of cluster 33MW10S/D, and Monitoring Wells 33MW16S/D were installed west of cluster 33MW10S/D at the property boundary. Figure 13-1 shows the new monitoring well locations. The shallow monitoring wells were completed to approximately 15 ft below the water table, and the deep monitoring wells were completed to bedrock. Drilling logs, monitoring well construction diagrams, and monitoring well development records are included as Appendices E, F, and G, respectively, of this Supplemental Investigation Report.

After the new wells had been allowed to recover following development and prior to groundwater sampling, groundwater levels and total depth measurements were taken from all monitoring wells on September 24, 2007 in the vicinity of SWMU 33. These measurements are presented on Table 13-1. A groundwater contour map for wells screened in the shallow unconfined saturated zone is presented as Figure 13-2, and a groundwater contour map for wells screened just above bedrock in the semiconfined saturated zone is presented as Figure 13-3. Groundwater flow in the shallow unconfined saturated zone is generally toward the northeast. Similarly, groundwater flow in the deep semi-confined saturated zone is toward the north and northeast.

The sample collection plan is outlined on Table 3-2. Groundwater samples were collected from 27 monitoring wells using low-flow sample collection techniques and submitted to TestAmerica Valparaiso

for analysis of VOCs. In addition, groundwater samples from select monitoring wells were analyzed for both unfiltered and field filtered RCRA metals to assist with characterization of SWMU 13 (See Section 11.0). Field QC samples included two field duplicates, one MS/MSD pair, and trip blanks for each cooler containing VOC samples. Groundwater sampling forms for each well are presented in Appendix H.

13.4 SUPPLEMENTAL INVESTIGATION RESULTS

Supplemental Investigation results for SWMU 33 are presented on Table 13-3 for the groundwater samples, and VOC detections were screening against MCLs. (Note: Metals results for samples collected to assist with the characterization of SWMU 13 are presented in Section 11.) Comprehensive data tables that present both constituent detections and the reporting limits for undetected constituents are provided on Table C-13 in Appendix C. In addition, the results of multiple rounds of sampling for each of the SWMU 33 monitoring wells are provided in Tables C-14 through C-40 of Appendix C.

VOCs were detected throughout the SWMU 33 area. The results for Total Chlorinated VOCs in the shallow wells (including the two intermediate-depth wells screened directly above the semi-confining layer in the shallow saturated zone) are presented on Figure 13-4, and the Total Chlorinated VOCs results for the deep wells are presented on Figure 13-5. The highest concentrations were located around the SWMU 33 former degreasing pit near Monitoring Wells 33MW2S, 33MW2, 33MW3, and decrease radially outward from this location. Concentrations in the shallow saturated zone at this location have decreased significantly from concentrations detected historically. TCE and related degradation products of cis-1,2-DCE and vinyl chloride were the primary VOCs detected. In addition, elevated VOC concentrations previously noted in samples collected from shallow and intermediate-depth wells at Monitoring Well cluster 33MW5S/5I/5D were also noted during this event. The following table summarizes the Total VOC groundwater samples from monitoring wells located at the degreaser and in closest proximity to the degreaser:

Supplemental Investigation Groundwater Data for Wells in Vicinity of Degreaser		
Well	**Location**	**Total VOCs (µg/L)**
Shallow Wells		
33MW2S	Degreaser	3,061
33MW4S	Northwest of Degreaser	Non-Detect (5)
33MW5S	East-Northeast of Degreaser	60
33MW7S	South of Degreaser	Non-Detect (5)
33MW8S	West of Degreaser	170
Intermediate Wells		
33MW2	Degreaser	2,416
33MW5I	East-Northeast of Degreaser	707

Supplemental Investigation Groundwater Data for Wells in Vicinity of Degreaser		
Well	**Location**	**Total VOCs (µg/L)**
Deep Wells		
33MW3	Degreaser	1,494
33MW4	Northwest of Degreaser	Non-Detect (5)
33MW5D	East-Northeast of Degreaser	1.7 J
33MW7D	West of Degreaser	Non-Detect (5)
Value in parentheses for non-detect results is the reporting limit.		

A detection of vinyl chloride was present in the groundwater sample collected from Monitoring Well 33MW10D. This is consistent with previous sampling events, but the detection was at a lower concentration than previously observed. VOCs were not detected in samples collected from Monitoring Wells 33MW16D and 33MW15D, and the low-level detections at Monitoring Well 33MW10D appears to be isolated from the plume centered on the former degreaser location.

Samples collected from Monitoring Well Clusters 33MW2/2S/3 and 33MW5S/5I/5D and Well 33MW8S were the only samples to exhibit exceedences of MCLs. The following table summarizes the VOC constituents that exceeded MCLs. Detailed information regarding the screening results can be obtained from Table 13-3. Samples where no constituents were identified at concentrations exceeding the MCL are not included below:

Samples with VOC Results above MCLs					
	Units	**1,1-DCE**	**cis-1,2-DCE**	**TCE**	**Vinyl Chloride**
33MW2S	µg/L	11 J	1,800	1,100	150
33MW2	µg/L	-	630	270	1,500
33MW3	µg/L	9 J	940	480	60
33MW5S	µg/L	-	-	-	4.1 J
33MW5I	µg/L	-	560	77	66
33MW8S	µg/L	-	-	130	-

Notes:

- = Indicates constituent either was not detected or does not exceed the MCL

µg/L = milligram per Liter

J - Analyte was detected below reporting limits

13.5 COMPARISON TO PREVIOUS DATA

Data from this monitoring event correlated well with previous sampling for the locations and type of VOC detections. Concentrations of VOCs have generally decreased across the SWMU 33 area since the last sampling event, with the exception of increases at Monitoring Wells 33MW3 and 33MW8S. The

reduced VOC concentrations in groundwater may be related to the significant time between sampling events. Tables C-14 through C-40 in Appendix C present comprehensive results for each well for sampling events conducted from 1997 through 2007. Similarities to previous events included:

- TCE and related degradation products of cis-1,2-DCE and vinyl chloride were the predominant VOCs detected.
- Samples collected from Monitoring Well cluster 33MW2/2S/3, which was located closest to the former degreaser, contained the highest levels of VOCs.
- At the Monitoring Well 33MW2S/2/3 cluster, VOCs appeared to have migrated from the shallow saturated zone to the deep saturated zone.
- Chlorinated VOCs in excess of MCLs were detected in samples collected from the shallow and intermediate-depth wells at Monitoring Well cluster 33MW5S/5I/5D.
- Vinyl chloride was detected in samples collected from Monitoring Well 33MW10D.

* * * * *

14.0 REFERENCES

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TABLES

Table 2-1
Sample Collection Summary
Supplemental Investigation
AK Steel Kansas City Facility

Location		SOIL												GROUNDWATER					
		Depth Intervals or Other Descriptor	Total Cadmium	Total Lead	Total Chromium	Hexavalent Chromium	RCRA Metals	pH	VOCs	SVOCs	PAHs	Volatile TPH	Extractable TPH	Description	Filtered Cadmium	Filtered Lead	Total RCRA Metals	Filtered RCRA Metals	VOCs
SWMU 2	Old Blue River "W" Landfill													Direct-Push	4	4			4
SWMU 3	South of Bar Fab Landfill													Direct-Push	1	1			
SWMU 6 AOC 4	RCRA Permitted Baghouse Dust Storage Tank / Boiler Furnace Area	0-2 ft 4-8 ft	12 12	12 12							12 12		12 12						
SWMU 7	No. 1 Melt Shop Baghouse Dust Tanks	0-0.5 ft 0.5-1 ft	3 3	3 3															
SWMU 9	No. 1 Melt Shop Baghouse Dust Conveyor	0-0.5 ft 0.5-1 ft	2 2	2 2															
SWMU 12	AMOCO Landfarm	0-2 ft 2-4 ft 4-6 ft 6-8 ft		2 2 2 2	2 2 2 2	2 2 2 2			2 2 2 2	2 2 2 2		2 2 2 2	2 2 2 2						
SWMU 24	Waste Hydraulic Lubricating Oil Storage Tanks	0-2 ft 2-4 ft 4-6 ft 6-8 ft					2 2 2 2	2 2 2 2	2 2 2 2		2 2 2 2		2 2 2 2	Direct-Push					2
SWMU 13	Pickle Liquor Tanks	0-2 ft 2-4 ft 4-6 ft 6-8 ft					1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1		1 1 1 1					See SWMU 33	See SWMU 33	
SWMU 17	Wire Mill Rinsewater Neutralization Tank	0-2 ft 2-4 ft 4-6 ft 6-8 ft							1 1 1 1										
SWMU 33	Nail Mill Degreasing Area													Monitoring Well			9	9	27
AOC 8	"Owl Gun Club" Shooting Park	0-0.5 ft 0.5-2 ft		3 3															
TOTAL			34	48	8	8	12	12	24	12	32	12	40		5	5	9	9	33

Notes:
- Volatile TPH includes gasoline range organics (GRO)
- Extractable TPH includes diesel range organics (DRO) and oil range organics (ORO)

RCRA = Resource Conservation and Recovery Act. RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.
SVOC = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds

Table 2-2
Analytical Methods and Parameters
Supplemental Investigation
AK Steel Kansas City Facility

Analysis Type	Analytical Method	Parameters		
ORGANIC ANALYSES				
Volatile Organic Compounds	SW846-8260B	1,1,1-Trichloroethane	Bromodichloromethane	Ethylbenzene
		1,1,2,2-Tetrachloroethane	Bromoform	Methylene chloride
		1,1,2-Trichloroethane	Bromomethane	Styrene
		1,1-Dichloroethane	Carbon disulfide	Tetrachloroethene
		1,1-Dichloroethene	Carbon tetrachloride	Toluene
		1,2-Dichloroethane	Chlorobenzene	trans-1,2-Dichloroethene
		1,2-Dichloropropane	Chloroethane	trans-1,3-Dichloropropene
		2-Butanone	Chloroform	Trichloroethene
		2-Hexanone	Chloromethane	Vinyl acetate
		4-Methyl-2-pentanone	cis-1,2-Dichloroethene	Vinyl chloride
		Acetone	cis-1,3-Dichloropropene	Xylenes, Total
		Benzene	Dibromochloromethane	
Semivolatile Organic Compounds	SW846-8270C	1,2,4-Trichlorobenzene	4-Chlorophenyl-phenyl ether	Dibenzo(a,h)anthracene
		1,2-Dichlorobenzene	4-Methylphenol	Dibenzofuran
		1,3-Dichlorobenzene	4-Nitroaniline	Diethyl phthalate
		1,4-Dichlorobenzene	4-Nitrophenol	Dimethyl phthalate
		2,4,5-Trichlorophenol	Acenaphthene	Fluoranthene
		2,4-Dichlorophenol	Acenaphthylene	Fluorene
		2,4-Dimethylphenol	Anthracene	Hexachlorobenzene
		2,4-Dinitrophenol	Benzo(a)anthracene	Hexachlorobutadiene
		2,4-Dinitrotoluene	Benzo(a)pyrene	Hexachlorocyclopentadiene
		2,6-Dinitrotoluene	Benzo(b)fluoranthene	Hexachloroethane
		2-Chloronaphthalene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
		2-Chlorophenol	Benzo(k)fluoranthene	Isophorone
		2-Methylnaphthalene	Benzoic acid	N-Nitroso-di-n-propylamine
		2-Methylphenol	Benzyl alcohol	N-Nitrosodiphenylamine
		2-Nitroaniline	Bis(2-chloroethoxy)methane	Napthalene
		2-Nitrophenol	Bis(2-chloroethyl)ether	Nitrobenzene
		3,3'-Dichlorobenzidine	Bis(2-chloroisopropyl)ether	Pentachlorophenol
		3-Nitroaniline	Bis(2-ethylhexyl)phthalate	Phenanthrene
		4,6-Dinitro-2-methylphenol	Butylbenzylphthalate	Phenol
		4-Bromophenyl-phenyl ether	Chrysene	Pyrene
		4-Chloro-3-methylphenol	Di-n-butylphthalate	
		4-Chloroaniline	Di-n-octylphthalate	
Polynuclear Aromatic Hydrocarbons	SW846-8270C	1-Methylnaphthalene	Benzo(a)pyrene	Fluoranthene
		2-Methylnaphthalene	Benzo(b)fluoranthene	Fluorene
		Acenaphthene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
		Acenaphthylene	Benzo(k)fluoranthene	Napthalene
		Anthracene	Chrysene	Phenanthrene
		Benzo(a)anthracene	Dibenzo(a,h)anthracene	Pyrene
Total Petroleum Hydrocarbons	SW846-8015M	Volatile TPH	Gasoline Range Organics (C6-C10)	
	OA-2	Extractable TPH	Diesel	Mineral Spirits
			Fuel Oil	Motor Oil
			Hydraulic Fluid	Unknown Hydrocarbons
			Kerosene	

Table 2-2
Analytical Methods and Parameters
Supplemental Investigation
AK Steel Kansas City Facility

Analysis Type	Analytical Method	Parameters		
INORGANIC ANALYSES				
Metals	SW846-6020	Arsenic	Chromium	Silver
		Barium	Lead	
		Cadmium	Selenium	
	SW846-7470/7471	Mercury		
	SW846-7196A	Hexavalent Chromium		
General	SW846-9045C	pH		

SW846 = Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. Final Update III. United States Environmental Protection Agency, July 1997.

OA-2 = OA-2. Extractable Petroleum Products (and Related Low Volatility Organic Compounds). University of Iowa Hygeinic Laboratory. July 27, 1993.

Table 2-3
Description of Data Qualifiers
Supplemental Investigation
AK Steel Kansas City Facility

Qualifier	Description
Qualifiers Added by the Laboratories	
B	Blank contamination. Analyte was found in the associated method blank as well as the sample.
D	Samples was diluted prior to analysis (used in historical data).
H	The sample was prepared or analyzed beyond the specified holding time.
J	The compound was detected. The result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL), and the reported concentration is an estimated value.
U	The compound was analyzed, but was not detected above the reporting limit.
Qualifiers Assigned during Data Review	
F	Constituent was detected in associated field equipment rinsate blank (used in historical data).
J+	The result is an estimated value and may be biased high.
J-	The result is an estimated value and may be biased low.
J*	The result is an estimated value. Quality control results exhibit accuracy and/or precision criteria outside of limits.
R	The data are unusable. The sample results are rejected due to inability to meet quality control criteria.
T	Constituent was detected in associated trip blank (used in historical data).
U*	The compound was not detected. Results were disregarded as false positive due to blank contamination.
Possible Combinations of Qualifiers (Lab and Data Review)	
BJ+	The analyte was detected in the method blank, and the result should be considered estimated with a high bias due to potential for contamination.
BJ*	The analyte was detected in the method blank. In addition, quality control results exhibited accuracy and/or precision criteria outside of limits. The result is an estimated value.
BU*	The analyte was detected in the method blank, and the result should be considered nondetect (i.e., false positive) due to contamination.
HBJ*	The sample was prepared or analyzed outside of holding time and blank contamination was noted in the analysis. The result is an estimated value that may be biased due to either the holding time (potential for low bias) or blank contamination (potential for high bias).
HJ-	The sample was prepared or analyzed outside of holding time and the result is an estimated value that may be biased low.
HUJ-	The sample was prepared or analyzed outside of holding time, and the analyte was not detected above the reporting limit. Due to the holding time exceedence, the reporting limit is an approximate value and may be biased low.
JBU*	The analyte was detected in the method blank at a concentration less than the reporting limit, and the result should be considered nondetect (i.e., false positive) due to contamination.

Table 2-3
Description of Data Qualifiers
Supplemental Investigation
AK Steel Kansas City Facility

Qualifier	Description
JR	The compound was detected at a concentration between the RL and MDL. However, the data is unusable/rejected due to inability to meet quality control criteria.
JU*	The analyte was detected at a concentration less than the reporting limit, and the result should be considered nondetect (i.e., false positive) due to contamination.
UJ-	The analyte was not detected above the reporting limit. However, the reporting limit is an approximate value and may be biased low.
UJ*	The analyte was not detected above the reporting limit. However, the reporting limit is an approximate value.
UR	The analyte was not detected above the reporting limit. However, the data is unusable/rejected due to inability to meet quality control criteria.

Table 2-4
Screening Levels for Soil and Water

Supplemental Investigation
AK Steel Kansas City Facility

	RFI Report Screening Levels		Region 6 Screening Levels	
	Soil	Water	Soil - Industrial	
	20 DAF SSL	MCL	Indoor Worker	Outdoor Worker
Metals	**(mg/kg)**	**(mg/L)**	**(mg/kg)**	**(mg/kg)**
Arsenic	29	0.010[a]	3.8	1.8
Barium	1,600	2	100,000	100,000
Cadmium	8	0.005	1,000	560
Chromium, Hexavalent	38	see Total Cr	64	71
Chromium, Trivalent	none[b]	see Total Cr	100,000	100,000
Chromium, Total	3,540[c]	0.1	450[d]	500[d]
Lead	400	0.015	800	800
Mercury	2	0.002	610	340
Selenium	5	0.05	10,000	570
Silver	34	NAv	10,000	570
Volatiles	**(µg/kg)**	**(µg/L)**	**(µg/kg)**	**(µg/kg)**
Acetone (2-Propanone)	16,000	NAv	56,000,000	60,000,000
Benzene	30	5	1,500	1,600
Bromodichloromethane	600	80[e]	2,400	2,600
Bromoform (Tribromomethane)	800	80[e]	720,000	240,000
Bromomethane (Methyl bromide)	200	NAv	13,000	15,000
Carbon Disulfide	32,000	NAv	720,000	720,000
Carbon Tetrachloride	70	5	530	580
Chlorobenzene (Monochlorobenzene)	1,000	100	460,000	500,000
Chloroethane (Monochloroethane, Ethyl Chloride)	NAv	NAv	6,500	7,200
Chloroform	600	80[e]	520	580
Chloromethane (Methyl chloride)	NAv	NAv	160,000	170,000
2-Chloroethyl Vinyl Ether	NAv	NAv	NAv	NAv
Dibromochloromethane	400	80[e]	2,400	2,600
1,1-Dichloroethane	23,000	NAv	2,300,000	2,300,000
1,2-Dichloroethane (EDC)	20	5	770	840
1,1-Dichloroethene (1,1-Dichloroethylene)	60	7	430,000	470,000
1,2-Dichloroethene (total)	see cis-/trans-	see cis-/trans-	see cis-/trans-	see cis-/trans-
cis-1,2-Dichloroethene	400	70	150,000	160,000
trans-1,2-Dichloroethene	700	100	180,000	200,000
1,2-Dichloropropane	30	5	770	850
cis-1,3-Dichloropropene	4	NAv	1,600[f]	1,700[f]
trans-1,3-Dichloropropene	4	NAv	1,600[f]	1,700[f]
Ethylbenzene	13,000	700	230,000	230,000
2-Hexanone (Methyl Butyl Ketone)	NAv	NAv	NAv	NAv
Methylene Chloride	20	5	21,000	22,000
Methyl Ethyl Ketone (2-Butanone)	NAv	NAv	34,000,000	34,000,000
4-Methyl-2-Pentanone (Hexone, MIBK)	NAv	NAv	17,000,000	17,000,000
Styrene	4,000	100	1,700,000	1,700,000
1,1,2,2-Tetrachloroethane	3	NAv	900	970
Tetrachloroethene	60	5	1,800	1,700
Toluene	12,000	1,000	520,000	520,000
1,1,1-Trichloroethane	2,000	200	1,400,000	1,400,000
1,1,2-Trichloroethane	20	5	1,900	2,100
Trichloroethene	60	5	92	100
Vinyl Acetate	170,000	NAv	1,400,000	1,600,000
Vinyl Chloride	10	2	860	860
Xylene (total)	see o-, m-, p-	10,000	210,000	210,000
m-Xylene	210,000	see total Xylene	210,000	210,000
o-Xylene	190,000	see total Xylene	280,000	280,000
p-Xylene	200,000	see total Xylene	370,000	370,000

Table 2-4
Screening Levels for Soil and Water

Supplemental Investigation
AK Steel Kansas City Facility

	RFI Report Screening Levels		Region 6 Screening Levels	
	Soil	Water	Soil - Industrial	
	20 DAF SSL	MCL	Indoor Worker	Outdoor Worker
Semivolatiles (including PAHs)	**(mg/kg)**	**(µg/L)**	**(mg/kg)**	**(mg/kg)**
Acenaphthene	570	NAv	38,000	33,000
Acenaphthylene	NAv	NAv	NAv	NAv
Anthracene	12000	NAv	100,000	100,000
Benzo(a)anthracene (Benz(a)anthracene)	2	NAv	7.8	2.3
Benzo(b)fluoranthene	5	NAv	7.8	2.3
Benzo(k)fluoranthene	49	NAv	78	23
Benzo(g,h,i)perylene	NAv	NAv	NAv	NAv
Benzo(a)pyrene	8	0.2	0.78	0.23
Benzoic Acid	400	NAv	100,000	100,000
Benzyl alcohol	NAv	NAv	100,000	100,000
4-Bromophenyl phenyl ether	NAv	NAv	NAv	NAv
Butyl benzyl phthalate	930	NAv	240	240
4-Chloroaniline (p-Chloroaniline)	0.7	NAv	8,200	2,700
bis(2-Chloroethoxy)methane	NAv	NAv	NAv	NAv
bis(2-Chloroethyl)ether	0.0004	NAv	0.62	0.62
bis(2-Chloroisopropyl)ether	NAv	NAv	8.1	8.2
bis(2-ethylhexyl)phthalate	3600	6	410	140
4-Chloro-3-methylphenol	NAv	NAv	NAv	NAv
2-Chloronaphthalene	NAv	NAv	27,000	26,000
2-Chlorophenol	4	NAv	240	260
4-Chlorophenyl phenyl ether	NAv	NAv	NAv	NAv
Chrysene	160	NAv	780	230
Dibenzo(a,h)anthracene	2	NAv	0.78	0.23
Dibenzofuran	NAv	NAv	2,500	1,700
Di-n-butyl phthalate	2300	NAv	100,000	68,000
1,2-Dichlorobenzene (ortho-dichlorobenzene)	17	600	370	370
1,3-Dichlorobenzene (meta-dichlorobenzene)	NAv	NAv	130	140
1,4-Dichlorobenzene (para-dichlorobenzene)	2	75	7.5	8.1
3,3'-Dichlorobenzidine	0.007	NAv	13	4.3
2,4-Dichlorophenol	1	NAv	6,100	2,100
Diethyl phthalate	470	NAv	100,000	100,000
2,4-Dimethylphenol	9	NAv	41,000	14,000
Dimethylphthalate	NAv	NAv	100,000	100,000
4,6-Dinitro-2-methylphenol	NAv	NAv	NAv	NAv
2,4-Dinitrophenol	0.3	NAv	4,100	1,400
2,4-Dinitrotoluene	0.0008	NAv	4,100	1,400
2,6-Dinitrotoluene	0.0007	NAv	2,000	680
Di-n-octylphthalate	10000	NAv	NAv	NAv
Fluoranthene	4300	NAv	82,000	24,000
Fluorene	560	NAv	33,000	26,000
Hexachlorobenzene	2	1	3.6	1.2
Hexachlorobutadiene	2	NAv	73	25
Hexachlorocyclopentadiene	400	50	12,000	4,100
Hexachloroethane	0.5	NAv	410	140
Indeno(1,2,3-cd)pyrene	14	NAv	7.8	2.3
Isophorone	0.5	NAv	6,000	2,000
2-Methylnaphthalene	NAv	NAv	NAv	NAv
2-Methylphenol (o-Cresol)	15	NAv	NAv	NAv
4-Methylphenol (p-Cresol)	NAv	NAv	NAv	NAv
Naphthalene	84	NAv	190	210
2-Nitroaniline	NAv	NAv	5,900	2,000
3-Nitroaniline	NAv	NAv	NAv	NAv

Table 2-4
Screening Levels for Soil and Water
Supplemental Investigation
AK Steel Kansas City Facility

	RFI Report Screening Levels		Region 6 Screening Levels	
	Soil	Water	Soil - Industrial	
	20 DAF SSL	MCL	Indoor Worker	Outdoor Worker
Semivolatiles (including PAHs)	**(mg/kg)**	**(µg/L)**	**(mg/kg)**	**(mg/kg)**
4-Nitroaniline	NAv	NAv	NAv	NAv
Nitrobenzene	0.1	NAv	110	110
2-Nitrophenol	NAv	NAv	NAv	NAv
4-Nitrophenol	NAv	NAv	16,000	5,500
N-Nitroso-di-n-propylamine	0.00005	NAv	0.82	0.27
N-Nitrosodiphenylamine	1	NAv	1,200	390
Pentachlorophenol	0.03	1	48	10
Phenanthrene	NAv	NAv	NAv	NAv
Phenol	100	NAv	100,000	100,000
Pyrene	4200	NAv	54,000	32,000
1,2,4-Trichlorobenzene	5	70	240	260
2,4,5-Trichlorophenol	270	NAv	100,000	68,000
2,4,6-Trichlorophenol	0.2	NAv	520	170

Notes:

a = The MCL for arsenic at the time of the RFI Report (1999) was 0.050 mg/L.
The arsenic MCL was lowered to 0.010 mg/L as of 01/23/2006.

b = For trivalent chromium, chemical-specific properties are such that the migration to groundwater pathway is not of concern at any soil concentration.

c = Total Chromium SSL is derived from the 95% UTL calculations for slag samples (see RFI Report 4.2.3)

d = The total chromium screening value is based on a 1/6 ratio of CrVI to CrIII.

e = The MCL for trihalomethanes at the time of the RFI Report (1999) was 100 µg/l.
The MCL was lowered to 80 µg/l on 12/31/2003. Trihalomethanes include: bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

f = The screening level is for 1,3-dichloropropene. Separate levels for the cis- and trans- isomers was not provided.

DAF = Dilution Attenuation Factor
MCL = Maximum Contaminant Level
NAv = Not Available.
PAH = Polynuclear Aromatic Hydrocarbon
SSL = Soil Screening Level

µg/kg = micrograms per kilogram
µg/L = micrograms per liter
mg/kg = milligram per kilogram
mg/l = milligrams per liter

Sources

Soil Screening Guidance: Technical Background Document
USEPA. April 1996. Office of Emergency And Remedial Response.

Drinking Water Regulations and Health Advisories
USEPA. June 2003. Office of Water.

Human Health Medium-Specific Screening Levels 2008
USEPA Region 6. December 4, 2007.

Table 3-1
SWMU 2 - Old Blue River "W" Landfill
Groundwater Sample Collection

Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analyses		
						Filtered Cadmium	Filtered Lead	VOCs
02B18	DW1	9/12/2007	510-18114-2		24 - 28	X	X	X
02B19	DW1	9/12/2007	510-18114-5		14 - 18	X	X	X
02B20	DW1	9/12/2007	510-18114-6		22 - 26	X	X	X
	DW1MS	9/12/2007	510-18114-6MS	Matrix Spike	22 - 26	X	X	X
	DW1MSD	9/12/2007	510-18114-6MSD	Matrix Spike Duplicate	22 - 26	X	X	X
02B21	DW1	9/12/2007	510-18114-3		16 - 20	X	X	X
	DW1D	9/12/2007	510-18114-4	Field Duplicate	16 - 20	X	X	X

Notes:

Water samples were field filtered for dissolved metals analysis.

ft - feet
VOCs - Volatile Organic Compounds

Table 3-2
SWMU 2 Direct-Push Groundwater Detections
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:		02B18 / DW1		02B19 / DW1		02B20 / DW1		02B21 / DW1		02B21 / DW1D	
	Depth (ft):		24 - 28		14 - 18		22 - 26		16 - 20		16 - 20	
	Date Collected:		9/12/2007		9/12/2007		9/12/2007		9/12/2007		9/12/2007	
	Lab ID:		510-18114-2		510-18114-5		510-18114-6		510-18114-3		510-18114-4	
	Comments:										Duplicate	
Parameter	**Units**	**MCL**										
Filtered Metals												
Cadmium, Dissolved	mg/L	0.005	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Lead, Dissolved	mg/L	0.015	0.0005	U	***0.012***		0.0005	U	***0.057***		***0.021***	
Volatile Organic Compounds												
1,1-Dichloroethane	ug/L	NAv	5	U	***1.4***	***J***	5	U	100	U	100	U
Acetone	ug/L	NAv	10	U	***50***		10	U	200	U	200	U
Benzene	ug/L	5	5	U	***1.2***	***J***	5	U	***7***	***J***	100	U
Carbon disulfide	ug/L	NAv	5	U	***1.7***	***J +***	***0.29***	***J +***	100	U	100	U
Ethylbenzene	ug/L	700	5	U	***28***		***0.55***	***J***	***830***		***880***	***J+***
Methylene Chloride	ug/L	5	5	U	***8.9***		5	U	100	U	100	U
Toluene	ug/L	1,000	5	U	***17***		***0.31***	***J***	***180***		***190***	***J+***
Xylenes, Total	ug/L	10,000	10	U	***180***		***2***	***J***	***3,200***		***3,300***	***J+***

Bold, italic = Detected
MCL = Maximum Contaminant Level
ug/L = micrograms per liter
mg/L = millgrams per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Higlighted cells indicate an MCL exceedence.

Table 4-1
SWMU 12 - AMOCO Landfarm
Soil Sample Collection

Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis							
						Total Lead	Total Chromium	Hexavalent Chromium	VOCs	SVOCs	Volatile TPH	Extractable TPH	pH
12B01A*	SB1	9/11/2007	510-18045-1		0 - 2	X	X	X	X	X	X	X	X
	SB2	9/11/2007	510-18045-2		2 - 4	X	X	X	X	X	X	X	X
	SB2D	9/11/2007	510-18045-3	Field Duplicate	2 - 4	X	X	X	X	X	X	X	X
	SB3	9/11/2007	510-18045-4		4 - 6	X	X	X	X	X	X	X	X
	SB4	9/11/2007	510-18045-5		6 - 8	X	X	X	X	X	X	X	X
12B03A*	SB1	9/11/2007	510-18106-3		0 - 2	X	X	X	X	X	X	X	X
	SB1MS	9/12/2007	510-18106-3MS	Matrix Spike	0 - 2	X	X	X	X	X	X	X	X
	SB1MSD	9/12/2007	510-18106-3MSD	Matrix Spike Duplicate	0 - 2	X	X	X	X	X	X	X	X
	SB2	9/11/2007	510-18106-4		2 - 4	X	X	X	X	X	X	X	X
	SB3	9/11/2007	510-18106-5		4 - 6	X	X	X	X	X	X	X	X
	SB4	9/11/2007	510-18106-6		6 - 8	X	X	X	X	X	X	X	X

Notes:

* - Borings were placed at the approximate locations of the RFI borings.

ft - feet
SVOCs - Semivolatile Organic Compounds
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compounds

Table 4-2
SWMU 12 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	12B01A / SB1	12B01A / SB2	12B01A / SB2D	12B01A / SB3	12B01A / SB4
					Depth (ft):	0 - 2	2 - 4	2 - 4	4 - 6	6 - 8
					Date Collected:	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007
					Lab ID:	510-18045-1	510-18045-2	510-18045-3	510-18045-4	510-18045-5
					Comments:					
		RFI	Region 6 Industrial							
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker						
Metals										
Chromium	mg/Kg	3,540	100,000	100,000		***1,100***	***52***	***22***	***16***	***7.2***
Chromium, hexavalent	mg/Kg	38	64	71		1.1 U	1.2 U	1.4 U	1.1 U	1.1 U
Lead	mg/Kg	400	800	800		***4,400***	***250***	***74***	***22***	***10***
Semivolatile Organic Compounds										
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		***9,700***	470 U	***1,000***	390 U	390 U
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000		***370 J***	470 U	460 U	390 U	390 U
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300		***3,700***	470 U	***210 J***	390 U	***81 J***
Benzo[a]pyrene	ug/Kg	8,000	780	230		***17,000***	470 U	***530***	390 U	***71 J***
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300		***15,000 J***	470 U	***530***	390 U	***75 J***
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv		***7,800***	470 U	***1,100***	390 U	***54 J***
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000		***3,300 J***	470 U	***140 J***	390 U	390 U
Chrysene	ug/Kg	160,000	780,000	230,000		***17,000***	470 U	***500***	390 U	***76 J***
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230		***7,300***	470 U	***550***	390 U	390 U
Dibenzofuran	ug/Kg	NAv	2,500,000	1,700,000		***510 J***	470 U	460 U	390 U	390 U
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300		***2,700***	470 U	***270 J***	390 U	390 U
Naphthalene	ug/Kg	84,000	190,000	210,000		***5,800***	470 U	***620***	390 U	390 U
Phenanthrene	ug/Kg	NAv	NAv	NAv		***1,500 J***	470 U	460 U	390 U	390 U
Pyrene	ug/Kg	4,200,000	5,400,000	3,200,000		***4,500***	470 U	***240 J***	390 U	390 U
Total Petroleum Hydrocarbons										
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv		***13,000***	***26***	***1,100***	***22***	***18***
Volatile Organic Compounds										
2-Butanone (MEK)	ug/Kg	NAv	34,000,000	34,000,000		15 U J*	16 U	***17***	14 U	13 U
Acetone	ug/Kg	16,000	56,000,000	60,000,000		12 HU J*	***54***	***63***	***34***	***28***
Benzene	ug/Kg	30	1,500	1,600		***5.3 J*** *	***4.7 J*** +	***3.5 J*** +	7 U	6.6 U
Carbon disulfide	ug/Kg	32,000	720,000	720,000		***7 J*** *	***3.9 J***	***4.8 J***	***2 J***	6.6 U
Ethylbenzene	ug/Kg	13,000	230,000	230,000		***9.9 J****	***10***	***9.1***	7 U	***7.5***
Methylene Chloride	ug/Kg	20	21,000	22,000		***4.7 J*** *	11 B U*	14 B U*	13 B U*	12 B U*
Toluene	ug/Kg	12,000	520,000	520,000		***7.3 J*** *	***7.2 J*** +	***2.1 J*** +	***1.5 J*** +	***2.6 J*** +
Xylenes, Total	ug/Kg	190,000	210,000	210,000		***14 J*** *	***15 J***	17 U	14 U	***11 J***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NAv = Not Available

Data qualifers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 4-2
SWMU 12 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	12B03A / SB1		12B03A / SB2		12B03A / SB3		12B03A / SB4	
					Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
					Date Collected:	9/11/2007		9/11/2007		9/11/2007		9/11/2007	
					Lab ID:	510-18106-3		510-18106-4		510-18106-5		510-18106-6	
					Comments:								
		RFI	Region 6 Industrial										
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker									
Metals													
Chromium	mg/Kg	3,540	100,000	100,000		***860***		***12***		***34***		***13***	
Chromium, hexavalent	mg/Kg	38	64	71		1.1	U	1.2	U	1.2	U	1.3	U
Lead	mg/Kg	400	800	800		***3,700***		***17***		***110***		***11***	
Semivolatile Organic Compounds													
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		***1,100***		430	U	420	U	430	U
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000		***43***	***J***	430	U	420	U	430	U
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300		***450***		430	U	420	U	430	U
Benzo[a]pyrene	ug/Kg	8,000	780	230		***3,100***	***J****	***61***	***J***	420	U	430	U
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300		***2,700***	***J****	***62***	***J***	420	U	430	U
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv		***2,900***	***J****	***180***	***J***	420	U	430	U
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000		***520***	***J*** *	430	U	420	U	430	U
Chrysene	ug/Kg	160,000	780,000	230,000		***990***	***J****	***71***	***J***	420	U	430	U
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230		***2,100***		***63***	***J***	420	U	430	U
Dibenzofuran	ug/Kg	NAv	2,500,000	1,700,000		390	U	430	U	420	U	430	U
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300		***1,100***	***J***	***45***	***J***	420	U	430	U
Naphthalene	ug/Kg	84,000	190,000	210,000		***550***		430	U	420	U	430	U
Phenanthrene	ug/Kg	NAv	NAv	NAv		***180***	***J***	430	U	420	U	430	U
Pyrene	ug/Kg	4,200,000	5,400,000	3,200,000		***580***	***J****	430	U	420	U	430	U
Total Petroleum Hydrocarbons													
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv		***10,000***	***J+***	***71***		***58***		***23***	
Volatile Organic Compounds													
2-Butanone (MEK)	ug/Kg	NAv	34,000,000	34,000,000		***110***	***J****	16	U	15	U	16	U
Acetone	ug/Kg	16,000	56,000,000	60,000,000		12	HU J-	***6.2***	***HJ -***	***22***	***H J-***	***21***	***H J-***
Benzene	ug/Kg	30	1,500	1,600		***11***	***J****	***3.7***	***J +***	***2.5***	***J +***	***2.3***	***J +***
Carbon disulfide	ug/Kg	32,000	720,000	720,000		29	U J*	6.6	U J*	7.6	U	7.9	U
Ethylbenzene	ug/Kg	13,000	230,000	230,000		***9.3***	***J****	***8.9***		7.6	U	7.9	U
Methylene Chloride	ug/Kg	20	21,000	22,000		***8.7***	***J****	***19***		***12***	***J+***	***13***	***J+***
Toluene	ug/Kg	12,000	520,000	520,000		29	U J*	***5***	***J +***	***2.9***	***J +***	***3.2***	***J +***
Xylenes, Total	ug/Kg	190,000	210,000	210,000		***13***	***J****	***13***	***J***	15	U	16	U

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NAv = Not Available

Data qualifers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 5-1
AOC 8 - "Owl Gun Club" Shooting Park
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis Total Lead
A08B26A*	SB1	9/12/2007	510-18114-9		0 - 0.5	X
	SB2	9/12/2007	510-18114-10		0.5 - 2	X
A08B49	SB1	9/12/2007	510-18114-7		0 - 0.5	X
	SB2	9/12/2007	510-18114-8		0.5 - 2	X
A08B50	SB1	9/12/2007	510-18114-11		0 - 0.5	X
	SB2	9/12/2007	510-18114-12		0.5 - 2	X

Notes:

* - Boring were placed at the approximate location of the RFI boring.

- Samples were visually examined for the presence of lead shot. No lead shot was found in the samples.

ft - feet

Table 5-2
AOC 8 Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	A08B26A / SB1	A08B26A / SB2	A08B49 / SB1	A08B49 / SB2	A08B50 / SB1	A08B50 / SB2
				Depth (ft):	0 - 0.5	0.5 - 2	0 - 0.5	0.5 - 2	0 - 0.5	0.5 - 2
				Date Collected:	9/12/2007	9/12/2007	9/12/2007	9/12/2007	9/12/2007	9/12/2007
				Lab ID:	510-18114-9	510-18114-10	510-18114-7	510-18114-8	510-18114-11	510-18114-12
				Comments:						
		RFI	Region 6 Industrial							
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker						
Metals										
Lead	mg/Kg	400	800	800	***150***	***200***	***53***	***76***	***31***	***43***

Bold, italic = Detected
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 6-1
SWMU 3 - South of Bar Fab Landfill
Groundwater Sample Collection

Supplemental Investigation
AK Steel Kansas City Facility

Sample Point*	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analyses	
						Filtered Cadmium	Filtered Lead
03B01A	DW1	--	--	--	DRY	--	--
03B02A	DW1	--	--	--	DRY	--	--
03B03A	DW1	--	--	--	DRY	--	--
	DW1MS	--	--	--	DRY	--	--
	DW1MSD	--	--	--	DRY	--	--
03B08A	DW1	9/13/2007	510-18156-1		23 - 27	X	X
	DW1D	9/13/2007	510-18156-2	Field Duplicate	23 - 27	X	X

Notes:
* - Borings were placed at the approximate locations of the RFI borings.
- Water samples were field filtered for dissolved metals analysis.
ft - feet
DRY - Refusal and a lack of groundwater was noted. Multiple offsets were attempted.

Table 6-2
SWMU 3 Direct-Push Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

			Sample:	03B08A / DW1	03B08A / DW1D
			Depth (ft):	23 - 27	23 - 27
			Date Collected:	9/13/2007	9/13/2007
			Lab ID:	510-18156-1	510-18156-2
			Comments:		Field Duplicate
Parameter	**Units**	**MCL**			
Filtered Metals					
Cadmium, Dissolved	mg/L	0.005		***0.001***	***0.0014***
Lead, Dissolved	mg/L	0.015		0.0005 U	0.0005 U

Bold, italic = Detected
mg/L = milligrams per liter

Data qualifiers are described on Table 2-3.

Refusal & lack of water noted for planned locations:
03B01A, 03B02A, and 03B03A.

Table 7-1
SWMU 7 - No. 1 Melt Shop Baghouse Dust Tanks
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis	
						Total Cadmium	Total Lead
07B01A	SB1	9/10/2007	510-17978-12		0 - 0.5	X	X
	SB2	9/10/2007	510-17978-13		0.5 - 1	X	X
07B02A	SB1	9/10/2007	510-17978-10		0 - 0.5	X	X
	SB2	9/10/2007	510-17978-11		0.5 - 1	X	X
07B03A	SB1	9/10/2007	510-17978-8		0 - 0.5	X	X
	SB2	9/10/2007	510-17978-9		0.5 - 1	X	X

Notes:

* - Borings were placed at the approximate locations of the RFI borings.

ft - feet

Table 7-2
SWMU 7 Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	07B01A / SB1		07B01A / SB2		07B02A / SB1		07B02A / SB2		07B03A / SB1		07B03A / SB2	
				Depth (ft):	0 - 0.5		0.5 - 1		0 - 0.5		0.5 - 1		0 - 0.5		0.5 - 1	
				Date Collected:	9/10/2007		9/10/2007		9/10/2007		9/10/2007		9/10/2007		9/10/2007	
				Lab ID:	510-17978-12		510-17978-13		510-17978-10		510-17978-11		510-17978-8		510-17978-9	
				Comments:												
		RFI	Region 6 Industrial													
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker												
Metals																
Cadmium	mg/Kg	8	1,000	560	***5.3***		***8.6***		***9.8***		***40***		***19***		***35***	
Lead	mg/Kg	400	800	800	***290***	***J+***	***290***	***J+***	***360***	***J+***	***1,000***	***J+***	***630***	***J+***	***940***	***J+***

Bold, italic = Detected
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 8-1
SWMU 9 - No. 1 Melt Shop Baghouse Dust Conveyor
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis	
						Total Cadmium	Total Lead
09G04*	SB1	9/10/2007	510-17978-6		0 - 0.5	X	X
	SB2	9/10/2007	510-17978-7		0.5 - 1	X	X
09B01	SB1	9/10/2007	510-17978-4		0 - 0.5	X	X
	SB2	9/10/2007	510-17978-5		0.5 - 1	X	X

Notes:

* - Discrete samples were collected from two depth intervals at 7 locations within grid 09G04. Discrete samples were composited to create a single sample from each depth interval to be submitted to the lab.

Table 8-2
SWMU 9 Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	**09B01 / SB01**	**09B01 / SB02**	**09G04 / SB01**	**09G04 / SB02**
				Depth (ft):	**0 - 0.5**	**0.5 - 1**	**0 - 0.5**	**0.5 - 1**
				Date Collected:	**9/10/2007**	**9/10/2007**	**9/10/2007**	**9/10/2007**
				Lab ID:	**510-17978-4**	**510-17978-5**	**510-17978-6**	**510-17978-7**
				Comments:				
		RFI	**Region 6 Industrial**					
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**				
Cadmium	mg/Kg	8	1,000	560	***1.3***	***2.5***	***2.4***	***1.8***
Lead	mg/Kg	400	800	800	***43 J+***	***110 J+***	***150 J+***	***120 J+***

Bold, italic = Detected
mg/kg = milligrams per kilogram

Data qualifers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-1
SWMU 6 / AOC 4 - RCRA Permitted Baghouse Dust Storage Tanks / Boiler Furnace Area
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis					
						Cadmium Lead	PAHs	Extractable TPH	VOCs	RCRA Metals	pH
SWMU 6											
06B15	SB1	9/18/2007	510-18356-4		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-5		4 - 8	X	X	X			
06B16	SB1	9/18/2007	510-18356-6		0 - 2	X	X	X			
	SB2	9/18/2007	510-18256-7		4 - 8	X	X	X			
06B17	SB1	9/18/2007	510-18356-1		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-2		4 - 8	X	X	X			
	SB2D	9/18/2007	510-18356-3	Field Duplicate	4 - 8	X	X	X			
06B18	SB1	9/18/2007	510-18356-8		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-9		4 - 8	X	X	X			
06B19	SB1	9/18/2007	510-18356-14		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-15		4 - 8	X	X	X			
06B20	SB1	9/18/2007	510-18356-10		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-11		4 - 8	X	X	X			
06B21	SB1	9/18/2007	510-18356-12		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-13		4 - 8	X	X	X			
06B22	SB1	9/18/2007	510-18356-26		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-27		4 - 8	X	X	X			
06B23	SB1	9/18/2007	510-18356-24		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-25		4 - 8	X	X	X			
AOC 4											
A04B05	SB1	9/18/2007	510-18356-18		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-19		4 - 8	X	X	X			
	SB2MS	9/18/2007	510-18356-19	Matrix Spike	4 - 8	X	X	X			
	SB2MSD	9/18/2007	510-18356-19	Matrix Spike Duplicate	4 - 8	X	X	X			
A04B06	SB1	9/18/2007	510-18356-22		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-23		4 - 8	X	X	X			
A04B07	SB1	9/18/2007	510-18356-16		0 - 2	X	X	X			
	SB2	9/18/2007	510-18356-17		4 - 8	X	X	X			
SWMU 6 / SWMU 24											
24B11*	SB1	9/17/2007	510-18284-1		0 - 2		X	X	X	X	X
	SB2	9/17/2007	510-18284-2		2 - 4		X	X	X	X	X
	SB2D	9/17/2007	510-18284-3	Field Duplicate	2 - 4		X	X	X	X	X
	SB3	9/17/2007	510-18284-4		4 - 6		X	X	X	X	X
	SB4	9/17/2007	510-18284-5		6 - 8		X	X	X	X	X

Table 9-1
SWMU 6 / AOC 4 - RCRA Permitted Baghouse Dust Storage Tanks / Boiler Furnace Area
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis					
						Cadmium Lead	PAHs	Extractable TPH	VOCs	RCRA Metals	pH
24B12*	SB1	9/17/2007	510-18284-7		0 - 2		X	X	X	X	X
	SB2	9/17/2007	510-18284-8		2 - 4		X	X	X	X	X
	SB3	9/17/2007	510-18284-9		4 - 6		X	X	X	X	X
	SB3MS	9/17/2007	510-18284-9	Matrix Spike	4 - 6		X	X	X	X	X
	SB3MSD	9/17/2007	510-18284-9	Matrix Spike Duplicate	4 - 6		X	X	X	X	X
	SB4	9/17/2007	510-18284-10		6 - 8		X	X	X	X	X

Notes:

* See also Table 10-1. Samples from location 24B11 and 24B12 were collected for characterization of both SWMU 6 and SWMU 24.

- Extractable TPH includes diesel range organics (DRO) and oil range organics (ORO)
- RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

ft - feet
PAHs - Polynuclear Aromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compounds

Table 9-2
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	06B15 / SB1	06B15 / SB2	06B16 / SB1	06B16 / SB2	06B17 / SB1	06B17 / SB2	06B17 / SB2D
				Depth (ft):	0 - 2	4 - 8	0 - 2	4 - 8	0 - 2	4 - 8	4 - 8
				Date Collected:	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007
				Lab ID:	510-18356-4	510-18356-5	510-18356-6	510-18356-7	510-18356-1	510-18356-2	510-18356-3
				Comments:							Duplicate
		RFI	Region 6 Industrial								
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**							
Metals											
Cadmium	mg/Kg	8	1,000	560	***2.5***	***2.1***	***5.4***	***0.67***	0.3 U	***0.42***	***4.5***
Lead	mg/Kg	400	800	800	***89***	***38***	***100***	***18***	0.15 U	***8.4***	***160***
Polynuclear Aromatic Hydrocarbons											
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350 U	***100 J***	370 U	400 U	420 U J*	***100 J***	***51 J***
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350 U	***120 J***	370 U	400 U	420 U J*	***140 J***	***55 J***
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Acenaphthylene	ug/Kg	NAv	NAv	NAv	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	***96 J***	350 U	370 U	400 U	***70 J ****	370 U	***94 J***
Benzo[a]pyrene	ug/Kg	8,000	780	230	***90 J***	350 U	370 U	400 U	***70 J ****	370 U	***85 J***
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	***130 J***	350 U	370 U	400 U	***99 J ****	370 U	***120 J***
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	***63 J***	350 U	370 U	400 U	***72 J ****	370 U	***75 J***
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	***54 J***	350 U	370 U	400 U	***45 J ****	370 U	***56 J***
Chrysene	ug/Kg	160,000	780,000	230,000	***110 J***	350 U	370 U	400 U	***89 J ****	370 U	***98 J***
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	***160 J***	350 U	***53 J***	400 U	***110 J ****	370 U	***150 J***
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	***49 J***	350 U	370 U	400 U	420 U J*	370 U	***48 J***
Naphthalene	ug/Kg	84,000	190,000	210,000	350 U	***54 J***	370 U	400 U	420 U J*	***65 J***	370 U
Phenanthrene	ug/Kg	NAv	NAv	NAv	***140 J***	***55 J***	370 U	***47 J +***	***84 J ****	***84 J***	***120 J***
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	***170 J***	350 U	***58 J***	400 U	***130 J ****	370 U	***160 J***
Extractable Petroleum Hydrocarbons											
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***89***	***44***	***170***	***31***	***150***	***48***	***150***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-2
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	06B18 / SB1	06B18 / SB2	06B19 / SB1	06B19 / SB2	06B20 / SB1	06B20 / SB2
					Depth (ft):	0 - 2	4 - 8	0 - 2	4 - 8	0 - 2	4 - 8
					Date Collected:	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007
					Lab ID:	510-18356-8	510-18356-9	510-18356-14	510-18356-15	510-18356-10	510-18356-11
					Comments:						
		RFI	Region 6 Industrial								
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**							
Metals											
Cadmium	mg/Kg	8	1,000	560		***1.9***	***4.1***	***0.34***	***0.95***	***1.6***	***7.5***
Lead	mg/Kg	400	800	800		***100***	***130***	***16***	***37***	***71***	***1,300***
Polynuclear Aromatic Hydrocarbons											
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		350 U	370 U	440 U	350 U	360 U	***620***
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		350 U	370 U	440 U	350 U	360 U	***720***
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000		350 U	370 U	***45 J***	350 U	***83 J***	390 U
Acenaphthylene	ug/Kg	NAv	NAv	NAv		350 U	370 U	440 U	350 U	360 U	***56 J***
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000		***130 J***	***57 J***	***99 J***	***73 J***	***190 J***	***64 J***
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300		***810***	***350 J***	***420 J***	***280 J***	***640***	***280 J***
Benzo[a]pyrene	ug/Kg	8,000	780	230		***820***	***390***	***400 J***	***250 J***	***550***	***240 J***
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300		***1,200***	***490***	***560***	***360***	***750***	***330 J***
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv		***340 J***	***250 J***	***200 J***	***110 J***	***270 J***	***110 J***
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000		***480***	***230 J***	***220 J***	***130 J***	***320 J***	***150 J***
Chrysene	ug/Kg	160,000	780,000	230,000		***800***	***400***	***410 J***	***260 J***	***640***	***290 J***
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230		***150 J***	370 U	440 U	350 U	360 U	***58 J***
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000		***1,600***	***630***	***850***	***600***	***1,400***	***470***
Fluorene	ug/Kg	560,000	33,000,000	26,000,000		350 U	370 U	440 U	350 U	***61 J***	390 U
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300		***340 J***	***170 J***	***180 J***	***98 J***	***260 J***	***94 J***
Naphthalene	ug/Kg	84,000	190,000	210,000		350 U	370 U	440 U	350 U	360 U	***340 J***
Phenanthrene	ug/Kg	NAv	NAv	NAv		***440***	***330 J***	***470***	***350 J***	***800***	***680***
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000		***1,500***	***720***	***750***	***510***	***1,100***	***430***
Extractable Petroleum Hydrocarbons											
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv		***310***	***1,100***	***81***	***150***	***210***	***350***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-2
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	06B21	/	SB1	06B21	/	SB2	06B22	/	SB1	06B22	/	SB2	06B23	/	SB1	06B23	/	SB2
				Depth (ft):	0	-	2	4	-	8	0	-	2	4	-	8	0	-	2	4	-	8
				Date Collected:	9/18/2007			9/18/2007			9/18/2007			9/18/2007			9/18/2007			9/18/2007		
				Lab ID:	510-18356-12			510-18356-13			510-18356-26			510-18356-27			510-18356-24			510-18356-25		
				Comments:																		
		RFI	Region 6 Industrial																			
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker																		
Metals																						
Cadmium	mg/Kg	8	1,000	560	***0.74***			***1.1***			***23***			***0.27***	***J***		***1.4***			***5.5***		
Lead	mg/Kg	400	800	800	***75***			***97***			***830***			***57***			***75***			***310***		
Polynuclear Aromatic Hydrocarbons																						
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***170***	***J***		***420***			3,900	U		***130***	***J***		360	U		350	U	
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***180***	***J***		***510***			3,900	U		***130***	***J***		360	U		350	U	
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000	380	U		390	U		3,900	U		380	U		360	U		350	U	
Acenaphthylene	ug/Kg	NAv	NAv	NAv	380	U		390	U		3,900	U		380	U		360	U		350	U	
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	***54***	***J***		***46***	***J***		3,900	U		***39***	***J***		360	U		350	U	
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	***330***	***J***		***230***	***J***		***650***	***J***		***41***	***J***		***150***	***J***	+	***100***	***J***	
Benzo[a]pyrene	ug/Kg	8,000	780	230	***300***	***J***		***240***	***J***		3,900	U		380	U		360	U		350	U	
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	***460***			***310***	***J***		***640***	***J***		***82***	***J***		***210***	***J***	+	***120***	***J***	
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	***160***	***J***		***170***	***J***		3,900	U		380	U		360	U		350	U	
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	***210***	***J***		***130***	***J***		3,900	U		380	U		***80***	***J***	+	***53***	***J***	
Chrysene	ug/Kg	160,000	780,000	230,000	***340***	***J***		***270***	***J***		***570***	***J***		***61***	***J***		***250***	***J***	+	***110***	***J***	
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230	380	U		***67***	***J***		3,900	U		380	U		360	U		350	U	
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	***540***			***390***			***1,100***	***J***		***100***	***J***		***330***	***J***	+	***200***	***J***	
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	380	U		390	U		3,900	U		380	U		360	U		350	U	
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	***140***	***J***		***110***	***J***		3,900	U		380	U		360	U		350	U	
Naphthalene	ug/Kg	84,000	190,000	210,000	***83***	***J***		***280***	***J***		3,900	U	J-	***48***	***J***	-	360	U	J-	350	U	J-
Phenanthrene	ug/Kg	NAv	NAv	NAv	***400***			***490***			***830***	***J***		***120***	***J***		***210***	***J***	+	***140***	***J***	
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	***520***			***380***	***J***		***1,100***	***J***		***150***	***J***		***430***		***J+***	***190***	***J***	
Extractable Petroleum Hydrocarbons																						
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***230***			***240***			***8,400***		***J-***	***2,500***			***1,200***			***1,400***		

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-3
AOC 4 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	A04B05 / SB1	A04B05 / SB2	A04B06 / SB1	A04B06 / SB2	A04B06 / SB2	A04B07 / SB1	A04B07 / SB2
					Depth (ft):	0 - 2	4 - 8	0 - 2	4 - 8	4 - 8	0 - 2	4 - 8
					Date Collected:	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007
					Lab ID:	510-18356-18	510-18356-19	510-18356-22	510-18356-23	510-18356-23RA	510-18356-16	510-18356-17
					Comments:					Reanalysis		
		RFI	Region 6 Industrial									
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**								
Metals												
Cadmium	mg/Kg	8	1,000	560	***0.16***	***1.5***	***0.14***	***0.69***	Not Analyzed	***2.3***	***1.2***
Lead	mg/Kg	400	800	800	***7.5***	***260***	***5.5***	***190***	Not Analyzed	***130***	***71***
Polynuclear Aromatic Hydrocarbons												
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***51 J***	***190 J***	360 U	360 U R	370 U	380 U	***1,000 J***
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***52 J***	***200 J***	360 U	360 U R	***67 J***	380 U	***1,000 J***
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000	360 U	***60 J***	360 U	360 U R	370 U	***120 J***	***5,900***
Acenaphthylene	ug/Kg	NAv	NAv	NAv	360 U	***330 J***	360 U	360 U R	370 U	380 U	3,800 U
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	360 U	***220 J***	360 U	360 U R	370 U	***280 J***	***11,000***
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	***45 J***	***950***	360 U	360 U R	***40 J***	***1,800***	***22,000***
Benzo[a]pyrene	ug/Kg	8,000	780	230	***38 J***	***1,100***	360 U	360 U R	370 U	***1,900***	***17,000***
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	***61 J***	***1,500***	360 U	360 U R	***47 J***	***2,600***	***22,000***
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	360 U	***490***	360 U	360 U R	370 U	***860***	***8,400***
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	360 U	***710***	360 U	360 U R	370 U	***1,100***	***8,600***
Chrysene	ug/Kg	160,000	780,000	230,000	***41 J***	***1,200***	360 U	***45 J R***	***59 J***	***1,800***	***18,000***
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230	360 U	390 U	360 U	360 U R	370 U	380 U	***3,900***
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	***100 J***	***3,000***	360 U	***55 J R***	***67 J***	***3,500***	***50,000***
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	360 U	***210 J***	360 U	360 U R	370 U	***82 J***	***5,900***
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	360 U	***450***	360 U	360 U R	370 U	***830***	***8,400***
Naphthalene	ug/Kg	84,000	190,000	210,000	360 U	***110 J***	360 U J-	360 U R	370 U	380 U	3,800 U
Phenanthrene	ug/Kg	NAv	NAv	NAv	***160 J***	***2,200***	***37 J***	***58 J R***	***66 J***	***1,200***	***38,000***
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	***81 J***	***2,600***	360 U	***61 J R***	***78 J***	***2,800***	***35,000***
Extractable Petroleum Hydrocarbons												
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***53***	***620***	***90***	***170***	Not Analyzed	***280***	***190***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NAv = Not Available

Data qualifers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-4
SWMU 24 Soil Detections Relevant to SWMU 6/AOC 4
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	24B11	/	SB1	24B11	/	SB2	24B11	/	SB2D	24B11	/	SB3	24B11	/	SB4
				Depth (ft):	0	-	2	2	-	4	2	-	4	4	-	6	6	-	8
				Date Collected:	9/17/2007			9/17/2007			9/17/2007			9/17/2007			9/17/2007		
				Lab ID:	510-18284-1			510-18284-2			510-18284-3			510-18284-4			510-18284-5		
				Comments:							Duplicate								
		RFI	Region 6 Industrial																
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker															
Metals																			
Cadmium	mg/Kg	8	1,000	560	0.24	U	J*	0.27	U	J*	0.23	U	J*	0.26	U	J*	0.25	U	J*
Lead	mg/Kg	400	800	800	0.12	U	J*	0.14	U	J*	0.12	U	J*	0.13	U	J*	0.12	U	J*
Polynuclear Aromatic Hydrocarbons																			
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350	U		360	U		360	U		370	U		***130***	***J***	
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350	U		360	U		360	U		370	U		***170***	***J***	
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000	350	U		360	U		360	U		370	U		390	U	
Acenaphthylene	ug/Kg	NAv	NAv	NAv	350	U		360	U		360	U		370	U		390	U	
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	350	U		360	U		360	U		370	U		***58***	***J***	
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	350	U		360	U		360	U		***200***	***J***		***210***	***J***	
Benzo[a]pyrene	ug/Kg	8,000	780	230	***78***	***J***		360	U		***52***	***J***		***180***	***J***		***160***	***J***	
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	***57***	***J***		360	U		***46***	***J***		***230***	***J***		***220***	***J***	
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	***76***	***J***		360	U		***43***	***J***		***160***	***J***		***96***	***J***	
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	350	U		360	U		360	U		***100***	***J***		***94***	***J***	
Chrysene	ug/Kg	160,000	780,000	230,000	***89***	***J***		360	U		***61***	***J***		***210***	***J***		***190***	***J***	
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230	350	U		360	U		360	U		370	U		390	U	
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	***78***	***J***		360	U		***52***	***J***		***340***	***J***		***400***		
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	350	U		360	U		360	U		370	U		390	U	
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	***39***	***J***		360	U		360	U		***110***	***J***		***79***	***J***	
Naphthalene	ug/Kg	84,000	190,000	210,000	350	U		360	U		360	U		370	U		***78***	***J***	
Phenanthrene	ug/Kg	NAv	NAv	NAv	350	U		360	U		360	U		***160***	***J***		***370***	***J***	
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	***160***	***J***		***43***	***J***		***73***	***J***		***290***	***J***		***320***	***J***	
Extractable Petroleum Hydrocarbons																			
Diesel	mg/Kg	NAv	NAv	NAv	16	U		3.3	U		***120***			3.3	U		180	U	
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***320***			***230***			***250***			***120***			***700***		

Bold, italic = Detected
NAv = Not Available
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 9-4
SWMU 24 Soil Detections Relevant to SWMU 6/AOC 4
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	**24B12 / SB1**		**24B12 / SB2**		**24B12 / SB3**		**24B12 / SB4**				
					Depth (ft):	**0 - 2**		**2 - 4**		**4 - 6**		**6 - 8**				
					Date Collected:	**9/17/2007**		**9/17/2007**		**9/17/2007**		**9/17/2007**				
					Lab ID:	**510-18284-7**		**510-18284-8**		**510-18284-9**		**510-18284-10**				
					Comments:											
		RFI	**Region 6 Industrial**													
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**												
Metals																
Cadmium	mg/Kg	8	1,000	560	0.27	U	J*	0.25	U	J*	***1.7***	***J****	0.25	U	J*	
Lead	mg/Kg	400	800	800	0.14	U	J*	0.12	U	J*	***110***	***J****	0.13	U	J*	
Polynuclear Aromatic Hydrocarbons																
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***46***	***J***		350	U		***310***	***J***	***250***	***J***		
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	***50***	***J***		350	U		***380***		***270***	***J***		
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000	360	U		350	U		360	U	370	U		
Acenaphthylene	ug/Kg	NAv	NAv	NAv	360	U		350	U		360	U	370	U		
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	360	U		***94***	***J***		***82***	***J***	370	U		
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	360	U		***240***	***J***		***290***	***J***	***57***	***J***		
Benzo[a]pyrene	ug/Kg	8,000	780	230	360	U		***170***	***J***		***210***	***J***	370	U		
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	360	U		***230***	***J***		***300***	***J***	***48***	***J***		
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	360	U		***100***	***J***		***120***	***J***	370	U		
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	360	U		***110***	***J***		***120***	***J***	370	U		
Chrysene	ug/Kg	160,000	780,000	230,000	360	U		***200***	***J***		***270***	***J***	***65***	***J***		
Dibenz(a,h)anthracene	ug/Kg	2,000	780	230	360	U		350	U		360	U	370	U		
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	360	U		***630***			***680***	***J-***	***100***	***J***		
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	360	U		***36***	***J***		360	U	370	U		
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	360	U		***88***	***J***		***96***	***J -***	370	U		
Naphthalene	ug/Kg	84,000	190,000	210,000	360	U		350	U		***180***	***J***	***120***	***J***		
Phenanthrene	ug/Kg	NAv	NAv	NAv	***72***	***J***		***500***			***620***	***J-***	***290***	***J***		
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	360	U		***480***			***520***		***84***	***J***		
Extractable Petroleum Hydrocarbons																
Diesel	mg/Kg	NAv	NAv	NAv	***10***			***8.6***			3.3	U	3.4	U		
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***29***			***21***			***130***		***99***			

Bold, italic = Detected
NAv = Not Available
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 10-1
SWMU 24 - Waste Hydraulic Lubricating Oil Storage Tanks
Soil and Groundwater Sample Collection

Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analyses VOCs
Groundwater Sampling Plan						
24B11	DW1	9/17/2007	510-18284-6		30 - 35	X
24B12	DW1	9/17/2007	510-18284-11		30 - 35	X
Trip Blanks						
TB	--	9/17/2007	510-18284-12	Trip Blank	--	X

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis				
						VOCs	PAHs	Extractable TPH	RCRA Metals	pH
Soil Sampling Plan										
24B11*	SB1	9/17/2007	510-18284-1		0 - 2	X	X	X	X	X
	SB2	9/17/2007	510-18284-2		2 - 4	X	X	X	X	X
	SB2D	9/17/2007	510-18284-3	Field Duplicate	2 - 4	X	X	X	X	X
	SB3	9/17/2007	510-18284-4		4 - 6	X	X	X	X	X
	SB4	9/17/2007	510-18284-5		6 - 8	X	X	X	X	X
24B12*	SB1	9/17/2007	510-18284-7		0 - 2	X	X	X	X	X
	SB2	9/17/2007	510-18284-8		2 - 4	X	X	X	X	X
	SB3	9/17/2007	510-18284-9		4 - 6	X	X	X	X	X
	SB3MS	9/17/2007	510-18284-9	Matrix Spike	4 - 6	X	X	X	X	NA
	SB3MSD	9/17/2007	510-18284-9	Matrix Spike Duplicate	4 - 6	X	X	X	X	NA
	SB4	9/17/2007	510-18284-10		6 - 8	X	X	X	X	X

Notes:

* See also Table 9-1. Soil samples from location 24B11 and 24B12 were collected for characterization of both SWMU 6 and SWMU 24.

- Extractable TPH includes diesel range organics (DRO) and oil range organics (ORO)
- RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

ft - feet
NA - MS/MSD is not applicable to pH analysis.
PAHs - Polynuclear Aromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compounds

Table 10-2
SWMU 24 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	24B11 / SB1	24B11 / SB2	24B11 / SB2D	24B11 / SB3	24B11 / SB4
					Depth (ft):	0 - 2	2 - 4	2 - 4	4 - 6	6 - 8
					Date Collected:	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007
					Lab ID:	510-18284-1	510-18284-2	510-18284-3	510-18284-4	510-18284-5
					Comments:			Duplicate		
		RFI	Region 6 Industrial							
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker						
RCRA Metals										
Arsenic	mg/Kg	29	3.8	1.8	0.47 U J*	0.54 U J*	0.064 JB U*	0.51 U J*	0.5 U J*	
Barium	mg/Kg	1,600	100,000	100,000	0.12 U J*	0.14 U J*	0.12 U J*	0.13 U J*	0.12 U J*	
Cadmium	mg/Kg	8	1,000	560	0.24 U J*	0.27 U J*	0.23 U J*	0.26 U J*	0.25 U J*	
Chromium	mg/Kg	3,540	100,000	100,000	***710 J****	***940 J****	***840 J****	***1,300 J****	***11 J****	
Lead	mg/Kg	400	800	800	0.12 U J*	0.14 U J*	0.12 U J*	0.13 U J*	0.12 U J*	
Mercury	mg/Kg	2	610	340	***0.0078 J +***	***0.01 J +***	***0.021 J +***	***0.011 J +***	***0.14 J+***	
Selenium	mg/Kg	5	10,000	570	***0.053 J ****	***0.064 J ****	***0.08 J ****	***0.12 J ****	***0.14 J ****	
Silver	mg/Kg	34	10,000	570	***0.69***	***1.1***	***1.2***	***0.81***	***0.2 J***	
Polynuclear Aromatic Hydrocarbons										
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350 U	360 U	360 U	370 U	***130 J***	
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv	350 U	360 U	360 U	370 U	***170 J***	
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000	350 U	360 U	360 U	370 U	***58 J***	
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300	350 U	360 U	360 U	***200 J***	***210 J***	
Benzo[a]pyrene	ug/Kg	8,000	780	230	***78 J***	360 U	***52 J***	***180 J***	***160 J***	
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300	***57 J***	360 U	***46 J***	***230 J***	***220 J***	
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv	***76 J***	360 U	***43 J***	***160 J***	***96 J***	
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000	350 U	360 U	360 U	***100 J***	***94 J***	
Chrysene	ug/Kg	160,000	780,000	230,000	***89 J***	360 U	***61 J***	***210 J***	***190 J***	
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000	***78 J***	360 U	***52 J***	***340 J***	***400***	
Fluorene	ug/Kg	560,000	33,000,000	26,000,000	350 U	360 U	360 U	370 U	390 U	
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300	***39 J***	360 U	360 U	***110 J***	***79 J***	
Naphthalene	ug/Kg	84,000	190,000	210,000	350 U	360 U	360 U	370 U	***78 J***	
Phenanthrene	ug/Kg	NAv	NAv	NAv	350 U	360 U	360 U	***160 J***	***370 J***	
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000	***160 J***	***43 J***	***73 J***	***290 J***	***320 J***	
Extractable Petroleum Hydrocarbons										
Diesel	mg/Kg	NAv	NAv	NAv	16 U	3.3 U	***120***	3.3 U	180 U	
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv	***320***	***230***	***250***	***120***	***700***	
Volatile Organic Compounds										
Acetone	ug/Kg	16,000	56,000,000	60,000,000	11 U	***38***	***7.2 J***	***13***	37 B U*	
Benzene	ug/Kg	30	1,500	1,600	***1.7 J +***	6.3 U	6.2 U	***1.6 J +***	7 U	
Carbon disulfide	ug/Kg	32,000	720,000	720,000	***3.9 J +***	***12***	***2.5 J +***	***3.7 J +***	7 U	
Ethylbenzene	ug/Kg	13,000	230,000	230,000	6.2 U	6.3 U	6.2 U	6.5 U	7 U	
Methylene Chloride	ug/Kg	20	21,000	22,000	***10 J+***	12 B U*	***13 J+***	***8.7 J+***	3.3 JB U*	
Toluene	ug/Kg	12,000	520,000	520,000	5.4 U	***1.3 J +***	5.5 U	***1.7 J +***	7 U	

Table 10-2
SWMU 24 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	**24B11 / SB1**	**24B11 / SB2**	**24B11 / SB2D**	**24B11 / SB3**	**24B11 / SB4**
				Depth (ft):	**0 - 2**	**2 - 4**	**2 - 4**	**4 - 6**	**6 - 8**
				Date Collected:	**9/17/2007**	**9/17/2007**	**9/17/2007**	**9/17/2007**	**9/17/2007**
				Lab ID:	**510-18284-1**	**510-18284-2**	**510-18284-3**	**510-18284-4**	**510-18284-5**
				Comments:			**Duplicate**		
		RFI	**Region 6 Industrial**						
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**					
Physical Parameters									
pH	S.U.	NAv	NAv	NAv	***11.3***	***11.8***	***11.9***	***12***	***9.02***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 10-2
SWMU 24 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	**24B12**	**/**	**SB1**		**24B12**	**/**	**SB2**		**24B12**	**/**	**SB3**		**24B12**	**/**	**SB4**	
					Depth (ft):	**0**	**-**	**2**		**2**	**-**	**4**		**4**	**-**	**6**		**6**	**-**	**8**	
					Date Collected:	**9/17/2007**				**9/17/2007**				**9/17/2007**				**9/17/2007**			
					Lab ID:	**510-18284-7**				**510-18284-8**				**510-18284-9**				**510-18284-10**			
					Comments:																
		RFI	**Region 6 Industrial**																		
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**																	
RCRA Metals																					
Arsenic	mg/Kg	29	3.8	1.8		0.077	JB	U*		0.08	JB	U*		***11***	***B***	***J****		0.5	U	J*	
Barium	mg/Kg	1,600	100,000	100,000		0.14	U	J*		0.12	U	J*		***110***		***J****		0.13	U	J*	
Cadmium	mg/Kg	8	1,000	560		0.27	U	J*		0.25	U	J*		***1.7***		***J****		0.25	U	J*	
Chromium	mg/Kg	3,540	100,000	100,000		***27***		***J****		***23***		***J****		***31***		***J****		***21***		***J****	
Lead	mg/Kg	400	800	800		0.14	U	J*		0.12	U	J*		***110***		***J****		0.13	U	J*	
Mercury	mg/Kg	2	610	340		***0.054***		***J+***		***0.039***		***J+***		***0.08***		***J+***		***0.02***		***J+***	
Selenium	mg/Kg	5	10,000	570		***0.12***	***J***	*****		***0.18***	***J***	*****		***0.68***		***J****		***0.13***	***J***	*****	
Silver	mg/Kg	34	10,000	570		***0.084***	***J***			***0.088***	***J***			***0.15***	***J***			***0.23***	***J***		
Polynuclear Aromatic Hydrocarbons																					
1-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		***46***	***J***			350	U			***310***	***J***			***250***	***J***		
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		***50***	***J***			350	U			***380***				***270***	***J***		
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000		360	U			***94***	***J***			***82***	***J***			370	U		
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300		360	U			***240***	***J***			***290***	***J***			***57***	***J***		
Benzo[a]pyrene	ug/Kg	8,000	780	230		360	U			***170***	***J***			***210***	***J***			370	U		
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300		360	U			***230***	***J***			***300***	***J***			***48***	***J***		
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv		360	U			***100***	***J***			***120***	***J***			370	U		
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000		360	U			***110***	***J***			***120***	***J***			370	U		
Chrysene	ug/Kg	160,000	780,000	230,000		360	U			***200***	***J***			***270***	***J***			***65***	***J***		
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000		360	U			***630***				***680***		***J-***		***100***	***J***		
Fluorene	ug/Kg	560,000	33,000,000	26,000,000		360	U			***36***	***J***			360	U			370	U		
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300		360	U			***88***	***J***			***96***	***J***	***-***		370	U		
Naphthalene	ug/Kg	84,000	190,000	210,000		360	U			350	U			***180***	***J***			***120***	***J***		
Phenanthrene	ug/Kg	NAv	NAv	NAv		***72***	***J***			***500***				***620***		***J-***		***290***	***J***		
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000		360	U			***480***				***520***				***84***	***J***		
Extractable Petroleum Hydrocarbons																					
Diesel	mg/Kg	NAv	NAv	NAv		***10***				***8.6***				3.3	U			3.4	U		
Unknown Hydrocarbons	mg/Kg	NAv	NAv	NAv		***29***				***21***				***130***				***99***			
Volatile Organic Compounds																					
Acetone	ug/Kg	16,000	56,000,000	60,000,000		22	B	U*		21	B	U*		18	B	U*		18	B	U*	
Benzene	ug/Kg	30	1,500	1,600		***2.4***	***J***	***+***		***1.9***	***J***	***+***		***5.8***	***J***	*****		***2.2***	***J***		
Carbon disulfide	ug/Kg	32,000	720,000	720,000		5.9	U			***2.5***	***J***	***+***		***2.5***	***J***	*****		***5***	***J***		
Ethylbenzene	ug/Kg	13,000	230,000	230,000		5.9	U			5.7	U			***1.4***	***J***	*****		6.6	U		
Methylene Chloride	ug/Kg	20	21,000	22,000		5.4	JB	U*		2.8	JB	U*		1.8	JB	U*		3.6	JB	U*	
Toluene	ug/Kg	12,000	520,000	520,000		***1.7***	***J***	***+***		***1.6***	***J***	***+***		***5***	***J***	*****		***1.5***	***J***		

Table 10-2
SWMU 24 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

				Sample:	**24B12 / SB1**	**24B12 / SB2**	**24B12 / SB3**	**24B12 / SB4**
				Depth (ft):	**0 - 2**	**2 - 4**	**4 - 6**	**6 - 8**
				Date Collected:	**9/17/2007**	**9/17/2007**	**9/17/2007**	**9/17/2007**
				Lab ID:	**510-18284-7**	**510-18284-8**	**510-18284-9**	**510-18284-10**
				Comments:				
		RFI	**Region 6 Industrial**					
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**				
Physical Parameters								
pH	S.U.	NAv	NAv	NAv	***8.84***	***8.37***	***8.21***	***7.91***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 11-1
SWMU 13 - Pickle Liquor Tanks
Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Estimated Depth of Sample (ft)	Chemical Analysis					
						VOCs	SVOCs	Volatile TPH	Extractable TPH**	RCRA Metals	pH
Soil Samples											
13B09A*	SB1	9/10/2007	510-17977-1		0 - 2	X	X	X	**	X	X
	SB2	9/10/2007	510-17977-2		2 - 4	X	X	X	**	X	X
	SB3	9/10/2007	510-17977-3		4 - 6	X	X	X	**	X	X
	SB4	9/10/2007	510-17977-4		6 - 8	X	X	X	**	X	X

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Type	Chemical Analyses	
					Total RCRA Metals	Filtered RCRA Metals
Groundwater Samples						
33MW5S	GW4	10/4/2007	510-19035-12		X	X
	GW4D	10/4/2007	510-19035-13	Field Duplicate	X	X
33MW5I	GW4	10/4/2007	510-19035-14		X	X
33MW5D	GW4	9/26/2007	510-18749-2		X	X
33MW11S	GW4	9/27/2007	510-18739-3		X	X
33MW11D	GW4	10/4/2007	510-19035-8		X	X
33MW12S	GW4	9/27/2007	510-18739-5		X	X
33MW12D	GW4	9/27/2007	510-18739-4		X	X
33MW13S	GW4	10/2/2007	510-18936-9		X	X
	GW4MS	10/2/2007	510-18936-9	Matrix Spike	X	X
	GW4MSD	10/2/2007	510-18936-9	Matris Spike Duplicate	X	X
33MW13D	GW4	10/1/2007	510-18936-1		X	X

Notes:

* - Boring was placed at the approximate locations of the RFI borings.

** - Extractable TPH was planned for samples collected from 13B09. The chain-of-custody was unclear regarding this requirement. Extractable TPH was requested via phone and email to the laboratory; however, the analysis was not performed.

- Samples were collected from Monitoring Wells in the SWMU 33 area for characterization of metals in groundwater related to SWMU 13.

- Volatile TPH includes gasoline range organics (GRO)

- Extractable TPH includes diesel range organics (DRO) and oil range organics (ORO)

- RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

ft - feet

TPH - Total Petroleum Hydrocarbons

SVOCs - Semivolatile Organic Compounds

VOCs - Volatile Organic Compounds

Table 11-2
SWMU 13 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	13B09A / SB1		13B09A / SB2		13B09A / SB3		13B09A / SB4	
					Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
					Date Collected:	9/10/2007		9/10/2007		9/10/2007		9/10/2007	
					Lab ID:	510-17977-1		510-17977-2		510-17977-3		510-17977-4	
					Comments:								
		RFI	Region 6 Industrial										
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker									
Metals													
Arsenic	mg/Kg	29	3.8	1.8		***2.3***		***5.8***		***6.7***		***19***	
Barium	mg/Kg	1,600	100,000	100,000		***330***		***270***		***240***		***310***	
Cadmium	mg/Kg	8	1,000	560		***1.6***		***0.96***		***1.9***		***7.5***	
Chromium	mg/Kg	3,540	100,000	100,000		***1,600***		***300***		***17***		***25***	
Lead	mg/Kg	400	800	800		***34***		***210***		***91***		***280***	
Mercury	mg/Kg	2	610	340		***0.048***		***0.67***		***0.22***		***0.45***	
Silver	mg/Kg	34	10,000	570		0.21	JB U*	0.32	B U*	0.24	JB U*	***0.68***	***B J+***
Inorganics													
pH	SU	NAv	NAv	NAv		***10.4***		***10.7***		***8.96***		***8.58***	
Semivolatile Organic Compounds													
2-Methylnaphthalene	ug/Kg	NAv	NAv	NAv		720	U	***390***	***J***	***100***	***J***	***370***	***J***
Acenaphthene	ug/Kg	570,000	38,000,000	33,000,000		720	U	400	U	440	U	***190***	***J***
Acenaphthylene	ug/Kg	NAv	NAv	NAv		***150***	***J***	***64***	***J***	440	U	440	U
Anthracene	ug/Kg	12,000,000	100,000,000	100,000,000		720	U	***45***	***J***	440	U	***110***	***J***
Benzo[a]anthracene	ug/Kg	2,000	7,800	2,300		***580***	***J***	***290***	***J***	***45***	***J***	***160***	***J***
Benzo[a]pyrene	ug/Kg	8,000	780	230		***570***	***J***	***250***	***J***	***56***	***J***	***140***	***J***
Benzo[b]fluoranthene	ug/Kg	5,000	7,800	2,300		***790***		***470***		***64***	***J***	***190***	***J***
Benzo[g,h,i]perylene	ug/Kg	NAv	NAv	NAv		***250***	***J***	***210***	***J***	***64***	***J***	***74***	***J***
Benzo[k]fluoranthene	ug/Kg	49,000	78,000	23,000		***400***	***J***	***160***	***J***	440	U	***79***	***J***
Chrysene	ug/Kg	160,000	780,000	230,000		***470***	***J***	***330***	***J***	***48***	***J***	***160***	***J***
Dibenzofuran	ug/Kg	NAv	2,500,000	1,700,000		720	U	***53***	***J***	440	U	440	U
Dimethyl phthalate	ug/Kg	NAv	100,000,000	100,000,000		***630***	***J***	400	U	440	U	440	U
Di-n-butyl phthalate	ug/Kg	2,300,000	100,000,000	68,000,000		720	U	***110***	***J***	440	U	440	U
Fluoranthene	ug/Kg	4,300,000	82,000,000	24,000,000		***690***	***J***	***580***		***82***	***J***	***380***	***J***
Fluorene	ug/Kg	560,000	33,000,000	26,000,000		720	U	400	U	440	U	***110***	***J***
Indeno[1,2,3-cd]pyrene	ug/Kg	14,000	7,800	2,300		***250***	***J***	***180***	***J***	440	U	***65***	***J***
Naphthalene	ug/Kg	84,000	190,000	210,000		720	U	***120***	***J***	440	U	***190***	***J***
Phenanthrene	ug/Kg	NAv	NAv	NAv		***87***	***J***	***230***	***J***	440	U	***240***	***J***
Pyrene	ug/Kg	4,200,000	54,000,000	32,000,000		***820***		***400***		***75***	***J***	***310***	***J***
Total Petroleum Hydrocarbons													
Gasoline Range Organics (C6-C10)	ug/Kg	NAv	NAv	NAv		110	U	***1,100***		***3,300***		***30,000***	

Table 11-2
SWMU 13 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	**13B09A / SB1**			**13B09A / SB2**			**13B09A / SB3**			**13B09A / SB4**		
					Depth (ft):	**0 - 2**			**2 - 4**			**4 - 6**			**6 - 8**		
					Date Collected:	**9/10/2007**			**9/10/2007**			**9/10/2007**			**9/10/2007**		
					Lab ID:	**510-17977-1**			**510-17977-2**			**510-17977-3**			**510-17977-4**		
					Comments:												
		RFI	**Region 6 Industrial**														
Parameter	**Units**	**20 DAF SSL**	**Indoor Worker**	**Outdoor Worker**													
Volatile Organic Compounds																	
Acetone	ug/Kg	16,000	56,000,000	60,000,000		12	U	J*	***15***	***H***	***J-***	***29***			***330***	***HB***	***J****
Carbon disulfide	ug/Kg	32,000	720,000	720,000		6.2	U	J*	***2.7***	***HJ***	***-***	***15***			***6.7***	***HJ***	***-***
Methylene Chloride	ug/Kg	20	21,000	22,000		6.2	U	J*	7.3	U		1.9	JB	U*	***2.8***	***J***	***+***
Toluene	ug/Kg	12,000	520,000	520,000		6.2	U	J*	7.3	U		***2.2***	***J***	***+***	***2.0***	***J***	***+***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NAv = Not Available
SU = Standard Units

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Table 11-3
SWMU 33 Area Groundwater Results for Metals*
Supplemental Investigation
AK Steel Kansas City Facility

			Sample:	33MW5S / GW4		33MW5S / GW4D		33MW5I / GW4		33MW5D / GW4		33MW11S / GW4		33MW11D / GW4	
			Depth:	Shallow		Shallow		Intermediate		Deep		Shallow		Deep	
			Date Collected:	10/4/2007		10/4/2007		10/4/2007		9/26/2007		9/27/2007		10/4/2007	
			Lab ID:	510-19035-12		510-19035-13		510-19035-14		510-18739-2		510-18739-3		510-19035-8	
			Comments:			Duplicate									
Parameter	**MCL**	**Units**													
Total Metals															
Arsenic	0.010	mg/L	***0.0092***		***0.0093***		***0.012***		***0.014***		***0.0095***		***0.0019***	***J***
Barium	2	mg/L	***0.25***		***0.25***		***0.22***		***1.3***		***0.51***		***1.2***	***B***
Cadmium	0.005	mg/L	***0.0003***	***J***	***0.00032***	***J***	***0.000084***	***J***	0.001	U	0.001	U	***0.00049***	***J***
Chromium	0.100	mg/L	***0.0013***		***0.00073***	***J***	0.001	U	***0.0011***		0.001	U	***0.0022***	
Lead	0.015	mg/L	***0.0023***		***0.0018***		***0.0015***		***0.0024***		0.0005	U	***0.003***	
Mercury	0.002	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Selenium	0.050	mg/L	0.0017	B U*	0.0014	B U*	0.001	U	***0.00061***	***J***	***0.00036***	***J***	0.001	U
Silver	NAv	mg/L	0.001	U	0.001	U	0.001	U	0.00073	JB U*	0.00047	JB U*	0.001	U
Filtered Metals															
Arsenic, Dissolved	0.010	mg/L	***0.0085***		**0.0088**		***0.013***		***0.011***		***0.0083***		***0.00092***	***J***
Barium, Dissolved	2	mg/L	***0.22***		**0.22**		***0.22***		***1.3***		***0.53***		***1.2***	
Cadmium, Dissolved	0.005	mg/L	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Chromium, Dissolved	0.100	mg/L	0.001	U	***0.00023***	***J***	***0.00021***	***J***	0.001	U	0.001	U	***0.00028***	***J***
Lead, Dissolved	0.015	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U	0.0005	U
Mercury, Dissolved	0.002	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U
Selenium, Dissolved	0.050	mg/L	0.001	U	0.001	U	0.001	U	***0.00047***	***J***	***0.00041***	***J***	***0.0021***	
Silver, Dissolved	NAv	mg/L	0.001	U	0.001	U	0.001	U	0.00066	JB U*	0.00076	JB U*	0.001	U

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

*Samples were collected from Monitoring Wells in the SWMU 33 area for characterization related to SWMU 13.

Table 11-3
SWMU 33 Area Groundwater Results for Metals*
Supplemental Investigation
AK Steel Kansas City Facility

			Sample:	33MW12S / GW4		33MW12D / GW4		33MW13S / GW4		33MW13D / GW4	
			Depth:	Shallow		Deep		Shallow		Deep	
			Date Collected:	9/27/2007		9/27/2007		10/2/2007		10/1/2007	
			Lab ID:	510-18739-5		510-18739-4		510-18936-9		510-18936-1	
			Comments:								
Parameter	**MCL**	**Units**									
Total Metals											
Arsenic	0.010	mg/L		0.002	U	***0.0012***	***J***	***0.0045***		***0.0018***	***J***
Barium	2	mg/L		***0.039***		***1.5***		***0.038***		***0.72***	
Cadmium	0.005	mg/L		***0.00046***	***J***	***0.00029***	***J***	***0.00026***	***J***	***0.00042***	***J***
Chromium	0.100	mg/L		0.001	U	0.001	U	***0.0011***	***B***	***0.0049***	***B***
Lead	0.015	mg/L		***0.0018***		***0.00069***		***0.0014***		***0.0033***	
Mercury	0.002	mg/L		0.0002	U	0.0002	U	0.0002	U	0.0002	U
Selenium	0.050	mg/L		***0.014***		***0.00056***	***J***	***0.00032***	***J***	0.001	U
Silver	NAv	mg/L		0.00039	JB U*	0.00044	JB U*	0.001	U	0.001	U
Filtered Metals											
Arsenic, Dissolved	0.010	mg/L		***0.00021***	***J***	0.002	U	***0.0022***		***0.00028***	***J***
Barium, Dissolved	2	mg/L		***0.031***		***0.66***		***0.035***		***0.63***	
Cadmium, Dissolved	0.005	mg/L		***0.00056***	***J***	0.001	U	0.001	U	0.001	U
Chromium, Dissolved	0.100	mg/L		0.001	U	0.001	U	0.00048	J U*	0.001	U
Lead, Dissolved	0.015	mg/L		0.0005	U	0.0005	U	0.0005	U	0.0005	U
Mercury, Dissolved	0.002	mg/L		0.0002	U	0.0002	U	0.0002	U	0.0002	U
Selenium, Dissolved	0.050	mg/L		***0.01***		***0.00038***	***J***	***0.00046***	***J***	***0.00042***	***J***
Silver, Dissolved	NAv	mg/L		0.00043	JB U*	0.00047	JB U*	0.001	U	0.001	U

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

*Samples were collected from Monitoring Wells in the SWMU 33 area for characterization related to SWMU 13.

Table 12-1
SWMU 17 - Wire Mill Rinsewater Neutralization Tank
Soil Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Date Collected	Lab ID #	Sample Depth (ft)	Sample Type	Chemical Analyses
						VOCs
Soil Samples						
17B08B	SB01	9/10/2007	510-17978-1	0 - 2		X
	SB02	9/10/2007	510-17978-2	2 - 4		X
	SB03	9/10/2007	510-17978-3	4 - 6		X
	SB03	9/11/2007	510-18106-1	4 - 6	Offset Boring	X
	SB04	9/11/2007	510-18106-2	6 - 8	Offset Boring	X

Notes:

- Due to refusal encountered in the 6-8 ft interval, a sample could not be collected on 9/10/2007. Different sampling equipment was used on 9/11/2007 to advance a slightly offset boring and collect samples from the 4-6 and 6-8 ft intervals.

ft - feet

VOCs - Volatile Organic Compounds

Table 12-2
SWMU 17 Soil Detections
Supplemental Investigation
AK Steel Kansas City Facility

					Sample:	17B08B / SB1	17B08B / SB2	17B08B / SB3	17B08B / SB3D	17B08B / SB4
					Depth (ft):	0 - 2	2 - 4	4 - 6	4 - 6	6 - 8
					Date Collected:	9/10/2007	9/10/2007	9/10/2007	9/11/2007	9/11/2007
					Lab ID:	510-17978-1	510-17978-2	510-17978-3	510-18106-1	510-18106-2
					Comments:				Offset Boring	Offset Boring
		RFI	Region 6 Industrial							
Parameter	Units	20 DAF SSL	Indoor Worker	Outdoor Worker						
Volatile Organic Compounds										
1,1-Dichloroethene	ug/Kg	60	430,000	470,000		6.8 U	5.6 U	5.6 U	28 HU J-	***1.6 J +***
Acetone	ug/Kg	16,000	56,000,000	60,000,000		***40***	***52 J+***	***35***	***52 HJ -***	***17 H J-***
Benzene	ug/Kg	30	1,500	1,600		***2.3 J +***	***1.3 J +***	5.6 U	28 HU J-	8.5 U
Carbon disulfide	ug/Kg	32,000	720,000	720,000		***3.5 J***	***3.4 J +***	***3.2 J***	28 HU J-	***1.9 J +***
cis-1,2-Dichloroethene	ug/Kg	400	150,000	160,000		***14***	***21 J+***	***8.8***	***27 HJ -***	***52 H J-***
Ethylbenzene	ug/Kg	13,000	230,000	230,000		***8.2***	5.6 U	***6.8***	28 HU J-	8.5 U
Methylene Chloride	ug/Kg	20	21,000	22,000		12 B U*	6.7 U*	5.9 B U*	***310 H J-***	8.5 U
Toluene	ug/Kg	12,000	520,000	520,000		***2.4 J +***	***0.92 J +***	***1.6 J +***	28 HU J-	8.5 U
trans-1,2-Dichloroethene	ug/Kg	700	180,000	200,000		6.8 U	5.6 U	5.6 U	28 HU J-	***3.3 J +***
Trichloroethene	ug/Kg	60	92	100		***140***	***130 J+***	***82***	***650 H J-***	***180 J+***
Vinyl chloride	ug/Kg	10	860	860		6.8 U	5.6 U	5.6 U	28 HU J-	***4.4 J +***
Xylenes, Total	ug/Kg	190,000	210,000	210,000		***21***	11 U	***16***	57 HU J-	17 U

Bold, italic = Detected
ug/kg = micrograms per kilogram
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are described on Table 2-4.

If more than one screening level is exceeded, the color for the highest screening level is used for the highlight.

Due to refusal encountered in the 6-8 ft bgs interval, a sample from the 6-8 ft bgs interval could not be collected on 9/10/2007. Different sampling equipment was used on 9/11/2007 to advance a slightly offset boring and collect the 4-6 and 6-8 ft bgs interval.

Table 13-1
Groundwater Elevation Measurements - September 2007
SWMU 33 - Nail Mill Degreasing Area

Supplemental Investigation

AK Steel Kansas City Facility

Well No.	Date	Easting (corrected)	Northing (corrected)	Ground Elevation (FMSL)	TOC Elevation (FMSL)	Depth to Water (FBTOC)	Water Level Elevation (FMSL)	Current Well Depth (FBTOC)	Total Depth from TOC (Feb 2001 Event)
Deep Wells									
33MW3	09/24/07	500595.93	1070791.82	747.26	746.89	31.51	715.38	62.11	62.30
33MW4	09/24/07	500354.98	1070983.66	748.12	747.86	31.44	716.42	70.21	70.24
33MW5D	09/24/07	501017.71	1070903.79	746.41	746.02	31.59	714.43	68.91	68.73
33MW6D	09/24/07	500601.87	1071190.10	749.30	751.95	38.06	713.89	71.32	71.32
33MW7D	09/24/07	500668.10	1070606.80	746.97	746.63	30.91	715.72	68.04	68.38
33MW10D	09/24/07	500243.24	1071542.85	746.31	745.87	32.22	713.65	67.28	67.45
33MW11D	09/24/07	501116.48	1071241.41	740.57	740.12	26.11	714.01	60.94	60.87
33MW12D	09/24/07	501227.00	1070666.52	746.87	746.56	30.81	715.75	68.69	68.72
33MW13D	09/25/07	501314.06	1070804.04	745.20	744.90	29.79	715.11	67.79	68.63
33MW14D	09/24/07	500093.56	1070733.07	748.75	748.42	30.78	717.64	68.85	68.82
33MW15D	09/24/07	500287.85	1071198.49	751.37	753.45	37.24	716.21	86.78	NA
33MW16D	09/24/07	500004.37	1071473.53	750.97	753.23	36.82	716.41	77.91	NA
Intermediate Wells									
33MW2	09/24/07	500602.14	1070791.72	747.22	746.96	12.45	734.51	36.15	36.19
33MW5I	09/24/07	501012.78	1070890.09	746.54	746.27	12.25	734.02	41.12	41.11
Shallow Wells									
33MW2S	09/24/07	500590.11	1070792.07	747.20	746.98	11.76	735.22	18.38	18.37
33MW4S	09/24/07	500363.55	1070983.16	748.14	747.91	14.61	733.30	17.25	17.20
33MW5S	09/24/07	501016.28	1070896.49	746.59	746.38	12.49	733.89	19.41	18.40
33MW7S	09/24/07	500667.87	1070601.50	746.96	746.59	11.22	735.37	20.41	20.34
33MW8S	09/24/07	500364.47	1070807.40	747.27	747.08	12.71	734.37	16.81	16.80
33MW9S	09/24/07	500691.85	1071320.18	747.44	750.19	18.61	731.58	22.36	22.11
33MW10S	09/24/07	500243.09	1071545.53	746.26	745.93	13.10	732.83	17.18	17.17
33MW11S	09/24/07	501109.05	1071242.97	740.24	739.74	10.61	729.13	18.01	18.00
33MW12S	09/24/07	501218.66	1070667.18	746.84	746.24	12.49	733.75	17.39	17.10
33MW13S	09/24/07	501320.69	1070804.26	745.24	744.79	11.55	733.24	17.42	17.41
33MW14S	09/24/07	500093.51	1070738.25	748.87	748.52	8.62	739.90	17.91	18.18
33MW15S	09/24/07	500288.65	1071203.57	751.09	753.18	18.15	735.03	27.02	NA
33MW16S	09/24/07	499999.36	1071472.24	751.00	753.52	19.62	733.90	27.70	NA

FMSL - Feet above mean sea level
TOC - Top of casing
FBTOC - Feet below top of casing
NA - Not available or applicable

Deep - Deep wells were screened just above bedrock in the deep semi-confined saturated zone.
Intermediate - Intermediate wells were screened directly over the semi-confining layer of the shallow saturated zone.
Shallow - Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table 13-2
SWMU 33 - Nail Mill Degreasing Area
Groundwater Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Screen Placement	Date Collected	Lab ID #	Sample Type	Chemical Analyses		
						VOCs	Total RCRA Metals	Filtered RCRA Metals
33MW2S	GW4	Shallow	10/5/2007	510-19072-2		X		
33MW2	GW4	Intermediate	10/5/2007	510-19072-3		X		
33MW3	GW4	Deep	10/4/2007	510-19035-11		X		
33MW4S	GW4	Shallow	10/1/2007	510-18936-5		X		
33MW4	GW4	Deep	9/26/2007	510-18739-1		X		
33MW5S	GW4	Shallow	10/4/2007	510-19035-12		X	X	X
	GW4D		10/4/2007	510-19035-13	Field Duplicate	X	X	X
33MW5I	GW4	Intermediate	10/4/2007	510-19035-14		X	X	X
33MW5D	GW4	Deep	9/26/2007	510-18739-2		X	X	X
33MW6D	GW4	Deep	10/1/2007	510-18936-2		X		
33MW7S	GW4	Shallow	10/1/2007	510-18936-4		X		
33MW7D	GW4	Deep	10/1/2007	510-18936-3		X		
33MW8S	GW4	Shallow	10/4/2007	510-19035-10		X		
33MW9S	GW4	Shallow	10/4/2007	510-19035-9		X		
33MW10S	GW4	Shallow	10/3/2007	510-19035-3		X		
	GW4QA		10/3/2007	0700529	QA Lab Split	X		
33MW10D	GW4	Deep	10/3/2007	510-19035-4		X		
	GW4D		10/3/2007	510-19035-5	Field Duplicate	X		
	GW4QA		10/3/2007	0700530	QA Lab Split	X		
33MW11S	GW4	Shallow	9/27/2007	510-18739-3		X	X	X
33MW11D	GW4	Deep	10/4/2007	510-19035-8		X	X	X
33MW12S	GW4	Shallow	9/27/2007	510-18739-5		X	X	X
33MW12D	GW4	Deep	9/27/2007	510-18739-4		X	X	X
33MW13S	GW4	Shallow	10/2/2007	510-18936-9		X	X	X
	GW4MS		10/2/2007	510-18936-9	Matrix Spike	X	X	X
	GW4MSD		10/2/2007	510-18936-9	Matrix Spike Duplicate	X	X	X
33MW13D	GW4	Deep	10/1/2007	510-18936-1		X	X	X
33MW14S	GW4	Shallow	10/3/2007	510-19035-6		X		
33MW14D	GW4	Deep	10/3/2007	510-19035-7		X		

Table 13-2
SWMU 33 - Nail Mill Degreasing Area
Groundwater Sample Collection
Supplemental Investigation
AK Steel Kansas City Facility

Sample Point	Sample Designator	Screen Placement	Date Collected	Lab ID #	Sample Type	Chemical Analyses		
						VOCs	Total RCRA Metals	Filtered RCRA Metals
33MW15S	GW4	Shallow	10/2/2007	510-18936-7		X		
33MW15D	GW4	Deep	10/2/2007	510-18936-6		X		
33MW16S	GW4	Shallow	10/2/2007	510-18936-8		X		
33MW16D	GW4	Deep	10/3/2007	510-19035-2		X		
Trip Blanks								
TB	092707		9/27/2007	510-18739-6	Trip Blank	X		
TB	100207		10/2/2007	510-18936-10	Trip Blank	X		
TB	100307		10/3/2007	510-19035-1	Trip Blank	X		
TB	100307QA		10/3/2007	07100531	Trip Blank	X		
TB	100507		10/5/2007	510-19072-1	Trip Blank	X		

Notes:
- Groundwater samples will be sbumited to the lab as both unfiltered and field filtered samples.
- Groundwater will be sampled using low-flow techniques.

ft - feet
RCRA - Resource Conservation and Recovery Act. RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.
VOCs - Volatile Organic Compounds

QA Lab Split - Sample submitted to Continental Analytical Services of Salina, Kansas for confirmation analysis.
Shallow - Shallow wells were screened in the shallow unconfined saturated zone.
Intermediate - Intermediate wells were screened directly over the semi-confining layer of the shallow saturated zone.
Deep - Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	33MW2S / GW4		33MW2 / GW4		33MW3 / GW4		33MW4S / GW4		33MW4 / GW4		33MW5S / GW4	
		Depth:	Shallow		Intermediate		Deep		Shallow		Deep		Shallow	
		Date Collected:	10/5/2007		10/5/2007		10/4/2007		10/1/2007		9/26/2007		10/4/2007	
		Lab ID:	510-19072-2		510-19072-3		510-19035-11		510-18936-5		510-18739-1		510-19035-12	
		Comments:												
Parameter	**MCL**	**Units**												
Volatile Organic Compounds														
1,1,1-Trichloroethane	200	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
1,1,2-Trichloroethane	5	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
1,1-Dichloroethane	NAv	ug/L	50	U	***11***	***J***	***2***	***J***	5	U	5	U	5	U
1,1-Dichloroethene	7	ug/L	***11***	***J***	***5***	***J***	***9***	***J***	5	U	5	U	5	U
1,2-Dichloroethane	5	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
Benzene	5	ug/L	10	U	10	U	2	U	5	U	5	U	***0.26***	***J***
Chloroform	80	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
cis-1,2-Dichloroethene	70	ug/L	***1,800***		***630***		***940***		5	U	5	U	***53***	
Ethylbenzene	700	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
Methylene Chloride	5	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
Tetrachloroethene	5	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
Toluene	1,000	ug/L	50	U	50	U	10	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	100	ug/L	50	U	50	U	***4***	***J***	5	U	5	U	5	U
Trichloroethene	5	ug/L	***1,100***		***270***		***480***		5	U	5	U	***2.4***	***J***
Vinyl chloride	2	ug/L	***150***		***1,500***		***60***		2	U	2	U	***4.1***	***J***
Xylenes, Total	10,000	ug/L	150	U	150	U	30	U	10	U	10	U	15	U
Total Chlorinated VOCs	NAv	ug/L	***3,061***		***2,416***		***1,494***		Not Detected		Not Detected		***60***	
Total VOCs	NAv	ug/L	***3,061***		***2,416***		***1,494***		Not Detected		Not Detected		***60***	

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	33MW5S / GW4D		33MW5I / GW4		33MW5D / GW4		33MW6D / GW4		33MW7S / GW4		33MW7D / GW4	
		Depth:	Shallow		Intermediate		Deep		Deep		Shallow		Deep	
		Date Collected:	10/4/2007		10/4/2007		9/26/2007		10/1/2007		10/1/2007		10/1/2007	
		Lab ID:	510-19035-13		510-19035-14		510-18739-2		510-18936-2		510-18936-4		510-18936-3	
		Comments:	Duplicate											
Parameter	**MCL**	**Units**												
Volatile Organic Compounds														
1,1,1-Trichloroethane	200	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	5	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
1,1-Dichloroethane	NAv	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
1,1-Dichloroethene	7	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane	5	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
Benzene	5	ug/L	***0.27***	***J***	5	U	***0.3***	***J***	5	U	5	U	5	U
Chloroform	80	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
cis-1,2-Dichloroethene	70	ug/L	***55***		***560***		5	U	5	U	5	U	5	U
Ethylbenzene	700	ug/L	5	U	25	U	***0.61***	***J***	5	U	5	U	5	U
Methylene Chloride	5	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
Tetrachloroethene	5	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
Toluene	1,000	ug/L	5	U	25	U	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	100	ug/L	***0.51***	***J***	***3.7***	***J***	5	U	5	U	5	U	5	U
Trichloroethene	5	ug/L	***3.2***	***J***	***77***		5	U	5	U	5	U	5	U
Vinyl chloride	2	ug/L	***4.2***	***J***	***66***		2	U	2	U	2	U	2	U
Xylenes, Total	10,000	ug/L	15	U	75	U	***0.81***	***J***	10	U	10	U	10	U
Total Chlorinated VOCs	NAv	ug/L	***63***		***707***		Not Detected		Not Detected		Not Detected		Not Detected	
Total VOCs	NAv	ug/L	***63***		***707***		***1.7***	***J***	Not Detected		Not Detected		Not Detected	

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	33MW8S / GW4	33MW9S / GW4	33MW10S / GW4	33MW10S / GW4QA	33MW10D / GW4	33MW10D / GW4D
		Depth:	Shallow	Shallow	Shallow	Shallow	Deep	Deep
		Date Collected:	10/4/2007	10/4/2007	10/3/2007	10/3/2007	10/3/2007	10/3/2007
		Lab ID:	510-19035-10	510-19035-9	510-19035-3	07100529	510-19035-4	510-19035-5
		Comments:				QA Lab Sample		Duplicate
Parameter	**MCL**	**Units**						
Volatile Organic Compounds								
1,1,1-Trichloroethane	200	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
1,1,2-Trichloroethane	5	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
1,1-Dichloroethane	NAv	ug/L	***4.4 J***	***1.3 J***	5 U	1 U	5 U	5 U
1,1-Dichloroethene	7	ug/L	***1.7 J***	5 U	5 U	1 U	5 U	5 U
1,2-Dichloroethane	5	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
Benzene	5	ug/L	1 U	1 U	5 U	1 U	5 U	5 U
Chloroform	80	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
cis-1,2-Dichloroethene	70	ug/L	***33***	***1.9 J***	5 U	1 U	5 U	5 U
Ethylbenzene	700	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
Methylene Chloride	5	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
Tetrachloroethene	5	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
Toluene	1,000	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
trans-1,2-Dichloroethene	100	ug/L	5 U	5 U	5 U	1 U	5 U	5 U
Trichloroethene	5	ug/L	***130***	***1.4 J***	5 U	1 U	5 U	5 U
Vinyl chloride	2	ug/L	***0.89 J***	5 U	2 U	1 U	2 U	***0.88 J***
Xylenes, Total	10,000	ug/L	15 U	15 U	10 U	3 U	10 U	10 U
Total Chlorinated VOCs	NAv	ug/L	***170***	***4.6 J***	Not Detected	Not Detected	Not Detected	***0.88 J***
Total VOCs	NAv	ug/L	***170***	***4.6 J***	Not Detected	Not Detected	Not Detected	***0.88 J***

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	33MW10D / GW4QA	33MW11S / GW4	33MW11D / GW4	33MW12S / GW4	33MW12D / GW4	33MW13S / GW4
		Depth:	Deep	Shallow	Deep	Shallow	Deep	Shallow
		Date Collected:	10/3/2007	9/27/2007	10/4/2007	9/27/2007	9/27/2007	10/2/2007
		Lab ID:	07100530	510-18739-3	510-19035-8	510-18739-5	510-18739-4	510-18936-9
		Comments:	QA Lab Sample					
Parameter	**MCL**	**Units**						
Volatile Organic Compounds								
1,1,1-Trichloroethane	200	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	NAv	ug/L	1 U	5 U	5 U	5 U	***0.59 J***	5 U
1,1-Dichloroethene	7	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
Benzene	5	ug/L	1 U	***0.46 J***	1 U	5 U	5 U	5 U
Chloroform	80	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	70	ug/L	1 U	***2.3 J***	5 U	5 U	5 U	5 U
Ethylbenzene	700	ug/L	1 U	***0.65 J***	5 U	5 U	5 U	5 U
Methylene Chloride	5	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
Toluene	1,000	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	100	ug/L	1 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	ug/L	1 U	***1.8 J***	5 U	5 U	5 U	5 U
Vinyl chloride	2	ug/L	***0.8 J***	2 U	5 U	2 U	2 U	***0.73 J***
Xylenes, Total	10,000	ug/L	3 U	***0.86 J***	15 U	10 U	10 U	10 U
Total Chlorinated VOCs	NAv	ug/L	***0.8 J***	***4.1 J***	Not Detected	Not Detected	***0.59 J***	***0.73 J***
Total VOCs	NAv	ug/L	***0.8 J***	***6.1 J***	Not Detected	Not Detected	***0.59 J***	***0.73 J***

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	33MW13D / GW4	33MW14S / GW4	33MW14D / GW4	33MW15S / GW4	33MW15D / GW4
		Depth:	Deep	Shallow	Deep	Shallow	Deep
		Date Collected:	10/1/2007	10/3/2007	10/3/2007	10/2/2007	10/2/2007
		Lab ID:	510-18936-1	510-19035-6	510-19035-7	510-18936-7	510-18936-6
		Comments:					
Parameter	**MCL**	**Units**					
Volatile Organic Compounds							
1,1,1-Trichloroethane	200	ug/L	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	ug/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	NAv	ug/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	7	ug/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	ug/L	5 U	5 U	5 U	5 U	5 U
Benzene	5	ug/L	5 U	5 U	5 U	5 U	5 U
Chloroform	80	ug/L	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	70	ug/L	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	700	ug/L	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	ug/L	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	ug/L	5 U	5 U	5 U	5 U	5 U
Toluene	1,000	ug/L	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	100	ug/L	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	ug/L	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	2	ug/L	2 U	2 U	2 U	2 U	2 U
Xylenes, Total	10,000	ug/L	10 U	10 U	10 U	10 U	10 U
Total Chlorinated VOCs	NAv	ug/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Total VOCs	NAv	ug/L	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

Table 13-3
SWMU 33 VOCs Detections in Groundwater
Supplemental Investigation
AK Steel Kansas City Facility

			Sample:	33MW16S / GW4		33MW16D / GW4	
			Depth:	Shallow		Deep	
			Date Collected:	10/2/2007		10/3/2007	
			Lab ID:	510-18936-8		510-19035-2	
			Comments:				
Parameter	**MCL**	**Units**					
Volatile Organic Compounds							
1,1,1-Trichloroethane	200	ug/L		5	U	5	U
1,1,2-Trichloroethane	5	ug/L		5	U	5	U
1,1-Dichloroethane	NAv	ug/L		5	U	5	U
1,1-Dichloroethene	7	ug/L		5	U	5	U
1,2-Dichloroethane	5	ug/L		5	U	5	U
Benzene	5	ug/L		5	U	5	U
Chloroform	80	ug/L		5	U	5	U
cis-1,2-Dichloroethene	70	ug/L		5	U	5	U
Ethylbenzene	700	ug/L		5	U	5	U
Methylene Chloride	5	ug/L		5	U	5	U
Tetrachloroethene	5	ug/L		5	U	5	U
Toluene	1,000	ug/L		5	U	5	U
trans-1,2-Dichloroethene	100	ug/L		5	U	5	U
Trichloroethene	5	ug/L		5	U	5	U
Vinyl chloride	2	ug/L		2	U	2	U
Xylenes, Total	10,000	ug/L		10	U	10	U
Total Chlorinated VOCs	NAv	ug/L		Not Detected		Not Detected	
Total VOCs	NAv	ug/L		Not Detected		Not Detected	

Bold, italic = Detected
ug/L = micrograms per liter
NAv = Not Available

Data qualifiers are described on Table 2-3.
Screening levels are presented on Table 2-4.

Highlighted cells indicate on MCL exceedence.

Total VOCs and Total Chlorinated VOCs are rounded.

Results for metals in groundwater are presented with the discussion of SWMU 13 (Section 11.0).

FIGURES

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Kansas City, Missouri

East 7TH
Kansas City
NW 4TH
210
Missouri River
Thornton
LLWELL
RAILROAD
I-435
E LEVEE RD
HAWTHORNE RD
Missouri River
N CEMENT CITY RD
Air Line Junction
Blue River
AK STEEL FACILITY
AK STEEL FACILITY
PAR
GIL
Fairmount
Hwy.24 / Winner Road
Athol
24
Mount Washington
Manchester School
12
Centropolis
Bristol
E 23RD
Bales Lake
78
Blue
MO06
HEART
E 27TH
40
MU58
VA MEDICAL CENTER
Leeds
470
435
3MO1
E 43RD
Scale
3000 ft

Map created using Precision Mapping 3.0

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Figure 1-1

SITE LOCATION MAP

AK STEEL KANSAS CITY FACILITY

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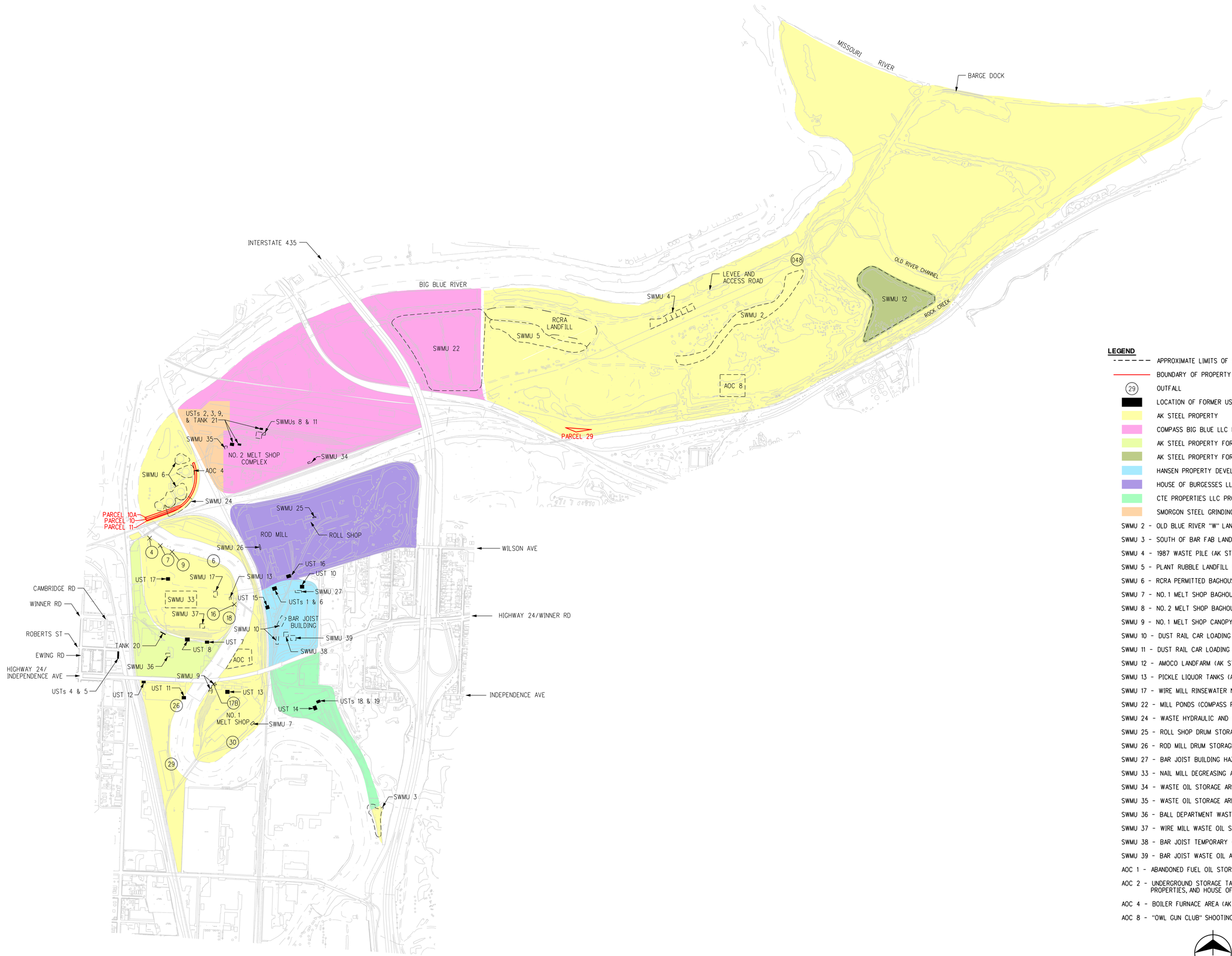

LEGEND

- APPROXIMATE LIMITS OF SWMU OR AOC AREA
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- (29) OUTFALL
- LOCATION OF FORMER USTs BELONGING TO AOC 2
- AK STEEL PROPERTY
- COMPASS BIG BLUE LLC PROPERTY (FORMERLY GST)
- AK STEEL PROPERTY FORMERLY LEASED TO GST
- AK STEEL PROPERTY FORMERLY LEASED TO AMOCO
- HANSEN PROPERTY DEVELOPMENT, INC.
- HOUSE OF BURGESSES LLC PROPERTY (FORMERLY GST)
- CTE PROPERTIES LLC PROPERTY (FORMERLY GST)
- SMORGON STEEL GRINDING SYSTEMS LLC PROPERTY (FORMERLY GST)

SWMU 2 - OLD BLUE RIVER "W" LANDFILL (AK STEEL PROPERTY)
SWMU 3 - SOUTH OF BAR FAB LANDFILL (AK STEEL PROPERTY)
SWMU 4 - 1987 WASTE PILE (AK STEEL PROPERTY)
SWMU 5 - PLANT RUBBLE LANDFILL (AK STEEL PROPERTY)
SWMU 6 - RCRA PERMITTED BAGHOUSE DUST STORAGE TANKS (AK STEEL PROPERTY)
SWMU 7 - NO. 1 MELT SHOP BAGHOUSE DUST TANK (AK STEEL PROPERTY)
SWMU 8 - NO. 2 MELT SHOP BAGHOUSE DUST TANK (COMPASS PROPERTY)
SWMU 9 - NO. 1 MELT SHOP CANOPY BAGHOUSE DUST CONVEYOR (AK STEEL PROPERTY)
SWMU 10 - DUST RAIL CAR LOADING AREA - BAR JOIST BUILDING (AMERICAN PROPERTIES PROPERTY)
SWMU 11 - DUST RAIL CAR LOADING AREA - NO. 2 MELT SHOP (COMPASS PROPERTY)
SWMU 12 - AMOCO LANDFARM (AK STEEL PROPERTY, AMOCO LEASED 1973 TO 1980)
SWMU 13 - PICKLE LIQUOR TANKS (AK STEEL PROPERTY)
SWMU 17 - WIRE MILL RINSEWATER NEUTRALIZATION TANK (AK STEEL PROPERTY)
SWMU 22 - MILL PONDS (COMPASS PROPERTY)
SWMU 24 - WASTE HYDRAULIC AND LUBRICATING OIL STORAGE TANKS (AK STEEL PROPERTY)
SWMU 25 - ROLL SHOP DRUM STORAGE AREA (HOUSE OF BURGESSES PROPERTY)
SWMU 26 - ROD MILL DRUM STORAGE AREA (HOUSE OF BURGESSES PROPERTY)
SWMU 27 - BAR JOIST BUILDING HAZARDOUS WASTE STORAGE AREA (AMERICAN PROPERTIES PROPERTY)
SWMU 33 - NAIL MILL DEGREASING AREA (AK STEEL PROPERTY)
SWMU 34 - WASTE OIL STORAGE AREA EAST OF GST's NO. 2 MELT SHOP (COMPASS PROPERTY)
SWMU 35 - WASTE OIL STORAGE AREA ON NORTH SIDE OF GST's 19" MILL (COMPASS PROPERTY)
SWMU 36 - BALL DEPARTMENT WASTE OIL STORAGE AREA (AK STEEL PROPERTY, FORMERLY GST LEASED)
SWMU 37 - WIRE MILL WASTE OIL STORAGE AREA (AK STEEL PROPERTY)
SWMU 38 - BAR JOIST TEMPORARY GREASE STORAGE AREA (AMERICAN PROPERTIES PROPERTY)
SWMU 39 - BAR JOIST WASTE OIL AND GREASE STORAGE AREA (AMERICAN PROPERTIES PROPERTY)
AOC 1 - ABANDONED FUEL OIL STORAGE TANK (AK STEEL PROPERTY)
AOC 2 - UNDERGROUND STORAGE TANKS (USTs) (AK STEEL, COMPASS, AMERICAN PROPERTIES, CTE PROPERTIES, AND HOUSE OF BURGESSES LLC PROPERTIES)
AOC 4 - BOILER FURNACE AREA (AK STEEL PROPERTY)
AOC 8 - "OWL GUN CLUB" SHOOTING PARK (AK STEEL PROPERTY)

NORTH

500' 0' 500' 1000'
SCALE IN FEET

Figure 1-2
FACILITY MAP
AK STEEL KANSAS CITY FACILITY

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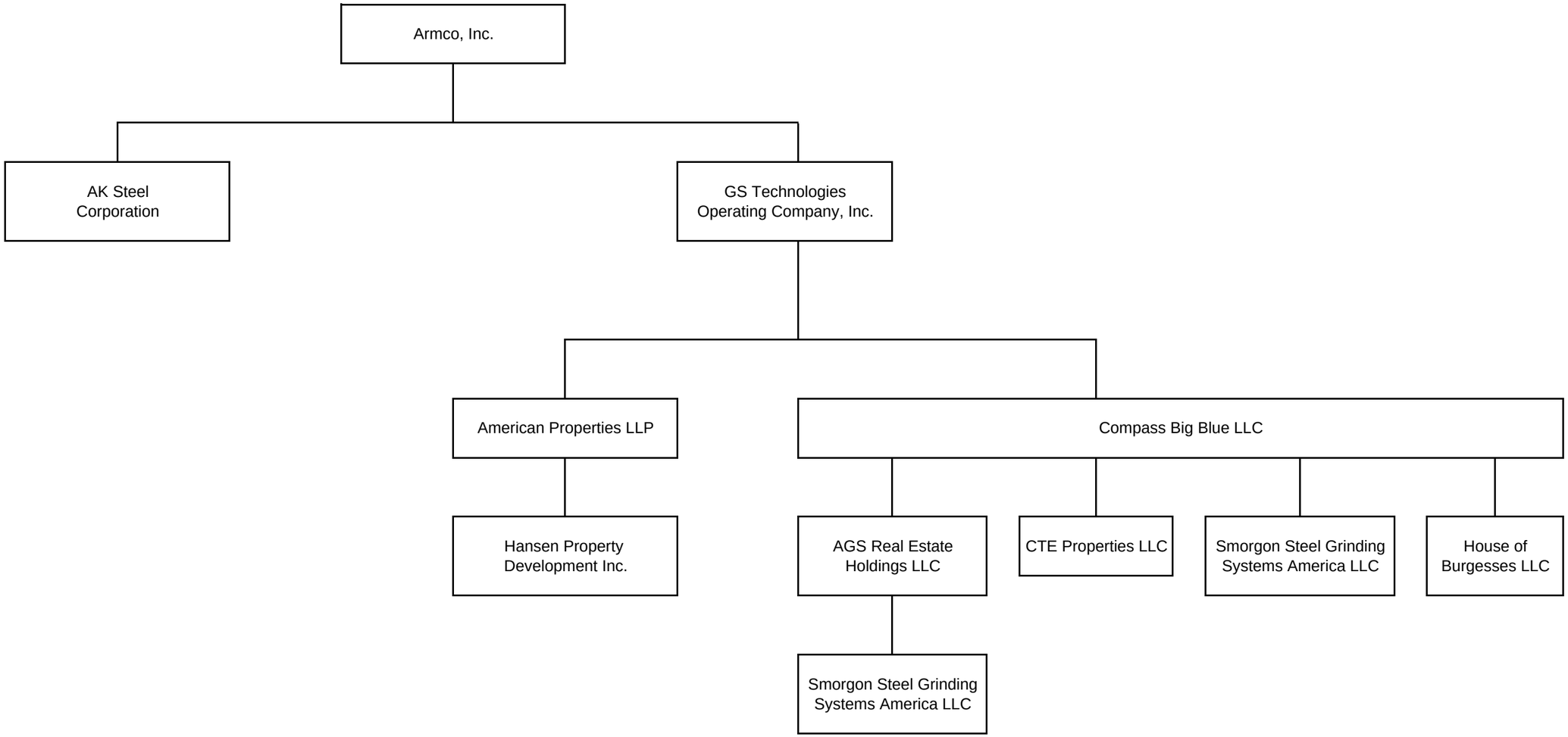
SINCE 1898

M:\AKSTEEL\DGN\01-482-63
M:\AKSTEEL\DGN\01-482-63\FIG 1-2\01-482-63FIG1-2.DGN 8-5-2008 8:55:11 AM
K:\DWG\AK STEEL\ Style: ★1000.csdt 2005
M:\AKSTEEL\DGN\01-482-63\FIG 1-2\01-482-63FIG1-2.DGN 8-5-2008 8:55 / CJM



Note: Ownership based on search of Jackson County, Missouri online public records (http://records.co.jackson.mo.us/localization/menu.asp).
Most recent Warranty Deed was dated April 16, 2007 (Hansen Property Development, Inc.).
American Grinding Systems (AGS) was sold to Smorgon Steel in October 2004.

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Figure 1-3

Ownership Status

AK Steel Kansas City Facility

K:\ENV\AK STEEL\Site\46619\Deliver\SI Report\Draft\Figures\Figure 1-3_Ownership Status.xls

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AK-46619-SUPP INVEST-SWMU2-FG3-1.DGN / 1-30-2008 9:51 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\ REPORT\SUPPLEMENTAL
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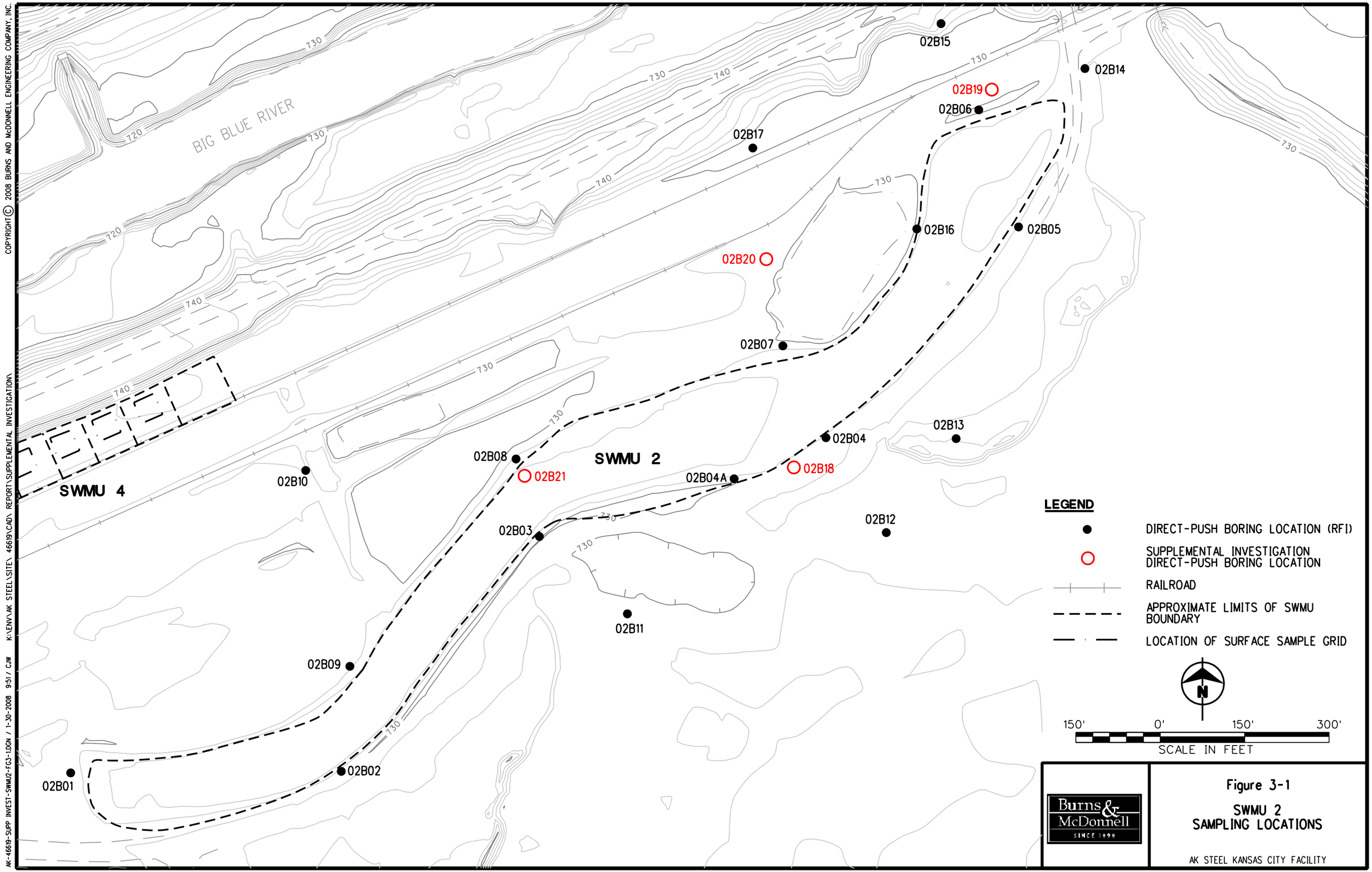
AK-SITE.DGN(SITE) Off=2,17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63



LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 3-1

SWMU 2
SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

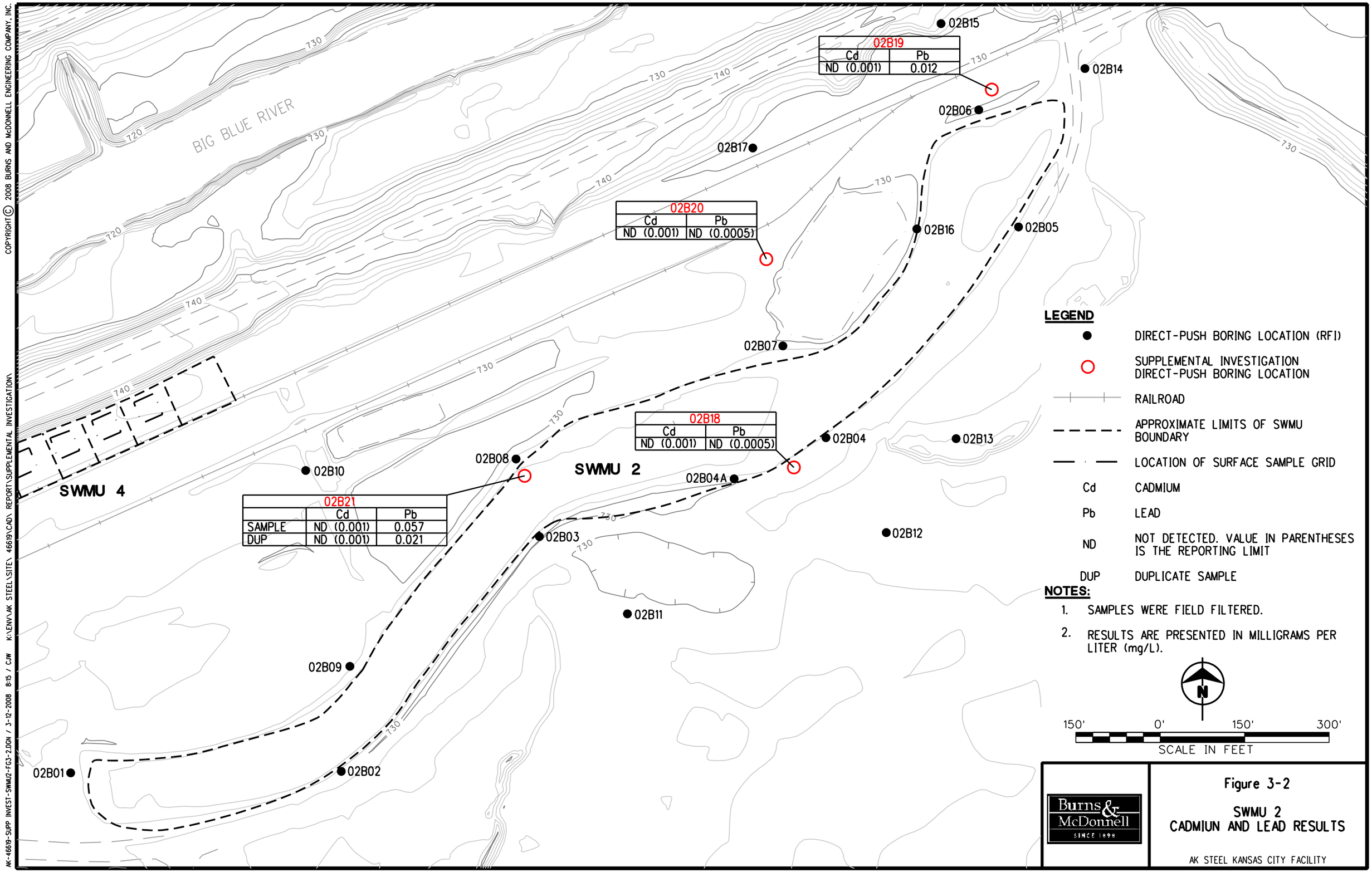


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Figure 3-2

SWMU 2
CADMIUN AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-17X11-2008.DGN() Off=59,61
AK-SITE.DGN(SITE) Off=2,17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63

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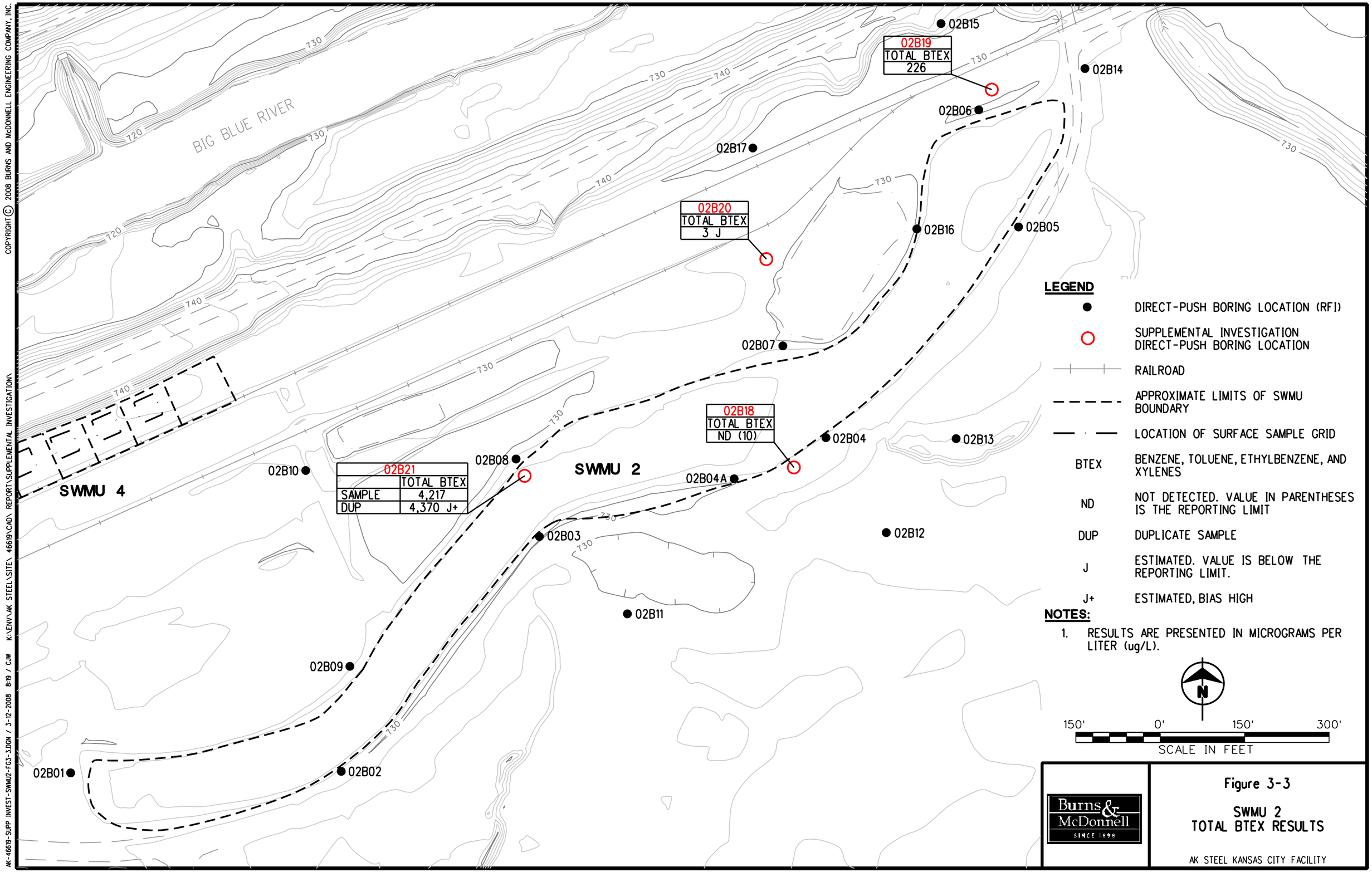

Figure 3-3

SWMU 2
TOTAL BTEX RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-17X11-2008.DGN() Off=59,61
AK-SITE.DGN(SITE) Off=2,17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
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AK-46619-SUPP INVEST-SWMU12-FG4-1.DGN / 1-30-2008 9:54 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
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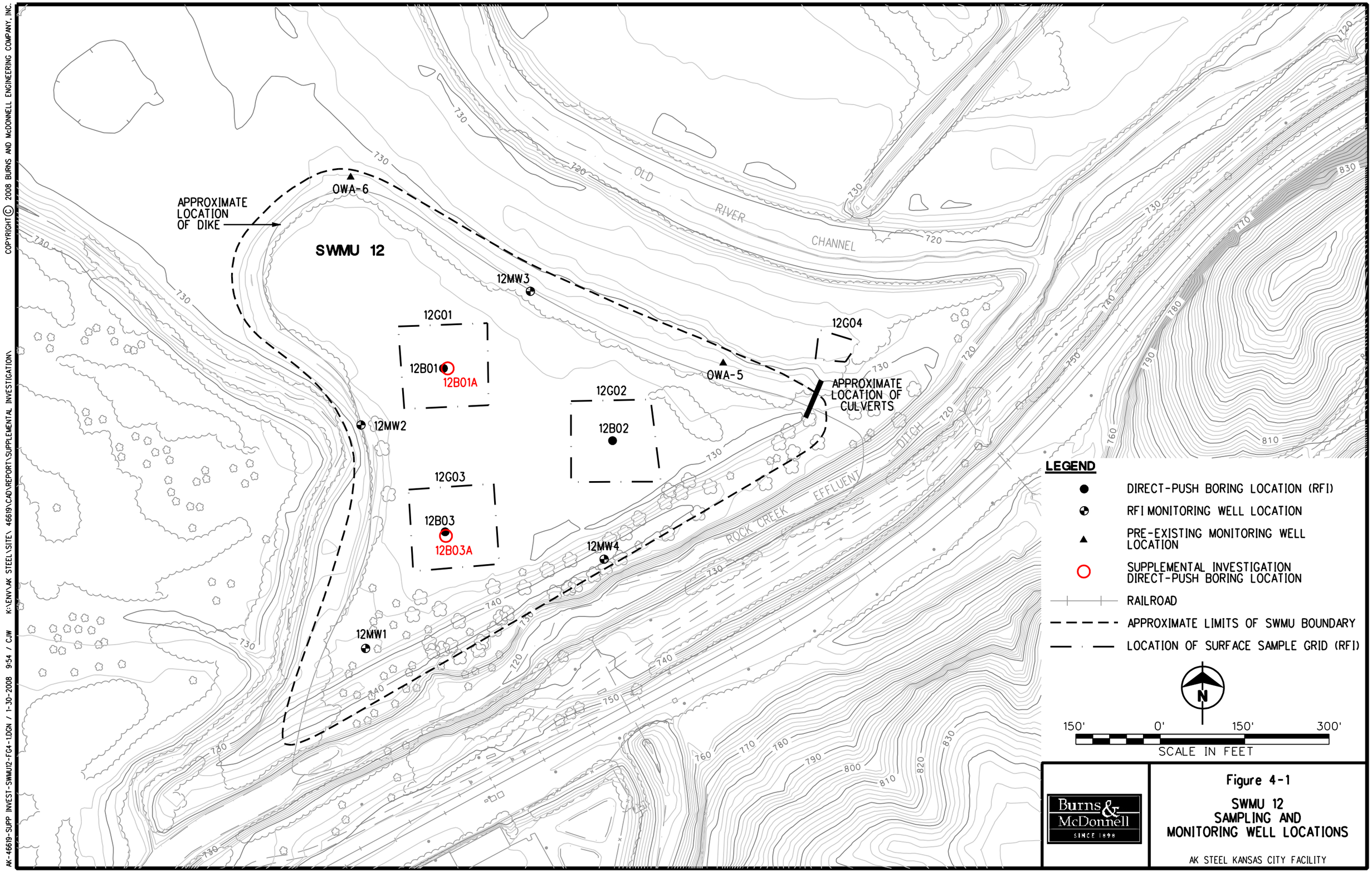
AK-CONTOUR.DGN(CONTOUR) O/I=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) O/I=62-63



LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)

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Figure 4-1

SWMU 12 SAMPLING AND MONITORING WELL LOCATIONS

AK STEEL KANSAS CITY FACILITY

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AK-17X11-2008.DGN(BORDER) 01=59,61
AK-SITE.DGN(SITE) 01=1,17 61=63
AK-CONTOUR.DGN(CONTOUR) 01=1,3 9,12-63
AK-ALLSWMU.DGN(SWMU) 01=62-63
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AK-46619-SUPP INVEST-SWMU12-FG4-2.DGN / 2-12-2008 10:20 / CJW

APPROXIMATE LOCATION OF DIKE

SWMU 12

OWA-6

OWA-5

12MW1

12MW2

12MW3

12MW4

12G01

12G02

12G03

12G04

12B01

12B02

12B03

APPROXIMATE LOCATION OF CULVERTS

OLD RIVER CHANNEL

ROCK CREEK EFFLUENT

DITCH

12B01A		
DEPTH	Cr	Pb
0-2	1,100	4,400
2-4	52	250
2-4 DUP	22	74
4-6	16	22
6-8	7.2	10

12B03A		
DEPTH	Cr	Pb
0-2	860	3,700
2-4	12	17
4-6	34	13
6-8	13	11

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- Cr CHROMIUM
- Pb LEAD
- DUP DUPLICATE SAMPLE

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/Kg).
3. HEXAVALENT CHROMIUM WAS NOT DETECTED IN THE SAMPLES.

N

150' 0' 150' 300'

SCALE IN FEET

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FIGURE 4-2

SWMU 12
CHROMIUM AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-46619-SUPP INVEST-SWMU12-FG4-3.DGN / 2-12-2008 10:29 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
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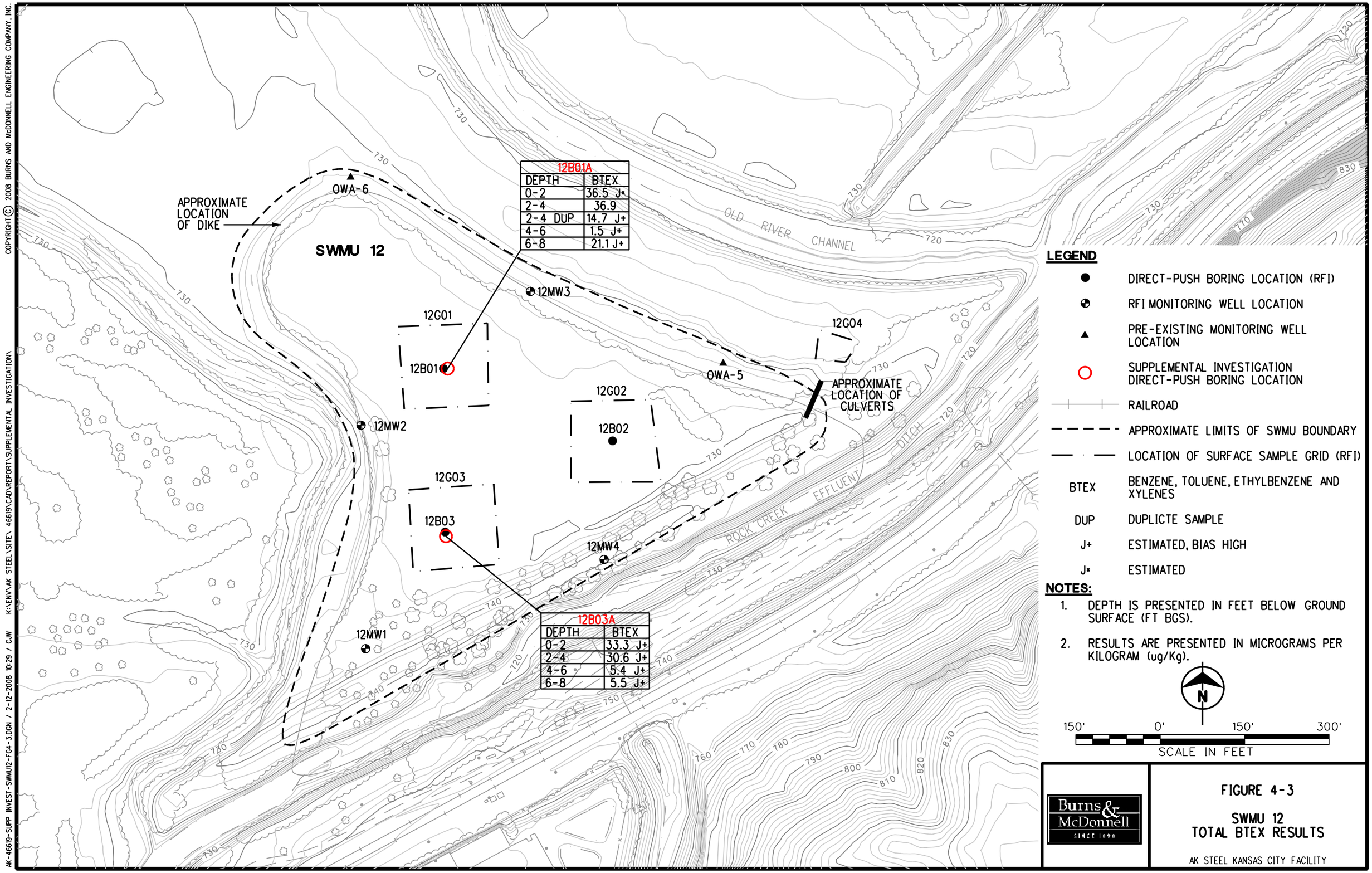
AK-SITE.DGN(SITE) O1f=1,17 61-63
AK-CONTOUR.DGN(CONTOUR) O1f=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) O1f=62-63



12B01A	
DEPTH	BTEX
0-2	36.5 J*
2-4	36.9
2-4 DUP	14.7 J+
4-6	1.5 J+
6-8	21.1 J+

12B03A	
DEPTH	BTEX
0-2	33.3 J+
2-4	30.6 J+
4-6	5.4 J+
6-8	5.5 J+

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)

BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES
DUP	DUPLICTE SAMPLE
J+	ESTIMATED, BIAS HIGH
J*	ESTIMATED

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (ug/Kg).

N

150' 0' 150' 300'

SCALE IN FEET

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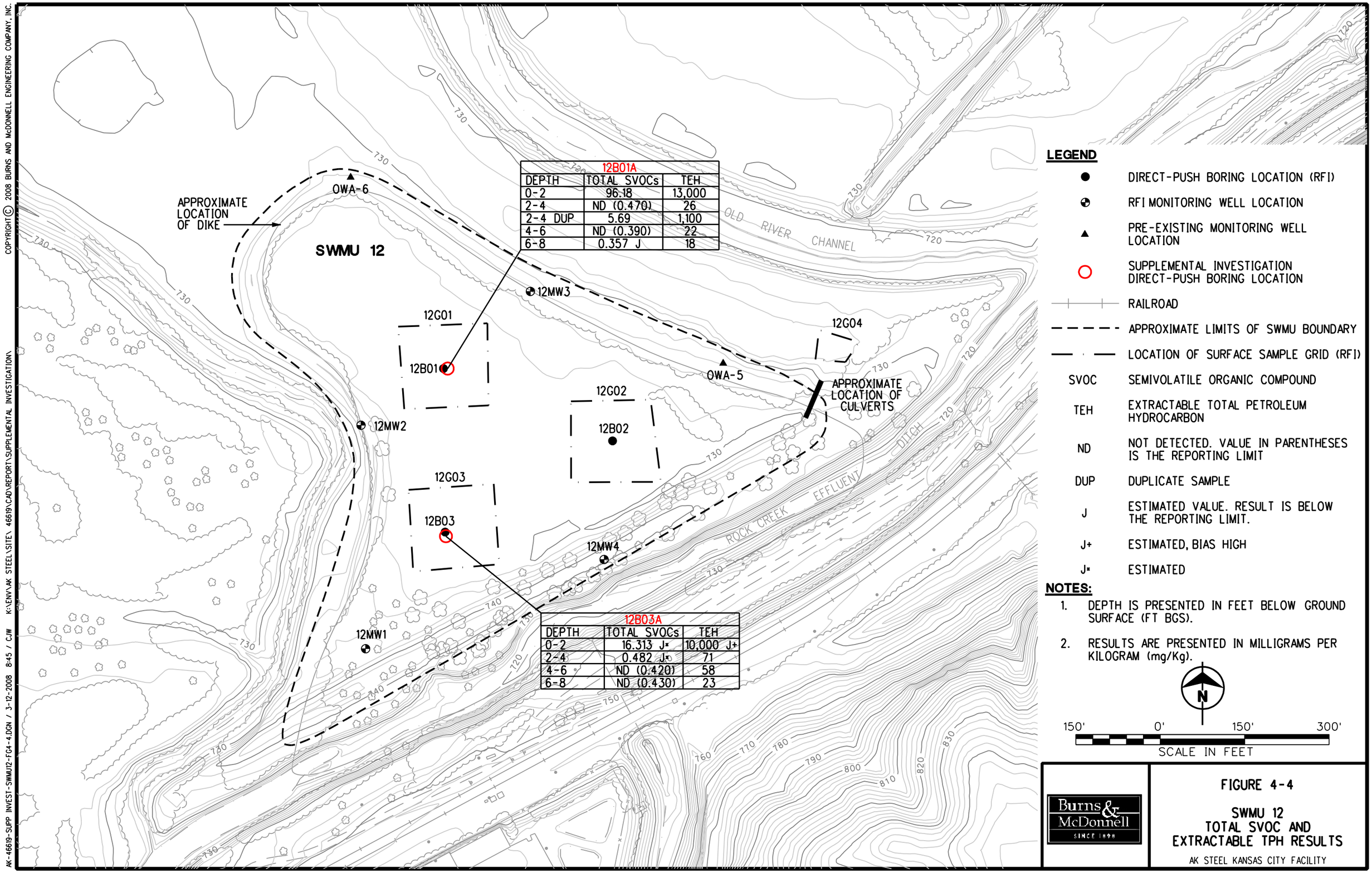
FIGURE 4-3

SWMU 12
TOTAL BTEX RESULTS

AK STEEL KANSAS CITY FACILITY



12B01A		
DEPTH	TOTAL SVOCs	TEH
0-2	96.18	13,000
2-4	ND (0.470)	26
2-4 DUP	5.69	1,100
4-6	ND (0.390)	22
6-8	0.357 J	18

12B03A		
DEPTH	TOTAL SVOCs	TEH
0-2	16.313 J*	10,000 J+
2-4	0.482 J*	71
4-6	ND (0.420)	58
6-8	ND (0.430)	23

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- SVOC — SEMIVOLATILE ORGANIC COMPOUND
- TEH — EXTRACTABLE TOTAL PETROLEUM HYDROCARBON
- ND — NOT DETECTED. VALUE IN PARENTHESES IS THE REPORTING LIMIT
- DUP — DUPLICATE SAMPLE
- J — ESTIMATED VALUE. RESULT IS BELOW THE REPORTING LIMIT.
- J+ — ESTIMATED, BIAS HIGH
- J* — ESTIMATED

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/Kg).

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell SINCE 1898

FIGURE 4-4

SWMU 12
TOTAL SVOC AND
EXTRACTABLE TPH RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-17X11-2008.DGN(BORDER) Off=59,61
AK-SITE.DGN(SITE) Off=3,17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63

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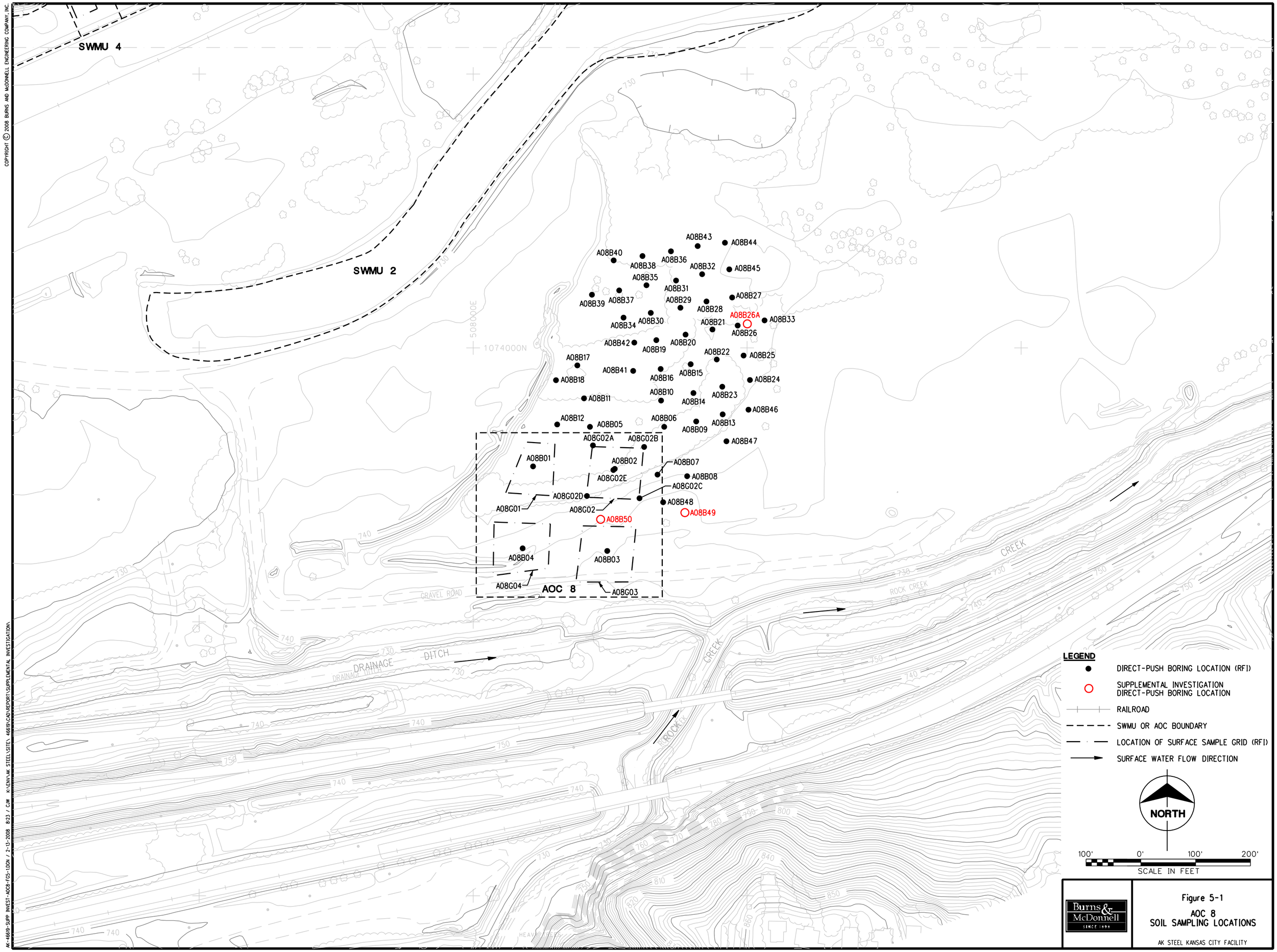

Figure 5-1
AOC 8
SOIL SAMPLING LOCATIONS
AK STEEL KANSAS CITY FACILITY

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AK-46619-SUPP INVEST-AOC8-FG5-1.DGN / 2-13-2008 8:23 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\

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SWMU 4

SWMU 2

Location	Depth (ft)	Lead
A08B38	0-1 1-2 2-3	43 ± 15.1 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B37	0-1 0-1 Dup 1-2 2-3	356 ± 25 575 ± 29.2 Not Detected 26 ± 14.4

Location	Depth (ft)	Lead
A08B40	0-1 1-2 2-3	49 ± 14.9 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B39	0-1 1-2 2-3	18 ± 15.1 25 ± 14.9 Not Detected

Location	Depth (ft)	Lead
A08B30	0-1 0-1 Dup 1-2 2-3	1061 ± 38.1 1010 ± 37.2 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B34	0-1 1-2 2-3	129 ± 19.4 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B17	0-1 1-2 2-3	Not Detected Not Detected Not Detected

Location	Depth (ft)	Lead
A08B18	0-1 1-2 2-3	54 ± 14.9 Not Detected 17 ± 13.3

Location	Depth (ft)	Lead
A08B11	0-1 1-2 2-3	1978 ± 49.9 17 ± 13.5 Not Detected

Location	Depth (ft)	Lead
A08B10	0-1 0-1 Dup 1-2 2-3	1048 ± 30.2 217 ± 30.2 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B12	0-1 1-2 2-3	Not Detected Not Detected Not Detected

Location	Depth (ft)	Lead
A08B05	0-1 1-2 2-3	2056 ± 53.1 38 ± 15.5 35 ± 14.8

Location	Depth (ft)	Lead
A08B07	0-1 1-2 2-3	18 ± 12.5 228 ± 19.9 24 ± 13.2

Location	Depth (ft)	Lead
A08B08	0-1 1-2 2-3	58 ± 14.2 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B35	0-1 1-2 2-3	782 ± 33.4 18 ± 14 Not Detected

Location	Depth (ft)	Lead
A08B36	0-1 1-2 2-3	47 ± 14.3 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B31	0-1 1-2 2-3	476 ± 27.3 16 ± 13.8 13 ± 13.1

Location	Depth (ft)	Lead
A08B29	0-1 1-2 2-3	366 ± 23.1 361 ± 23.4 20 ± 14.5

Location	Depth (ft)	Lead
A08B32	0-1 1-2 2-3	78 ± 16.4 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B28	0-1 1-2 2-3	124 ± 15.8 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B27	0-1 0-1 Dup 1-2 2-3	30 ± 13 84 ± 14.9 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B33	0-1 1-2 2-3	31 ± 14.5 23 ± 13.4 Not Detected

Location	Depth (ft)	Lead
A08B26	0-1 1-2 2-3	2613 ± 56.2 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B21	0-1 1-2 2-3	653 ± 29.8 50 ± 16.2 Not Detected

Location	Depth (ft)	Lead
A08B20	0-1 1-2 1-2 Dup 2-3	3137 ± 63.4 Not Detected 26 ± 15.7 Not Detected

Location	Depth (ft)	Lead
A08B19	0-1 1-2 2-3	18 ± 14.4 20 ± 14.8 14 ± 13.4

Location	Depth (ft)	Lead
A08B15	0-1 1-2 2-3	2249 ± 53.9 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B25	0-1 1-2 2-3	Not Detected Not Detected Not Detected

Location	Depth (ft)	Lead
A08B16	1-2 2-3	117 ± 17.8 Not Detected

Location	Depth (ft)	Lead
A08B22	0-1 1-2 2-3	509 ± 26.3 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B24	0-1 1-2 2-3	17 ± 11.8 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B23	0-1 1-2 2-3	390 ± 24.8 Not Detected Not Detected

Location	Depth (ft)	Lead
A08B13	0-1 1-2 2-3	70 ± 14.4 Not Detected 36 ± 17.5

Location	Depth (ft)	Lead
A08B14	0-1 1-2 1-2 Dup 2-3	2473 ± 56 Not Detected 48 ± 16.2 Not Detected

Location	Depth (ft)	Lead
A08B09	0-1 1-2 2-3	692 ± 30.2 19 ± 13.9 Not Detected

Location	Depth (ft)	Lead
A08B06	0-1 1-2 2-3 2-3 Dup	1134 ± 37.8 163 ± 19.4 20 ± 14.7 Not Detected

A08G02A NA
A08G02B NA
A08G02 NA
A08G02C NA
A08G02D NA
A08G02E NA
A08G01 NA
A08G03 NA
A08G04 NA
A08B01 NA
A08B02 NA
A08B03 NA
A08B04 NA
A08B41 NA
A08B42 NA
A08B43 NA
A08B44 NA
A08B45 NA
A08B46 NA
A08B47 NA
A08B48 NA

AOC 8

DRAINAGE DITCH

ROCK CREEK

LEGEND

- ● DIRECT-PUSH BORING LOCATION (RFI)
- NA NOT ANALYZED BY FIELD XRF
- RAILROAD
- SWMU OR AOC BOUNDARY
- LOCATION OF SURFACES SAMPLE GRID (RFI)
- SURFACE WATER FLOW DIRECTION

NOTE:

1. THE SCREENING LEVEL FOR LEAD IN SOIL FROM THE RFI REPORT WAS 400 mg/Kg. VALUES IN EXCESS OF THIS SCREENING LEVEL ARE HIGHLIGHTED RED.

NORTH

100' 0' 100' 200'

SCALE IN FEET

Burns & McDonnell SINCE 1906

Figure 5-2

AOC 8
XRF RESULTS FOR LEAD

AK STEEL KANSAS CITY FACILITY

AK-4619-SUPP INVEST-AOC8-XRF-LEAD-FIG5-2.DGN / 2-11-2008 14:27 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK2XRB-2008.DGN(BORDER) OH=61
AK-SITE-BNDRY.DGN OH=63
AK-SWMU.DGN OH=63
AKCON-ADGN(CONT) OH=82-63

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SWMU 4

SWMU 2

A08B43 A08B44 A08B40 A08B36 A08B38 A08B32 A08B45 A08B35 A08B31 A08B39 A08B37 A08B29 A08B27 A08B28 A08B34 A08B30 A08B21 A08B26 A08B33 A08B42 A08B19 A08B20 A08B22 A08B25 A08B17 A08B41 A08B16 A08B15 A08B24 A08B18 A08B10 A08B23 A08B11 A08B14 A08B46 A08B12 A08B05 A08B06 A08B13 A08B09 A08B47 A08G02A A08G02B A08B01 A08B02 A08B07 A08G02E A08B08 A08G02C A08G02D A08B48 A08G01 A08G02 A08B04 A08B03 A08G04 A08G03

AOC 8

A08B26A	
DEPTH	Pb
0-0.5	150
0.5-2	200

A08B49	
DEPTH	Pb
0-0.5	53
0.5-2	76

A08B50	
DEPTH	Pb
0-0.5	31
0.5-2	43

508000E

1074000N

GRAVEL ROAD

DRAINAGE DITCH

ROCK CREEK

HEAVY TREES

LEGEND

- ● DIRECT-PUSH BORING LOCATION (RFI)
- ○ SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- SWMU OR AOC BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- SURFACE WATER FLOW DIRECTION
- Pb LEAD

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAMS (mg/Kg).

NORTH

100' 0' 100' 200'

SCALE IN FEET

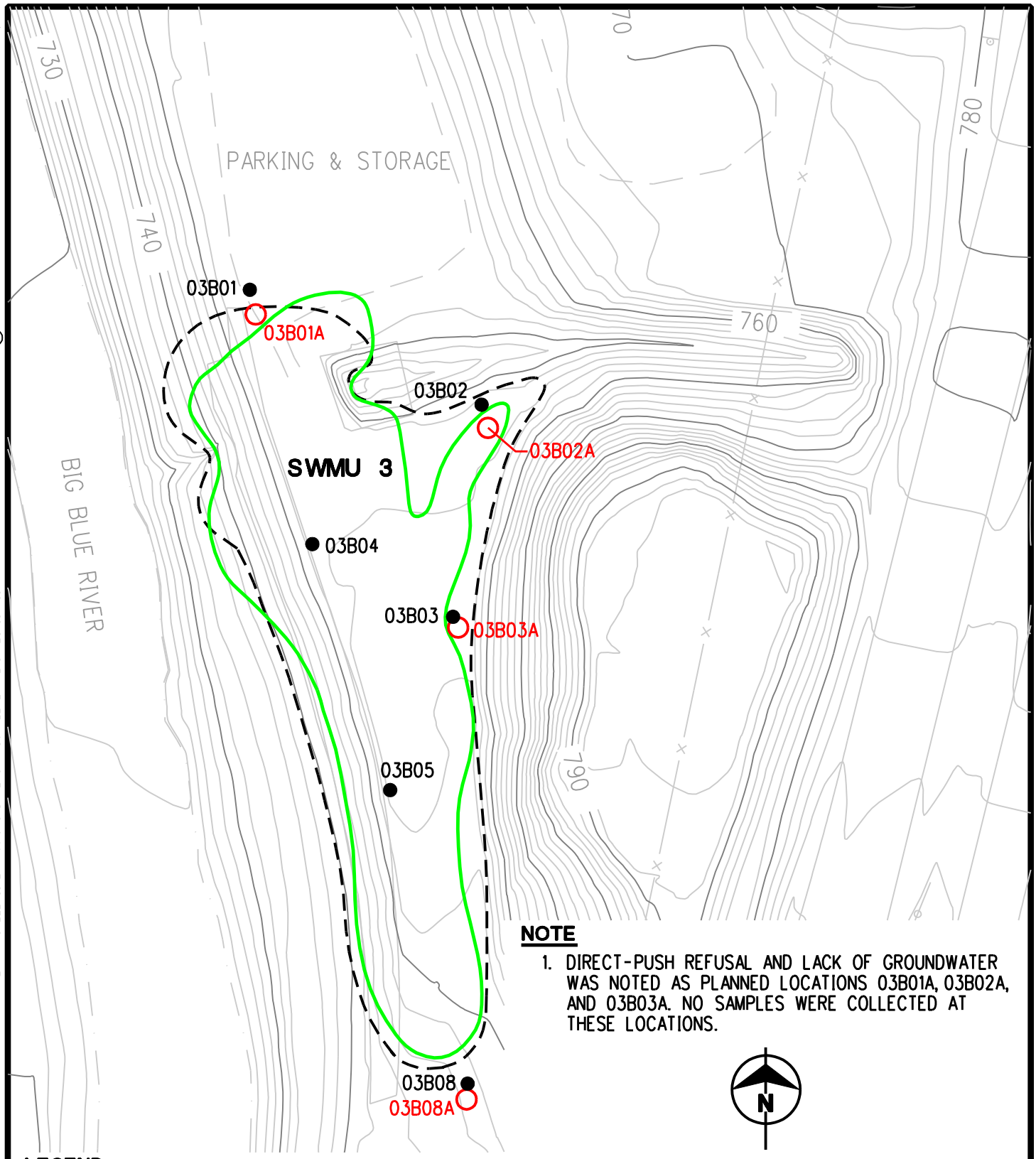
Burns & McDonnell SINCE 1898

Figure 5-3

AOC 8
LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

AK-4669-SUPP INVEST-AOC8-F05-3.DGN / 2-13-2008 8:38 / CJW K:\CIVIL\AK STEEL\SITE\ 4669\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK2XNB-2008 NONBORDER).DIT=61
AK-SITE-2008 (HORIZ).DIT=63
AK-SITE-2008 (VERT).DIT=62-63
AKCON-ADJOIN(CONT).DIT=62-63



NOTE

1. DIRECT-PUSH REFUSAL AND LACK OF GROUNDWATER WAS NOTED AS PLANNED LOCATIONS 03B01A, 03B02A, AND 03B03A. NO SAMPLES WERE COLLECTED AT THESE LOCATIONS.

LEGEND

- ● RFI DIRECT-PUSH BORING LOCATION FOR GROUNDWATER
- ○ SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- — — — SWMU BOUNDARY
- APPROXIMATE LANDFILL BOUNDARY FROM 1988 REMCOR REPORT

Burns & McDonnell SINCE 1898

Figure 6-1

SWMU 3 SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

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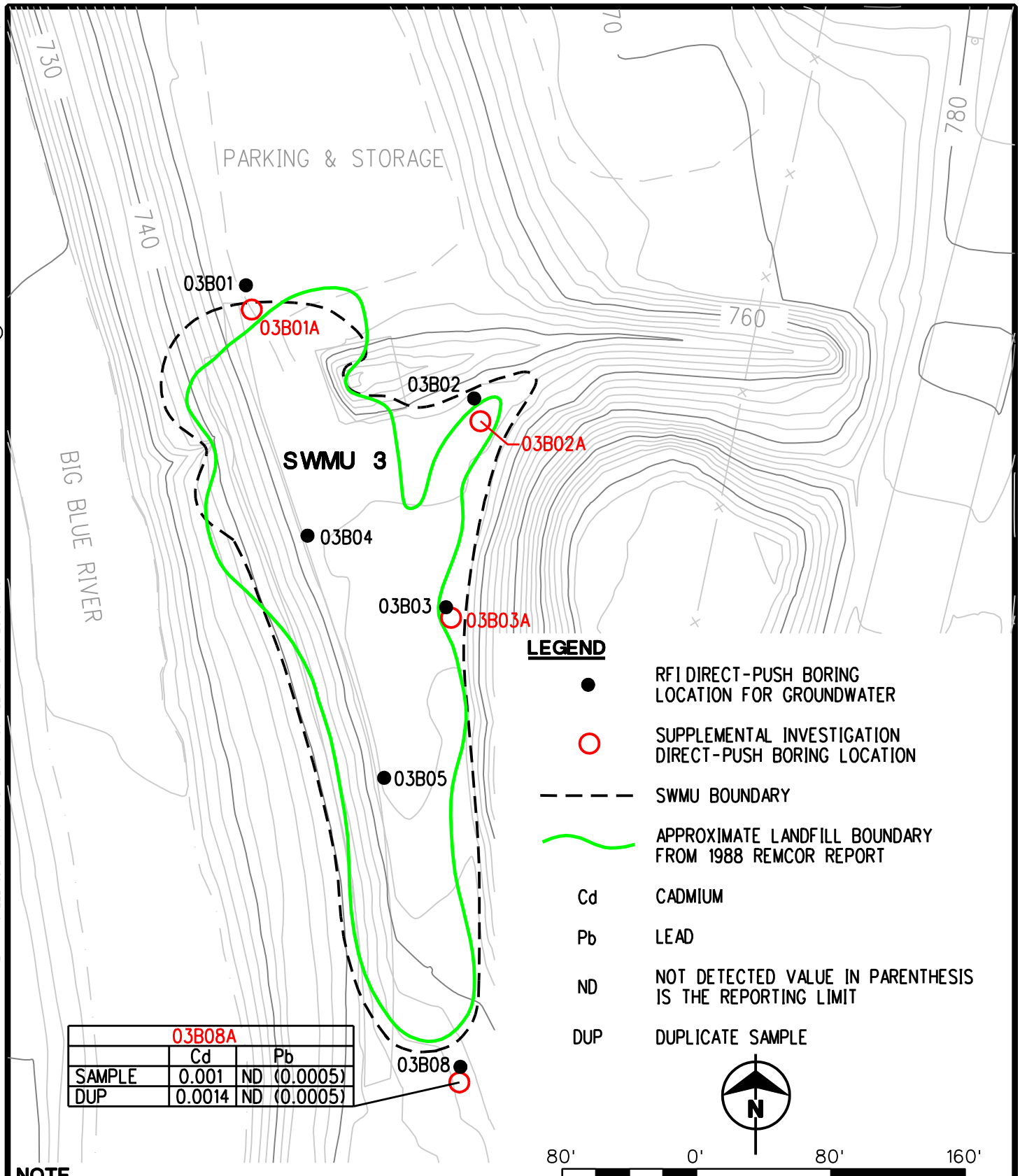
AK85X11-2008.DGN() Off=61
AKSITE.DGN() Off=3,6,11-12,63
AKCON-B.DGN() Off=19,62-63
AK-ALLSWMU.DGN() Off=62

K:\EV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\

AK-46619-SUPP INVEST-SWMU3-FG6-1.DGN / 1-30-2008 14:20 / CJW



03B08A		
	Cd	Pb
SAMPLE	0.001	ND (0.0005)
DUP	0.0014	ND (0.0005)

NOTE

1. DIRECT-PUSH REFUSAL AND LACK OF GROUNDWATER WAS NOTED AS PLANNED LOCATIONS 03B01A, 03B02A, AND 03B03A. NO SAMPLES WERE COLLECTED AT THESE LOCATIONS.
2. SAMPLES WERE FIELD FILTERED.
3. RESULTS ARE PRESENTED IN MILLIGRAMS PER LITER (mg/L).

Burns & McDonnell SINCE 1898

Figure 6-2

SWMU 3
CADMIUM AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-46619-SUPP INVEST-SWMU3-FG6-2.DGN / 3-12-2008 8:35 / CJW
K:\EV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK85X11-2008.DGN() Off=61
AKSITE.DGN() Off=3,6,11-12,63
AKCON-B.DGN() Off=19,62-63
AK-ALLSWMU.DGN() Off=62

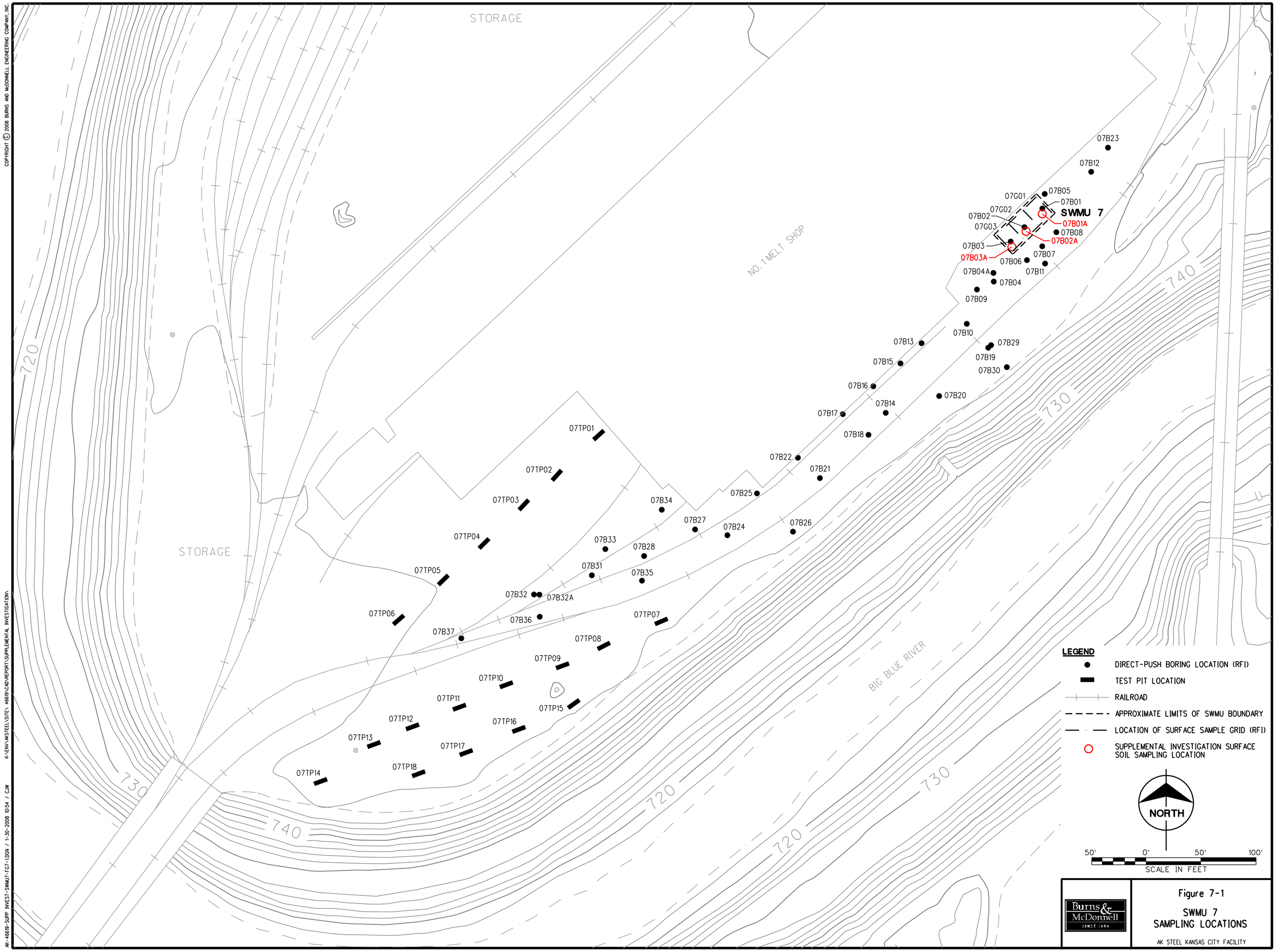

Figure 7-1

SWMU 7
SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

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AK24X18-2008.DGN(BORDER) 01f=61
AK-SITE.DGN(SITE) 01f=1,3-9,12-63
AK-CONTOUR.DGN(CONTOUR) 01f=1,3-9,12-63
AK-ALL.SWMU.DGN(SWMU) 01f=62-63
K:\ENV\AKSTEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK-46619-SUPP INVEST-SWMU7-FG7-1.DGN / 1-30-2008 10:54 / CJW

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STORAGE

NO. 1 MELT SHOP

BIG BLUE CREEK

SWMU 7

Location	Depth (ft)	Lead
07B23	0-1	91 ± 18
	1-2	150 ± 24.9
	2-3	101 ± 18.6

Location	Depth (ft)	Lead
07B12	0-1	595 ± 38
	1-2	111 ± 19.8
	2-3	708 ± 44
	3-4	1534 ± 75.5

Location	Depth (ft)	Lead
07B11	0-1	19 ± 13.5
	2-3	Not Detected
	3-4	Not Detected

Location	Depth (ft)	Lead
07B04A	3-4	82 ± 14.1

Location	Depth (ft)	Lead
07B10	0-1	984 ± 43.8
	1-2	374 ± 26.2
	2-3	384 ± 26.4

Location	Depth (ft)	Lead
07B13	0-1	2089 ± 72.6
	1-2	257 ± 20.8
	1-2 Dup	128 ± 17.5
	2-3	263 ± 22.4
	3-4	15 ± 12.5

Location	Depth (ft)	Lead
07B09	0-1	317 ± 25.3
	1-2	281 ± 22.9
	2-3	371 ± 23
	3-4	90 ± 15.4

Location	Depth (ft)	Lead
07B29	0-1	58 ± 18.1
	1-2	81 ± 17.1
	2-3	28 ± 14.5
	4-5	129 ±20
	5-6	Not Detected
	6-7	Not Detected
	7-8	Not Detected

Location	Depth (ft)	Lead
07B15	0-1	1267 ± 47.6
	1-2	372 ± 25.7
	2-3	53 ± 13

Location	Depth (ft)	Lead
07B16	0-1	1236 ± 48.3
	0-1 Dup	893 ± 39.6
	1-2	701 ± 31.3

Location	Depth (ft)	Lead
07B17	0-1	1466 ± 57.6
	1-2	253 ± 22
	1-2 Dup	347 ± 25.2
	2-3	159 ± 23.1

Location	Depth (ft)	Lead
07B19	0-1	371 ± 30.5
	1-2	248 ± 27.3
	2-3	37 ± 22
	3-4	468 ± 26

Location	Depth (ft)	Lead
07B30	1-2	115 ± 19
	2-3	97 ± 17.5
	3-4	Not Detected
	3-4 Dup	22 ± 13.5
	4-5	Not Detected
	5-6	Not Detected
	6-7	Not Detected
	7-8	Not Detected

Location	Depth (ft)	Lead
07B20	0-1	217 ± 25.1
	1-2	117 ± 19.6
	2-3	30 ± 14.3

Location	Depth (ft)	Lead
07B14	0-1	655 ± 35.7
	1-2	571 ± 30.3
	2-3	289 ± 23.8

Location	Depth (ft)	Lead
07B18	0-1	847 ± 71.5
	1-2	242 ± 26.3
	2-3	32 ± 14.4
	3-4	Not Detected

Location	Depth (ft)	Lead
07B21	0-1	201 ± 23.7
	1-2	333 ± 27.2
	2-3	14 ± 13

Location	Depth (ft)	Lead
07B26	0-1	23 ± 13
	1-2	34 ± 15.4
	2-3	Not Detected
	2-3 Dup	30 ± 14.6

Location	Depth (ft)	Lead
07B24	0-1	67 ± 17.6
	1-2	42 ± 19.2

Location	Depth (ft)	Lead
07B25	0-1	678 ± 40.8
	1-2	1119 ± 50.1
	2-3	692 ± 41.3

Location	Depth (ft)	Lead
07B22	0-1	266 ± 24
	1-2	596 ± 43.3

Location	Depth (ft)	Lead
07B34	0-1	107 ± 20.3
	1-2	1881 ± 60.9

Location	Depth (ft)	Lead
07B33	0-1	198 ± 22.8
	1-2	285 ± 27.6
	2-3	36 ± 16.2

Location	Depth (ft)	Lead
07B31	1-2	331 ± 31.1
	2-3	Not Detected
	4-5	38 ± 21
	5-6	Not Detected

Location	Depth (ft)	Lead
07B32	0-1	272 ± 27.2
	1-2	3072 ± 79.6
	2-3	6070 ± 117

Location	Depth (ft)	Lead
07B32A	3-4	175 ± 20.6
	4-5	1052 ± 42.1
	5-6	162 ± 19.4

Location	Depth (ft)	Lead
07B27	0-1	689 ± 39.9
	1-2	427 ± 34.6

Location	Depth (ft)	Lead
07B35	0-1	1648 ± 59.8
	1-2	1166 ± 48.8
	1-2 Dup	707 ± 43.8
	2-3	566 ± 42.7

Location	Depth (ft)	Lead
07B28	1-2	523 ± 35.7
	2-3	575 ± 32.7
	3-4	839 ± 41.5
	4-5	647 ± 36.1
	5-6	1002 ±42.7

07G01 NA
07G02 NA
07G03 NA
07B01 NA
07B02 NA
07B03 NA
07B04 NA
07B04A
07B05 NA
07B06 NA
07B07 NA
07B08 NA
07B09
07B10
07B11
07B12
07B13
07B14
07B15
07B16
07B17
07B18
07B19
07B20
07B21
07B22
07B23
07B24
07B25
07B26
07B27
07B28
07B29
07B30
07B31
07B32
07B32A
07B33
07B34
07B35
07B36
07B37
07TP01 STL
07TP02 STL
07TP03 STL
07TP04 STL
07TP05 STL
07TP06 STL
07TP07 STL
07TP08 STL
07TP09 STL
07TP10 STL
07TP11 STL
07TP12 STL
07TP13 STL
07TP14 STL
07TP15 STL
07TP16 STL
07TP17 STL
07TP18 STL

720
730
740

LEGEND

- ● DIRECT-PUSH BORING LOCATION (RFI)
- NA NOT ANALYZED BY FIELD XRF
- STL SOIL DATA AVAILABLE FROM ANALYSIS BY STL-BURLINGTON. SEE RFI REPORT (BMCD, 1999)
- ▬ TEST PIT LOCATION
- RAILROAD
- SWMU OR AOC BOUNDRAY
- LOCATION OF SURFACE SAMPLE GRID (RFI)

NOTE:

1. THE SCREENING LEVEL FOR LEAD IN SOIL FROM THE RFI REPORT WAS 400 mg/Kg. VALUES IN EXCESS OF THIS SCREENING LEVEL ARE HIGHLIGHTED RED.

NORTH

50' 0' 50' 100'

SCALE IN FEET

Figure 7-2

SWMU 7
XRF AND NON-ITS
RICHARDSON RESULTS FOR LEAD

AK STEEL KANSAS CITY FACILITY

Burns & McDonnell SINCE 1898

AK2AXB-2008.DGN(BORDER) 01-60-61
AK-SITE BOASTER1 01-17-61
AK-SITE BOASTER2 01-17-61
AK-ALASWMU DGNSWMU01 01-43
AK-ALASWMU DGNSWMU07 01-43

K:\ENV\AK STEEL\SITE\ 46659\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\

AK-46659-SUPP INVEST-SWMU7-XRF-LEAD-FG7-2.DGN / 2-11-2008 14:16 / CJW

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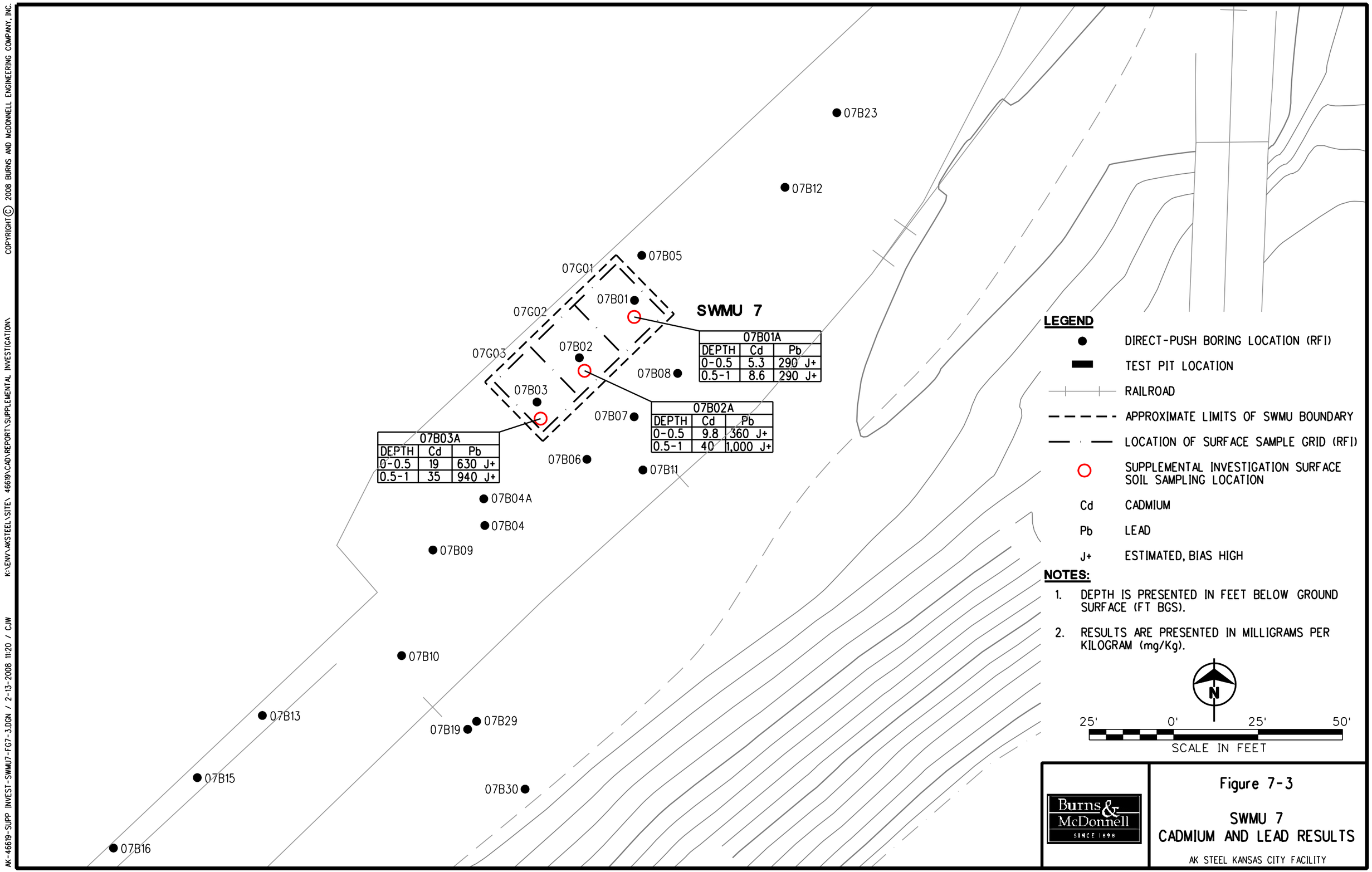
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
AK-17X11-2008.DGN() Off=61
K:\ENV\AKSTEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENT...
AK-46619-SUPP INVEST-SWMU7-FG7-3.DGN / 2-13-2008 11:20 / CJW



Burns & McDonnell SINCE 1898

Figure 7-3

SWMU 7
CADMIUM AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

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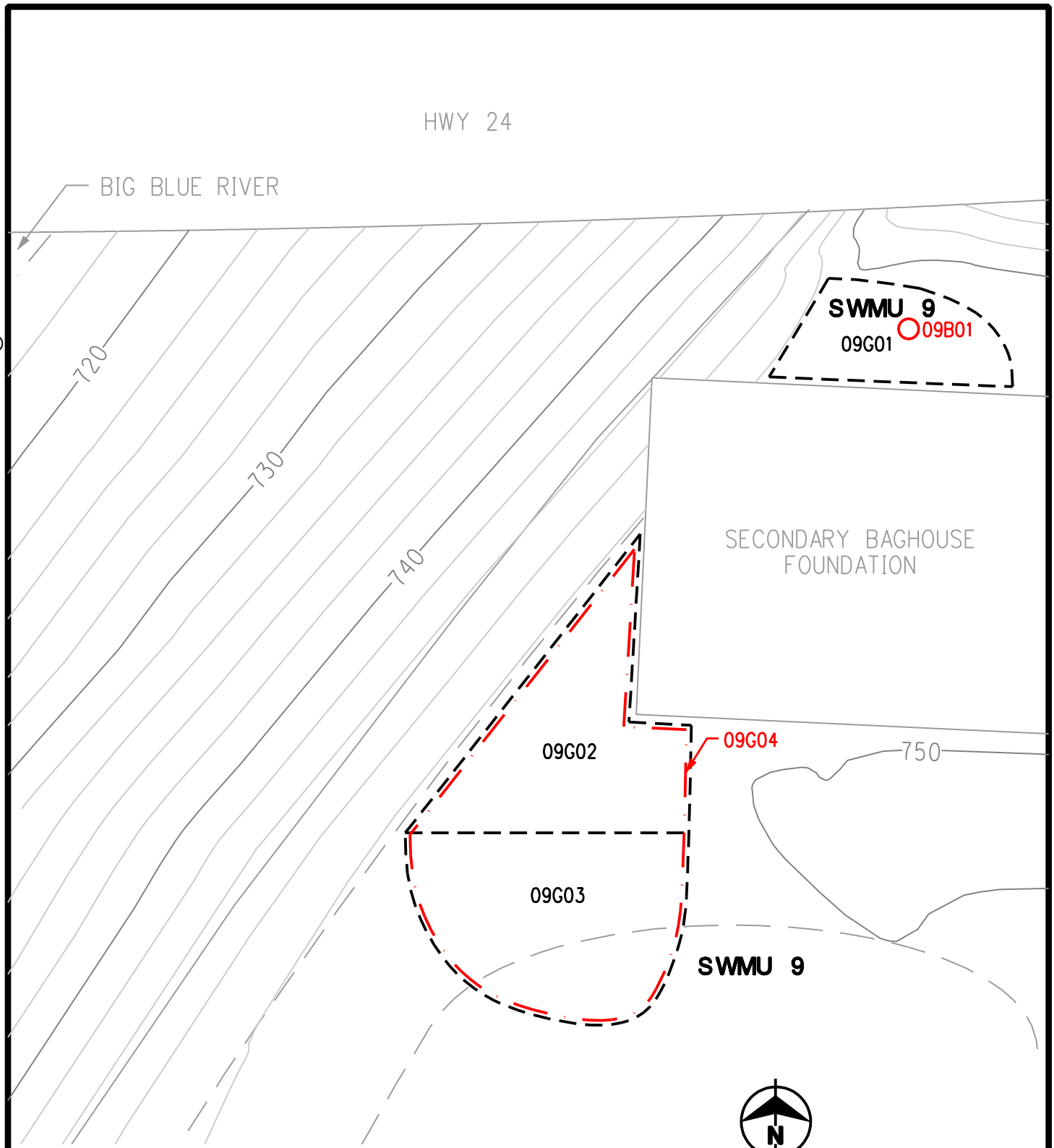

LEGEND

- SUPPLEMENTAL INVESTIGATION LOCATION OF DISCRETE SAMPLE
- RAILROAD
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- SUPPLEMENTAL INVESTIGATION LOCATION OF COMPOSITE SURFACE SAMPLE GRID

Burns & McDonnell SINCE 1898

Figure 8-1

SWMU 9
SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

AK-46619-SUPP INVEST-SWMU9-FGB-1.DGN / 1-30-2008 14:18 / CJW
K:\ENV\AK STEEL\SITE\ 46619\ CAD\ REPORT\SUPPLEMENTAL INVESTIGATION\
AK85XTI-2008.DGN(BORD) Off=58-59,61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63

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AK-46619-SUPP INVEST-SWMU9-FGB-2.DGN / 2-12-2008 11:38 / CJW
K:\ENV\AK STEEL\SITE\ 46619\ CAD\ REPORTS\SUPPLEMENTAL INVESTIGATION\
AK85XTI-2008.DGN(BORD) Off=58-59,61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63

HWY 24

BIG BLUE RIVER

720

730

740

750

SWMU 9

09G01

09B01		
DEPTH	Cr	Pb
0-0.5	1.3	43 J+
0.5-1	2.5	110 J+

SECONDARY BAGHOUSE FOUNDATION

09G02

09G04		
DEPTH	Cr	Pb
0-0.5	2.4	150 J+
0.5-1	1.8	120 J+

09G03

SWMU 9

LEGEND

- SUPPLEMENTAL INVESTIGATION LOCATION OF DISCRETE SAMPLE
- RAILROAD
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- SUPPLEMENTAL INVESTIGATION LOCATION OF COMPOSITE SURFACE SAMPLE GRID
- Cd CADMIUM
- Pb LEAD
- J+ ESTIMATED, BIAS HIGH

N

25' 0' 25' 50'

SCALE IN FEET

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. CADMIUM AND LEAD RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/Kg).

Burns & McDonnell SINCE 1898

Figure 8-2

SWMU 9
CADMIUM AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

AK18X24-V-2008.DGN(BORDER) Off=61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
AK-TANK-PARCEL.DGN() Off=2,17,56-63
AK-46619-SUPP INVEST-SWMU6-FG9-1.DGN / 3-12-2008 8:50 / CJW
K:\ENV\AKSTEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
COPYRIGHT © 2003 BURNS AND McDONNELL ENGINEERING COMPANY, INC.

SWMU 6
AOC 4
SWMU 24
TANK NO. 5 (REMOVED)
TANK NO. 4 (REMOVED)
TANK NO. 3 (REMOVED)
TANK NO. 2 (REMOVED)
TANK NO. 1 (REMOVED)
AST5-SR4
AST5-SR3C
AST5-SR3
AST5-SR2C
AST5-SR2 & 2A
AST5-SR1C
AST5-SR1 & 1A
06B23
06B22
06B13
06B14
06B14A
544 Sq. Ft. METAL BUILDING (REMOVED)
TRENCH 06T01
TRENCH 06T02
TRENCH 06T03
TRENCH 06T03A
TRENCH 06T04
TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C
OVERHEAD PIPE BRIDGE
BURIED WATER LINE
A04B02
A04B06
A04B03
A04B03A
A04B01
A04B05
A04B04
A04B07
TRENCH A04T01
TRENCH A04T02
TRENCH A04T03
1 STORY METAL BUILDING 1694 Sq. Ft. (REMOVED)
06B19
06B09
06B12
06B11A
06B11
06B21
06B10
06B10A
06B20
06B08
06B18
06B05
06B03
06B17
06B04
06B16
06B07
06B07A
24B11
06B06
06B06A
24B12
06B02
06B01
06B15
METAL BUILDING 276 Sq. Ft. (REMOVED)
PIPE BRIDGE
GRAVEL
GRAVEL DRIVE
KANSAS CITY SOUTHERN RAILROAD
750
PARCEL 3A
PARCEL 10A
PARCEL 10
PARCEL 11

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- DISCRETE SURFACE SOIL SAMPLING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION BORING LOCATION
- TRENCH LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF AOC/SWMU BOUNDARY
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- BOUNDARY OF TEMPORARY EASEMENT FOR KC TERMINAL RAILROAD

NOTES:

1. DURING THE RFI, LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24 IN THE RFI REPORT.
2. SAMPLE LOCATIONS AST5-SR1, AST5-SR1A, AST5-SR2, AST5-SR2A, AST5-SR3, AND AST5-SR4 WERE REMOVED BY VACUUM TRUCK DURING RFI PHASE 2 (1998).
3. SEE ALSO FIGURES 10-1 AND 10-2. LOCATIONS 24B11 AND 24B12 ARE ALSO BEING COLLECTED FOR SWMU 24 VERIFICATION.

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-1

SWMU 6 AND AOC 4 SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

AK18X24-V-2008.DGN(BORDER) Off=61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
AK-TANK-PARCEL.DGN() Off=2,17,56-63
AK-46619-SUPP INVEST-SWMU6-FG9-2.DGN / 2-15-2008 9:08 / CJW
K:\ENV\AKSTEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
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06B23		
DEPTH	Cd	Pb
0-2	1.4	75
4-8	5.5	310

06B22		
DEPTH	Cd	Pb
0-2	23	830
4-8	0.27 J	57

A04B06		
DEPTH	Cd	Pb
0-2	0.14	5.5
4-8	0.69	190

A04B05		
DEPTH	Cd	Pb
0-2	0.16	7.5
4-8	1.5	260

A04B07		
DEPTH	Cd	Pb
0-2	2.3	130
4-8	1.2	71

06B19		
DEPTH	Cd	Pb
0-2	0.34	0.95
4-8	16	37

06B18		
DEPTH	Cd	Pb
0-2	1.9	100
4-8	4.1	130

06B20		
DEPTH	Cd	Pb
0-2	1.6	71
4-8	7.5	1,300

06B17		
DEPTH	Cd	Pb
0-2	ND (0.3)	ND (0.15)
4-8	0.42	8.4
4-8 DUP	4.5	160

06B21		
DEPTH	Cd	Pb
0-2	0.74	75
4-8	1.1	97

06B16		
DEPTH	Cd	Pb
0-2	5.4	100
4-8	0.67	18

24B11		
DEPTH	Cd	Pb
0-2	ND (0.24)	ND (0.12)
2-4	ND (0.27)	ND (0.14)
2-4 DUP	ND (0.23)	ND (0.12)
4-6	ND (0.28)	ND (0.13)
6-8	ND (0.25)	ND (0.12)

06B15		
DEPTH	Cd	Pb
0-2	2.5	89
4-8	2.1	38

24B12		
DEPTH	Cd	Pb
0-2	ND (0.27)	ND (0.14)
2-4	ND (0.25)	ND (0.12)
4-6	1.7 J*	110 J*
6-8	ND (0.25)	ND (0.13)

SWMU 6
AOC 4
SWMU 24
TANK NO. 5 (REMOVED)
TANK NO. 4 (REMOVED)
TANK NO. 3 (REMOVED)
TANK NO. 2 (REMOVED)
TANK NO. 1 (REMOVED)
AST5-SR4
AST5-SR3C
AST5-SR3
AST5-SR2C
AST5-SR2 & 2A
AST5-SR1C
AST5-SR1 & 1A
06B13
06B14
06B14A
544 Sq. Ft. METAL BUILDING (REMOVED)
1 STORY METAL BUILDING 1694 Sq. Ft. (REMOVED)
METAL BUILDING 276 Sq. Ft. (REMOVED)
TRENCH 06T01
TRENCH 06T02
TRENCH 06T03A
TRENCH 06T04
TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C
TRENCH A04T01
TRENCH A04T02
TRENCH 06T03
OVERHEAD PIPE BRIDGE
BURIED WATER LINE
A04B01
A04B02
A04B03
A04B03A
A04B04
06B01
06B02
06B03
06B04
06B05
06B06
06B06A
06B07
06B07A
06B08
06B09
06B10
06B10A
06B11
06B11A
06B12
GRAVEL
GRAVEL DRIVE
KANSAS CITY SOUTHERN RAILROAD
750
PARCEL 3A
PARCEL 10A
PARCEL 10
PARCEL 11

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- DISCRETE SURFACE SOIL SAMPLING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION BORING LOCATION
- TRENCH LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF AOC/SWMU BOUNDARY
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- BOUNDARY OF TEMPORARY EASEMENT FOR KC TERMINAL RAILROAD

Cd	CADMIUM
Pb	LEAD
ND	NOT DETECTED. VALUE IN PARENTHESIS IS THE REPORTING LIMIT
J	ESTIMATED. RESULT IS BELOW THE REPORTING LIMIT.
J*	ESTIMATED
DUP	DUPLICATE SAMPLE

NOTES:

1. DURING THE RFI, LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24 IN THE RFI REPORT.
2. SAMPLE LOCATIONS AST5-SR1, AST5-SR1A, AST5-SR2, AST5-SR2A, AST5-SR3, AND AST5-SR4 WERE REMOVED BY VACUUM TRUCK DURING RFI PHASE 2 (1998).
3. SEE ALSO FIGURES 10-1 AND 10-2. LOCATIONS 24B11 AND 24B12 ARE ALSO BEING COLLECTED FOR SWMU 24 VERIFICATION.
4. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
5. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/Kg).

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-2

SWMU 6 AND AOC 4 CADMIUM AND LEAD RESULTS

AK STEEL KANSAS CITY FACILITY

AK18X24-V-2008.DGN(BORDER) Off=61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
AK-TANK-PARCEL.DGN() Off=2,17,56-63
AK-46619-SUPP INVEST-SWMU6-FG9-3.DGN / 3-12-2008 8:58 / CJW
K:\ENV\AKSTEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
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06B23		
DEPTH	TOTAL PAHs	TEH
0-2	1.66 J+	1,200
4-8	0.913 J	1,400

06B22		
DEPTH	TOTAL PAHs	TEH
0-2	4.89 J	8,400
4-8	0.901 J	2,500

A04B06		
DEPTH	TOTAL PAHs	TEH
0-2	0.037 J	90
4-8	0.424 J	170

A04B05		
DEPTH	TOTAL PAHs	TEH
0-2	0.629 J	53
4-8	15.52 J	620

A04B07		
DEPTH	TOTAL PAHs	TEH
0-2	18.872 J	280
4-8	256.1 J	190

06B19		
DEPTH	TOTAL PAHs	TEH
0-2	4.604 J	81
4-8	3.021 J	150

06B18		
DEPTH	TOTAL PAHs	TEH
0-2	8.61 J	310
4-8	4.017 J	1,100

06B20		
DEPTH	TOTAL PAHs	TEH
0-2	7.064 J	210
4-8	4.932 J	350

06B21		
DEPTH	TOTAL PAHs	TEH
0-2	3.887 J	230
4-8	4.043 J	240

06B17		
DEPTH	TOTAL PAHs	TEH
0-2	0.769 J+	150
4-8	0.389 J	48
4-8 DUP	1.112 J	150

06B16		
DEPTH	TOTAL PAHs	TEH
0-2	0.111 J	170
4-8	0.047 J+	31

24B11		
DEPTH	TOTAL PAHs	TEH
0-2	0.577 J	320
2-4	0.043 J	230
2-4 DUP	0.327 J	370
4-6	1.98 J	120
6-8	2.575 J	700

24B12		
DEPTH	TOTAL PAHs	TEH
0-2	0.168 J	39
2-4	2.878 J	29.6
4-6	4.178 J	130
6-8	1.284 J	99

06B15		
DEPTH	TOTAL PAHs	TEH
0-2	1.062 J	89
4-8	0.329 J	44

SWMU 6
SWMU 24
AOC 4
TANK NO. 5 (REMOVED)
TANK NO. 4 (REMOVED)
TANK NO. 3 (REMOVED)
TANK NO. 2 (REMOVED)
TANK NO. 1 (REMOVED)
544 Sq. Ft. METAL BUILDING (REMOVED)
1 STORY METAL BUILDING 1694 Sq. Ft. (REMOVED)
METAL BUILDING 276 Sq. Ft. (REMOVED)
OVERHEAD PIPE BRIDGE (REMOVED)
OVERHEAD PIPE BRIDGE
BURIED WATER LINE
TRENCH 06T01
TRENCH 06T02
TRENCH 06T03A
TRENCH 06T04
TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C
TRENCH A04T01
TRENCH A04T02
TRENCH 06T03
AST5-SR4
AST5-SR3C
AST5-SR2C
AST5-SR3
AST5-SR2 & 2A
AST5-SR1C
AST5-SR1 & 1A
06B13
06B14
06B14A
A04B01
A04B02
A04B03
A04B03A
A04B04
06B08
06B09
06B10
06B10A
06B11
06B11A
06B12
06B01
06B02
06B03
06B04
06B05
06B06
06B06A
06B07
06B07A
PARCEL 3A
PARCEL 10A
PARCEL 10
PARCEL 11
KANSAS CITY SOUTHERN RAILROAD
GRAVEL
GRAVEL DRIVE
750

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- DISCRETE SURFACE SOIL SAMPLING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION BORING LOCATION
- TRENCH LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF AOC/SWMU BOUNDARY
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- BOUNDARY OF TEMPORARY EASEMENT FOR KC TERMINAL RAILROAD
- PAH — POLYNUCLEAR AROMATIC HYDROCARBONS
- TEH — EXTRACTABLE TOTAL PETROLEUM HYDROCARBONS
- J — ESTIMATED VALUE. ONE OR MORE OF THE INDIVIDUAL PAH CONSTITUENTS WAS DETECTED BELOW THE REPORTING LIMIT.
- J+ — ESTIMATED, BIAS HIGH
- DUP — DUPLICATE SAMPLE

NOTES:

1. DURING THE RFI, LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24 IN THE RFI REPORT.
2. SAMPLE LOCATIONS AST5-SR1, AST5-SR1A, AST5-SR2, AST5-SR2A, AST5-SR3, AND AST5-SR4 WERE REMOVED BY VACUUM TRUCK DURING RFI PHASE 2 (1998).
3. SEE ALSO FIGURES 10-1 AND 10-2. LOCATIONS 24B11 AND 24B12 ARE ALSO BEING COLLECTED FOR SWMU 24 VERIFICATION.
4. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
5. RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/Kg).

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-3

SWMU 6 AND AOC 4 TOTAL PAH AND EXTRACTABLE TPH RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-TANK-PARCEL.DGN() Off=2,17-18,56-63
AK-17X11-2008.DGN(BORDER) Off=59,61
AK-TANK-PARCEL.DGN() Off=1,3-9,12-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPL INVESTIGATION\
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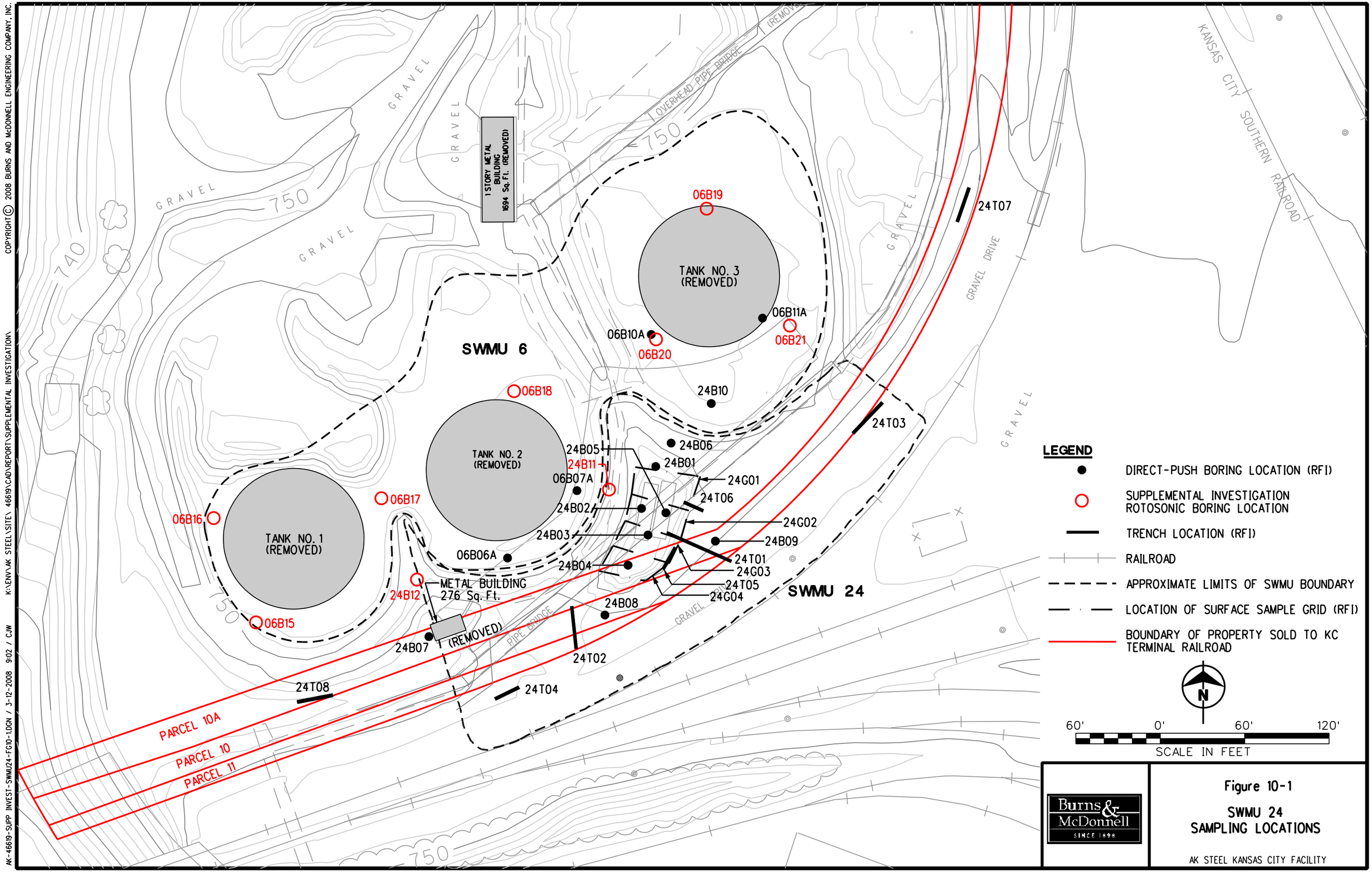


LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION ROTOSONIC BORING LOCATION
- TRENCH LOCATION (RFI)
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD

N

60' 0' 60' 120'

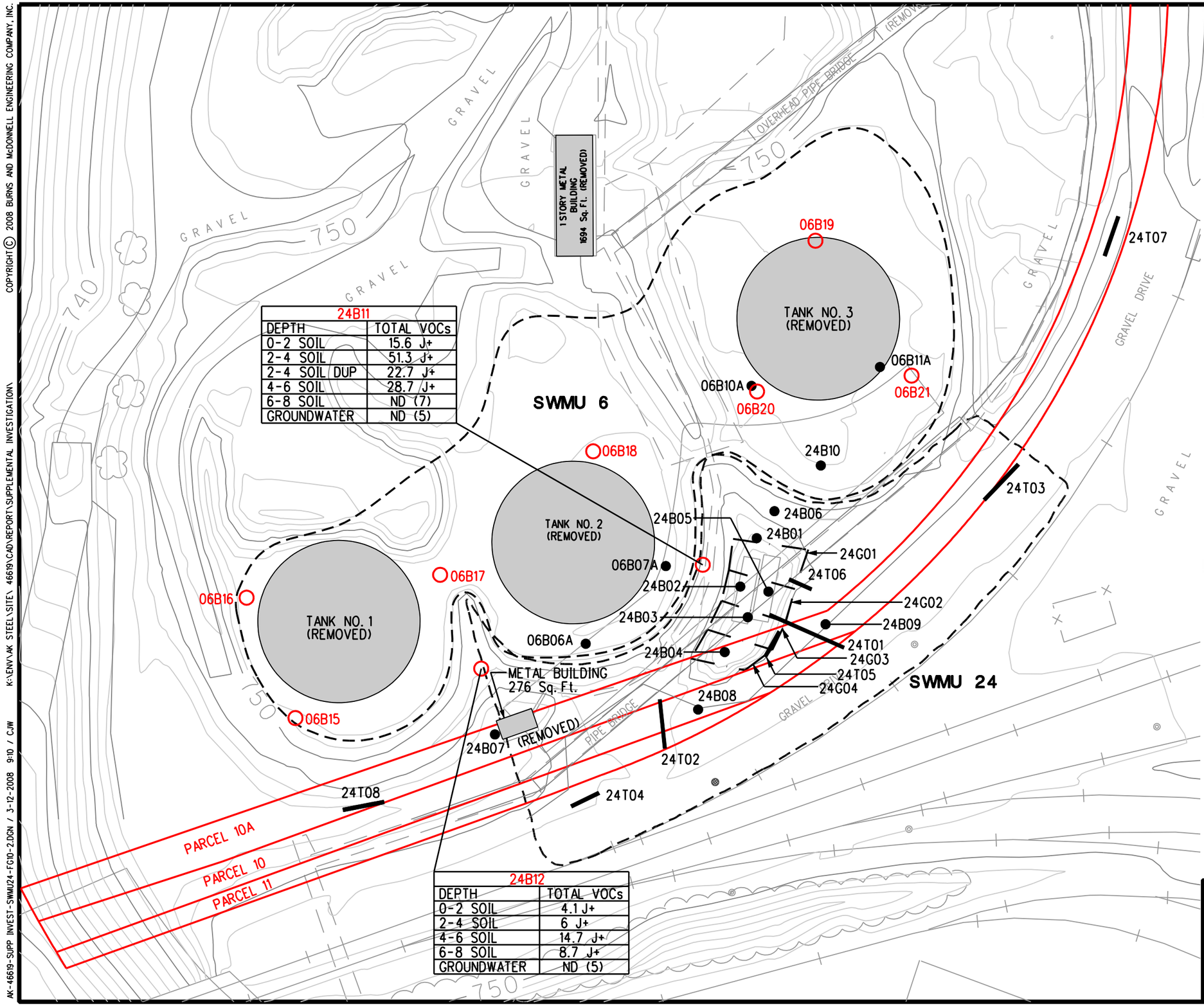
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 10-1

SWMU 24
SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY



24B11	
DEPTH	TOTAL VOCs
0-2 SOIL	15.6 J+
2-4 SOIL	51.3 J+
2-4 SOIL DUP	22.7 J+
4-6 SOIL	28.7 J+
6-8 SOIL	ND (7)
GROUNDWATER	ND (5)

24B12	
DEPTH	TOTAL VOCs
0-2 SOIL	4.1 J+
2-4 SOIL	6 J+
4-6 SOIL	14.7 J+
6-8 SOIL	8.7 J+
GROUNDWATER	ND (5)

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION ROTOSONIC BORING LOCATION
- TRENCH LOCATION (RFI)
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- LOCATION OF SURFACE SAMPLE GRID (RFI)
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- VOC — VOLATILE ORGANIC COMPOUND
- ND — NOT DETECTED. VALUE IN PARENTHESES IS THE REPORTING LIMIT.
- DUP — DUPLICATE SAMPLE
- J — ESTIMATED VALUE. RESULT IS BELOW THE REPORTING LIMIT
- J+ — ESTIMATED, BIAS HIGH
- J= — ESTIMATED

NOTES:

1. DEPTH FOR SOIL SAMPLES IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. SOIL SAMPLES RESULTS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (ug/Kg).
3. GROUNDWATER SAMPLE RESULTS ARE PRESENTED IN MICROGRAMS PER LITER (ug/L).
4. SEE ALSO FIGURES 9-1 THROUGH 9-3. LOCATIONS 24B11 AND 24B12 WERE ALSO COLLECTED FOR SWMU 6/AOC 4 VERIFICATION.

N

60' 0' 60' 120'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 10-2

SWMU 24
TOTAL VOC RESULTS

AK STEEL KANSAS CITY FACILITY

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AK-TANK-PARCEL.DGN() Off=2,17-18,56-63
AK-17X11-2008.DGN(BORDER) Off=59,61
AK-SITE.DGN(SITE) Off=17,61-63
AK-CONTOUR.DGN(CONTOUR) Off=1,3-9,12-63
AK-ALLSWMU.DGN(SWMU) Off=62-63
K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK-46619-SUPP INVEST-SWMU24-FG10-2.DGN / 3-12-2008 9:10 / CJW

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AK-17X11-2008.DGN(BORDER) 01/=59,61
AK-SITE.DGN(SITE) 01/=17,61-63
AK-CONTOUR.DGN(CONTOUR) 01/=13-9,11-63
AK-ALLSWMU.DGN(SWMU) 01/=62-63
K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\
AK-46619-SUPP INVEST-SWMU13-FG11-1.DGN / 3-12-2008 9:20 / CJW

WILSON ROAD BRIDGE

720

13B13

13B08

13B11

13B12

13B10

13B09

13B09A

13B07A

13B07

13B06

13B14

13B02

13B01

SWMU 13

13B03

13B03A

13B05

13B04

13B15

LEGEND

- DIRECT-PUSH BORING LOCATION (RFI)
- SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- APPROXIMATE LIMIT OF SWMU BOUNDARY

N

25' 0' 25' 50'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 11-1

SWMU 13
SOIL SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

AKSITE.DGN() Off=3,63
AKCON-B.DGN() Off=62-63
AK-ALLSWMU.DGN() Off=5,62-63
AK-11X17-2008.DGN() Off=61

AK-46619-SUPP INVEST-SWMU13-FG11-2.DGN / 3-12-2008 9:54 / CJW

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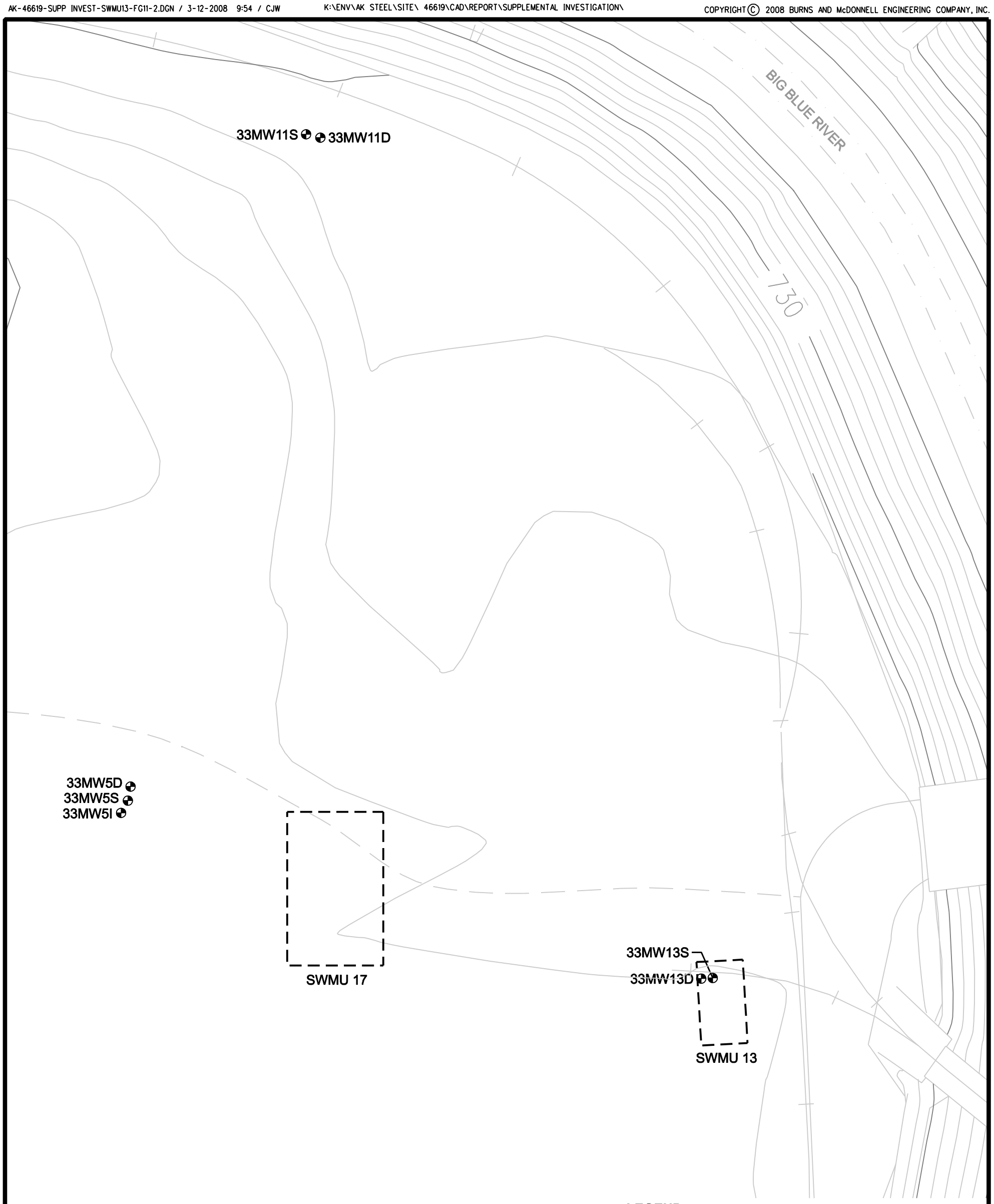

Figure 11-2

SWMU 13 GROUNDWATER SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

Burns & McDonnell SINCE 1898

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AK-46619-SUPP INVEST-SWMU13-FG11-3.DGN / 3-13-2008 9:06 / CJW K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\
AK-17X11-2008.DGN(BORDER) O/F=59,61
AK-SITE.DGN(SITE) O/F=17,61-63
AK-CONTOUR.DGN(CONTOUR) O/F=1,3-9,11-63
AK-ALLSWMU.DGN(SWMU) O/F=62-63

WILSON ROAD BRIDGE

720

13B13

SWMU 13

13B08

13B11

13B12

13B10

13B09

13B07A

13B07

13B06

13B14

13B02

13B01

13B03

13B03A

13B05

13B04

13B15

13B09A	
DEPTH	TOTAL SVOC
0-2	5,687 J
2-4	3,882 J
4-6	534 J
6-8	2,768 J

LEGEND

- ● DIRECT-PUSH BORING LOCATION (RFI)
- ○ SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- RAILROAD
- – – – – APPROXIMATE LIMIT OF SWMU BOUNDARY
- SVOC SEMIVOLATE ORGANIC COMPOUND
- J ESTIMATED VALUE

NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (ug/Kg).
3. SINCE THE MAJORITY OF THE DETECTED SVOCS WERE DETECTED BETWEEN THE METHOD DETECTION LIMIT (MDL) AND THE REPORTING LIMIT (RL), TOTAL SVOC RESULTS WERE ESTIMATED (J FLAG).
4. THE MAJORITY OF DETECTED SVOCS WERE POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS).

N

25' 0' 25' 50'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 11-3

SWMU 13
TOTAL SVOC RESULTS

AK STEEL KANSAS CITY FACILITY

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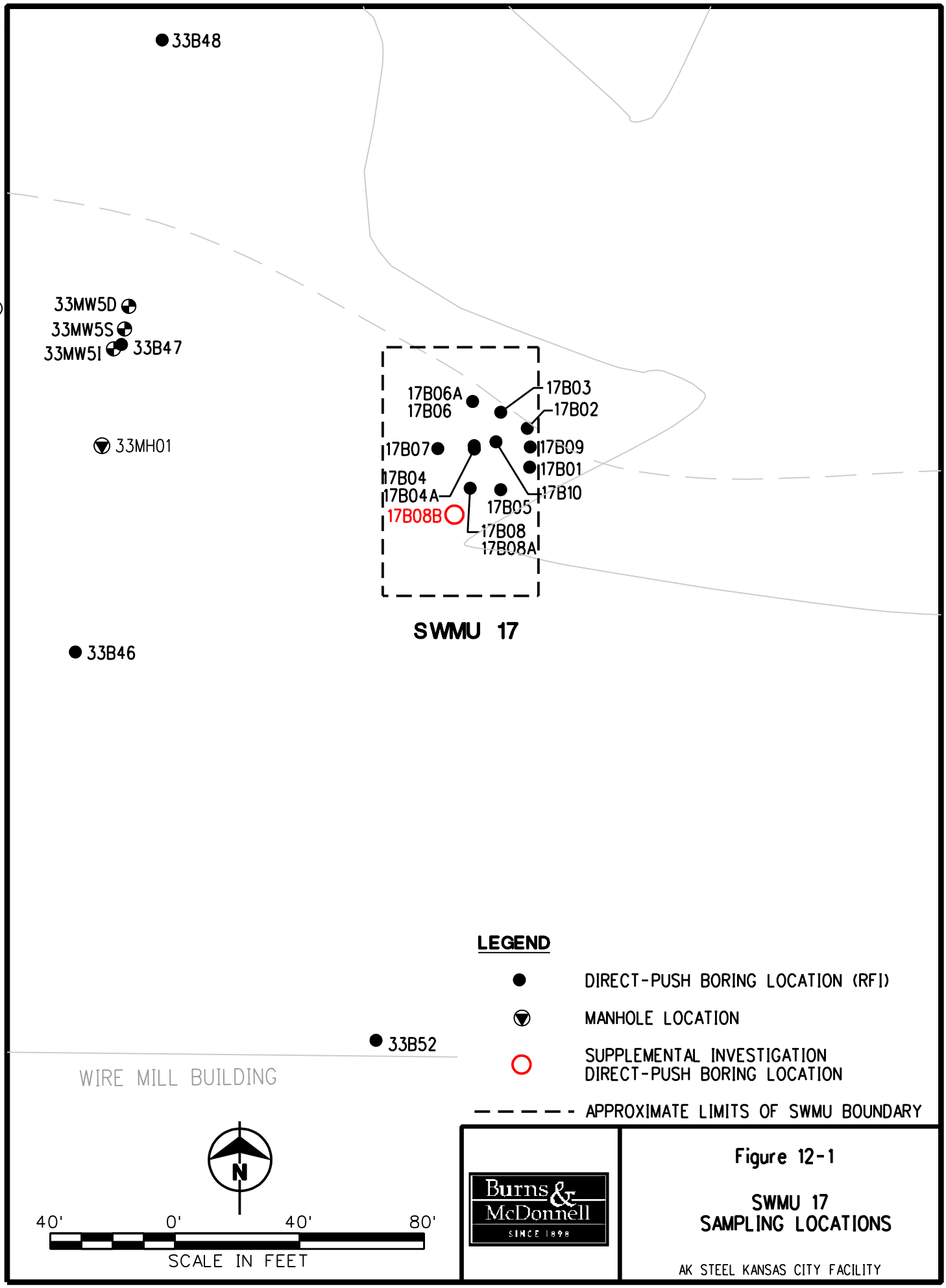

LEGEND

- ● DIRECT-PUSH BORING LOCATION (RFI)
- ▽ MANHOLE LOCATION
- ○ SUPPLEMENTAL INVESTIGATION DIRECT-PUSH BORING LOCATION
- – – – – APPROXIMATE LIMITS OF SWMU BOUNDARY

Burns & McDonnell SINCE 1898

Figure 12-1

SWMU 17
SAMPLING LOCATIONS

AK STEEL KANSAS CITY FACILITY

AK-4619-SUPP INVEST-SWMU17-FG12-1.DGN / 1-30-2008 13:44 / CJW
K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK85X11-2008.DGN(Ref) Off=61
AKSITE.DGN() Off=63
AKCON-B.DGN() Off=62-63
AK-ALLSWMU.DGN() Off=5,62-63

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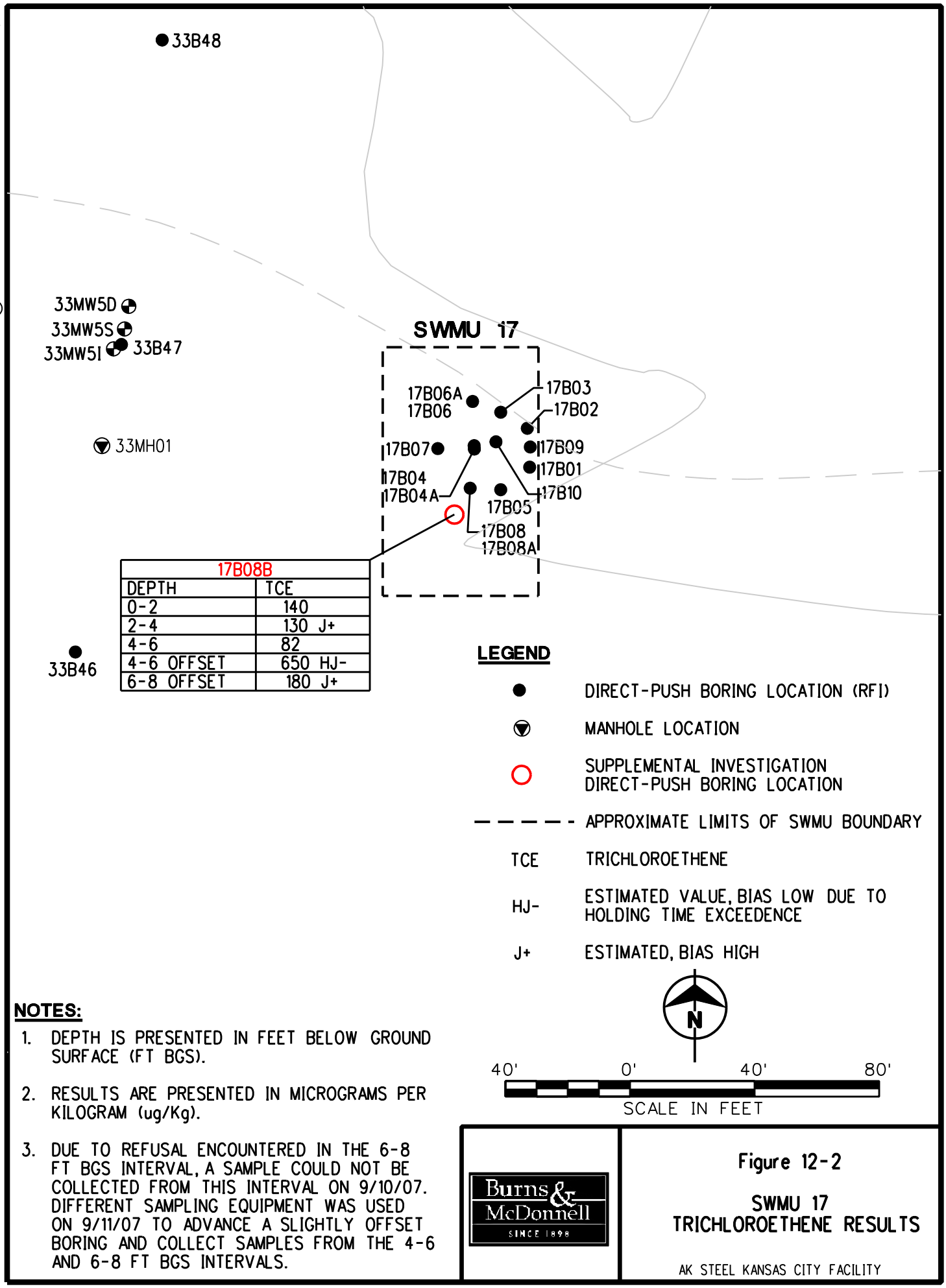
AK-4619-SUPP INVEST-SWMU17-FG12-2.DGN / 2-15-2008 8:03 / CJW
K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\
AK85X11-2008.DGN(Ref) Off=61
AKSITE.DGN() Off=63
AKCON-B.DGN() Off=62-63
AK-ALLSWMU.DGN() Off=5,62-63



NOTES:

1. DEPTH IS PRESENTED IN FEET BELOW GROUND SURFACE (FT BGS).
2. RESULTS ARE PRESENTED IN MICROGRAMS PER KILOGRAM (ug/Kg).
3. DUE TO REFUSAL ENCOUNTERED IN THE 6-8 FT BGS INTERVAL, A SAMPLE COULD NOT BE COLLECTED FROM THIS INTERVAL ON 9/10/07. DIFFERENT SAMPLING EQUIPMENT WAS USED ON 9/11/07 TO ADVANCE A SLIGHTLY OFFSET BORING AND COLLECT SAMPLES FROM THE 4-6 AND 6-8 FT BGS INTERVALS.

Burns & McDonnell SINCE 1898

Figure 12-2

SWMU 17
TRICHLOROETHENE RESULTS

AK STEEL KANSAS CITY FACILITY

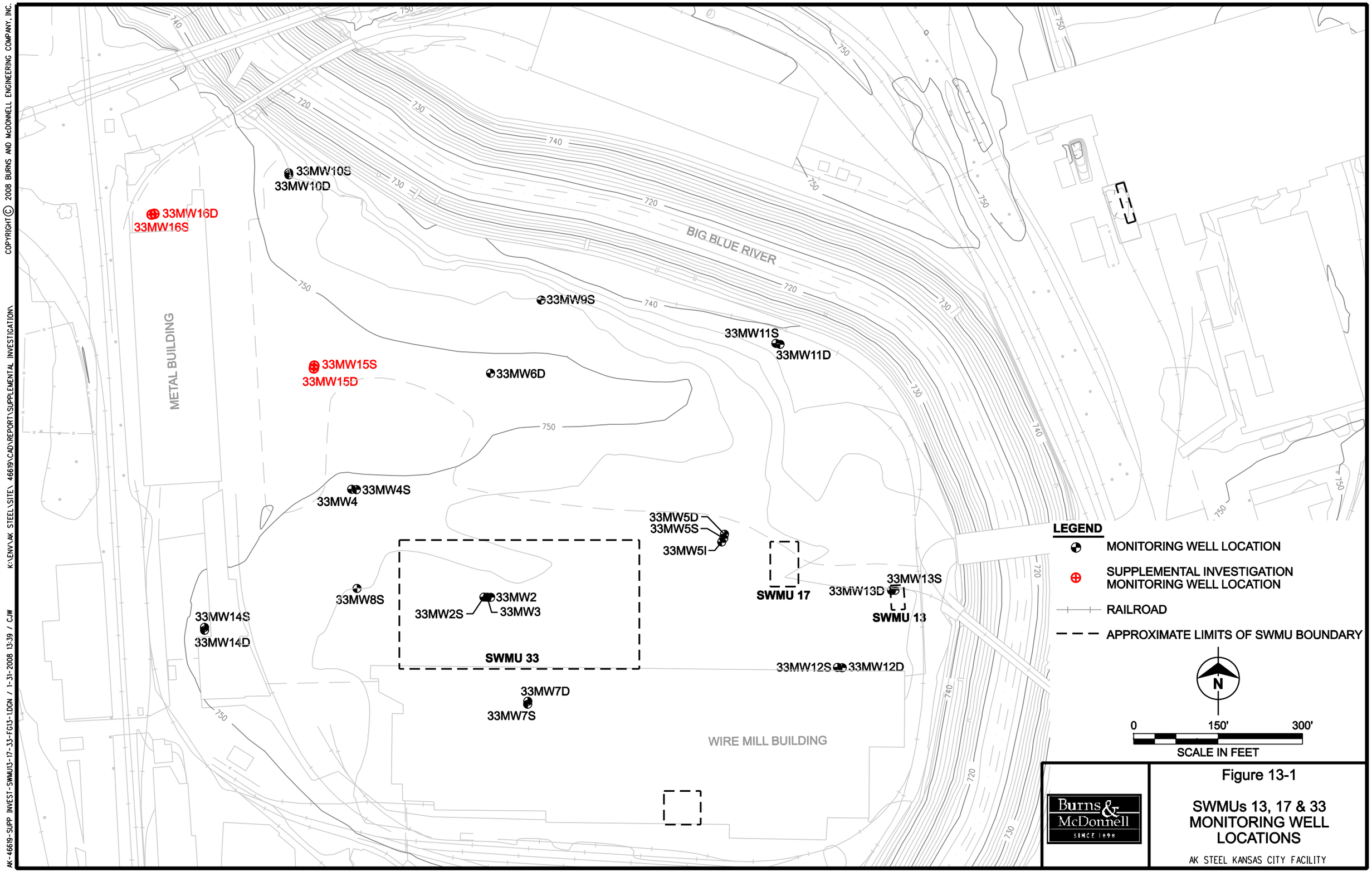


Figure 13-1

SWMUs 13, 17 & 33 MONITORING WELL LOCATIONS

AK STEEL KANSAS CITY FACILITY

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AKSITE.DGN() Off=3,63
AKCON-B.DGN() Off=62-63
AK-17X11-2008.DGN() Off=61
AK-ALLSWMU.DGN() Off=5,62-63

K:\ENV\AK STEEL\SITE\ 46619\CAD\REPORT\SUPPLEMENTAL INVESTIGATION\

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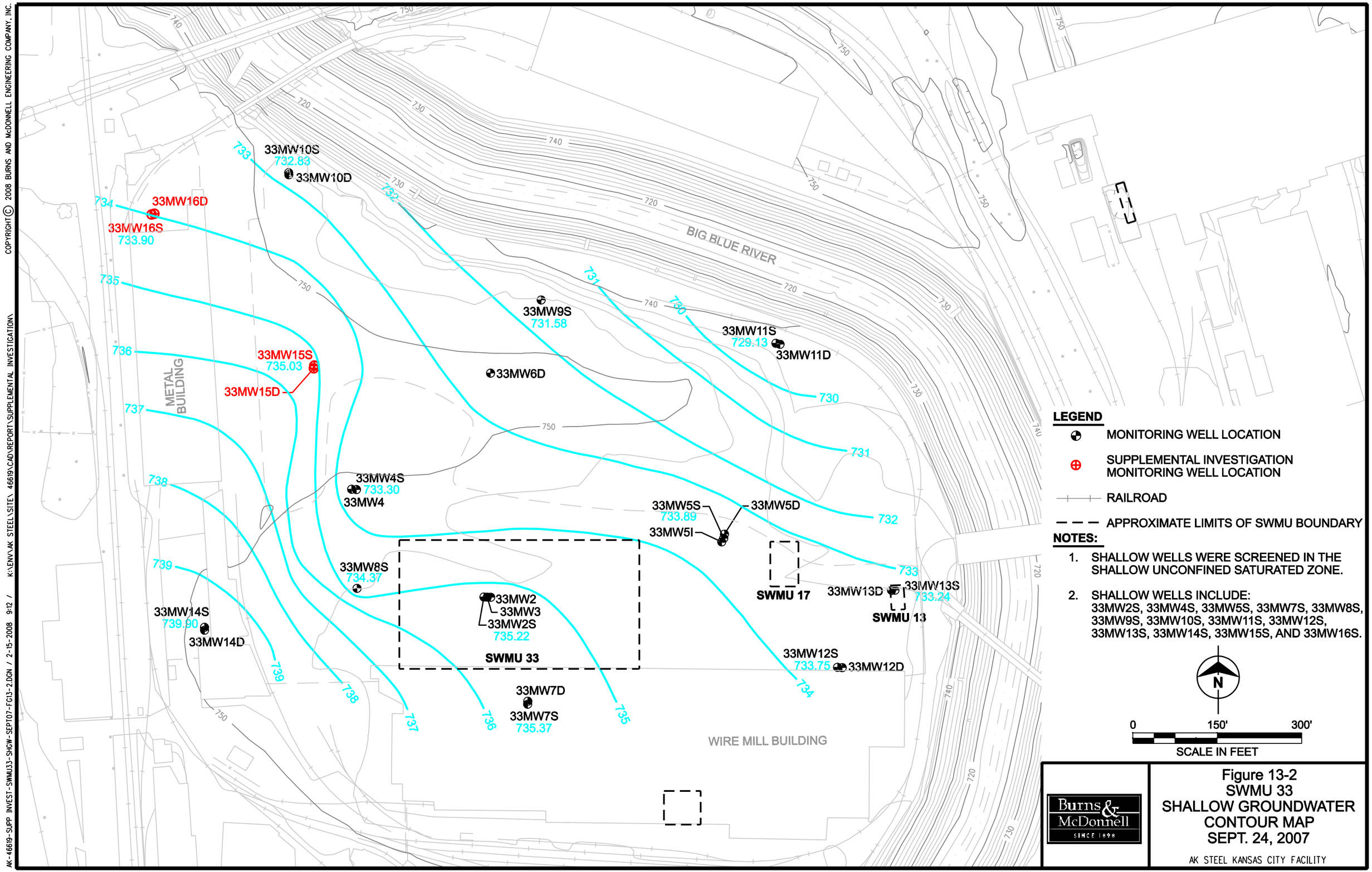

LEGEND

- MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION MONITORING WELL LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY

NOTES:

1. SHALLOW WELLS WERE SCREENED IN THE SHALLOW UNCONFINED SATURATED ZONE.
2. SHALLOW WELLS INCLUDE: 33MW2S, 33MW4S, 33MW5S, 33MW7S, 33MW8S, 33MW9S, 33MW10S, 33MW11S, 33MW12S, 33MW13S, 33MW14S, 33MW15S, AND 33MW16S.

N

0 150' 300'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 13-2
SWMU 33
SHALLOW GROUNDWATER CONTOUR MAP
SEPT. 24, 2007

AK STEEL KANSAS CITY FACILITY

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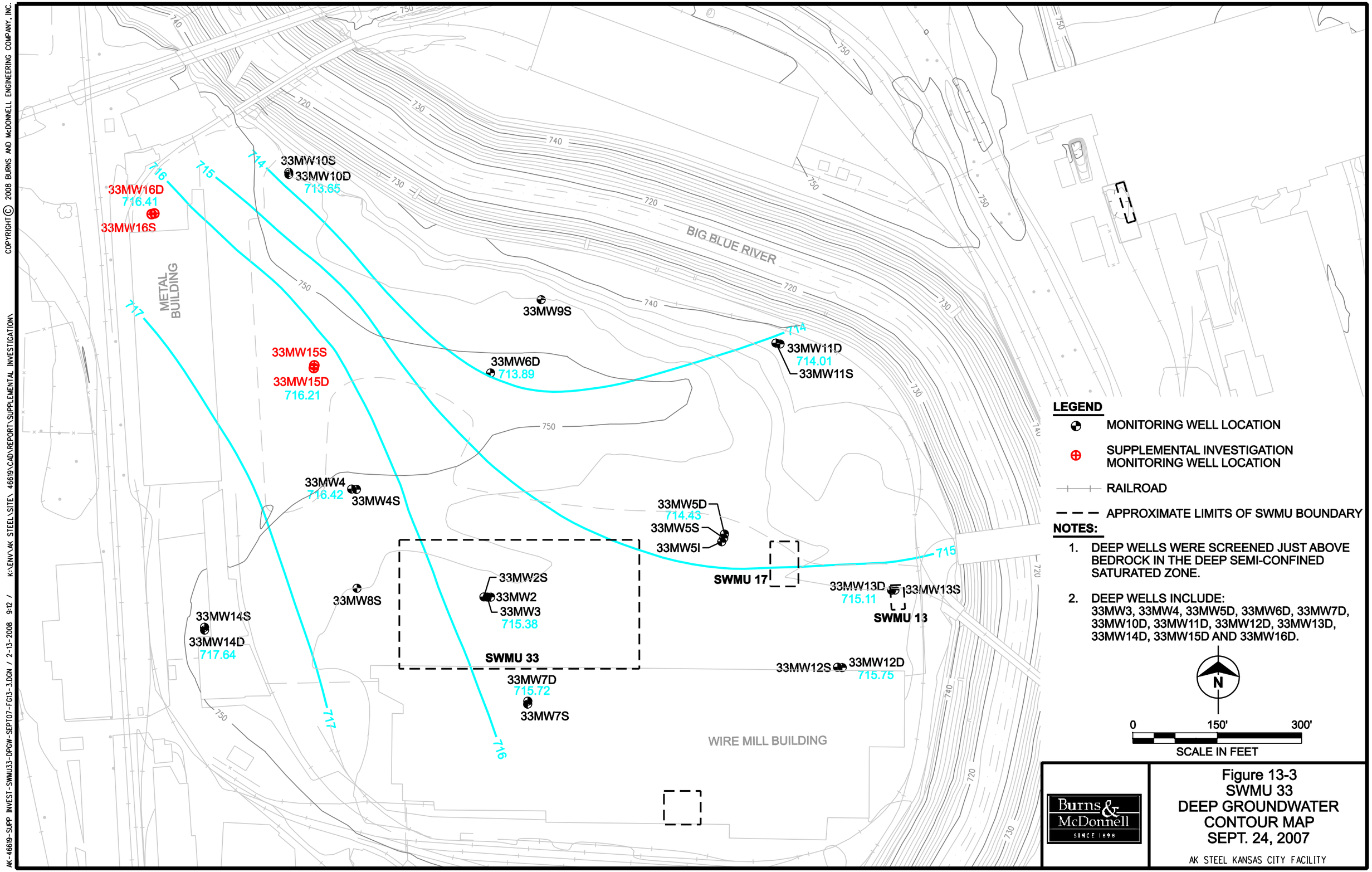

Figure 13-3
SWMU 33
DEEP GROUNDWATER CONTOUR MAP
SEPT. 24, 2007

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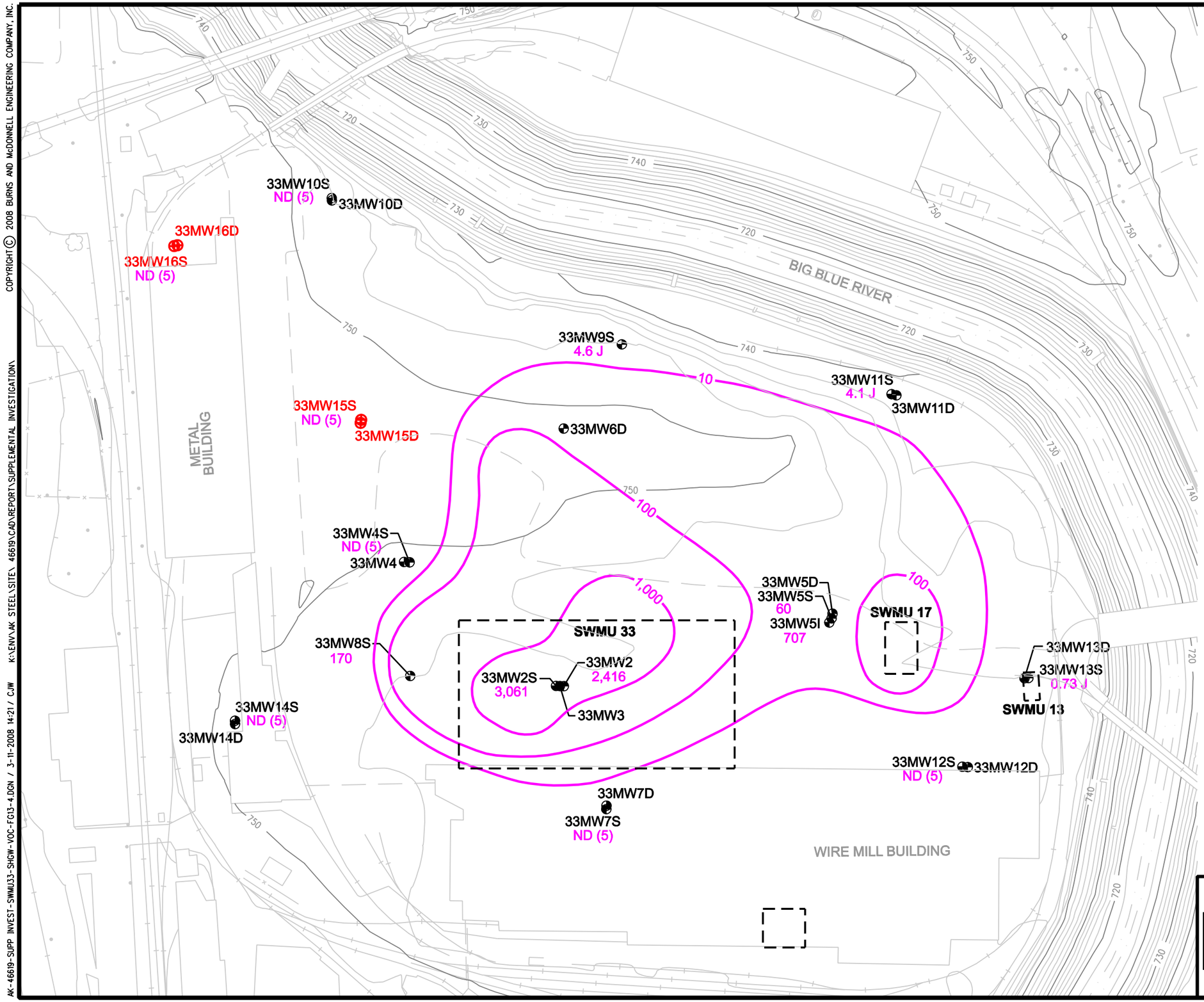

LEGEND

- MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION MONITORING WELL LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- J ESTIMATED VALUE
- ND NOT DETECTED. VALUE IN PARENTHESES IS THE REPORTING LIMIT.

NOTES:

1. SHALLOW WELLS ARE SCREENED IN THE SHALLOW UNCONFINED SATURATED ZONE.
2. SHALLOW WELLS INCLUDE: 33MW2S, 33MW4S, 33MW5S, 33MW7S, 33MW8S, 33MW9S, 33MW10S, 33MW11S, 33MW12S, 33MW13S, 33MW14S, 33MW15S, AND 33MW16S.
3. MONITORING WELLS 33MW2 AND 33MW5I ARE INTERMEDIATE DEPTH WELLS SCREENED DIRECTLY ABOVE THE SEMI-CONFINING LAYER IN THE SHALLOW SATURATED ZONE. THESE WELLS ARE NOT USED IN CONTOURING SHALLOW GROUNDWATER DATA.
4. THE RESULTS AND ISOCONCENTRATION CONTOURS ARE REPORTED IN MICROGRAMS PER LITER (ug/L)
5. THE REPORTING LIMIT IS 5 ug/L. RESULTS LESS THAN 5 ug/L ARE REPORTED AS ESTIMATED (J FLAG).
6. CONTOURS GENERATED CONSIDERING HISTORICAL WELL AND DIRECT-PUSH DATA THAT CONSISTED OF A GREATER DENSITY OF SAMPLING POINTS. CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS AND MAY NOT REPRESENT ACTUAL CONCENTRATIONS AT LOCATIONS SHOWN.
7. DETECTED CHLORINATED VOCs IN SHALLOW GROUNDWATER INCLUDE: 1,1-DICHLOROETHENE, 1,1-DICHLOROETHANE CIS-1,2-DICHLOROETHENE, TRANS-1,2-DICHLOROETHENE, TRICHLOROETHENE, AND VINYL CHLORIDE.

0 150' 300'
SCALE IN FEET

N

Burns & McDonnell SINCE 1898

Figure 13-4
SWMU 33
TOTAL CHLORINATED VOC RESULTS
SHALLOW GROUNDWATER

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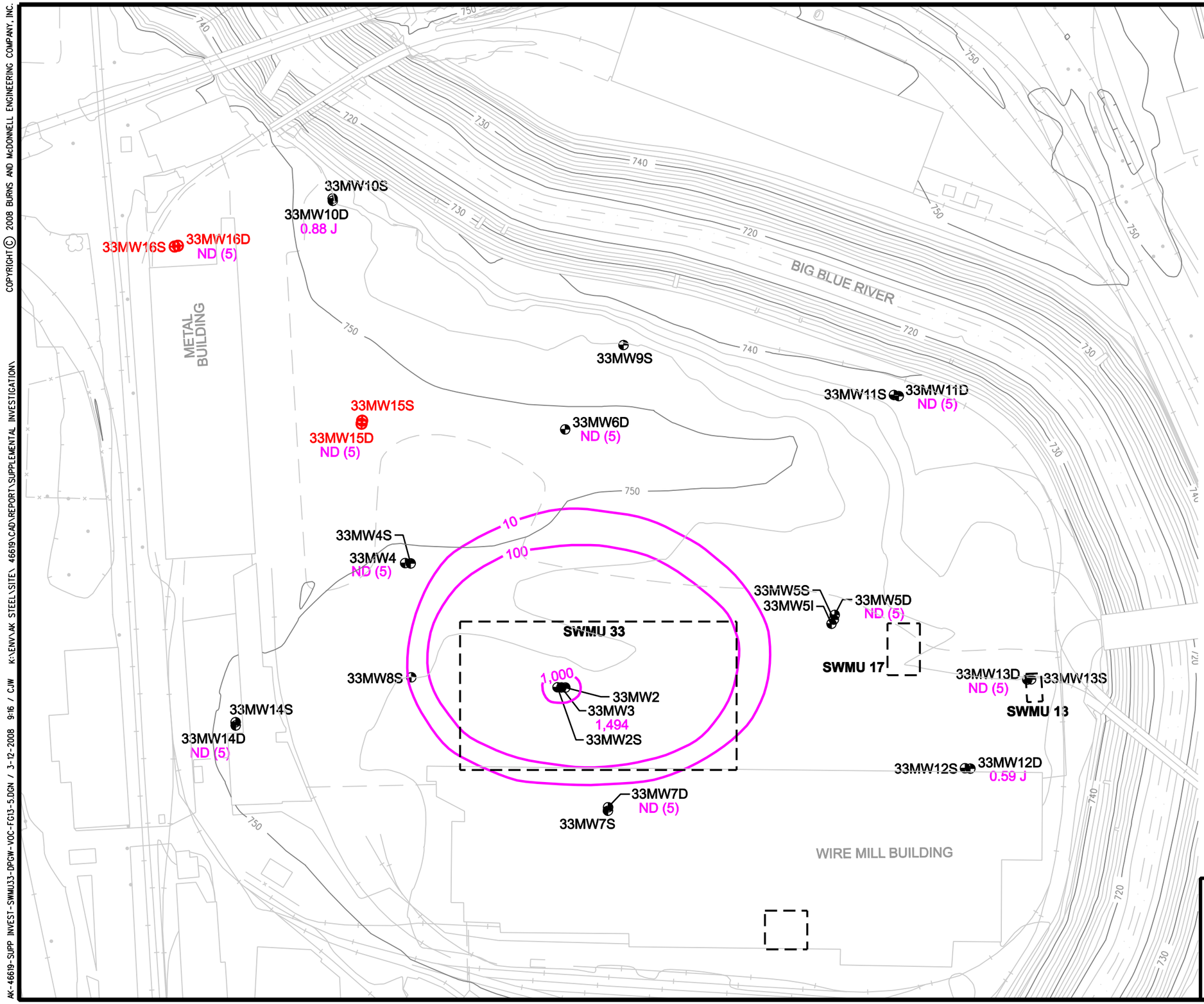

LEGEND

- MONITORING WELL LOCATION
- SUPPLEMENTAL INVESTIGATION MONITORING WELL LOCATION
- RAILROAD
- APPROXIMATE LIMITS OF SWMU BOUNDARY
- J ESTIMATED VALUE
- ND NOT DETECTED. VALUE IN PARENTHESES IS THE REPORTING LIMIT.

NOTES:

1. DEEP WELLS ARE SCREENED JUST ABOVE BEDROCK IN THE DEEP SEMI-CONFINED SATURATED ZONE.
2. DEEP WELLS INCLUDE: 33MW3, 33MW4, 33MW5D, 33MW6D, 33MW7D, 33MW10D, 33MW11D, 33MW12D, 33MW13D, 33MW14D, 33MW15D AND 33MW16D.
3. RESULTS AND ISOCONCENTRATION CONTOURS ARE PRESENTED IN MICROGRAMS PER LITER (ug/L).
4. THE REPORTING LIMIT IS 5 ug/L. RESULTS LESS THAN 5 ug/L ARE REPORTED AS ESTIMATED (J FLAG).
5. DETECTED CHLORINATED VOCs IN DEEP GROUNDWATER INCLUDE: 1,1-DICHLOROETHANE, 1,1-DICHLOROETHENE, CIS-1,2-DICHLOROETHENE, TRANS-1,2-DICHLOROETHENE, TRICHLOROETHENE, AND VINYL CHLORIDE.
6. CONTOURS GENERATED CONSIDERING HISTORICAL WELL AND DIRECT-PUSH DATA THAT CONSISTED OF A GREATER DENSITY OF SAMPLING POINTS. CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS AND MAY NOT REPRESENT ACTUAL CONCENTRATIONS AT LOCATIONS SHOWN.

N

0 150' 300'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 13-5
SWMU 33
TOTAL CHLORINATED VOC RESULTS
DEEP GROUNDWATER

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EXHIBITS

Exhibit 1-1

Letter from Nancy Wentworth, USEPA QA Division to Leigh Ing, TNRCC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL CENTER FOR ENVIRONMENTAL RESEARCH
AND QUALITY ASSURANCE
WASHINGTON, DC 20460

APR 26 1999

OFFICE OF
RESEARCH AND DEVELOPMENT

Ms. Leigh Ing
Deputy Director
Office of Waste Management
TNRCC
P.O. Box 13087
Austin, Texas 78711-3087

Dear Ms. Ing:

On February 10, 1999, representatives of U.S. Environmental Protection Agency (EPA) and Intertek Testing Services Environmental Laboratories, Inc. (ITS-ENV) met at the request of ITS-ENV, for a presentation on the company's efforts to reprocess data at the Richardson, Texas, facility

Company representatives presented information concerning the efforts by ITS-ENV to reprocess, evaluate, and screen data EPA has a number of concerns that lead the Agency to conclude that the ITS-ENV reprocessing effort cannot generate reliable data The reprocessing effort addresses only a portion of the entire analytical process – the electronic data. The reliability of the data is dependant, however, upon the quality and integrity of all steps in the analytical process. A considerable portion of that measurement system is not addressed by the reprocessing effort.

Evidence developed during the course of the investigation indicates problems extending beyond the electronic data including holding times, improper storage, preparation, and handling of samples, manipulation of surrogate spikes. These problems cannot be addressed by the reprocessing of electronic instrument data.

Neither the original analyses nor the current reprocessing efforts comply with the requirements of U.S. EPA's quality system Electronically reprocessing compromised data cannot generate "reliable data," particularly in regard to false negatives. The reprocessing procedure cannot correct the improper practices that compromised the original data.

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In conclusion, EPA cannot accept that the reprocessing of electronic instrument data will correct the original falsifications that took place at these laboratories. We do understand that the evaluation and screening processes is quite useful to some ITS-ENV clients. Reprocessed data, however, would not be acceptable to U.S. EPA for clean-up or compliance purposes.

Sincerely,

Nancy W. Wentworth, Director
Quality Assurance Division
Office of Research and Development

cc: Ann Strahl, TNRCC

Exhibit 1-2

Letter from Ken Herstowski, USEPA Region 7 to Tom Stutz, Sunflower Army Ammunition Plant

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

NOV 12 1999

Mr. Tom Stutz
Commander's Representative
Sunflower Army Ammunition Plant
P.O. Box 640
DeSoto, KS 66018-0640

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 1

To NANCI HIGGINBOTHAM	From D. KARNS
Dept./Agency TS&M	Phone # 983-3363
Fax # 822-3463	Fax # 426-5509

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Dear Mr. Stutz:

RE: RCRA Facility Investigation (RFI)
Sunflower Army Ammunition Plant
DeSoto, KS
RCRA ID# KS3213820878

The Environmental Protection Agency (EPA or the Agency) has determined, after careful analysis, that data generated by Intertek Testing Services Environmental Laboratories, Inc. (ITS-ENV) at the now-closed laboratories in Richardson, Texas and Houston, Texas, are unreliable and cannot be used in Agency decision-making. Both laboratories previously operated under the names of Inchcape Testing Services Environmental Laboratories, Inc., and NDRC, Inc.

I understand that ITS-ENV data from these laboratories were used in the RFI addendums for Solid Waste Management Units (SWMUs) 7, 8, 9, 15, 16, 17, 20, 25, 26, 30, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 49, 51, and 52, as well as in other facility reports. Given that EPA cannot rely on ITS-ENV data from the Richardson or Houston facilities, any SWMUs with decisions based on that data will need to be resampled. Please submit your schedule for the resampling of these SWMUs within 30 days of the date of this letter.

If you have any questions regarding this matter, please call me at (913) 551-7631.

Sincerely,

Kenneth V. Herstowski
RCRA Corrective Action and Permits Branch
Air, RCRA, and Toxics Division

cc: Dennis Degner, Kansas Department
of Health and Environment

RECYCLE

APPENDICES

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Relevant Information from RFI Report

APPENDIX A - Relevant Information from the RFI Report (Submitted on CD)

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
AST	Aboveground Storage Tank
atm-m^3/mol	Atmospheres-cubic meters/mole
ATSDR	Agency for Toxic Substances and Disease Registry
BEHP	Bis(2-ethylhexyl)phthalate
bgs	Below ground surface
BMcD	Burns & McDonnell
BMWCI	Burns & McDonnell Waste Consultants, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CEC	Cation Exchange Capacity
cfs	Cubic feet per second
CH	Clay
cis-1,2-DCE	cis-1,2-Dichloroethene
CL	Silty or sandy clay
cm	Centimeter
COE	Corp of Engineers
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
Cr	Chromium
DAF	Dilution Attenuation Factor
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
EP-Toxicity	Extraction Procedure for Toxicity
Facility	Armco Kansas City, Missouri Facility
°F	Degrees Fahrenheit
ft	Feet
GC	Clayey gravel (soil reference)
GC	Gas chromatography (analytical reference)
GM	Silty gravel
GST	GS Technologies Corporation
HHRA	Human Health Risk Assessment
HSWA	Hazardous and Solid Waste Amendments
I-435	Interstate Highway 435
IM	Interim Measures
IMP	*Interim Measures Plan for the Armco Kansas City Facility*
K	Hydraulic conductivity
KCT	Kansas City Terminal Railway Company
K_d	Adsorption coefficient
Kg	Kilogram
K_{oc}	Organic Carbon-Water Partitioning Coefficient
K_{ow}	Octanol-Water Partitioning Coefficient
L	Liter
MCL	Maximum Contaminant Level
MDNR	Missouri Department of Natural Resources
mg	Milligram

LIST OF ACRONYMS AND ABBREVIATIONS (CONTINUED)

ML	Silt, clayey silt
mmHg	Millimeters of mercury
MSL	Mean Sea Level
nm	Nanometers
NPDES	National Pollution Discharge Elimination System
PAH	Polynuclear Aromatic Hydrocarbon
PCE	Tetrachloroethene
Permit	Armco's Part B Post-Closure Permit
PID	Photoionization Detector
ppm	Parts per million
PSI	Pollutant Standards Index
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RCRA Landfill	Closed Emission Control Dust Landfill
redox	Reduction/oxidation
Revised IMP	*Revised Interim Measures Plan for the Armco Kansas City Facility*
RFI	Resource Conservation and Recovery Act (RCRA) Facility Investigation
RFI Workplan	*RCRA Facility Investigation Workplan for the Armco Kansas City Facility*
SC	Clayey sand
sec	Second
SESOIL	Seasonal Soil Compartment Model
SM	Silty sand
Sq. mi.	Square mile
SSL	Soil Screening Level
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
trans-1,2-DCE	trans-1,2-Dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
TCE	Trichloroethene
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
µg	Microgram
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UTL	Upper Tolerance Limit
UV	Ultraviolet
VOC	Volatile Organic Compound
WCC	Woodward Clyde Consultants
XRF	X-Ray Fluorescence

2.0 ENVIRONMENTAL SETTING

This chapter presents regional and site-specific information pertaining to the Facility environmental setting. Topics discussed in this chapter include the following: Facility location and description, climate, summary of field investigation methods, surface water, geology, hydrogeology, and ecology.

2.1 LOCATION AND DESCRIPTION

As stated earlier in Section 1.2.1 of this Report, the properties owned by Armco and GST occupy approximately 860 acres within the Blue River and Missouri River alluvial valleys in northeast Kansas City, Missouri, Jackson County and are east and west of I-435 (see Figure 2-1). The Facility occupies portions of Section 6, T49N, R32W; Section 1, T49N, R33W; and Sections 28, 29, 30, 31 and 32, T50N, R32W, and lies between 94° 26' 53" and 94° 30' 00" west longitude and 39° 05' 56" and 39° 07' 37" north latitude. Of the approximately 860 total acres at the Facility, 300 acres are owned by GST and 100 acres are owned by Armco but leased and controlled by GST.

2.1.1 Current and Future Land Use

Land use in the vicinity of the Facility is characterized by medium to heavy industrial activity. The Facility is zoned M2A Heavy Industrial by the city of Kansas City, Missouri, and there is no plan for this zoning designation to change. The area of the Facility west of I-435 contains the active steel mill facilities now owned by GST as well as approximately 117 acres still owned by Armco. The area east of I-435 (approximately 445 acres) is largely undeveloped ground that is included in the proposed right-of-way for the South Riverfront Expressway. Localized residential developments are located to the southeast and west of the Facility. Detailed information on Facility structures and activities is included in Section 1.2 of this Report.

2.1.2 Public Access to the Facility

Overland access to the Facility by the general public is limited by perimeter fencing, gates, and guards. The Facility is, however, marginally accessible from the Blue and Missouri Rivers and from Rock Creek since fencing is absent at the top of the river banks.

2.2 CLIMATE

The general climate in the area of the Facility is classified as continental. Northwestern Missouri is subject to frequent daily weather changes and large seasonal weather contrasts. Weather patterns are determined by the dynamics of converging cold air masses moving down from the north and warm, moist air masses moving up from the south. The relative position of the jet stream is critical in determining the migration paths of low and high pressure systems that govern air mass movements affecting the Facility.

2.2.1 Annual Weather Data

During summer months, temperatures rise to 90 °F or higher on an average of 40 to 50 days; temperatures over 100°F are rare. During the winter months, approximately 110 days on average have temperatures below 32°F; temperatures below 0°F are infrequent (NOAA, 1999). The Kansas City area averages 36.1 inches of precipitation per year (including an average annual snowfall of 18.9 inches), with the majority occurring during the months of May, June, and September. Average seasonal precipitation is distributed as follows: Spring – 29 percent, Summer – 35 percent, Fall – 24 percent, and Winter – 12 percent. The relative humidity varies from approximately 54 to 86 percent. The yearly normal relative humidity is 73 percent at midnight, 79 percent at 6 a.m., 59 percent at noon, and 59 percent at 6 p.m. (NOAA, 1999).

The prevailing wind direction is from south to north. Figure 2-2 is a wind rose from the National Weather Service Station located at the downtown Municipal Airport in Kansas City, Missouri.

2.2.2 Air Quality

The federal Clean Air Act implemented a measure of community-wide air quality monitoring called the Pollutant Standards Index (PSI). The PSI provides daily levels of air pollution recorded at numerous monitoring points across the Kansas City Area. PSI values range from 0 to 500 with air quality considered unhealthful when PSI values exceed 100. The PSI for Kansas City ranges from less than 10 in the winter months to greater than 75 during the summer months. These PSI values are categorized as good to moderate. The pollutants indexed by the PSI are called "Criteria Pollutants." The Criteria Pollutants are ozone (O_3), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM10), and sulfur dioxide (SO_2). Each of these pollutants is monitored individually at each monitoring station and must maintain a value below the daily mean average. All exceedences to the daily average are reported. The Kansas City area received 14 exceedence days for ozone during the period from 1994 to1997. Nine of the 14 exceedence days occurred in 1995. All of the ozone exceedences occurred during the summer; all other criteria pollutants have remained in compliance with the daily standard with no exceedence days during the 1994 to 1997 interval.

2.3 SUMMARY OF FIELD INVESTIGATION METHODS

The following paragraphs summarize the various investigation methods utilized during the RFI. The actual procedures used for the investigative methods are detailed in the approved Workplans and Workplan Addenda (BMWCI 1994, 1996, 1996a, 1996b, 1997, 1997b, and 1997d) and are not restated here.

2.3.1 Direct-Push Borings

Two hundred and fifty-one direct-push borings for the procurement of groundwater samples, soil samples, and geophysical parameters were completed during the RFI. The borings were completed, sampled, and backfilled per the approved Workplans and Workplan Addenda (BMWCI 1994, 1996, 1996a, 1996b, 1997, 1997b, and 1997d). Boring logs were prepared for direct-push borings from which soil samples were obtained; these boring logs can be found in Appendix B. Boring logs were not prepared for direct-push borings from which only

groundwater samples were obtained. Thirty-one direct-push borings were completed for the purpose of advancing a conductivity probe to bedrock in order to determine approximate depth to bedrock and to evaluate alluvial stratigraphy. The conductivity probes were useful in identifying subsurface materials and bedrock contacts in areas where boring data were not available. The conductivity probe logs can be found in Appendix C.

2.3.2 Physical Soil Sample Borings

Six soil borings (33B56, 33B57, 33B58, 33B59, 33B60 and 33MW5I) were installed at SWMU 33 for the purpose of collecting soil samples for analysis of physical soil parameters and for comparing actual sediment types observed with adjacent conductivity probe logs. This provided additional information to interpret subsurface lithology at conductivity probe locations remote from soil borings. Soil samples for analysis of physical parameters were also collected from two soil borings at SWMU 12 and two trenches at SWMU 6. The soil physical parameter samples are summarized on Table 2-1 and the lab data for the samples is presented in Appendix D. The soil boring logs are presented in Appendix B.

Standard geophysical testing was performed in each of the six SWMU 33 soil borings listed above. The geophysical parameters measured included gamma ray, caliper, single point resistivity, conductivity, and spontaneous potential. In addition, gamma ray logging was performed through the casing of eight completed monitoring wells at SWMU 33 (33MW3, 33MW4, 33MW5D, 33MW6D, 33MW11D, 33MW12D, 33MW13D, and 33MW14D). The geophysical log profiles are shown alongside their respective soil boring logs in Appendix E.

2.3.3 Monitoring Well Borings

During the RFI, twenty-three soil borings were installed for the purpose of collecting soil samples and/or installing groundwater monitoring wells at SWMUs 12, 22, 33, and AOC 1. The soil boring logs are included in Appendix B. The monitoring well construction diagrams are presented in Appendix F. The monitoring well construction data are summarized in Tables 2-2 and 2-3. Copies of MDNR monitoring well certification records for the wells are included in

Appendix G. Monitoring well development records are included in Appendix H. A gamma ray geophysical tool was used to differentiate borehole stratigraphy through cased SWMU 33 monitoring wells which extended to bedrock. These geophysical logs are included in Appendix E.

2.3.4 Exploratory Trenches

Eighteen test pits were excavated at SWMU 7 and sixteen trenches were excavated at AOC 4, SWMU 6, and SWMU 24, to characterize subsurface stratigraphy and collect soil samples beneath the dense surface slag layer. In addition, four monitoring wells at AOC 1 and one monitoring well at SWMU 33 were completed in trenches excavated through the dense surface slag layer. The dense slag at these locations prevented near surface drilling with hollow-stem auger equipment. The trench logs are included in Appendix I.

2.4 SURFACE WATER

2.4.1 Surface Water Bodies

Surface drainage at the Facility is controlled by the Blue River, the Missouri River, and Rock Creek (Figure 2-1). Virtually all of the Facility lies within the 100-year flood boundary shown in Figure 2-3. The 100-year flood boundary maps incorporated in this figure predate completion of the Blue River flood control project. The United States Army Corps of Engineers (COE) and the Federal Emergency Management Agency (FEMA) are in the process of revising the flood maps based on the added protection of the channelization project.

2.4.1.1 Blue River

South of the KCT bridge crossings (Figure 2-1), the Facility is roughly bisected by the Blue River. North of the KCT bridge crossings, the Blue River forms the western, northern and northwestern Facility boundary, meandering north and northeast toward the Missouri River. The Blue River traverses approximately 4.35 river miles (2.37 straight line miles) from the south end of the property at SWMU 3 to the confluence with the Missouri River at Missouri River mile

358.1. The Blue River channel through the Facility has been paved (approximately 0.67 miles) or lined with rip-rap (approximately 2.0 miles) for flood control by the COE. The paved portion of the Blue River channel is adjacent to the boundary of SWMU 33. In the eastern portion of the Facility, a levee that was constructed and maintained by Armco is present on the south side of the Blue River (Figure 2-1).

The flood control channel adjacent to SWMU 33 is approximately 200 feet wide with 3:1 slopes descending to a 26.5:1 sloping channel floor. The low flow channel is a 15 feet wide by 5 feet deep rectangular subchannel within the channel floor. Adjacent to SWMU 33, total depth from the top of the 3:1 slope to the bottom of the low flow channel is approximately 30 feet. A profile view of the flood control channel is included in Appendix J.

There is a gauging station on the Blue River at 12th Street (Station #06893590) approximately 0.25 miles upstream of the southern Armco property boundary (USGS, 1999); however, the station does not record discharge data. Because of the proximity of the Facility to the Missouri River and the resulting impoundment effect, calculation of maximum Blue River discharge past the Facility was not attempted. Blue River discharge past the Facility during the Plaza flood rainfall event on September 12 and 13, 1977 was estimated by summing the Brush Creek gauging station (#06893560) and the Blue River near 95th Street gauging station (#06893500) discharges for that date. This estimate of discharge is conservative since additional storm sewers and drainages contribute water to the Blue River between the gauging stations and the Facility. On September 12 and 13, 1977, a discharge of 17,600 cubic feet/second (cfs) was recorded at the Brush Creek gauging station and 20,600 cfs was recorded at the Blue River gauging station, respectively, for a total of 38,200 cfs (USGS, 1999). Peak flow data for these two stations is included in Appendix J.. The drainage area for the Blue River and its tributaries encompasses approximately 188 square miles (sq. mi.) (USGS, 1999).

2.4.1.2 Rock Creek

Rock Creek bounds the southern edge of the Facility east of I-435 from approximately AOC 8 to the confluence with the Missouri River, a distance of approximately 1.5 miles (Figure 2-1).

SWMU 12 is surrounded by a former meander loop of Rock Creek that was cut off when the channel was deepened and straightened. At a gauging station approximately 3.2 miles upstream of the Facility on Rock Creek, the average and median peak discharges from 1967 through 1975 (period for which data was collected) were 1,200 and 960 cfs, respectively. The drainage area for Rock Creek and its tributaries encompasses approximately 5.2 sq. mi. (USGS, 1999).

2.4.1.3 Missouri River

The Missouri River bounds the northeastern edge of the Facility at the barge dock (Figure 2-1). SWMU 12 is the nearest SWMU to the Missouri River at a distance of approximately 2,600 feet. There is a gauging station (Station #06893000) on the Missouri River at Kansas City at mile 366.1 on the downstream side of the right pier of the Chicago, Burlington and Quincy Railroad Bridge. The station is 8.0 miles upstream of the confluence of the Missouri River and Blue River. The average discharge from 1970 through the present past the station is 74,200 cfs; median discharge for the same interval is 63,300 cfs. The drainage area for the Missouri River and its tributaries encompasses approximately 485,000 sq. mi. (USGS, 1999).

2.4.1.4 Temporal Surface Water Bodies

A number of low-lying areas in the eastern portion of the Facility are prone to ponding during periods of heavy precipitation and/or elevated river stages. Some of these low areas originated as borrow sites for construction fill used at the Facility. The ponded areas are generally characterized by internal drainage with no outlet (water dissipates through evaporation and infiltration) and shallow depths (less than 5 ft). Depending on the season and river stage, the ponded areas range in size from a few hundred square feet to approximately 8.6 acres.

2.4.2 Surface Drainage

In general, precipitation falling on paved areas of the Facility drains into the Blue River directly via overland sheet flow, or indirectly via storm sewers. Surface water falling on unpaved areas may infiltrate into the subsurface or drain into the Blue River directly via overland sheet flow, or indirectly via storm sewers. Additional data regarding Facility surface drainage is presented in

Chapter 3.0 of this Report. Drainage Basin Maps were provided as Appendix A2 in Addendum No. 1 to the RFI Workplan (BMWCI, 1997). The approximate locations of storm sewers in the SWMU 33 area from the Drainage Basin Maps are shown on Figure 2-6.

2.4.3 Surface Water Current and Future Uses

With the exception of process cooling water contained in the GST Mill Ponds (SMWU 22), surface water at the Facility is not currently being used. No change in the status of surface water usage at the Facility is planned for the future.

2.5 GEOLOGY

2.5.1 Regional Geology

The Facility is located within the Osage Plains physiographic province. This province is typified by dissected till plains with broad uplands separated by steep sided valleys and broad valley floors. Unconsolidated deposits of alluvial, glacial, aeolian, and residual origin constitute the youngest geologic materials in the region (Hasan, et al, 1988). Major alluvial deposition occurred along the Missouri and Kansas Rivers as well as their tributaries. The alluvium tends to coarsen with depth and is generally composed of clays, silts, sands, and gravels. Loess (wind-blown silt) deposits over 100 feet thick occur on the bluffs bounding the Blue and Missouri River alluvial valleys in the region. In general, loess deposits are thickest north of the Missouri and Kansas Rivers and gradually thin to the south. The Kansas City area is located at the southern limit of Pleistocene glaciation. Glacial till covers much of the area north of the Missouri and Kansas rivers and is present at several localities south of the Rivers. Glacial till is an unstratified mixture of clay, silt, sand, gravel, and boulders deposited during glacial retreat.

The Facility is located midway along a 150 mile wide band of outcropping Pennsylvanian age rock which extends in a north-south direction through western Missouri and eastern Kansas (Parizek and Gentile, 1965). Within this band, more than 300 feet of rock belonging to the Pleasanton, Kansas City, Lansing, and Douglas Groups is exposed. Rock comprising these groups consists primarily of alternating shale and limestone strata with local, laterally

discontinuous, fine-grained sandstone beds. Published data indicate that bedrock of the Pleasanton Group ranging in thickness from approximately 20 to 150 feet (Parizek and Gentile, 1965), occurs beneath the Facility (Figure 2-4). Thickness of bedrock beneath the Facility was not determined during the RFI. All borings that reached bedrock were terminated with only minimal penetration into bedrock.

Regionally, bedrock units dip gently (10 to 20 feet per mile) westward off the Ozark uplift and toward the Forest City Basin. In the Kansas City area, this regional structure is modified by the northwest trending Penn Valley Syncline, Bannister Ridge Anticline, and Centerview-Kansas City Anticline.

2.5.2 Site Geology

Subsurface geologic conditions were characterized during the RFI by drilling and sampling borings located across the Facility.

2.5.2.1 Artificial Fill

Artificial fill at the Facility is composed largely of slag and refractory brick rubble. Slag is composed primarily of silica, carbon, calcium carbonate, and minor metals that crystallize into a surface crust of impurities during cooling of molten steel. Slag is rock-like in appearance and physical qualities. Slag, which does not leach metals, is commonly used as a construction material.

Slag and refractory brick rubble have historically been used at the Facility to fill low lying ground adjacent to the Blue River; to construct levees and rail sidings; and to surface roads and parking areas at the Facility. The fill deposits can be loose and granular or relatively dense and massive depending upon the temperature of the slag when deposited. Slag deposited while still extremely hot and semi-plastic formed dense, rock-like layers. Slag fill placed at AOC 1 is of this type. Slag deposited after relatively cool formed loose gravel and cobble deposits with

intercalated sand to clay size matrix material. Slag fill placed at SWMUs 33 and 6 is of this type.

In soil borings and trenches completed during the RFI, slag fill material at the Facility is classified variously according to the Unified Soil Classification System (USCS) as GM (sandy-silty gravel) or GC (clayey gravel). Most of the slag observed during the RFI was in the gravel size range although cobble and boulder size slag material was encountered. Large boulders of metaliferous slag are believed to have been responsible for refusal encountered by direct-push boring and hollow-stem auger drilling equipment. Slag was encountered at SWMUs 4, 6, 7, 8, 9, 11, 12, 13, 17, 22, 24, 25 and 33 at depths ranging from the ground surface to 17 feet below ground surface (bgs).

2.5.2.2 Alluvium

The natural silty clay loam to stratified fine sandy loam topsoil at the Facility has been classified by the Soil Conservation Service as belonging to the Haynie, Parkville, Zook, and Gilliam soil series (Preston, 1984). The pH of the topsoil typically ranges from 5.6 to 8.4 and the shrink-swell potential for these soils ranges from low to high. Appendix K contains the soil survey map for the Facility along with the associated legend of soil types.

The Facility is located upon the alluvial valleys of the Missouri River and the Blue River near their confluence. The Quaternary-aged Missouri River and Blue River alluvial deposits beneath the Facility have been classified as:

- CL-CH - Clay; sandy clay; silty clay; low to high plasticity
- ML-CL - Silts; clayey silts; silty or clayey very fine sands; silty or sandy clays; and silty or sandy clay; low to medium plasticity
- SM-SP - Silty sand to poorly graded sand
- GC - Clayey gravel, gravel-sand mixture
- GW (Fill) - Boulder to gravel size slag and brick fragments in a sand to clay size slag matrix

There are two distinct alluvial sediment profiles at the Facility that are believed to reflect source areas within their respective drainages. The arc of the Missouri River alluvial valley southern boundary sweeps across the Blue River alluvial valley just north of SWMUs 8 and 11 (see Figure 2-1). South of SWMUs 8 and 11, the Facility is located wholly within the Blue River alluvial valley and the sediment profile is dramatically different from the Missouri River alluvial valley. In the Blue River alluvial valley, sediment grain size is more uniformly fine; soil samples collected and analyzed for physical parameters were classified as CH, CL, ML, or SC (Table 2-1 and Appendix D).

Blue River Alluvial Valley – At SWMU 33, the typical Blue River alluvial valley sediment profile (Figure 2-5) has approximately 10 feet of slag and brick fill underlain by approximately 50 feet of clay, sandy clay, or silty clay of low to high plasticity. Within this interval, thin, laterally discontinuous lenses of clayey or silty fine sand may also be present. Above the bedrock contact at approximately 65 ft, there is approximately 5 feet of clayey to fine sandy gravel. The gravel is typically composed of limestone or chert fragments. The fine-grained nature of the Blue River dominated alluvial valley sediments is probably reflective of the fine-grained rock types providing sediment to the Blue River drainage basin (i.e. primarily Pennsylvanian-aged limestones, mudstones, and shales) and a relatively lower flow velocity than the Missouri River. The location of geologic profiles that illustrate the vertical and lateral distribution of Blue River dominated alluvial valley alluvium at SWMU 33 are shown on Figure 2-6. The SWMU 33 geologic profiles are shown as Figures 2-7, 2-8, and 2-9.

Missouri River Alluvial Valley – The sediment profile in the Missouri River alluvial valley (north of SWMUs 8 and 11) is dominated by coarsening downward alluvial sediments typical of large river systems such as the Missouri River. Coarsening downward sedimentation within the Missouri River alluvium is characterized by silts and clays predominating at shallow depths, grading to fine sands and finally to coarse sand and gravels near the bedrock contact. These coarser grain sediments are evidence of their original source areas in the Rocky Mountains.

Previous subsurface investigations were conducted at the RCRA Landfill which is located just south of the Blue River and east of I-435 in the eastern portion of the Facility (BMcD, 1987).

The Missouri River alluvial valley dominated alluvium in this area was characterized as a sequence of near-surface clayey silts and silty clays coarsening downward to sands and gravels in the lower portion of the alluvium (Figure 2-5). The near-surface silty clays and clayey silts grade into fine sand at a depth of approximately 10 to 25 feet bgs. At a depth below 30 to 40 feet bgs, the fine sand grades to coarse sands and gravels. The location of a geologic profile which illustrates the vertical and lateral distribution of Missouri River dominated alluvial valley alluvium in the eastern portion of the Facility (SWMUs 2, 4, 5, 12, 22 and AOC 8) is shown on Figure 2-10. The geologic profile for this area is shown in Figure 2-11.

The differences between the two sediment profiles are reflected in the different set of hydrogeologic properties possessed by each. This subject is discussed in more detail in Subsection 2.6.2.

2.5.2.3 Bedrock

Where observed, bedrock beneath the alluvial materials at the Facility has been identified as the unnamed shale member of the upper Pleasanton Group, Missourian Series, Pennsylvanian System (Figure 2-4). This shale reportedly has an average thickness of 25 feet throughout western and northern Missouri (Thompson, et al, 1995). The unnamed shale member of the Pleasanton Group was encountered in every boring extended to bedrock during the RFI. Depth to bedrock varies across the Facility from approximately 25 to 50 feet bgs at SWMU 12 to 60 to 70 feet bgs in the vicinity of SWMUs 33, 22, 5 and 2. Bedrock elevations tend to be higher near the margins of the flood plain. The Facility is not located in an area of active faulting (Holocene displacement), therefore, seismic instability is not expected at the Facility.

2.6 HYDROGEOLOGY

2.6.1 Regional Hydrogeology

Potable and industrial groundwater supply wells in the Kansas City area obtain groundwater from the unconsolidated Missouri River alluvium. Recharge to the Missouri River alluvial groundwater system can occur from the river and associated tributaries, from Pennsylvanian

Kansas City Group bedrock, and from precipitation infiltration on flood plain areas. Regional groundwater flow is generally toward the Missouri River (Figure 2-12).

The Pennsylvanian Pleasanton Group bedrock is considered an aquitard in the vicinity of the Facility and throughout much of western Missouri. The Facility lies within the bedrock groundwater province referred to as the Saline Groundwater Province. Paleozoic (Cambrian to Pennsylvanian) bedrock saturated zones beneath the Kansas City area contain groundwater with total dissolved solid (TDS) levels that exceed 20,000 parts per million (ppm) and are not usable for potable supply (Hayes, 1967). The potential for hydraulic interconnection occurring between the alluvial valley saturated zone and the underlying Paleozoic saturated zone is believed to be minimal.

2.6.2 Site Hydrogeology

2.6.2.1 Saturated Zone Characteristics

Existing hydrogeological conditions were characterized using periodic water level measurement data, data obtained from saturated zone slug testing of monitoring wells, and data obtained from a limited saturated zone pumping test. Water level data collected during the RFI for the SWMUs 12, 22, 33, AOC 1, and RCRA landfill monitoring wells are presented in Appendix L. Hydrographs that show seasonal water level elevations for the SWMU 22-RCRA landfill vicinity, SWMU 33, and AOC 1 monitoring wells are included in Appendix M. Water level data collected at the Facility indicate that the piezometric groundwater surface elevations are generally lowest during the winter and early spring and higher during the summer and fall. The seasonal groundwater fluctuations correspond positively with periods of low and high precipitation and river stages.

Missouri River Dominated Alluvial valley - North of SWMUs 8 and 11 (Figure 2-1), Missouri River alluvial valley sediments are typified by a single, unconfined alluvial saturated zone. Review of historic groundwater data for the closed RCRA Landfill east of the SWMU 22 area showed groundwater elevations ranging from approximately 712 to 722 feet above MSL (BMcD,

1991). During the RFI, water levels in the SWMU 22-RCRA Landfill area of the Facility generally ranged from 720 to 740 feet above MSL, or 5 to 25 feet bgs.

Blue River Dominated Alluvial valley - South of SWMUs 8 and 11 where fine-grained Blue River alluvial valley sediments predominate, the hydrogeology is characterized by an upper, unconfined saturated zone underlain by a lower, semi-confined saturated zone. Soil borings and geophysical logs have indicated that a localized, laterally discontinuous, semi-confining layer exists beneath SWMU 33. This low permeability, high plasticity clay semi-confining layer was encountered at approximately 40 feet bgs in Monitoring Well Soil Borings 33MW5S, 33MW5I, 33MW5D (Figure 2-9). Actual thickness of the semi-confining layer is not known but it is less than 20 feet at this well cluster given the relative position of well screens in Monitoring Wells 33MW5I and 33MW5D. Both the upper, unconfined and lower, semi-confined saturated zones are composed predominantly of fine-grained silty clay sediments; however, the base of the lower, semi-confined saturated zone contains limestone and cherty gravel in a silty clay matrix. Water level elevations in the SWMU 33 monitoring wells generally ranged from 730 to 740 feet above MSL (5 to 15 feet bgs) in the upper, unconfined saturated zone and 715 to 725 feet above MSL (20 to 30 feet bgs) in the lower, semi-confined saturated zone.

At AOC 1, approximately 15 to 18 feet of dense slag material overlies the silty clay Blue River alluvial valley sediments. All attempts to drill through the slag with either direct-push or hollow-stem auger drilling equipment met with refusal. Four trenches were excavated through the slag layer into the underlying silty clay sediments of the Blue River alluvial valley for the purpose of installing four monitoring wells. The water levels in the monitoring wells generally ranged from 737 to 746 feet above MSL (6.9 to 9.1 feet bgs).

2.6.2.2 Saturated Zone Permeability Testing

Slug testing and a limited pumping test were performed at SWMU 33 to determine saturated zone permeability characteristics. Saturated zone testing in the SWMU 22-RCRA Landfill vicinity was not performed during the RFI. Previous calculations of hydraulic conductivity (K) values for the alluvium in this area have been made based on consolidation tests and grain size

distribution analysis (BMcD, 1987). In the SWMU 22-RCRA Landfill vicinity, K calculations vary from 1.5E-08 centimeters per second (cm/sec) [4.2E-05 ft/day] in the upper clay layer to 5.0E-05 cm/sec (1.4 ft/day) in the lower silty sand stratum. Based on soil type, coarse sand and gravel overlying the bedrock surface may have K in the range of 1.0E-2 cm/sec (28.3 ft/day).

At SWMU 33, saturated zone slug tests were performed using the following methodology. In shallow monitoring wells where the well screen intersected both saturated and unsaturated zone materials, a solid slug was lowered into the well and displaced water was allowed to enter the formation until static conditions were reached. Upon removal of the solid slug, formation water flowed back into the well until static equilibrium conditions were achieved. The rate of groundwater recovery was measured during this period and used to calculate K. A different method of slug testing was utilized for deep monitoring wells screened immediately above bedrock, wholly within the saturated zone. A vacuum was applied to the well and the water column in the well was raised approximately 10 feet. Upon vacuum release, displaced water returned to the formation until static equilibrium conditions were reached. The rate of groundwater recovery during this period was measured using a pressure transducer and a datalogger and was then used to calculate K.

Data from the slug tests indicate an average K of 8.97E-03 cm/sec (25.4 ft/day) for rising head slug tests in the shallow, unconfined saturated zone and 1.74E-02 cm/sec (49.5 ft/day) for falling head slug tests in the deep, semi-confined saturated zone. K values were calculated using the methodology of Bouwer & Rice, 1976, and are summarized in Table 2-4. Slug test data and calculations are included in Appendix N.

A pumping test was performed at SWMU 33 on Monitoring Well 33MW5I (installed to the bottom of the shallow, unconfined saturated zone) to determine K and to obtain data on the degree of hydraulic connection with the lower, semi-confined saturated zone. Pumping test data are generally considered more reliable than slug test data for the characterization of saturated zone hydraulics. Monitoring Well 33MW5I is screened just above the semi-confining layer and Monitoring Well 33MW5S is screened across the water surface of the shallow, unconfined saturated zone (see Figure 2-9). A sustainable pumping rate of 0.5 gallon per minute was

established in 33MW5I using a Grundfos submersible pump and controller. Pressure transducers and a datalogger were used to monitor drawdown and recovery rate in the pumping well (33MW5I) and two nearby monitoring wells in the same well cluster (33MW5D and 33MW5S).

Time drawdown and time recovery data from Monitoring Well 33MW5S yielded K values of 1.01E-02 cm/sec (28.6 ft/day) and 1.67E-02 cm/sec (47.3 ft/day), respectively, for the upper part of the shallow, unconfined saturated zone (includes large proportion of slag fill). Distance drawdown data from Monitoring Well 33MW5S yielded K of 2.10E-02 cm/sec (59.4 ft/day) for the upper portion of the shallow, unconfined saturated zone. The average K (using time drawdown, time recovery, and distance drawdown data) for the upper portion of the shallow, unconfined saturated zone in 33MW5S was 1.59E-02 cm/sec (45.1 ft/day).

Time drawdown and time recovery data from Monitoring Well 33MW5I yielded K values of 8.80E-04 cm/sec (2.5 ft/day) and 9.17E-05 cm/sec (0.3 ft/day), respectively, for the entire shallow, unconfined saturated zone above the semi-confining layer. The average K (time drawdown and time recovery data) for the entire shallow, unconfined saturated zone above the semi-confining layer was 4.86E-04 cm/sec (1.4 ft/day).

During the pumping test, water levels were also monitored in the lower, semi-confined saturated zone via Monitoring Well 33MW5D. The hydrograph of 33MW5D data shows drawdown and recovery in the deep, semi-confined saturated zone in response to pumping from the overlying, unconfined saturated zone (Appendix O). This evidence indicates that there is a limited degree of hydraulic connection between the shallow, unconfined saturated zone in 33MW5S and 33MW5I, and the deep, semi-confined saturated zone in 33MW5D.

The K values were calculated from pumping test results using the methodology of Jacob (Heath, 1998) and are summarized in Table 2-5. Pumping test data and calculations are included in Appendix O.

In summary, the pumping test results provide the most representative K value for the shallow, unconfined saturated zone and the slug test results provide an indication of deep, semi-confined

saturated zone K values at SWMU 33. Based on Monitoring Well 33MW5S pumping test results, it appears that the slag and brick fill material (which is approximately 12 feet thick at the 33MW5S, 33MW5I, and 33MW5D monitoring well cluster) has a relatively higher K than the clays and silty clays composing the rest of the unconfined saturated zone above the semi-confining layer. Average K in Monitoring Well 33MW5I (4.86E-04 cm/sec; 1.4 ft/day) is two orders of magnitude lower than for Monitoring Well 33MW5S (1.59E-02 cm/sec; 45.1 ft/day). Average slug test derived K for the deep semi-confined saturated zone immediately above the bedrock contact in Monitoring Well 33MW5D (1.74E-02 cm/sec; 49.2 ft/day) is comparable with K in the slag and brick material of the shallow, unconfined saturated zone. The relatively high permeability in 33MW5D is probably due to the clayey gravel immediately above the bedrock contact.

2.6.2.3 Groundwater Flow Direction and Gradient

Groundwater table contour maps have been produced for water level measurements obtained from monitoring wells installed at SWMU 12, SWMU 33, the SWMU 22 vicinity (includes RCRA Landfill wells), and AOC 1. Groundwater gradient at each of these SWMUs is discussed separately in the sections below. Groundwater gradient data for SWMU 33 and SWMU 22 vicinity wells are summarized in Table 2-6.

AOC 1 - Groundwater gradient at AOC 1 is relatively flat. As seen on Figure 2-13, there was only 0.01 feet difference in water surface elevations between the seven monitoring wells when measured on May 29, 1997. The flat gradient at this location could be associated with the paved flood control channel adjacent to AOC 1.

SWMU 12 - The groundwater surface at SWMU 12 appears to have an east-west trough with flow toward the west (Figure 2-14). Groundwater gradients from the north and south toward the trough were 1.02E-02 and 6.67E-03, respectively on February 14, 1997 (Table 2-6). Bedrock topography may be exerting control on the groundwater surface beneath SWMU 12, which is close to the southern edge of the Missouri River alluvial valley (Figure 2-1).

SWMU 22-Mill Pond/RCRA Landfill Vicinity - Groundwater contour maps prepared using the SWMU 22-Mill Pond/RCRA landfill vicinity well data for three representative monitoring events are included in Figures 2-15 (June 30, 1998), 2-16 (January 18, 1999) and 2-17 (March 11, 1999). Near the SWMU 22-Mill Pond/RCRA landfill, during normal to below normal river levels, groundwater flow is generally toward the Blue River. During periods of heavy precipitation and high water levels within the Blue River channel, the hydraulic gradient may be temporarily reversed, causing groundwater to flow away from the Blue River. These periods of flow reversal are probably of short duration.

In general, the groundwater surface in the SWMU 22-Mill Pond/RCRA landfill vicinity slopes toward the north. However, groundwater flow paths diverge beneath the southeast corner of the Mill Pond area with groundwater flowing northward to the Blue River and westward into a cone of depression developed by Rock Creek Railroad Tunnel dewatering (Figure 2-16). The area of influence created by tunnel dewatering varies in size due to river level, groundwater level, and pumping rate. Piezometer 22PZ05S has had anomalously high water levels (relative to other wells) since it was installed. It is not clear why groundwater levels are elevated in 22PZ05S. Based on these representative monitoring events, the average hydraulic gradient (vertical feet per horizontal feet) in the unconfined saturated zone in the SWMU 22-Mill Pond/RCRA Landfill vicinity for groundwater was 4.85E-03 (Table 2-6).

SWMU 33 - Groundwater contour maps for the shallow, unconfined saturated zone and the deep semi-confined saturated zone at SWMU 33 were prepared using groundwater level data from four representative monitoring events as shown on Figures 2-18 and 2-19 (May 29, 1997); Figures 2-20 and 2-21 (July 6, 1998); Figures 2-22 and 2-23 (January 18, 1999), and Figures 2-24 and 2-25 (March 11, 1999). At SWMU 33, during normal to below normal river levels, groundwater flow is toward the Blue River (perpendicular to the trend of the channel at any given point). During periods of heavy precipitation and high water levels within the Blue River channel, the hydraulic gradient may be temporarily reversed in the immediate vicinity of the River. These periods of flow reversal are probably of short duration. Locally, the paved concrete flood control channel may influence groundwater flow within the shallow, unconfined saturated zone. Additionally, infilled basement foundations and deep storm sewers may be

exerting some hydraulic influence. The deepest known storm sewer from the former Armco mill works at (and north of) SWMU 33 traverses from a catch basin near Monitoring Well 33MW4S to Outfall 009 near the railroad bridges northwest of SWMU 33 (Figure 2-6). The approximate invert elevation of this storm sewer is shown on geologic profile 33B-33B' (Figure 2-8) for comparison with the shallow, unconfined saturated zone and deep, semi-confined saturated zone groundwater surface elevations. It is apparent that this storm sewer is above the deep groundwater surface and below the shallow unconfined saturated zone surface. From examination of the groundwater contour maps, there may be some influence exerted by the storm drains or their backfill upon the shallow, unconfined saturated zone groundwater surface. The Gooseneck Creek sewer system (outfalls to the Blue River near the northwest corner of SWMU 33) may be influencing groundwater flow in the deep, semi-confined saturated zone. This is a Kansas City owned storm sewer with most of its drainage area lying outside of the Facility (Figure 2-6).

The average groundwater gradients at SWMU 33 (determined from representative groundwater level measurements taken during this RFI) were 1.30E-02 in the shallow, unconfined saturated zone and 1.22E-03 in the deep semi-confined saturated zone (Table 2-6).

A bedrock contour map (Figure 2-26) was prepared for SWMU 33 using soil boring and conductivity probe data to evaluate the relationship between bedrock surface topography and the semi-confined, deep saturated zone piezometric groundwater surface. A comparison of the deep, semi-confined saturated zone groundwater contour maps (Figures 2-19, 2-21, and 2-25) with the bedrock contour map (Figure 2-25) does not show any obvious relationship between groundwater surface and bedrock topography.

2.6.3 Groundwater Current and Future Uses

During investigation for the Permit application for the RCRA Landfill (BMcD, 1987), 17 industrial process or potable supply wells were found to exist within a 3 mile radius of the RCRA landfill. Information on these wells (which was included as Appendix CC in BMcD, 1987) is included in Appendix G. The present status of these wells is unknown.

A water well search was conducted during this RFI for industrial process or potable water supply wells installed since 1987 within a 1/2-mile radius of the Facility using the MDNR Wellhead Protection Unit database. The current water well search was centered on Section 31 of Township 50N, Range 32W, at the approximate center of the Facility and encompassed two sections on all sides of the Facility. This ensured a minimum half-mile search beyond the irregularly shaped Facility property boundaries. The search did not indicate any new industrial process or water supply wells in the search area. Eight wells in the search database were inconclusive in their descriptions so registration records were requested from MDNR; it appears that all eight are monitoring wells. The database search results along with the eight well registration records mentioned above are included in Appendix G.

Groundwater is not currently used for any purpose at the Facility. Potable water is supplied by the city of Kansas City, Missouri. The anticipated future uses for groundwater beneath the facility are expected to remain unchanged.

2.7 ECOLOGY

The Facility is located on the Blue River and Missouri River valley floors. Historically, bottomland forest communities would have contained a variety of mixed hardwoods including swamp white oak (*Quercus bicolor*), pin oak (*Q. palustris*), American elm (*Ulmus americana*), big shellbark hickory (*Carya laciniosa*), blue beech (*Carpinus caroliniana*), cottonwood (*Populus deltoides*), and bur oak (*Quercus illinoensis*) (Nelson, 1985). Historic wildlife species of bottomland forests included black bear (*Ursus americanus*), cougar (*Felis concolor*), raccoon (Procyon lotor), opossum (*Didelphis virginiana*), beaver (*Castor canademnsis*), muskrat (*Ondatra zibethicus*), cotton rat (*Sigmodon hispidus*), barred owl (*Strix varia*), red-shouldered hawk (*Buteo platypterus*), wood duck (*Aix sponsa*), great blue heron (*Ardea herodias*), pileated woodpecker (*Dryocopus pileatus*), red-headed woodpecker (*Melanerpes erythrocephalus*), warblers (*Dendroica sp.*), salamanders, toads (*Bufo sp.*), tree frogs, leopard frogs (*Rana sp.*), black rat snakes (*elaphe obsoleta*), and garter snakes (*Thamnophis sp.*) (Nelson, 1985).

Due to extensive modification of the land and industrial development for over 120 years, there are no virgin bottomland forest communities remaining within the Facility. Currently, the majority of the western portion of the Facility has been paved over or developed to accommodate Armco and GST industrial activities. The eastern portion of the Facility (east of I-435) along the Blue and Missouri Rivers contains a mosaic of ecological communities including cottonwood riparian forest, old field, and small areas of emergent and forested wetlands. However, the majority of ecological communities within this area are disturbed and have little ecological value.

Applicable agencies, including the Missouri Department of Conservation and the U.S. Fish and Wildlife Service, were contacted by letter, requesting information on potentially sensitive species and habitats found within the Facility. No threatened and endangered species or sensitive communities exist at the Facility. The response letters from the above mentioned agencies are provided at the end of Appendix Y.

In the eastern portion of the Facility (east of I-435), the property is bounded by rivers and/or streams on three sides. The Blue River bounds the north side of the property and flows toward the east-northeast into the Missouri River. Rock Creek bounds the majority of the south side of the property and also flows east-northeast into the Missouri River. The north-northeast end of the property is bounded by the Missouri River. The habitat in this area supports flora and fauna typically found in disturbed areas along the Missouri River. Wildlife identified during a field site visit in October 1998 included a variety of mammals, birds, amphibians, reptiles, fish, and plants. Further discussion on the microhabitats of specific SWMUs is detailed in Section 3.0 in Appendix Y. The full Ecological Evaluation is provided in Appendix Y.

* * * * *

Table 2-1
Physical Soil Sample Results
Armco Kansas City Facility

Sample Point	Sample Designator	Depth Interval (Ft. bgs)	USCS Classification and Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterburg Limits			% Passing No. 200	K20 cm/s	CEC meq/100g	TOC mg/kg
						LL	PL	PI				
12MW1	ST-1	5.0 - 7.0	ML: dark grayish-brown sandy silt	18.1	NA	NL	NP	NPI	59.6	NA	12.61	7,150
12MW1	SS-1	18.0 - 20.0	CL: dark brown sandy silt	26	NA	22	14	8	57.9	NA	15.71	7,110
12MW1	SS-2	25.0 - 26.0	SC: dark brown mottled gray clayey sand with gravel	13.5	NA	18	10	8	31.3	NA	19.61	9,930
12MW3	ST-1	4.0 - 6.0	CL: brown mottled black and light brown lean clay with iron stains	10.9	NA	47	19	28	99.5	NA	34.30	10,200
12MW3	ST-2	8.0 - 10.0	CH: dark brown mottled light brown fat clay	30.4	NA	70	22	48	96.3	NA	22.13	12,100
12MW3	CS-1	14.0 - 19.0	SC: dark brown clayey sand with organics	28.7	NA	23	16	7	44.5	NA	16.13	10,000
06T01	ST-1	19.0 - 21.0	CH: dark gray fat clay	31.6	89.3	63	24	39	95.7	7.8E-06	37.7	3,890
06T03A	ST-1	17.0 - 19.0	CL: dark brown speckled black lean clay	30.5	91.4	46	17	29	98.7	1.1E-07	27.4	3,300
33B56	SB-3	20.0 - 22.0	CL: brown lean clay	31.2	88.0	40	20	20	87.5	NA	24.7	2,730
33B56	SB-4	32.0 - 34.0	CL: dk. gray mottled red-brn. lean clay	46.6	80.7	44	18	26	97.5	NA	32.7	9,450
33B56	SB-5	34.0 - 36.0	CH: dark gray fat clay	41.0	80.4	75	25	50	99.7	8.3E-09	44.6	10,200
33B57	SB-2	34.0 - 36.0	CL: gray lean clay with sand	31.0	92.1	43	19	24	84.7	NA	25.3	4,250
33B57	SB-3	52.0 - 54.0	CH: gray fat clay w/ fine sand at bottom	36.8	90.9	56	26	30	99.2	NA	32.8	17,300
33B58	SB-1	28.0 - 30.0	CL: dark gray lean clay	32.4	88.1	40	21	19	92.9	NA	30.5	8,020
33B58	SB-2	43.0 - 45.0	CH: gray fat clay	49.5	71.9	79	30	49	100.0	5.7E-09	36.2	10,200
33B59	SB-1	18.0 - 20.0	CH: brown fat clay	36.1	82.3	92	36	56	99.7	NA	61.7	5,670
33B59	SB-4	33.0 - 35.0	CH: dark brown fat clay	54.0	77.8	97	24	73	85.9	NA	35.7	3,500
33B60	SB-5	28.0 - 30.0	CL: dark gray lean clay	35.8	65.5	43	22	21	96.9	NA	28.3	7,790
33B60	SB-6	43.0 - 45.0	CL: dark gray, black lean clay with sand	35.9	NA	40	20	20	76.2	NA	39.1	15,100
33MW5I	SB-3	15.0 - 17.0	CH: dark brn. speckled black fat clay	27.9	93.9	76	26	50	97.6	8.4E-09	33.2	5,620
33MW5I	SB-4	32.0 - 34.0	CL: dark gray lean clay	34.8	87.5	42	24	18	97.7	NA	25.8	7,770
33MW5I	SB-5	42.0 - 44.0	CL: mottled dark gray lean clay	54.8	68.6	42	20	22	98.8	1.3E-08	43.7	8,020

Notes:

Ft. bgs = Feet below ground surface
USCS = Unified Soil Classification System per ASTM D2487
pcf = Pounds per cubic foot
LL = Liquid limit per ASTM D422
PL = Plastic limit per ASTM D422
PI = Plasticity index per ASTM D422
NL = Not liquid
NP = Not plastic
NPI = No plasticity index
K20 = Hydraulic conductivity after correction to 20 degrees Celsius using ASTM D5084
cm/s = Centimeters/second
CEC = Cation exchange capacity using USEPA method 9081
meq/100g = Milliequivalents/100 grams
TOC = Total organic carbon using USEPA method 9060
mg/kg = Milligrams/kilogram
NA = Not analyzed

Table 2-2
SWMU 33 / AOC 1 Monitoring Well Construction Data
Armco Kansas City Facility

Facility	Well Number	Location		Ground Elevation	TOC Elevation	Total Depth from TOC	Depth to Top of Screen from TOC	Screen Elevation	
		Easting	Northing					Top	Bottom
SWMU 33	33MW02	500602.14	1070791.72	747.22	746.96	35.93	13.0	734.0	724.0
SWMU 33	33MW02S	500590.11	1070792.07	747.20	746.98	20.22	9.8	737.2	727.2
SWMU 33	33MW03	500595.93	1070791.82	747.26	746.89	64.92	53.0	693.9	683.9
SWMU 33	33MW04	500354.98	1070983.66	748.12	747.86	72.27	61.0	686.9	676.9
SWMU 33	33MW04S	500363.55	1070983.16	748.14	747.91	20.47	9.8	738.1	728.1
SWMU 33	33MW05S	501016.28	1070896.49	746.15	746.38	20.47	10.2	736.2	726.2
SWMU 33	33MW05I	501012.78	1070890.09	746.54	746.27	41.00	30.4	715.8	705.8
SWMU 33	33MW05D	501017.71	1070903.79	746.31	746.02	71.39	60.5	685.5	675.5
SWMU 33	33MW06D	500601.87	1071190.10	749.30	751.95	72.59	61.6	690.4	680.4
SWMU 33	33MW07S	500667.87	1070601.50	746.96	746.59	20.65	10.1	736.5	726.5
SWMU 33	33MW07D	500665.10	1070606.50	746.97	746.63	69.31	58.7	687.9	677.9
SWMU 33	33MW08S	500364.47	1070807.40	747.27	747.08	20.48	10.2	736.9	726.9
SWMU 33	33MW09S	500691.85	1071320.18	747.44	750.19	22.43	12.4	737.8	727.8
SWMU 33	33MW10S	500243.09	1071545.53	746.26	745.93	17.27	6.8	739.1	729.1
SWMU 33	33MW10D	500243.85	1071542.85	746.31	745.87	67.42	56.9	689.0	679.0
SWMU 33	33MW11S	501109.05	1071242.97	740.24	739.74	17.99	7.5	732.2	722.2
SWMU 33	33MW11D	501116.48	1071241.41	740.57	740.12	60.94	50.5	689.6	679.6
SWMU 33	33MW12S	501218.66	1070667.18	746.84	746.24	17.44	6.9	739.3	729.3
SWMU 33	33MW12D	501227.00	1070666.52	746.87	746.56	68.84	58.3	688.3	678.3
SWMU 33	33MW13S	501320.69	1070804.26	745.24	744.79	17.69	7.2	737.6	727.6
SWMU 33	33MW13D	501314.06	1070804.04	745.20	744.90	68.69	58.2	686.7	676.7
SWMU 33	33MW14S	500093.51	1070738.25	748.87	748.52	18.24	7.8	740.8	730.8
SWMU 33	33MW14D	500093.56	1070733.07	748.75	748.42	69.13	58.6	689.8	679.8
AOC 1	A01MW1	501389.72	1069989.77	744.10	744.98	18.08	NA	NA	NA
AOC 1	A01MW2	501449.09	1070067.01	744.60	745.50	16.38	NA	NA	NA
AOC 1	A01MW3	501493.66	1070139.09	744.60	745.49	17.31	NA	NA	NA
AOC 1	A01MW4	501553.79	1070214.65	744.30	745.15	16.21	7.0	738.2	728.2
AOC 1	A01MW5	501660.49	1070190.61	745.50	745.51	16.30	7.6	737.9	727.9
AOC 1	A01MW6	501387.30	1069882.81	744.70	745.46	17.41	7.8	737.7	727.7
AOC 1	A01MW7	501675.36	1069979.24	745.70	746.40	17.63	7.9	738.5	728.5

Notes:
NA = Not Available
TOC = Top of Casing

Table 2-3
RCRA Landfill / SWMU 22 / SWMU 12 Monitoring Well Construction Data
Armco Kansas City Facility

Facility	Well Number	Location		Ground Elevation	TOC Elevation	Total Depth from TOC	Depth to Top of Screen from TOC	Screen Elevation	
		Easting	Northing					Top	Bottom
RCRA Landfill	MW-1	504877.93	1074601.73	733.0	734.50	26.50	11.50	723.00	NA
RCRA Landfill	MW-2	506010.10	1074625.55	734.8	737.14	39.34	13.34	723.80	NA
RCRA Landfill	MW-3A	506151.91	1074582.72	734.7	737.77	40.10	19.60	718.30	698.30
RCRA Landfill	MW-4	506269.33	1074520.95	733.1	736.99	40.89	21.39	715.60	NA
RCRA Landfill	MW-5	505340.45	1074264.95	729.1	730.03	32.43	18.93	711.10	701.10
RCRA Landfill	MW-6	506467.55	1073943.30	730.1	732.25	33.65	22.15	710.10	700.10
RCRA Landfill	MW-7	507411.85	1073905.92	729.6	730.78	32.68	21.18	709.60	699.60
RCRA Landfill	MW-8	506551.11	1073452.10	727.4	728.35	29.45	18.95	709.40	699.40
RCRA Landfill	MW-9	505378.85	1074745.66	735.8	738.25	40.45	24.45	712.80	697.80
RCRA Landfill	MW-10	505076.82	1074387.20	728.4	730.05	33.65	22.95	708.75	703.75
RCRA Landfill	PZ-Xa	504811.23	1073667.11	727.3	729.58	24.00	13.50	716.08	706.08
SWMU 22	22PZ01S	503473.02	1074577.59	732.9	736.17	21.91	11.37	724.80	714.80
SWMU 22	22PZ02S	504230.33	1074702.70	733.2	737.07	22.07	11.37	725.70	715.70
SWMU 22	22PZ03S	504652.91	1074726.78	733.3	736.30	21.67	11.20	725.10	715.10
SWMU 22	22PZ05S	504117.35	1073684.26	731.7	735.52	21.88	11.42	724.10	714.10
SWMU 12	12MW01	510117.68	1074471.65	733.3	735.83	27.53	16.40	719.40	709.40
SWMU 12	12MW02	510109.48	1074868.82	733.2	735.67	27.97	17.50	718.20	708.20
SWMU 12	12MW03	510410.51	1075106.56	732.9	735.58	26.18	14.70	720.90	710.90
SWMU 12	12MW04	510541.54	1074630.25	738.8	740.90	30.30	18.80	721.10	711.10

Notes:
NA = Not Available
TOC = Top of Casing

Table 2-4
SWMU 33 Hydraulic Conductivity Values - Slug Test*
Armco Kansas City Facility

Well Number	Date	K (ft/day)	K (ft/min)	K (cm/sec)
Falling Head Test				
33MW5D	02/03/98	51.7	3.59E-02	1.82E-02
33MW6D	02/03/98	38.2	2.65E-02	1.34E-02
33MW7D	02/03/98	58.6	4.07E-02	2.07E-02
Rising Head Test				
33MW2S	02/04/98	32.5	2.26E-02	1.15E-02
33MW4S	02/04/98	22.9	1.59E-02	8.05E-03
33MW5S	02/03/98	36.1	2.51E-02	1.27E-02
33MW7S	02/03/98	4.3	3.00E-03	1.52E-03
33MW2S	02/04/98	5.5	3.79E-03	1.92E-03
33MW4S	02/03/98	51.3	3.56E-02	1.81E-02
Average Falling Head Test K		**49.5**	**3.44E-02**	**1.74E-02**
Average Rising Head Test K		**25.4**	**1.77E-02**	**8.97E-03**

Notes:

K = Hydraulic conductivity

ft/day = Feet / day

ft/min = Feet / minute

cm/sec = Centimeters / second

* = Hydraulic conductivity values calculated using methodology of Bouwer & Rice 1976.

Table 2-5
SWMU 33 Hydraulic Conductivity Values - Pumping Test*
Armco Kansas City Facility

Well Number	Date	K (ft/day)	K (ft/min)	K (cm/sec)
Time Drawdown				
33MW5S	10/27/98	28.6	1.99E-02	1.01E-02
33MW5I	10/27/98	2.5	1.73E-03	8.80E-04
Time Recovery				
33MW5S	10/27/98	47.3	3.29E-02	1.67E-02
33MW5I	10/27/98	0.3	1.80E-04	9.17E-05
Distance Drawdown				
33MW5S	10/27/98	59.4	4.13E-02	2.10E-02
	33MW5S Average K	**45.1**	**3.14E-02**	**1.59E-02**
	33MW5I Average K	**1.4**	**9.56E-04**	**4.86E-04**

Notes:

K = Hydraulic conductivity

ft/day = Feet / day

ft/min = Feet / minute

cm/sec = Centimeters / second

33MW5S Average K = Average of time drawdown, time recovery, & distance drawdown K calculations for Monitoring Well 33MW5S

33MW5I Average K = Average of time drawdown & time recovery K calculations for Monitoring Well 33MW5I

* = Hydraulic conductivity values calculated using methodology of Jacob Method (Heath, 1998).

Table 2-6
SWMUs 12, 22, and 33 Water Level Gradient Data
Armco Kansas City Facility

Location	Date	Zone	Gradient[1]
SWMU 12[2]	February 14, 1997	Shallow	1.02E-02
SWMU 12[3]	February 14, 1997	Shallow	6.67E-03
SWMU 22 Vicinity[4]	June 30, 1998	Shallow	1.52E-03
SWMU 22 Vicinity[4]	January 18, 1999	Shallow	6.12E-03
SWMU 22 Vicinity[4]	March 11, 1999	Shallow	6.91E-03
		SWMU 22 Vicinity Gradient Average	**4.85E-03**
SWMU 33 Area	May 29, 1997	Shallow	8.89E-03
SMWU 33 Area	May 29, 1997	Deep	8.33E-04
SMWU 33 Area	July 6, 1998	Shallow	1.40E-02
SMWU 33 Area	July 6, 1998	Deep	8.33E-04
SMWU 33 Area	January 18, 1999	Shallow	1.00E-02
SMWU 33 Area	January 18, 1999	Deep	2.22E-03
SMWU 33 Area	March 11, 1999	Shallow	1.90E-02
SWMU 33 Area	March 11, 1999	Deep	1.01E-03
		SWMU 33 Area Shallow Zone Average	**1.30E-02**
		SWMU 33 Area Shallow Zone Average (May/July data)	**1.14E-02**
		SWMU 33 Area Shallow Zone Average (Jan/Mar data)	**1.45E-02**
		SWMU 33 Area Deep Zone Average	**1.22E-03**
		SWMU 33 Area Deep Zone Average (May/July data)	**8.33E-04**
		SWMU 33 Area Deep Zone Average (Jan/Mar data)	**1.62E-03**

Notes:

1 = Vertical feet / Horizontal feet

2 = Gradient measured from north to south toward east - west trending groundwater trough.

3 = Gradient measured from south to north toward east - west trending groundwater trough.

4 = SWMU 22 Vicinity includes measurements from RCRA Landfill monitoring wells and piezometers.

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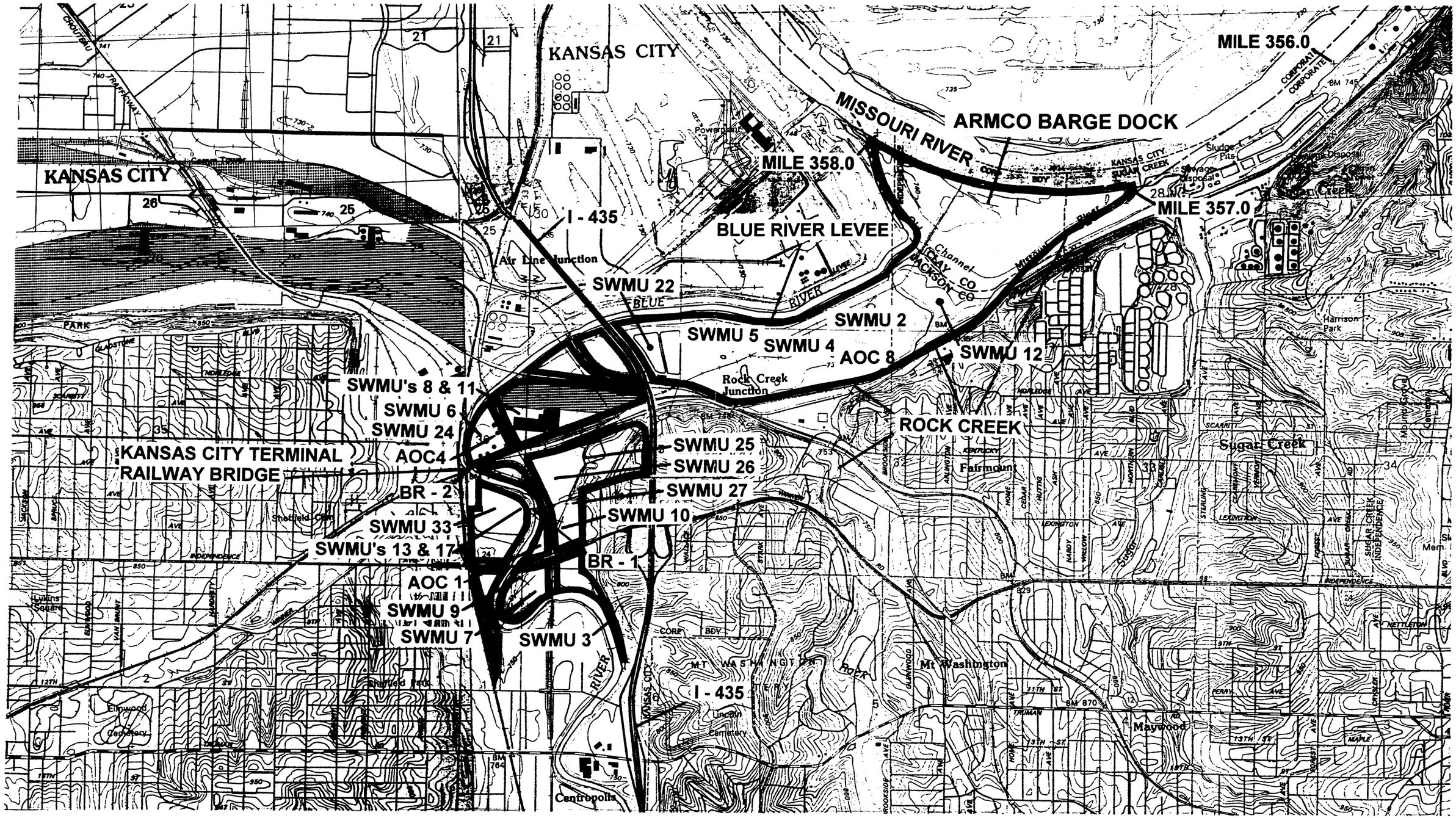


NOTE: ADAPTED FROM THE FOLLOWING 7.5" TOPOGRAPHIC MAPS:

- INDEPENDENCE, MO QUADRANGLE
- NORTH KANSAS CITY, MO-KS QUADRANGLE
- LIBERTY, MO QUADRANGLE
- KANSAS CITY, MO QUADRANGLE

N

2000' 0' 2000' 4000'

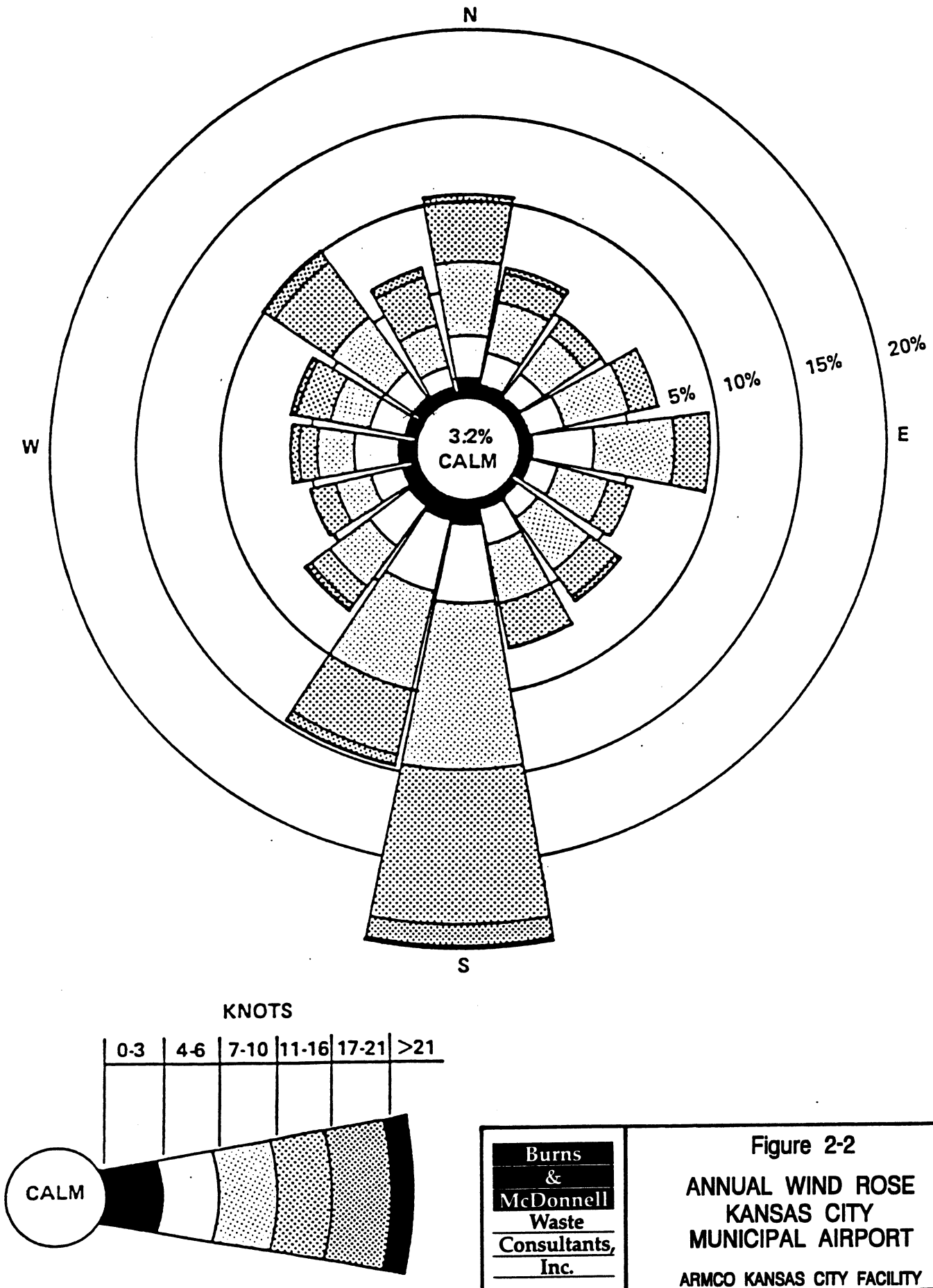
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-1

REGIONAL TOPOGRAPHY FACILITY MAP

ARMCO KANSAS CITY FACILITY



Burns & McDonnell Waste Consultants, Inc.

Figure 2-2

ANNUAL WIND ROSE
KANSAS CITY
MUNICIPAL AIRPORT

ARMCO KANSAS CITY FACILITY

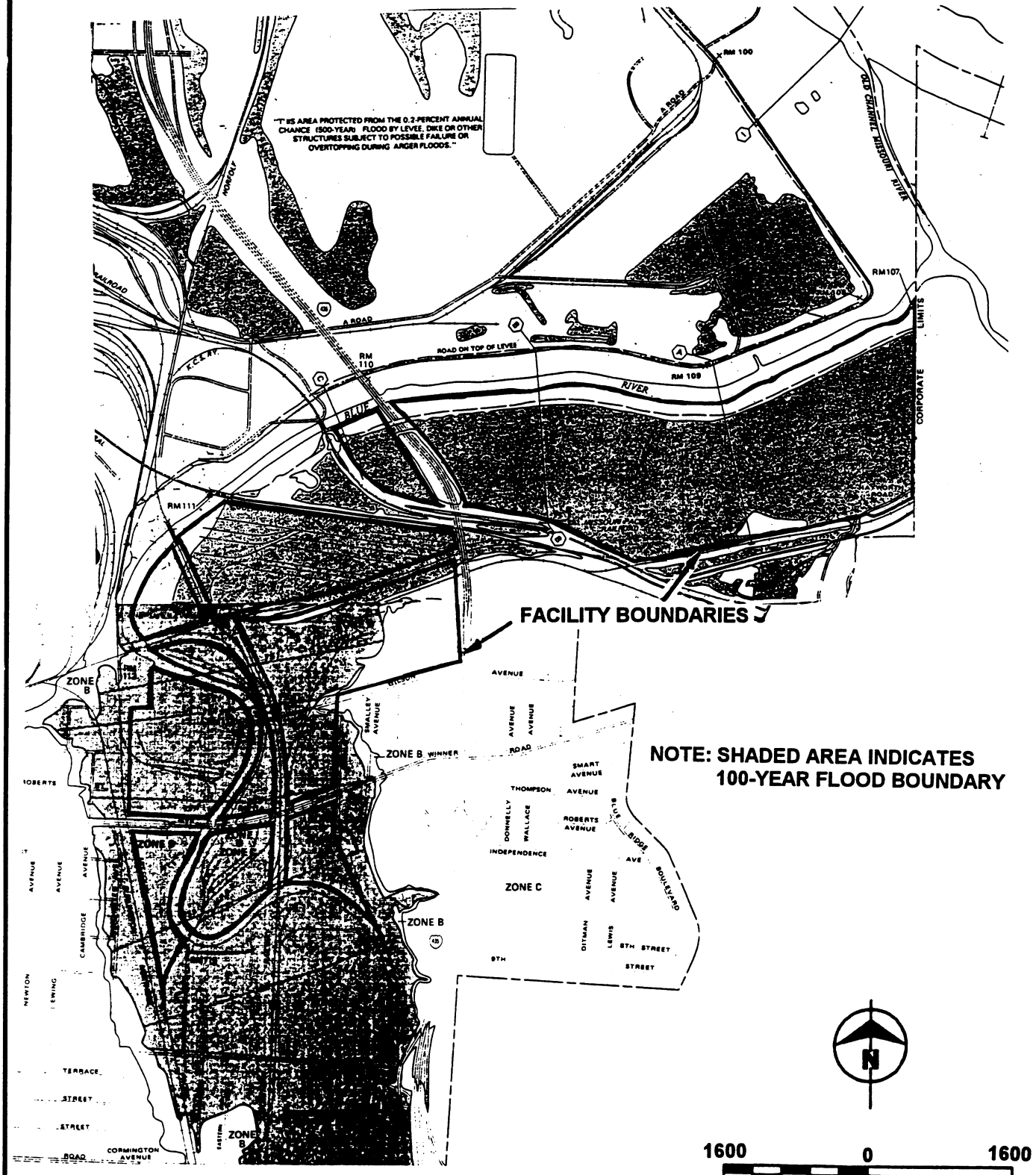


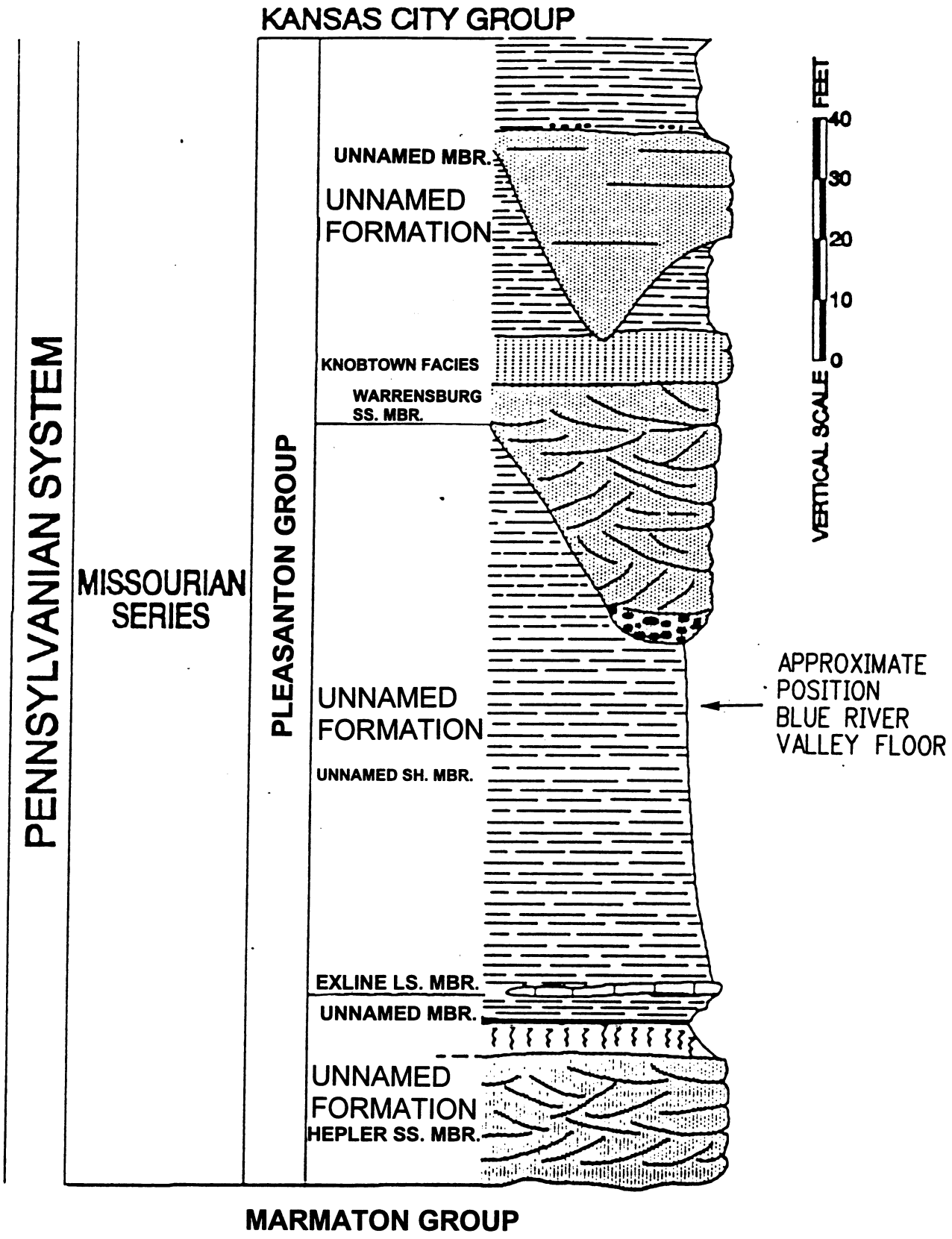
Figure 2-3

FLOOD HAZARD BOUNDARY MAP

ARMCO KANSAS CITY FACILITY

Burns & McDonnell Waste Consultants, Inc.

SWMU_AREAS:SWMU001.DGN,OF=3
BORING LOCATIONS.ARMCONEL.DGN,OF=1-24,26-63
SITE,SITE.DGN,OF=2,63
ARMCONB.ARMCONB.DGN,OF=NONE
SWMUFG03.DGN/4-MAR-96 14:47/DBR



ADAPTED FROM THOMPSON, 1995.

Burns & McDonnell Waste Consultants, Inc.

Figure 2-4

PLEASANTON GROUP STRATIGRAPHIC COLUMN

ARMCO KANSAS CITY FACILITY

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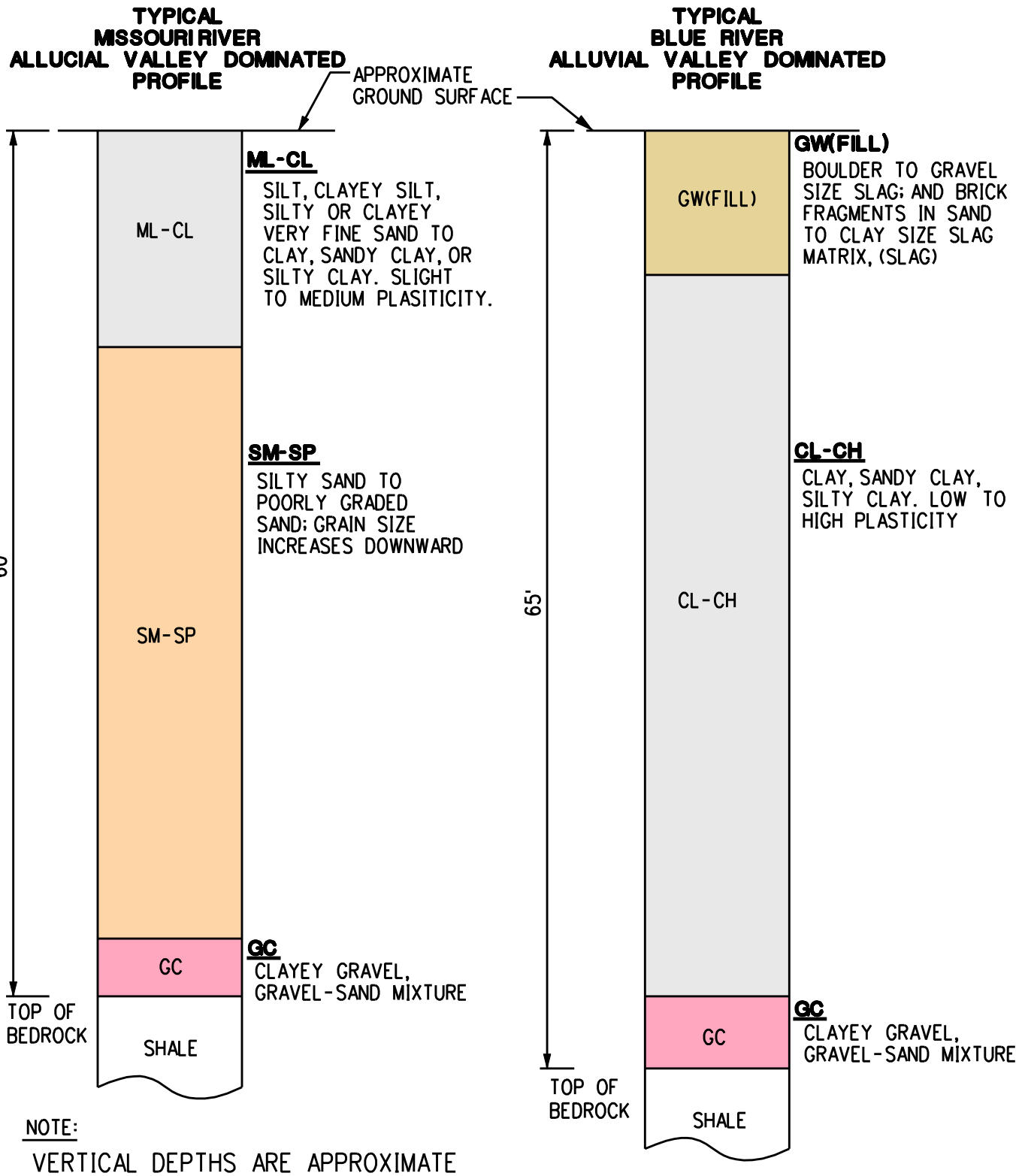
k:*res*global*stdbdr*ustn*civil*2d*wcibdr04.dgn
k:*res*global*stdbdr*ustn*civil*2d*wcibdr03.dgn
33-FIG01.DGN/10-SEP-99 16:38/SOS K:\ARMCORF\USTN\



Burns & McDonnell
SINCE 1898

Figure 2-5

TYPICAL ALLUVIAL VALLEY
SEDIMENT PROFILES

ARMCO KANSAS CITY FACILITY

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NOTE:

⁂ REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93.

LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- GEOLOGIC PROFILE LOCATION
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS ⁂ (INVERT ELEVATION AT OUTFALL SHOWN WHERE AVAILABLE)

OUTFALL *004
INV. EL. 733.91

GOOSENECK CREEK SEWER

33B'

33MW10S
33MW10D
33CP-12

OUTFALL *009
INV. EL. 722.53

OUTFALL *011

33A'

OUTFALL *006
INV. EL. 726.30

33CP-13
33MW11S
33MW11D

BRISTOL AVE. SEWER 48"

33CP-3
33MW6D

33MW4S
33MW4
33CP-15
33B60

33C

CATCH BASIN
INVERT EL. = 735.25'

33CP-16

33MW5D
33MW5S
33MW5I
33CP-1

SWMU 13

33MW13S
33MW13D
33CP14

SWMU 17

33C'

33CP-5A
33CP-8
33B58

33MW2S
33MW3
33MW2

30" RCP

33CP-11A
33MW14S
33A
33MW14D

33B59
33CP-4A

SWMU 33

24" RCP

33MW7D
33MW7S
33CP-10

8" VCP

12" VCP

33CP-6A
33B

24" RCP

OUTFALL *016
INV. EL. 734.89

OUTFALL * 018
INV. EL. 725.84

NORTH

80' 0' 80' 160'
SCALE IN FEET

K:\ARMCORF\USTIN\GISFIG9B\ 33XLOCZ.DGN/ 8-30-1999 11:18/TDC
K:\ARMCORF\USTIN\INTMEAS\SITE.DGN\ OFF=1,22-62-63
K:\ARMCORF\USTIN\GISFIG9B\ARMCOTOPO.DGN\SEAR1 OFF=NONE
K:\ARMCORF\USTIN\GISFIG9B\ARMCOBASE.DGN\SEAR1 OFF=NONE
K:\RES\GLOBAL\STORM\USTIN\V11\ARCHIVE\124218.DGN\1 OFF=61

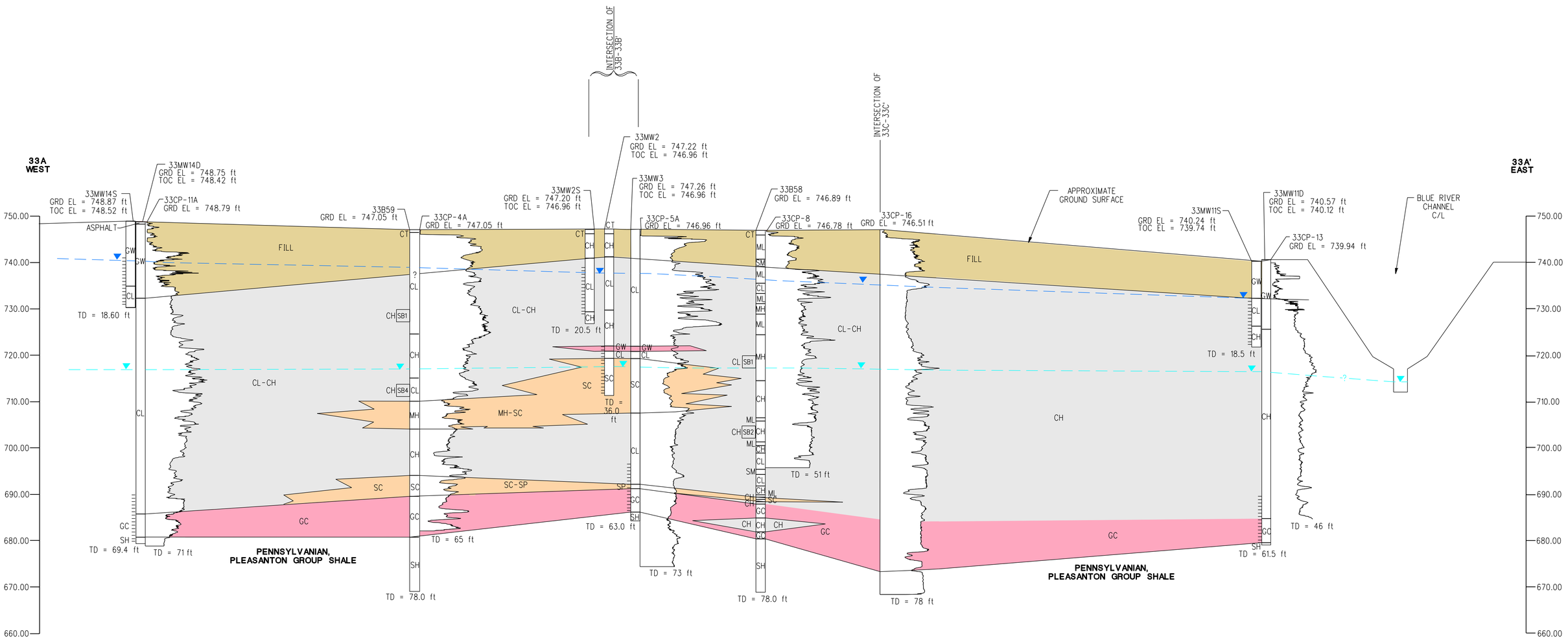
Burns & McDonnell Waste Consultants, Inc.

Figure 2-6

SWMU 33 GEOLOGIC PROFILE LOCATION MAP

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 2002 BY BURNS & McDONNELL ENGINEERING COMPANY, INC.



VERTICAL SCALE — 10' 0' 10' 20' — SCALE IN FEET

HORIZONTAL SCALE, CROSS SECTION — 50' 0' 50' 100' — SCALE IN FEET

HORIZONTAL SCALE, CONDUCTIVITY — 200' 0' 200' 400' — SCALE IN mS/m

ALL SCALES APPROXIMATE

LEGEND

GRD EL	GROUND ELEVATION
TOC EL	TOP OF CASING ELEVATION
MW	MONITORING WELL
CP	CONDUCTIVITY PROBE
TD	TOTAL DEPTH
SH	SHALE
CH	CLAY; HIGH PLASTICITY
CL	CLAY, SANDY CLAY, SILTY CLAY; LOW TO MEDIUM PLASTICITY
ML	SILT, CLAYEY SILT, SILTY OR CLAYEY VERY FINE SAND; SLIGHT PLASTICITY
MH	SILT, FINE SANDY SILT; HIGH PLASTICITY
SC	CLAYEY SAND
GC	CLAYEY GRAVEL, GRAVEL-SAND MIXTURE
GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURE (SLAG)

SOIL CONDUCTIVITY PROFILE

WELL SCREEN INTERVAL

CL SB5 — PHYSICAL SOIL SAMPLE LOCATION AND LAB CLASSIFICATION

DEEP SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

SHALLOW SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

NOTE:

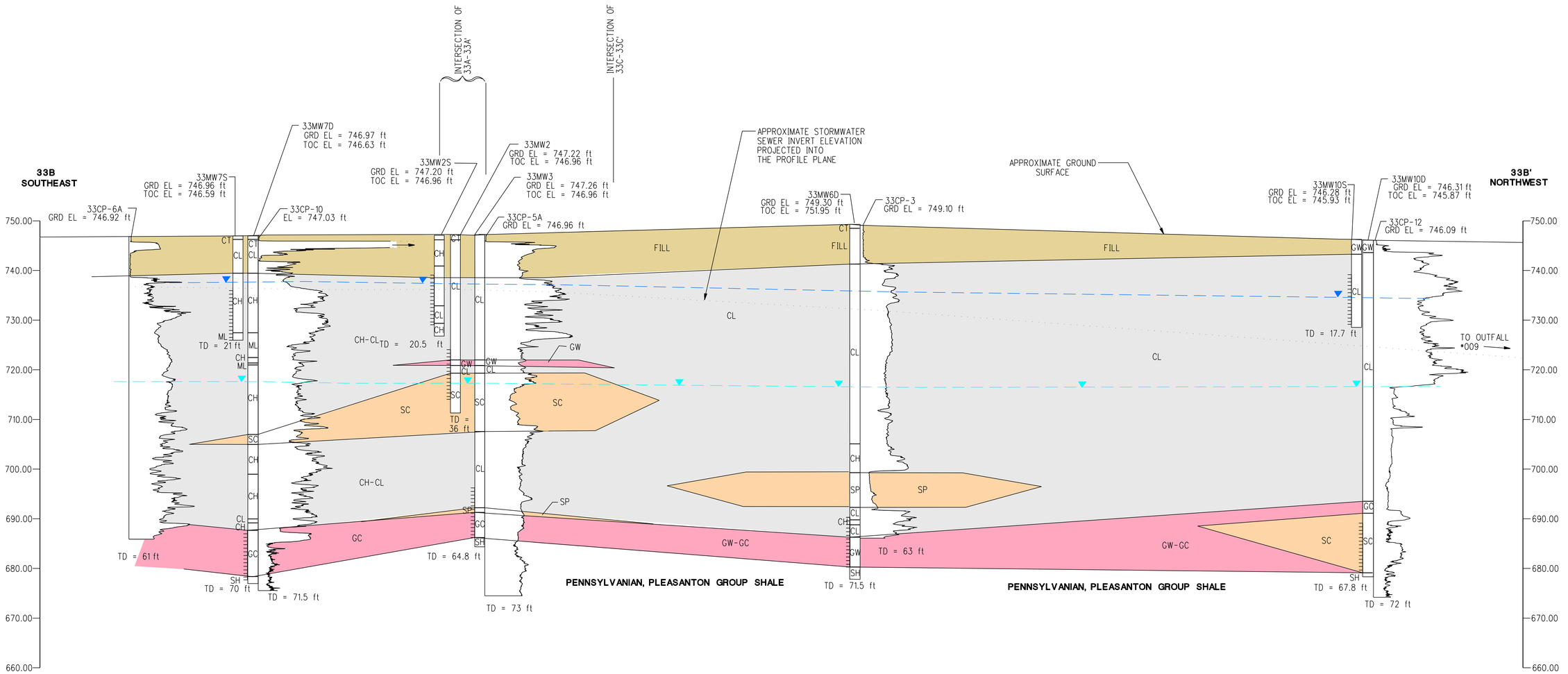
DATA FROM MONITORING WELLS 33MW2 AND 33MW3 WERE OBTAINED FROM NAIL MILL PHASE II INVESTIGATION REPORT COMPLETED BY TERRACON ENVIRONMENTAL, INC. NOVEMBER 18, 1991.

Figure 2-7

SWMU 33 GEOLOGIC PROFILE 33A-33A'

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 2002 BY BURNS & McDONNELL ENGINEERING COMPANY, INC.



VERTICAL SCALE 10' 0' 10' 20' — SCALE IN FEET

HORIZONTAL SCALE, CROSS SECTION 50' 0' 50' 100' — SCALE IN FEET

HORIZONTAL SCALE, CONDUCTIVITY 200' 0' 200' 400' — SCALE IN mS/m

ALL SCALES APPROXIMATE

LEGEND

GRD EL	GROUND ELEVATION
TOC EL	TOP OF CASING ELEVATION
MW	MONITORING WELL
CP	CONDUCTIVITY PROBE
TD	TOTAL DEPTH
SH	SHALE
CH	CLAY; HIGH PLASTICITY
CL	CLAY, SANDY CLAY, SILTY CLAY; LOW TO MEDIUM PLASTICITY
ML	SILT, CLAYEY SILT, SILTY OR CLAYEY VERY FINE SAND; SLIGHT PLASTICITY
MH	SILT, FINE SANDY SILT; HIGH PLASTICITY
SC	CLAYEY SAND
GC	CLAYEY GRAVEL, GRAVEL-SAND MIXTURE
GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURE (SLAG)

SOIL CONDUCTIVITY PROFILE

WELL SCREEN INTERVAL

DEEP SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

SHALLOW SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

APPROXIMATE STORMWATER SEWER INVERT ELEVATION

NOTE:

DATA FROM MONITORING WELLS 33MW2 AND 33MW3 WERE OBTAINED FROM NAIL MILL PHASE II INVESTIGATION REPORT COMPLETED BY TERRACON ENVIRONMENTAL, INC. NOVEMBER 18, 1991.

Figure 2-8

SWMU 33 GEOLOGIC PROFILE 33B-33B'

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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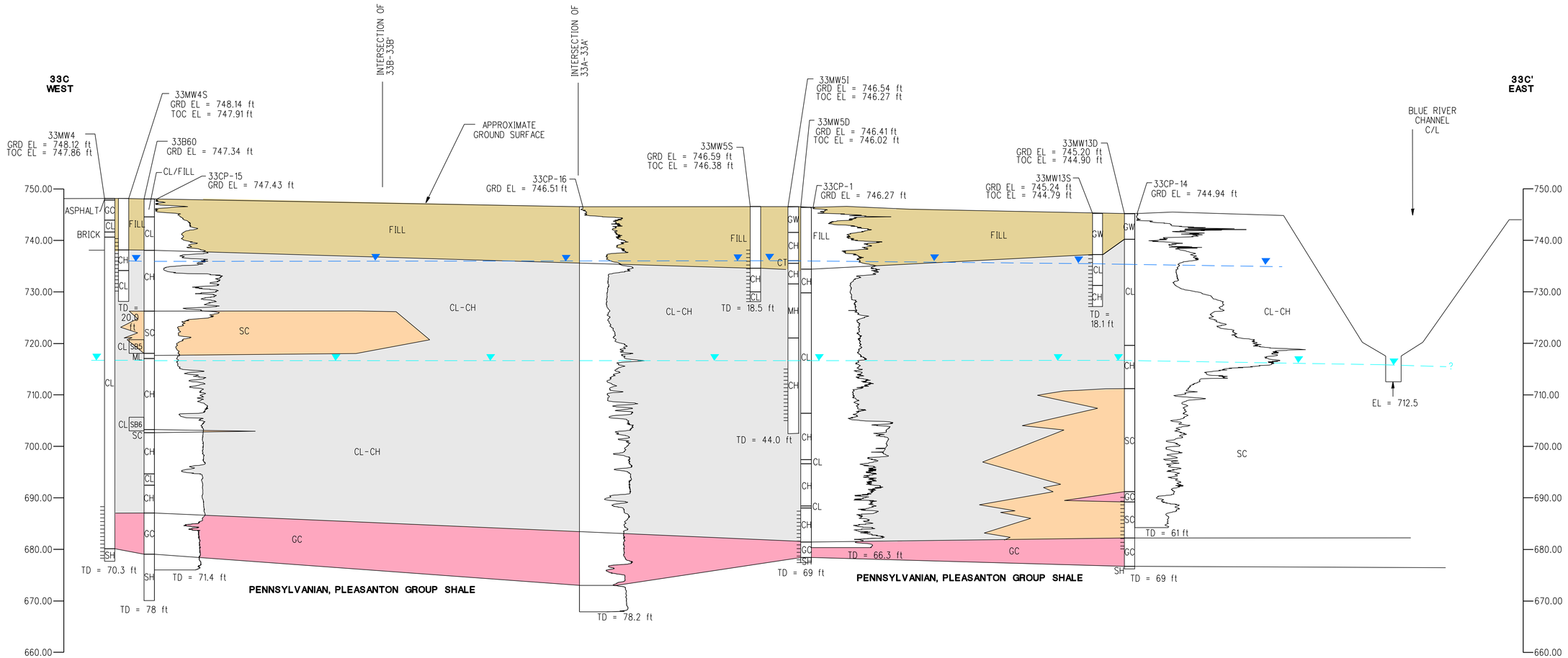


VERTICAL SCALE — 10' 0' 10' 20' — SCALE IN FEET

HORIZONTAL SCALE, CROSS SECTION — 50' 0' 50' 100' — SCALE IN FEET

HORIZONTAL SCALE, CONDUCTIVITY — 200' 0' 200' 400' — SCALE IN mS/m

ALL SCALES APPROXIMATE

LEGEND

GRD EL	GROUND ELEVATION
TOC EL	TOP OF CASING ELEVATION
MW	MONITORING WELL
CP	CONDUCTIVITY PROBE
TD	TOTAL DEPTH
SH	SHALE
CH	CLAY: HIGH PLASTICITY
CL	CLAY, SANDY CLAY, SILTY CLAY: LOW TO MEDIUM PLASTICITY
ML	SILT, CLAYEY SILT, SILTY OR CLAYEY VERY FINE SAND: SLIGHT PLASTICITY
MH	SILT, FINE SANDY SILT: HIGH PLASTICITY
SC	CLAYEY SAND
GC	CLAYEY GRAVEL, GRAVEL-SAND MIXTURE
GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURE (SLAG)

SOIL CONDUCTIVITY PROFILE

WELL SCREEN INTERVAL

CL SB5 PHYSICAL SOIL SAMPLE LOCATION AND LAB CLASSIFICATION

DEEP SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

SHALLOW SATURATED ZONE GROUNDWATER ELEVATION ON 1/18/99

NOTE:

DATA FROM MONITORING WELL 33MW4 WERE OBTAINED FROM NAIL MILL PHASE II INVESTIGATION REPORT COMPLETED BY TERRACON ENVIRONMENTAL, INC. NOVEMBER 18, 1991.

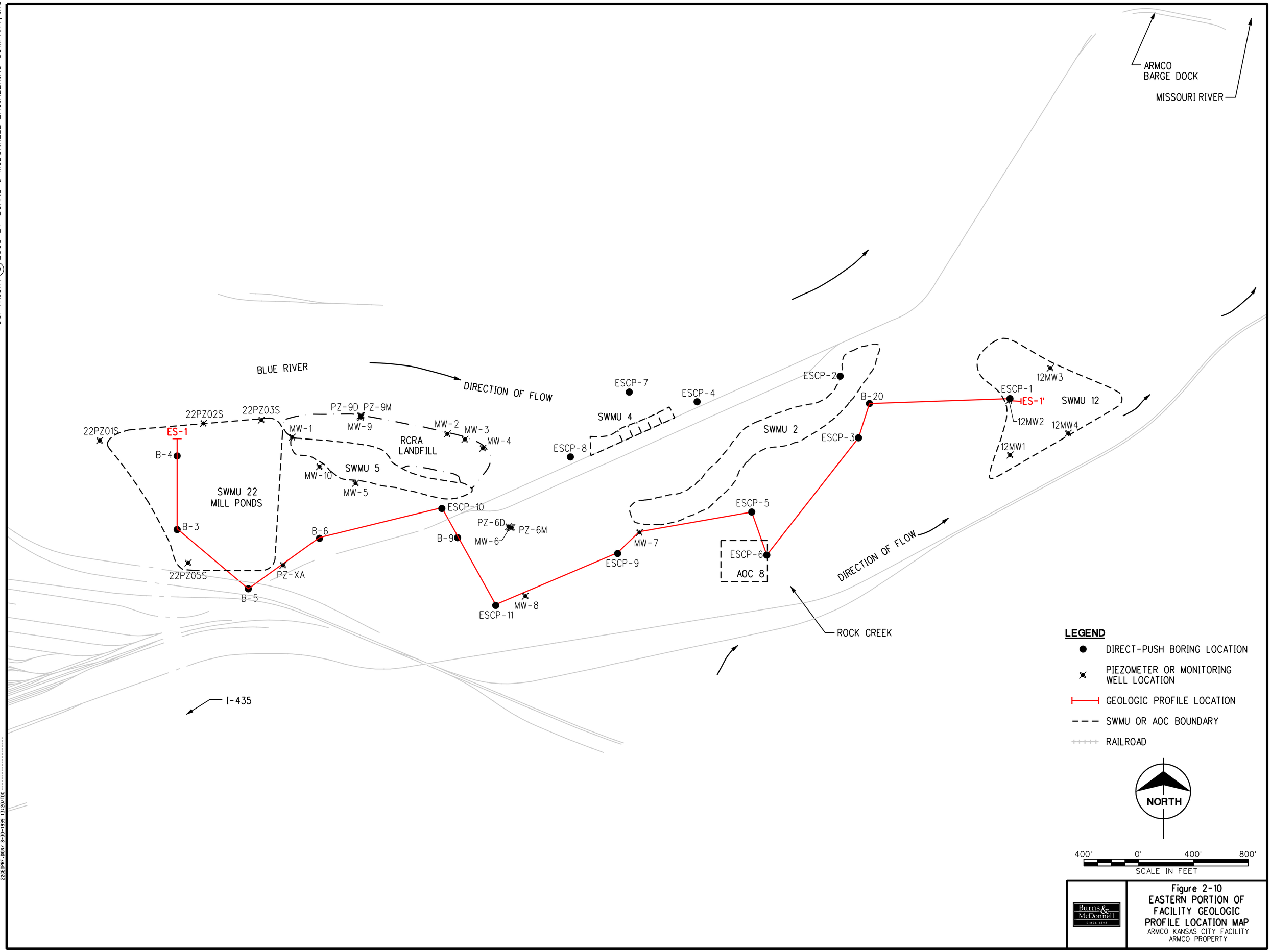
Figure 2-9

SWMU 33 GEOLOGIC PROFILE 33C-33C'

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

K:\Env\Projects\16DOM\Austin\Civil\M2Dwg\33G24.dgn
33SECDOM2-AUG-99 15:51:17 JTG

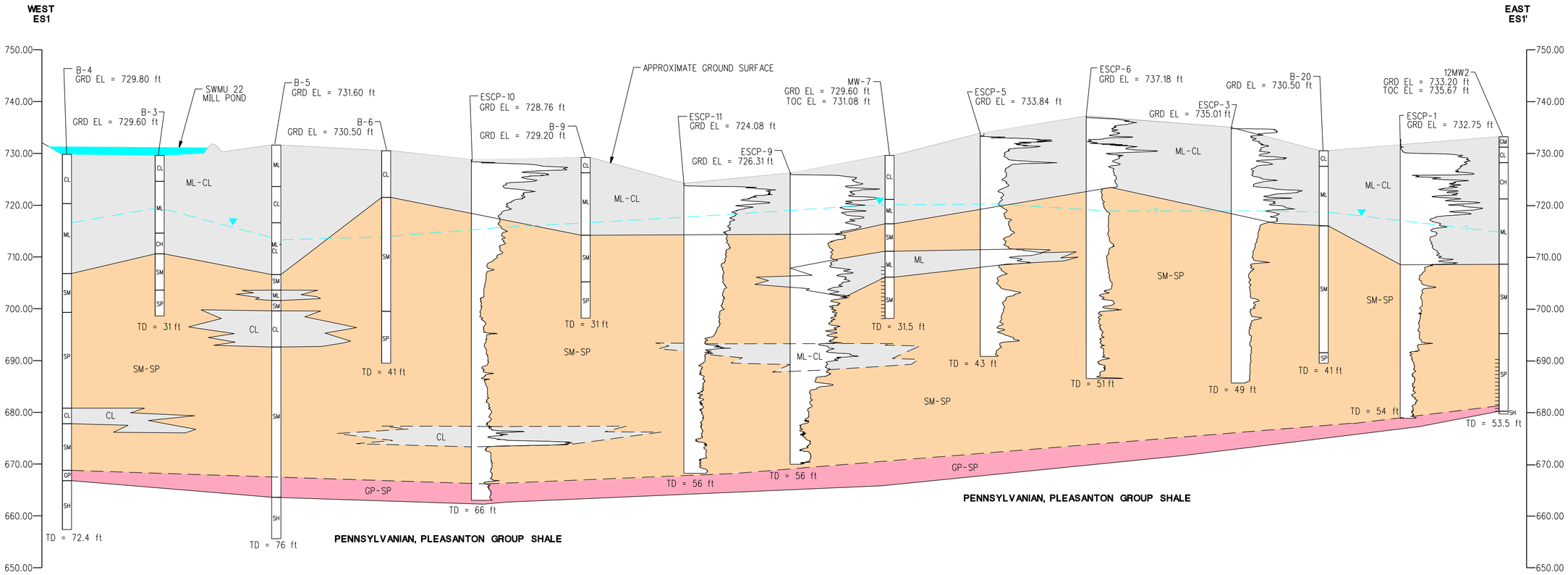
COPYRIGHT © 2003 BY BURNS & McDONNELL ENGINEERING COMPANY, INC.



Burns & McDonnell

Figure 2-10
EASTERN PORTION OF FACILITY GEOLOGIC PROFILE LOCATION MAP
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 2002 BY BURNS & McDONNELL ENGINEERING COMPANY, INC.



VERTICAL SCALE — 10' 0' 10' 20' — SCALE IN FEET

HORIZONTAL SCALE, CROSS SECTION — 300' 0' 300' 600' — SCALE IN FEET

HORIZONTAL SCALE, CONDUCTIVITY — 100' 0' 100' 200' — SCALE IN mS/m

ALL SCALES APPROXIMATE

LEGEND

GRD EL	GROUND ELEVATION
TOC EL	TOP OF CASING ELEVATION
MW	MONITORING WELL
ESCP	CONDUCTIVITY PROBE
TD	TOTAL DEPTH
SH	SHALE
CH	CLAY; HIGH PLASTICITY
CL	CLAY, SANDY CLAY, SILTY CLAY; LOW TO MEDIUM PLASTICITY
ML	SILT, CLAYEY SILT, SILTY OR CLAYEY VERY FINE SAND; SLIGHT PLASTICITY
MH	SILT, FINE SANDY SILT; HIGH PLASTICITY
SC	CLAYEY SAND
SM	SILTY SAND
SP	POORLY GRADED SAND
GC	CLAYEY GRAVEL, GRAVEL-SAND MIXTURE
GW	WELL-GRADED GRAVEL, GRAVEL-SAND MIXTURE (SLAG)
GP	POORLY GRADED GRAVEL

SOIL CONDUCTIVITY PROFILE

WELL SCREEN INTERVAL

GROUNDWATER ELEVATION ON 1/18/99; ELEVATIONS SHOWN ARE EXTRAPOLATED FROM GROUNDWATER CONTOUR MAP (FIGURE 2-16).

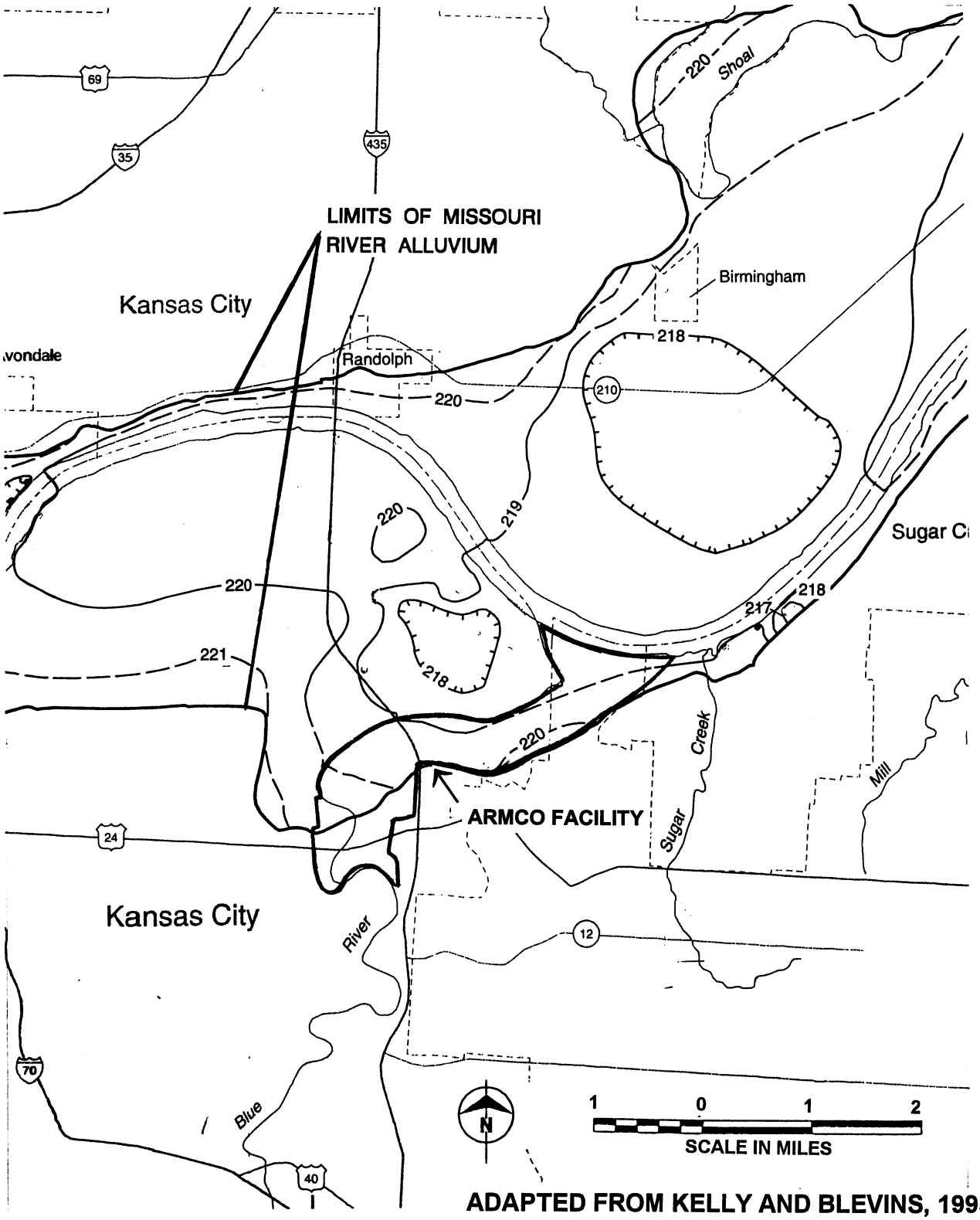
NOTE:

SOIL BORINGS B-3, B-4, B-5, B-6, B-9, B-20 WERE OBTAINED FROM E. D'APPOLONIA CONSULTING ENGINEERS DRAWING 69-198-E1, DATED 10/30/69.

Figure 2-11

GEOLOGICAL PROFILE ES1-ES1'

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY



LEGEND

—— 220 – – – – POTENTIOMETRIC CONTOUR DASHED WHERE APPROXIMATELY LOCATED. HACHURES INDICATE DEPRESSION. DATUM IS SEA LEVEL.

Burns & McDonnell Waste Consultants, Inc.

Figure 2-12

REGIONAL GROUNDWATER MAP OF MISSOURI RIVER ALLUVIUM

ARMCO KANSAS CITY FACILITY

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k:\armcorfi\austn\ref98\swmu0001.dgn
k:\armcorfi\austn.sup\fig17x11.dgn
k:\armcorfi\austn\intrmeds\site.dgn
A01GW529.DGN/9-JUN-99 10:09/CJW K:\ARMCORFI\USTN\GISFIG98\

A01MW4
737.55

A01MW5
737.54

A01MW3
737.54

A01MW2
737.55

A01MW1
737.54

AOC 1

A01MW6
737.54

A01MW7
737.55

100' 0' 100' 200'
SCALE IN FEET

LEGEND

- ✱ MONITORING WELL LOCATION
- 738.99 WATER LEVEL ELEVATION MEASURED ON 5/29/97
- +++ RAILROAD

NOTE:

RANGE OF WATER LEVEL ELEVATIONS WAS 0.01 FOOT WHICH IS THE LIMIT OF ACCURACY FOR THE MEASURING INSTRUMENT UTILIZED. DATA NOT CONTOURABLE; NO DISCERNIBLE HYDRAULIC GRADIENT.

Burns & McDonnell Waste Consultants, Inc.

Figure 2-13
AOC 1
GROUNDWATER CONTOUR MAP
MAY 29, 1997
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\armcorfi\ustn.sup\fig17x11.dgn
12GW297.DGN/11-JUN-99 10:39/TFG K:\ARMCORFI\USTN\GISFIG98\

OWA-6
717.77

APPROXIMATE
LOCATION OF DIKE

OLD RIVER CHANNEL

717.00

716.00

715.00

12MW3
716.91

12B01

12G01

12G02

12G04

OWA-5
713.88

APPROXIMATE
LOCATION OF
CULVERTS

12MW2
713.74

714.00

12B02

12G03

715.00

12B03

12MW4
715.91

716.00

12MW1
716.06

ROCK CREEK EFFLUENT DITCH

ROCK CREEK

LEGEND

- DIRECT-PUSH BORING LOCATION
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- LOCATION OF SURFACE SOIL SAMPLING GRID
- 715.10 WATER LEVEL ELEVATION MEASURED ON 2/14/97
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-14
SWMU 12 GROUNDWATER CONTOUR MAP-FEB. 14, 1997

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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k:\armcorfi\ustn\ref98\swmu0001.dgn
k:\armcorfi\ustn_sup\fi17x11.dgn
k:\armcorfi\ustn\infrmgds\site.dgn
220W630.DGN/14-JUN-99 11:18/TFG K:\ARMCORFI\USTN\GISFIG98\

BIG BLUE RIVER

722.50
723.00
22PZ03S
722.32
22PZ02S
723.28
22PZ01S
723.13
MW-1
722.44
MW-9
722.49
722.50
RCRA
LANDFILL
MW-2
722.84
MW-3A
722.67
MW-4
722.89
MW-10
722.74
SWMU 5
MW-5
722.94
723.00
SWMU 22
723.50
724.00
725.00
726.00
727.00
728.00
729.00
22PZ05S
729.29
PZ-XA
723.67
723.50
MW-6
723.11
MW-7
723.58
MW-8
723.96
ROCK CREEK
TUNNEL

N

LEGEND

- ✷ MONITORING WELL LOCATION
- 723.58 WATER LEVEL ELEVATION MEASURED ON 6/30/98
- WATER LEVEL CONTOUR
- SWNU BOUNDARY
- RAILROAD

300' 0' 300' 600'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-15
SWMU 22 - AREA
GROUNDWATER CONTOUR
MAP - JUNE 30, 1998
ARMCO KANSAS CITY FACILITY
GST PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

k:\armcorfi\ustn\ref98\swmu0001.dgn
k:\armcorfi\ustn\sup\figl7x11.dgn
k:\armcorfi\ustn\intrmeds\site.dgn
K:\ARMCORFI\USTN\GISFIG98\
22CW118.DGN/14-JUN-99 10:53/TFG

BIG BLUE RIVER

22PZ01S
715.16

22PZ02S
DRY

22PZ03S
714.79

MW-1
714.09

MW-9
714.05

RCRA
LANDFILL

MW-2
714.44

MW-3A
714.14

MW-4
714.69

MW-10
714.57

SWMU 22

SWMU 5

MW-5
714.96

714.50

715.00

715.50

716.00

716.50

717.00

717.50

718.00

718.50

719.00

719.50

713.50

714.00

717.00

718.00

719.00

720.00

721.00

722.0

MW-6
716.11

MW-7
720.07

22PZ05S
722.50

PZ-XA
712.87

MW-8
718.49

ROCK CREEK
TUNNEL

N

300' 0' 300' 600'
SCALE IN FEET

LEGEND

✷	MONITORING WELL LOCATION
714.09	WATER LEVEL ELEVATION MEASURED ON 1/18/99
———	WATER LEVEL CONTOUR
– – – – –	SWMU BOUNDARY
+++++	RAILROAD

NOTES:

1. GROUNDWATER DEPRESSION DUE TO ACTIVE GROUNDWATER PUMPING IN VICINITY OF PZ-XA FOR RAILROAD TUNNEL DEWATERING; PZ-XA WATER LEVEL MEASURED ON JAN. 22, 1999.

Burns & McDonnell Waste Consultants, Inc.

Figure 2-16
SWMU 22 - AREA
GROUNDWATER CONTOUR
MAP - JAN. 18, 1999
ARMCO KANSAS CITY FACILITY
GST PROPERTY

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k:\armcorfi\ustn\ref98\swmu0001.dgn
k:\armcorfi\ustn.sup\fig17x11.dgn
k:\armcorfi\ustn\intrmeds\site.dgn
22GW31199.DGN/14-JUN-99 11:21/TFG K:\ARMCORFI\USTN\GISFIG98\

BIG BLUE RIVER

BR-3
▲714.48

22PZ01S
716.97

22PZ02S
DRY

22PZ03S
715.61

MW-1
715.77

MW-9
715.83

MW-2
716.33

MW-3A
715.90

MW-4
716.19

MW-10
716.02

MW-5
716.34

MW-6
716.93

MW-7
719.42

MW-8
718.80

PZ-XA
715.67

22PZ05S
727.02

SWMU 22

SWMU 5

RCRA
LANDFILL

ROCK CREEK
TUNNEL

715 716 717 718 719 720 721 722 723 724 725 726 727

716.50 717 717.50 718 718.50 719

LEGEND

- ✷ MONITORING WELL LOCATION
- ▲ BRIDGE MONITORING STATION
- 723.58 WATER LEVEL ELEVATION MEASURED ON 6/30/98
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD

N

350' 0' 350' 700'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-17
SWMU 22 - AREA
GROUNDWATER CONTOUR
MAP - MAR. 11, 1999
ARMCO KANSAS CITY FACILITY
GST PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

K:*ARMCORF|*USTN*GISF|G98*STORMSWR.DGN(STORM SEWER) OFF=NONE
K:*ARMCORF|*USTN.SUP*F|G17X11.DGN(BDR) OFF=1-8,61-62
K:*ARMCORF|*USTN*INTRMEAS*SITE.DGN() OFF=1-8,42,62-63
K:*ARMCORF|*USTN.SUP*SWMU0001.DGN() OFF=3,54
33S52997.DGN/ 8-30-1999 9:55/TDC K:\ARMCORF\USTN\GISF\G98\

OUTFALL *004
INV. EL. 733.91

OUTFALL *009
INV. EL. 722.53

OUTFALL *011

OUTFALL *006
INV. EL. 726.30

BRISTOL AVE. SEWER 48"

33MW9S
734.27

735.0

736.0

737.0

738.0

739.0

33MW4S
736.40

33MW5S
737.78

33MW2S
739.05

33MW8S
737.53

33MW7S
739.45

SWMU 33

SWMU 17

SWMU 13

30" RCP

24" RCP

8" VCP

12" VCP

OUTFALL *016
INV. EL. 734.89

OUTFALL *018
INV. EL. 725.84

LEGEND

- ✷ MONITORING WELL LOCATION
- 738.99 WATER LEVEL ELEVATION MEASURED ON 5/29/97
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-18
SWMU 33 SHALLOW GROUNDWATER CONTOUR MAP
MAY 29, 1997
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

K:*ARMCORF|*USTN*GISF|G98*STORMSWR.DGN(STORM SEWER) OFF=NONE
K:*ARMCORF|*USTN.SUP*F|G17X11.DGN(BDR) OFF=1-8,61-62
K:*ARMCORF|*USTN*INTRMEAS*SITE.DGN( ) OFF=1-8,42,62-63
K:*ARMCORF|*USTN.SUP*SWMJ0001.DGN( ) OFF=3,54
33D52997.DGN 8-30-1999 9:57/TDC K:\ARMCORF\USTN\GISF\G98\

OUTFALL *004
INV. EL. 733.91

OUTFALL *009
INV. EL. 722.53

OUTFALL *011

OUTFALL *006
INV. EL. 726.30

BRISTOL AVE. SEWER 48"

33MW6D
723.06

723.1

723.1

723.2

723.2

723.3

723.3

723.4

723.4

33MW4
723.15

33MW5D
723.17

33MW2
739.44

33MW3
723.46

SWMU 33

SWMU 17

SWMU 13

30" RCP

24" RCP

33MW7D
723.49

8" VCP

12" VCP

24" RCP

OUTFALL *016
INV. EL. 734.89

OUTFALL *018
INV. EL. 725.84

LEGEND

- ✷ MONITORING WELL LOCATION
- 738.80 WATER LEVEL ELEVATION MEASURED ON 5/29/97
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-19
SWMU 33 DEEP
GROUNDWATER CONTOUR MAP
MAY 29, 1997
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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K:\ARMCORF\USTN.SUP\FIG17X11.DGN(BDR) OFF=1-8,61-62
K:\ARMCORF\USTN\INTRMEAS\SITE.DGN() OFF=1-8,42,62-63
K:\ARMCORF\USTN.SUP\SWMUDOD1.DGN() OFF=3,54
K:\ARMCORF\USTN\CTSF(G98\STORMSWR.DGN(STORM SEWER) OFF=NONE
33S70698.DGN/ 8-30-1999 9:59/TDC K:\ARMCORF\USTN\GISFIG98\

OUTFALL #004
INV. EL. 733.91

OUTFALL #009
INV. EL. 722.53

OUTFALL #011

OUTFALL #006
INV. EL. 726.30

OUTFALL #016
INV. EL. 734.89

OUTFALL # 018
INV. EL. 725.84

BRISTOL AVE. SEWER 48"

30" RCP

24" RCP

24" RCP

12" VCP

8" VCP

33MW10S
736.34

33MW9S
734.24

33MW11S
732.64

33MW4S
736.74

33MW5S
738.51

33MW5I
738.45

33MW8S
737.28

33MW2S
739.78

33MW14S
741.19

33MW12S
737.80

33MW7S
739.47

33MW13S
738.38

SWMU 33

SWMU 17

SWMU 13

736
737
738
739
740
741
735
734
733

LEGEND

- ✷ MONITORING WELL LOCATION
- 738.80 WATER LEVEL ELEVATION MEASURED ON 7/6/98
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-20
SWMU 33 SHALLOW GROUNDWATER CONTOUR MAP
JULY 6, 1998
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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k:\armcorfi\ustn.sup\fig17x11.dgn
k:\armcorfi\ustn\infrmeds\site.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
33070698.DGN/14-JUN-99 16:30/CJW K:\ARMCORFI\USTN\GISFIG98\

OUTFALL •004
INV. EL. 733.91

OUTFALL •009
INV. EL. 722.53

OUTFALL •011

OUTFALL •006
INV. EL. 726.30

OUTFALL •016
INV. EL. 734.89

OUTFALL • 018
INV. EL. 725.84

BRISTOL AVE. SEWER 48"

30" RCP

24" RCP

24" RCP

12" VCP

8" VCP

33MW10D
721.80

33MW11D
721.75

33MW6D
721.54

33MW4
721.52

33MW5D
721.59

33MW13D
721.62

33MW3
721.85

33MW14D
721.87

33MW12D
721.52

33MW7D
718.82

SWMU 33

SWMU 17

SWMU 13

721.80

721.70

721.60

721.80

721.70

721.60

LEGEND

✷	MONITORING WELL LOCATION
738.80	WATER LEVEL ELEVATION MEASURED ON 7/6/98
———	WATER LEVEL CONTOUR
- - - - -	SWMU BOUNDARY
++++++	RAILROAD
———	APPROXIMATE LOCATION OF STORM SEWERS*

***NOTE**

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-21
SWMU 33 DEEP
GROUNDWATER CONTOUR MAP
JULY 6, 1998
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

k:\grmcorfi\ustn.sup\fig17x11.dgn
k:\grmcorfi\ustn\intrmeas\site.dgn
k:\grmcorfi\ustn.sup\swmu0001.dgn
k:\grmcorfi\ustn\gisfig98\stormswr.dgn
33S11899.DGN/14-JUN-99 16:39/CJW K:\ARMCORFI\USTN\GISFIG98\

BR-2
714.64

OUTFALL *004
INV. EL. 733.91

714.70

735.0

33MW10S
734.89

734.0

OUTFALL *009
INV. EL. 722.53

736.0

737.0

738.0

739.0

740.0

733.0

714.80

OUTFALL *011

33MW9S
732.46

33MW11S
732.14

OUTFALL *006
INV. EL. 726.30

714.90

BRISTOL AVE. SEWER 48"

733.0

734.0

735.0

736.0

737.0

738.0

739.0

33MW4S
735.70

33MW5S
736.58

33MW8S
736.42

33MW2S
737.54

SWMU 33

SWMU 17

SWMU 13

33MW13S
735.85

BR-1
714.96

30" RCP

33MW14S
740.18

740.0

33MW12S
736.91

OUTFALL *016
INV. EL. 734.89

24" RCP

33MW7S
738.11

8" VCP

12" VCP

24" RCP

OUTFALL * 018
INV. EL. 725.84

LEGEND

- ✷ MONITORING WELL LOCATION
- ▲ BRIDGE MONITORING STATION
- 738.99 WATER LEVEL ELEVATION MEASURED ON 1/18/99
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-22
SWMU 33 SHALLOW GROUNDWATER CONTOUR MAP
JAN. 18, 1999
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

K:*ARMCORF*USTN*GISFIG98*STORMSWR.DGN(STORM SEWER) OFF=NONE
K:*ARMCORF*USTN.SUP*FIG17X11.DGN(BDR) OFF=1-8,61-62
K:*ARMCORF*USTN*INTRMEAS*SITE.DGN() OFF=1-8,42,62-63
K:*ARMCORF*USTN.SUP*SWMU0001.DGN() OFF=3,54
33D11899.DGN/ 8-30-1999 11:04/TDC K:\ARMCORF\USTN\GISFIG98\

BR-2
714.64

OUTFALL *004
INV. EL. 733.91

714.70

33MW10D
716.91

716.90

OUTFALL *009
INV. EL. 722.53

716.80

716.70

OUTFALL *011

714.80

716.70

OUTFALL *006
INV. EL. 726.30

33MW6D
716.67

33MW11D
716.76

716.80

714.90

BRISTOL AVE. SEWER 48"

717.00

33MW4
716.68

716.90

33MW5D
716.87

33MW5I
736.59

717.00

717.10

SWMU 17

33MW13D
717.06

SWMU 13

BR-1
714.96

33MW3
717.39

33MW2
737.86

SWMU 33

33MW14D
717.18

717.10

717.20

33MW12D
717.13

OUTFALL *016
INV. EL. 734.89

30" RCP

24" RCP

33MW7D
717.34

8" VCP

12" VCP

24" RCP

OUTFALL * 018
INV. EL. 725.84

717.20

LEGEND

- MONITORING WELL LOCATION
- BRIDGE MONITORING STATION
- 738.80 — WATER LEVEL ELEVATION MEASURED ON 1/18/99
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

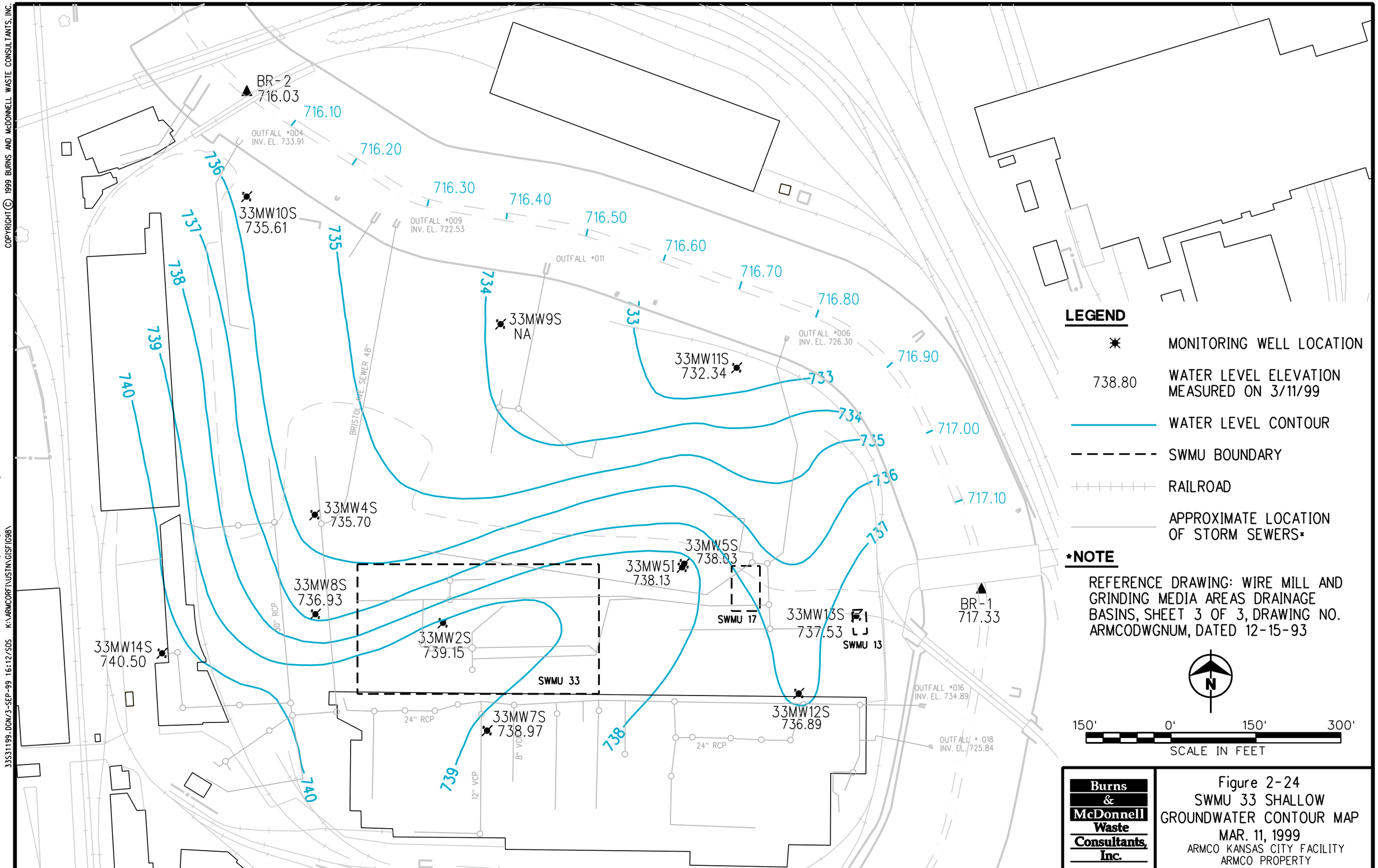
REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-23
SWMU 33 DEEP
GROUNDWATER CONTOUR MAP
JAN. 18, 1999
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY



Burns & McDonnell Waste Consultants, Inc.

Figure 2-24
SWMU 33 SHALLOW GROUNDWATER CONTOUR MAP
MAR. 11, 1999
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

k:\armcorfi\ustn.sup\fig17x11.dgn
k:\armcorfi\ustn\intrmeas\site.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\armcorfi\ustn\gisfig98\stormswr.dgn
33S31199.DGN/3-SEP-99 16:12/SOS K:\ARMCORFI\USTN\GISFIG98\

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

K:*ARMCORF*USTN*GISFIG98*STORMSWR.DGN(STORM SEWER) OFF=NONE
K:*ARMCORF*USTN.SUP*FIG17X11.DGN(BDR) OFF=1-8,61-62
K:*ARMCORF*USTN*INTRMEAS*SITE.DGN() OFF=1-8,42,62-63
K:*ARMCORF*USTN.SUP*SWMU0001.DGN() OFF=3,54
33031199.DGN 8-30-1999 10:04 TDC K:\ARMCORF\USTN\GISFIG98\

BR-2
716.03

OUTFALL *004
INV. EL. 733.91

33MW10D
718.31

OUTFALL *009
INV. EL. 722.53

OUTFALL *011

OUTFALL *006
INV. EL. 726.30

33MW11D
718.20

33MW6D
717.99

BRISTOL AVE. SEWER 48"

33MW4
717.97

33MW5D
718.36

33MW13D
718.73

SWMU 17

SWMU 13

BR-1
717.33

33MW3
719.03

SWMU 33

33MW14D
718.59

30" RCP

24" RCP

33MW12D
719.07

33MW7D
719.05

8" VCP

12" VCP

OUTFALL *016
INV. EL. 734.89

OUTFALL *018
INV. EL. 725.84

716.10
716.20
716.30
716.40
716.50
716.60
716.70
716.80
716.90
717.00
717.10
717.30
718.10
718.20
718.30
718.40
718.50
718.60
718.70
718.80
718.90
719.00

LEGEND

- ✷ MONITORING WELL LOCATION
- ▲ BRIDGE MONITORING STATION
- 718.80 WATER LEVEL ELEVATION MEASURED ON 3/11/99
- WATER LEVEL CONTOUR
- SWMU BOUNDARY
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-25
SWMU 33 DEEP
GROUNDWATER CONTOUR MAP
MAR. 11, 1999
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

COPYRIGHT © 1999 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

K:*ARMCORF|*USTN.SUP*F1G17X11.DGN(BDR) OFF=61-62
K:*ARMCORF|*USTN*INTRMEAS*SITE.DGN() OFF=1-8,42,62-63
K:*ARMCORF|*USTN.SUP*SWMU0001.DGN() OFF=3,54
K:*ARMCORF|*USTN*G|SFIG98*STORMSWR.DGN(STORM SEWER) OFF=NONE
33BEDRK.DGN/ 8-30-1999 10:05/TDC K:\ARMCORF\USTN\GISFIG98\

OUTFALL *004
INV. EL. 733.91

OUTFALL *009
INV. EL. 722.53

OUTFALL *011

OUTFALL *006
INV. EL. 726.30

OUTFALL *016
INV. EL. 734.89

OUTFALL * 018
INV. EL. 725.84

33MW-10D
679.3

33MW6D
680.3

33MW11D
679.5

33B56
680.6

33B60
678.3

33B58
680.4

33MW5D
678.4

33MW13D
676.7

33MW3
682.1

33B59
680.7

33MW14D
680.7

33MW12D
677.9

33MW7D
678.4

33B57
672.2

679.0
680.0
681.0
682.0
678.0
677.0
676.0
675.0
674.0
673.0

SWMU 33
SWMU 17
SWMU 13

30" RCP
24" RCP
12" VCP
8" VCP
BRISTOL AVE. SEWER 48"

LEGEND

- ✷ MONITORING WELL LOCATION
- ● SOIL BORING LOCATION
- 680.3 BEDROCK ELEVATION CONTOUR
- —673.0— ELEVATION AT TOP OF BEDROCK
- RAILROAD
- APPROXIMATE LOCATION OF STORM SEWERS*

*NOTE

REFERENCE DRAWING: WIRE MILL AND GRINDING MEDIA AREAS DRAINAGE BASINS, SHEET 3 OF 3, DRAWING NO. ARMCODWGNUM, DATED 12-15-93

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2-26
SWMU 33 BEDROCK GEOLOGIC CONTOUR MAP
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

3.0 POTENTIAL MIGRATION PATHWAYS

This chapter summarizes the potential migration pathways at the Facility. Migration potential of a given constituent is controlled by its specific properties (chemical and physical) and characteristics of the matrix through which the constituent is transported. Potential migration pathways include subsurface, surface, and air routes, and are summarized in Table 3-1 for each SWMU. In addition, this table provides information regarding surface cover material (e.g., vegetation, asphalt, slag, etc.) which influences potential migration of constituents.

For most potential migration pathways, the extent of constituent migration depends on several factors. These include the quantity and rate of the constituent released, characteristics of the matrix to which it is released, and the physical and chemical characteristics of the released constituent. These factors are applicable to the subsurface, surface, and air pathways described below. An overall assessment of expected contaminant fate and transport potential for the primary contaminants of concern at the Facility is provided in Chapter 25.0. More detailed analysis of potential migration pathways and contaminant fate and transport potential is provided on a SWMU-specific basis in each SWMU chapter (Chapters 5.0 through 24.0).

3.1 SUBSURFACE PATHWAYS

Subsurface migration pathways identified at the Facility include subsurface soil, storm sewers, and groundwater.

3.1.1 Subsurface Soil

A constituent released to surface or subsurface soils has the potential to migrate vertically through the vadose (unsaturated) and capillary fringe soil zones to the saturated zone. As described previously in Chapter 2.0, native subsurface materials at the Facility are composed of two primary types.

In portions of the Facility south of SWMUs 8 and 11 in the Blue River dominated alluvial valley, clays and silty clays are the most common sediment types. This sediment style is characterized by relatively low permeabilities and semi-confining aquiclude intervals. Given the silty-clay material in the Blue River dominated alluvial valley sediments, constituents released to this soil are not expected to migrate significantly in a horizontal or vertical direction. The relatively low permeability of the silty-clay materials is expected to partially restrict the downward migration of a constituent as water infiltrates through the subsurface.

In portions of the Facility north of SWMUs 8 and 11 in the Missouri River dominated alluvial valley, native clays and silty clays in the near surface materials grade downward to fine sand and finally to coarse sand and gravels near the bedrock contact. This "coarsening-downward" style of sedimentation is typical of large river alluvial deposits and is characterized by relatively higher permeabilities and generally unconfined aquifer conditions. In the Missouri River dominated alluvial valley sediments, potential for migration increases with depth due to increasing grain size of the alluvial material. As a released constituent infiltrates, adsorption to surface and shallow subsurface soils is expected.

Many areas of the Facility have surface cover materials, such as soil caps, asphalt, or concrete, which reduce or eliminate infiltration of rainwater thereby decreasing the potential for vertical migration of a constituent in the subsurface.

3.1.2 Storm Sewers

Storm sewers are located throughout the western portion of the Facility to collect storm water runoff and discharge it to the Blue River. A sewer line could provide a route for a constituent to migrate through the subsurface soil depending on the condition of the sewer line.

3.1.3 Groundwater

The groundwater migration pathway is important given the saturated zone soil characteristics and the potential for migration to surface water bodies located at the Facility. The presence of a

constituent in the groundwater may be the result of naturally occurring conditions, migration from the subsurface soil, or chemical degradation in the subsurface.

Regional groundwater flow beneath the Facility is primarily in the north-northeast direction towards the Blue River and the Missouri River. Locally, groundwater flow direction is towards the Blue River. Adjacent to SWMU 33 and AOC 1, the Blue River flows through a concrete flood control channel. The concrete channel appears to limit the hydraulic connection between the groundwater and the River.

Constituents dissolved in the groundwater are expected to migrate horizontally with groundwater flow. This is especially true for the eastern portion of the Facility located in the Missouri River dominated alluvial valley alluvium, where the geology of the saturated zone consists primarily of sand and gravel. The alluvium, which coarsens downward, extends to bedrock and could also allow constituents to migrate vertically to the shale bedrock, depending on the nature of the contaminant. Bedrock is the confining layer.

In the Blue River dominated alluvial valley alluvium beneath the SWMU 33 area, horizontal migration of constituents in groundwater is expected to be more limited. This is based on the nature of the alluvium, which consists primarily of clays and silty clays. Immediately above the shale bedrock layer in the deep semi-confined saturated zone, a layer of gravel exists and contaminants, if present, would be expected to migrate in a horizontal direction. At SWMU 33, volatile organic compound (VOC) constituents have migrated downward between the shallow unconfined saturated zone and the deep semi-confined saturated zone.

3.2 SURFACE PATHWAYS

Potential surface migration pathways identified at the Facility include storm water runoff and surface water/sediment.

3.2.1 Storm Water Runoff

The major source of surface water is from precipitation events. Storm water runoff may pick up soluble contaminants or contaminants adsorbed to sediment or surface soil and transport them as it travels.

In many areas of the western portion of the Facility (i.e. west of I-435), storm water enters surface catch basins or drains and is discharged through storm sewers to the Blue River. Drainage basin maps for the Facility were provided as Appendix A2 in Addendum No. 1 to the RFI Workplan (BMWCI, 1997). These maps also provide locations of storm sewer outfalls.

At some areas located adjacent to the Blue River, storm water runoff flows overland directly into the River. In other areas, storm water runoff collects in a low-lying area(s) and infiltrates and/or evaporates.

3.2.2 Surface Water/Sediment

Surface water may transport soluble constituents or constituents adsorbed to sediment. Sediment is created through the erosion of surface features and the subsequent transport of soil particles from their original location. This is done naturally through the action of storm water runoff, wind, and the force of gravity.

Surface water bodies at the Facility were previously described in Subsection 2.4.1. The primary surface water bodies at the Facility include the Blue River, the Missouri River, and Rock Creek. Storm water runoff at the Facility may drain to these water bodies. The Blue River and Rock Creek both flow to the east and ultimately join the Missouri River in the northeast portion of the Facility. Groundwater also flows toward and intercepts these surface water bodies.

Temporal surface water bodies may exist in low-lying areas located in the eastern portion of the Facility. These low-lying areas are prone to ponding during periods of heavy precipitation and/or elevated river stages. Water collects in these low lying areas, which are characterized by no outlet and shallow depths, and dissipates through infiltration and/or evaporation.

3.3 AIR PATHWAYS

Potential air migration pathways identified at the Facility include volatilization and airborne dust.

3.3.1 Volatilization

Organic compounds with volatilization potential (primarily VOCs and to a lesser extent semivolatile organic compounds [SVOCs]) could be released into the atmosphere from vadose zone soil. Once in the atmosphere, volatilized constituents could diffuse into the stratosphere or breakdown via a chemical reaction. Volatilization potential is limited by surface covering materials at the Facility, such as asphalt, concrete, or compacted slag fill.

3.3.2 Airborne Dust

Surface soil particulate could become airborne from operational activities at the Facility that produce dust. This would be most applicable during dry, summer months. Prevailing winds in the Kansas City area are from the south-southwest. Dust could be trapped in the immediate SWMU area depending on local surface features (e.g., dikes, levees, or buildings), thus limiting its migration potential. Many of the SWMUs are covered with materials such as asphalt, concrete, compacted slag fill, or vegetation that significantly decrease the potential for exposure to contaminants via airborne particulate.

* * * * *

Table 3-1
Potential Migration Pathways
Armco Kansas City Facility

SWMU or AOC	Property Owner	Surface Cover	Storm Water Drainage		Potential Migration Pathways [1]							Primary Contaminants [2]	
					Subsurface			Surface		Air			
			Patterns	Receiving SW Body	Soil to GW [3]	GW Transport	Storm Sewers	Storm Wtr Runoff	SW Transport	Volatil-ization	Dust	Soil	GW
SWMU 2 - Old Blue River "W" Landfill	Armco	Soil Cap	Runs off cap; P & I in immediate SWMU area		X	X				X		--	VOCs Pb
SWMU 3 - South of Bar Fab Landfill	Armco	Soil Cap/ Asphalt	Runs off cap/asphalt toward Blue River on west or to open ditch on north [4]	Blue River	X	X						--	--
SWMU 4 - 1987 Waste Pile	Armco	Slag	P & I in western portion of SWMU area		X	X		X			X	Cd Pb	--
SWMU 5 - Plant Rubble Landfill	Armco	Soil Cap	Runs off cap; P & I in immediate SWMU area		X	X						--	--
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks and AOC 4 - Boiler Furnace Area	Armco/ KCT RR	Slag	P & I in immediate SWMU/ AOC area		X	X		X		X	X	VOCs SVOCs Metals	--
SWMU 7 - No. 1 Melt Shop Baghouse Dust Tank	Armco	Slag	Runs toward Blue River on south-southwest or to storm drains in SWMU area	Blue River	X	X	X	X	X		X	Cd Pb	--
SWMU 8 - No. 2 Melt Shop Baghouse Dust Tank and SWMU 11 - Dust Rail Car Loading Area - No. 2 Melt Shop	GST	Slag/ Asphalt	Runs toward storm drains west of SWMUs	Blue River	X	X	X	X	X		X	Cd Pb	--
SWMU 9 - No. 1 Melt Shop Canopy Baghouse Dust Conveyor	Armco	Slag	Runs toward Blue River on west	Blue River	X	X	X [5]	X	X		X	--	--
SWMU 10 - Dust Rail Car Loading Area - Bar Joist Building	GST	Asphalt	Runs toward storm drains at ends or middle of building	Blue River	X	X	X					Cd Pb	--
SWMU 12 - Amoco Landfarm	Armco	Vegetation	P & I or evaporates inside dike around SWMU (Note - culvert valves kept closed)		X	X		X			X	SVOCs Pb	--
SWMU 13 - Pickle Liquor Tanks	Armco	Slag	Runs toward storm drain southeast of SWMU	Blue River	X	X	X	X	X		X	--	SVOCs Metals
SWMU 17 - Wire Mill Rinsewater Neutralization Tank	Armco	Slag	Runs toward storm drain southeast of SWMU 13	Blue River	X	X	X	X	X	X	X	VOCs	(see SWMU 33)

Table 3-1
Potential Migration Pathways
Armco Kansas City Facility

SWMU or AOC	Property Owner	Surface Cover	Storm Water Drainage		Potential Migration Pathways [1]							Primary Contaminants [2]	
					Subsurface			Surface		Air			
			Patterns	Receiving SW Body	Soil to GW [3]	GW Transport	Storm Sewers	Storm Wtr Runoff	SW Transport	Volatil-ization	Dust	Soil	GW
SWMU 22 - Mill Ponds	GST	NA	Contained in Ponds or P & I in immediate area outside of Ponds	Blue River [6]	X	X			X [6]			--	As
SWMU 24 - Waste Hydraulic and Lubricating Oil Storage Tanks	Armco/ KCT RR	Slag	P & I in immediate SWMU area		X	X		X		X	X	SVOCs Metals	VOCs
SWMU 25 - Roll Shop Drum Storage Area	GST	Asphalt/ Concrete	Runs toward storm drain in southeast portion of SWMU	Blue River	X	X	X					SVOCs Metals	--
SWMU 26 - Rod Mill Drum Storage Area	GST	Concrete	NA (under building)		X	X	X					--	--
SWMU 27 - Bar Joist Building Hazardous Waste Storage Area	GST	Concrete	NA (inside building)		X	X	X					Cd Pb	--
SWMU 33 - Nail Mill Degreasing Area	Armco	Slag	Runs toward storm drains east of SWMU or storm drain catch basins west of SWMU	Blue River	X	X	X	X	X	X	X	VOCs	VOCs
AOC 1 - Abandoned Fuel Oil Storage Tank	Armco	Slag	P & I in immediate AOC area or runs toward Blue River on west	Blue River	X	X	X [5]	X	X		X	--	--
AOC 8 – "Owl Gun Club" Shooting Park	Armco	Vegetation	P & I in immediate AOC area		X	X		X			X	Pb	--

Notes:

[1] = Indication of a potential migration pathway does not imply that actual transport via that pathway has or is occurring.

[2] = Primary contaminants based on RFI nature and extent evaluation.

[3] = Soil leaching to groundwater pathway will be minimal for capped or paved areas.

[4] = City of Kansas City, Missouri storm sewer. In area north of SWMU 3, sewer is an open ditch.

[5] = Although subsurface storm sewers are present, they are not connected to any storm drains in the immediate SWMU or AOC area.

[6] = A portion of the Mill Pond water is discharged to the Blue River through GST's NPDES permitted outfall 042.

NA = Not applicable

GW = Groundwater

P & I = Ponds and infiltrates

SW = Surface Water

X = Indicates potential pathway may be applicable.

-- = Indicates no primary contaminants applicable.

As = Arsenic

Cd = Cadmium

Pb = Lead

SVOCs = Semivolatile Organic Compounds

VOCs = Volatile Organic Compounds

4.0 INTRODUCTION TO THE NATURE AND EXTENT OF CONTAMINATION

This chapter provides an introduction to the organization of the nature and extent of contamination discussions provided in the RFI Report and summarizes the analyses performed on the RFI data.

4.1 OVERVIEW

During the RFI, samples were collected for chemical and/or physical analyses in accordance with the Revised IMP, the RFI Workplan, and their associated Addenda, all of which have been approved by MDNR and USEPA. The physical sample analytical results are discussed in Chapter 2.0. This Chapter and Chapters 5.0 through 24.0 present the findings of the chemical analytical results collected during the RFI.

The nature and extent of contamination at the Facility was well defined by the RFI activities. Over the course of the investigation activities, approximately 130 surface soil, 140 trench soil, 120 test pit, 555 soil boring, 4 sediment, 4 surface water, 105 direct-push groundwater, and 55 monitoring well groundwater samples were submitted to analytical laboratories, resulting in more than 1,700 chemical analyses. Based on site history, chemical analyses were conducted primarily for lead, cadmium, VOCs, SVOCs, polynuclear aromatic compounds (PAHs), and total petroleum hydrocarbons (TPH). Other chemical analyses performed during the RFI included RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), pH, Skinner's VOCs, Skinner's SVOCs, hexavalent chromium, and natural attenuation parameters. RFI chemical analytical methods and parameter lists are summarized in Table 4-1.

General supporting information for the data and text provided in this Chapter and Chapters 5.0 through 24.0 is provided in the following Appendices:

- Appendix P - Survey Data
- Appendix Q - On-Site TPH Immunoassay Results
- Appendix R - On-Site Analytical Gas Chromatography (GC) VOC Results

- Appendix S - On-Site Analytical X-Ray Fluorescence (XRF) Results
- Appendix T - Analytical Results for Natural Attenuation Parameters for SWMU 33
- Appendix U - Analytical Laboratory TPH Data
- Appendix V - RCRA Landfill Groundwater Data
- Appendix W - RFI Phases 1 and 2 Quality Control Evaluation Reports
- Appendix X - Human Health Risk Assessment
- Appendix Y - Ecological Risk Assessment
- Appendix Z - RFI Phases 1 and 2 Chemical Data Analytical Laboratory Reports

Note: IM chemical data analytical laboratory reports and the IM Quality Control Evaluation Report were previously provided in the *Interim Measures Investigation Report* (BMWCI, 1997a).

4.2 DATA ANALYSIS

Chemical laboratory analytical results are reviewed and discussed in Chapters 5.0 through 24.0, which summarize the nature and extent of contamination, if any, for specific SWMUs and AOCs. Chemical analyses performed on samples collected during the investigation included pH, metals, VOCs, SVOCs, PAHs, TPH, and/or natural attenuation parameters (see Table 4-1). The type of chemical analysis performed was determined by evaluation of historical operations for each area of the Facility.

The following subsections summarize the quality control evaluations performed on the RFI data, the on-site analytical data, the development of background concentrations for metals, the use of TPH data as a screening tool, the screening of the data for nature and extent determination, and the presentation of the analytical data in the RFI Report.

4.2.1 Quality Control Evaluations

Over the course of the IM and RFI, three different analytical laboratories were used for sample analysis:

- Intertek Testing Services (Richardson, Texas Facility) – Interek Testing Services in Richardson, Texas was used for the analysis of all samples collected during the IM (1996), RFI Phase 1 (1997), and portions of RFI Phase 2 (prior to August 1, 1998).

- Intertek Testing Services (Colchester, Vermont Facility) – Intertek Testing Services in Colchester, Vermont was used for the analysis of samples collected during the latter portion of RFI Phase 2 (after August 1, 1998). In September 1998, this facility was sold and is currently operated as Severn-Trent Laboratories.

- Southwest Laboratory of Oklahoma (Broken Arrow, Oklahoma Facility) – Southwest Laboratory of Oklahoma in Broken Arrow, Oklahoma was used for the analysis of slag background samples collected in December 1998.

BMWCI reviewed the laboratory analytical data to determine the quality of the data. Quality control (QC) samples (field duplicates, matrix spike/matrix spike duplicates, equipment rinsate blanks, and trip blanks) were collected and analyzed with the field samples to assist in the review of the analytical data. Appendix W contains the results of the BMWCI QC evaluations performed for the data collected in Phases 1 and 2. The QC Evaluation Report for the IM analytical data was previously presented in the *Interim Measures Investigation Report* (BMWCI, 1997a).

The factors evaluated as part of the BMWCI QC evaluations included precision, accuracy, representativeness, completeness, and comparability. A rigorous data validation was completed on the RFI analytical data following procedures outlined in *USEPA's National Functional Guidelines for Organic Data Review* (USEPA, 1993) and *USEPA's National Functional Guidelines for Inorganic Data Review* (USEPA, 1994a). Analytical data collected during the RFI was validated in accordance with the requirements of the Quality Assurance Project Plan contained in the RFI Workplan.

The laboratory added qualifiers to the analytical data based upon laboratory quality control procedures performed during sample analysis. Based upon the QC evaluations by BMWCI,

additional qualifiers were added as appropriate to the analytical data results. Qualifiers (J, J*, B, D, U, F, R, etc.) follow some concentration values reported in the data results tables and elsewhere in this report. Definitions of qualifiers are summarized at the end of each data results table and in the QC Evaluation Reports.

Overall, the quality of the laboratory analytical data for the Armco RFI was valid for evaluation of the nature and extent of contamination of the Facility and for use in risk and/or engineering evaluations. As indicated in Appendix W, the data quality objectives (precision, accuracy, representativeness, completeness, and comparability) were met. Very few sample results (approximately seven individual analyses out of 1,700) were qualified as unusable.

4.2.2 Field Screening Methods

Field screening methods (on-site GC analysis for VOCs, on-site immunoassay analysis for TPH, and on-site XRF spectroscopy analysis for lead) were used as tools to provide real-time information for placing sampling or well locations, to determine the need for additional sampling locations, and to initially delineate the nature and extent of contamination at a SWMU. The following sections provide a discussion of the field screening methods.

4.2.2.1 On-Site GC Analysis

Hydro-Logic of Eudora, Kansas provided field services for GC analysis of VOCs. Results for the on-site GC analysis are presented in Appendix R.

As presented in the RFI Workplan and its associated Addendum No. 3, groundwater samples were collected in the SWMU 33 area to assist in characterization and delineation of VOCs. During RFI Phase 1, 54 groundwater samples were collected and analyzed on-site. Forty-eight were analyzed for chlorinated VOCs [trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), and vinyl chloride]. Due to odors encountered during sampling, 22 of these samples were also analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). During RFI Phase 2, an additional six groundwater samples were collected and

analyzed on-site for chlorinated VOCs. Confirmation samples were submitted to the analytical laboratory for seven of the RFI Phase 1 samples and two of the RFI Phase 2 samples.

Due to odors encountered during advancement of conductivity probes in the vicinity of SWMU 2, on-site GC analysis for chlorinated VOCs and BTEX was used to determine the need for additional sampling. Eight direct-push groundwater samples from SWMU 2 were collected and analyzed on-site. Due to a lack of VOC detections during the on-site analysis, all of the samples were submitted to the analytical laboratory for confirmation analysis.

4.2.2.2 On-Site Immunoassay Analysis

Using procedures presented in the Revised IMP, immunoassay analysis and photoionization detector (PID) readings were used to expedite the definition of the nature and extent of contamination in the SWMU 24 trenches during the IM investigation. When visual observations and PID readings indicated that the horizontal extent of soil contamination had been reached in a trench, an immunoassay test was used to confirm that the soil was below a certain detectable concentration of TPH. Twenty-six trench soil samples were analyzed for TPH using immunoassays. Sixteen confirmation samples were collected from their respective TPH immunoassay sample locations and sent to the analytical laboratory. In addition to TPH, confirmation samples were analyzed for VOCs, PAHs, and RCRA metals. PID readings and immunoassay results are provided in Appendix Q.

4.2.2.3 On-Site XRF Spectroscopy

Procedures for XRF analysis for the field characterization of lead in soil were presented in a letter dated April 28, 1998 from Armco to USEPA. Appendix S contains the XRF analytical results.

During RFI Phase 2, XRF spectroscopy was used as a soil screening tool at SWMUs 4, 6, 7, 24, and 27 and AOCs 4 and 8 to assist in determining the need for additional sampling locations and the nature and extent of lead contamination in soil. Approximately 480 samples were analyzed

using XRF spectroscopy. Of these samples, approximately 290 were sent to the analytical laboratory for confirmatory analysis.

XRF lead data was used solely as a field screening method to quickly determine whether additional soil sampling was or was not necessary for adequate definition of lead contamination in an area. Once sampling of an area was assumed adequate based on XRF data, samples were selected and sent to the analytical laboratory for confirmation analysis. Laboratory analytical data was used for the final extent characterization of lead (and other RCRA metals, as applicable) in soil at SWMUs where XRF spectroscopy was utilized.

4.2.3 Development of Metal Concentrations in Slag

During the RFI, a sampling program was conducted to assess background concentrations of metals in slag at the Facility. Due to the widespread presence of inert slag material on the site, ten representative slag samples were collected from a remote slag levee in the 0 to 1 foot depth interval from the side slopes of the levee. The matrix was observed to be fine to medium grain sand with gravel slag fragments. The samples were analyzed for RCRA metals and hexavalent chromium.

Table 4-2 provides the results for the slag samples. For the purposes of the RFI, the concentration of metals in slag was statistically determined as the 95% upper tolerance limit (UTL). The 95% UTL is a statistical interval that is designed to capture 95% of a population (its coverage) with a specified confidence. Table 4-3 provides the 95% UTL concentrations calculated for the slag samples

4.2.4 Emission Control Dust Description

Soil at many SWMUs has been impacted by emission control dust. The emission control dust generated at the No. 1 and No. 2 Melt Shops has been classified as hazardous waste K061 since 1980. K061 waste is defined as emission control dust/sludge from the primary production of steel in electric arc furnaces. The basis for the K061 hazardous waste listing is the presence of hexavalent chromium, lead, and cadmium. Analyses of the emission control dust from the

Facility indicate that the primary contaminants of concern are cadmium and lead. Armco's Kansas City operations were limited to the production of carbon steel rather than stainless steel. Chromium levels present in the Facility's emission control dust TCLP and EP-Toxicity leachate typically ranged from 0.02 to 0.2 mg/L and were below TCLP and EP-Toxicity levels for definition of a hazardous waste. Therefore, chromium was not considered a primary contaminant of concern associated with this emission control dust. Representative analytical data associated with emission control dust TCLP and EP-Toxicity leachate was provided in Appendix A of the RFI Workplan (BMWCI, 1996a).

4.2.5 TPH Data

Samples collected at SWMUs 4, 6, 12, 13, 17, 24, 25, 26, 27 and 33 and AOCs 1 and 4 were analyzed for TPH components (both gasoline and diesel range) in addition to VOCs, SVOCs, and/or PAHs. TPH refers to a mixture of hydrocarbons that includes a large number of constituents. The composition of the mixture is greatly variable, as are the chemical characteristics of the individual components. Therefore, TPH was used as an indicator of general organic compound contamination. Volatile petroleum hydrocarbons (also known as gasoline range TPH) were used as an indicator of VOC contamination (including BTEX), and extractable petroleum hydrocarbons (also known as diesel range TPH and/or motor oil) were used as an indicator to SVOC contamination (including PAHs). In general, samples that exhibited elevated extractable TPH concentrations were also analyzed for SVOCs. In addition, samples with elevated volatile TPH concentrations were typically analyzed for VOCs. Thus, determination of the nature and extent of contamination from the corresponding VOCs and SVOCs was used as a means to evaluate the nature and extent of TPH contamination. Therefore, TPH per se was not considered in the nature and extent discussions, but the corresponding SVOC and VOC constituents exceeding screening criteria were evaluated. TPH analytical data are presented in Appendix U.

4.2.6 Screening of Data

Table 4-4 presents the soil and water generic screening levels. Generic screening levels were used to screen the data for the purpose of defining the nature and extent of contamination.

Screening levels provide a practical and achievable method of determining when extent of contamination has been adequately defined. The screening of data is solely for definition of the nature and extent of contamination during the RFI. Screening levels used for nature and extent definition do not represent site-specific corrective action objectives, replace the site-specific risk assessment, or indicate the need for corrective measures.

4.2.6.1 Soil Screening Criteria

Contaminants in soil samples were screened against generic soil screening levels (SSLs) as established in *Soil Screening Guidance* (USEPA, 1996). SSLs are risk-based concentrations that combine exposure assumptions and toxicity data. Generic SSLs are based on several default assumptions that are protective of human health for most site conditions. As stated in the *Soil Screening Guidance*, "where contaminant concentrations equal or exceed SSLs, further study or investigation, but not necessarily cleanup, is warranted." The *Soil Screening Guidance* accepts the use of generic SSLs for RCRA investigations to define the nature and extent of contamination.

SSLs are available for ingestion, inhalation, and migration to groundwater. For this Facility, SSLs established for migration to groundwater were selected. Migration to groundwater is applicable for soil contamination at the SWMUs at this Facility, because the majority are in non-operational areas and are not occupied by workers. SSLs for soil ingestion and dust inhalation were considered for the evaluation of SWMUs with surface soil contamination which are located within current operation areas (SWMUs 8/11, 25, 26 and 27). However, using ingestion and/or inhalation SSLs was rejected for the following reasons: 1) SWMUs 25 and 27 contamination is located under concrete flooring or asphalt, 2) SWMUs 8 and 11 contamination is cadmium and lead, of which the migration to groundwater SSLs are equal to or less than SSLs for ingestion and inhalation, and 3) SWMU 26 detections were limited to barium, cadmium, and chromium of which the migration to groundwater SSLs are less than SSLs for ingestion and inhalation.

Generic SSLs for migration to groundwater are provided in the guidance using a default dilution attenuation factor (DAF) of 20 (20 DAF SSL). The DAF accounts for natural processes (dilution

and attenuation) that reduce contaminant concentrations in the subsurface. USEPA selected the default DAF factor of 20 to reflect a contaminant's threat to groundwater resources (e.g., receptor points) as it is transported through an aquifer. The 20 DAF is applicable to this Facility based on its industrial setting and locations of receptor points in relation to the SWMUs.

For organic constituents in soil, definition of the extent of contamination was evaluated by screening the data to the generic 20 DAF SSL. For metallic parameters in soil, definition of the extent was also evaluated by screening the data to the 20 DAF SSL. Chromium screening was based upon its speciation in the environment (trivalent, hexavalent, and total). Data from slag samples indicated that slag has minimal hexavalent chromium at 1.44 milligram per kilogram (mg/Kg) or less as compared to total chromium (3,540 mg/Kg). This indicates that trivalent chromium is the predominant chromium species in slag. Since slag was widely used as fill and construction material at the Facility, the calculated 95% UTL for total chromium (3,540 mg/Kg) was used for screening total chromium results. An exception was made for SWMU 12 which contained petroleum refining wastes unique to that SWMU. For SWMU 12, the 20 DAF SSLs for trivalent and hexavalent chromium were used to screen the data. Since the migration of trivalent chromium to groundwater is not significant at any concentration, there is no established 20 DAF SSL for trivalent chromium. The hexavalent chromium 20 DAF SSL is 38 mg/Kg.

4.2.6.2 Groundwater Screening Criteria

Even though water from the site is not used for either drinking water or process water, maximum contaminant levels (MCLs) established in *Drinking Water Regulations and Health Advisories* (USEPA, 1998) were selected as a conservative measure for groundwater screening purposes. Definition of the extent of contamination was evaluated by screening the groundwater data to MCLs.

4.3 DATA PRESENTATION

Analytical data are presented throughout Chapters 5.0 through 24.0 in analytical results data tables, on figures, and in the nature and extent of contamination discussions. Supporting analytical result tables and figures for each chapter are found at the end of the chapter following

the text. In Chapters 5.0 through 24.0, duplicate samples collected during the RFI are provided on the analytical result data tables and included in the discussions regarding sampling activities and the nature and extent of contamination for an area.

A summary of chemical samples collected during the RFI is provided in the first table of each of Chapters 5.0 through 24.0. These investigation activity summary tables provide the sample locations and number of samples with depth (including duplicate samples), the associated RFI phase, and chemical analysis performed. Following the summary tables in each chapter are the analytical result data tables. Analytical result data tables in most cases have been condensed to show only the actual compounds detected in one or more of the samples listed on a table. In addition, the total concentrations for detected VOCs and/or SVOCs are provided on the tables. Qualifiers (B, F, J, J*, etc.) associated with individual detections were not carried through on the total concentrations.

Figures are provided in Chapters 5.0 through 24.0 to show the sampling locations for the area. In addition, each chapter contains figures that present results for the constituent of interest at the SWMU or AOC.

The nature and extent of contamination is described for each area in its respective text (Chapters 5.0 through 24.0). Provided in each chapter is a general description of the area, the scope of RFI activities completed, a discussion of the nature and extent of contamination, and a summary of the results of the risk evaluation as presented in Appendices X and Y. At the end of each chapter, a summary section is provided to summarize the overall findings for the area.

* * * * *

Table 4-1
RFI Analytical Methods
Armco Kansas City Facility

Analysis Type	Preparation Method		Analytical Method	Parameters		
	Water	Soil				
ORGANIC ANALYSIS						
Volatiles	--	--	SW846-8260	1,1,1-Trichloroethane	Benzene	m,p-Xylene
				1,1,2,2-Tetrachloroethane	Bromodichloromethane	Methyl chloride
				1,1,2-Trichloroethane	Bromoform	Methylene chloride
				1,1-Dichloroethane	Bromomethane	o-Xylene
				1,1-Dichloroethene	Carbon disulfide	Styrene
				1,2-Dichloroethane	Carbon tetrachloride	Tetrachloroethene
				1,2-Dichloroethene	Chlorobenzene	Toluene
				1,2-Dichloropropane	Chloroethane	trans-1,2-Dichloroethene
				2-Butanone	Chloroform	trans-1,3-Dichloropropene
				2-Chloroethylvinyl ether	cis-1,2-Dichloroethene	Trichloroethene
				2-Hexanone	cis-1,3-Dichloropropene	Vinyl acetate
				4-Methyl-2-pentanone	Dibromochloromethane	Vinyl chloride
				Acetone	Ethylbenzene	
Semivolatiles	SW846-3520B	SW846-3550A	SW846-8270	1,2,4-Trichlorobenzene	4-Chloroaniline	Di-n-octylphthalate
				1,2-Dichlorobenzene	4-Chlorophenyl-phenyl ether	Dibenzo(a,h)anthracene
				1,3-Dichlorobenzene	4-Methylphenol	Dibenzofuran
				1,4-Dichlorobenzene	4-Nitroaniline	Diethyl phthalate
				2,4,5-Trichlorophenol	4-Nitrophenol	Dimethyl phthalate
				2,4,6-Trichlorophenol	Acenaphthene	Fluoranthene
				2,4-Dichlorophenol	Acenaphthylene	Fluorene
				2,4-Dimethylphenol	Anthracene	Hexachlorobenzene
				2,4-Dinitrophenol	Benzo(a)anthracene	Hexachlorobutadiene
				2,4-Dinitrotoluene	Benzo(a)pyrene	Hexachlorocyclopentadiene
				2,6-Dinitrotoluene	Benzo(b)fluoranthene	Hexachloroethane
				2-Chloronaphthalene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
				2-Chlorophenol	Benzo(k)fluoranthene	Isophorone
				2-Methylnaphthalene	Benzoic acid	N-Nitroso-di-n-propylamine
				2-Methylphenol	Benzyl alcohol	N-Nitrosodiphenylamine
				2-Nitroaniline	Bis(2-chloroethoxy)methane	Napthalene
				2-Nitrophenol	Bis(2-chloroethyl)ether	Nitrobenzene
				3,3'-Dichlorobenzidine	Bis(2-chloroisopropyl)ether	Pentachlorophenol
				3-Nitroaniline	Bis(2-ethylhexyl)phthalate	Phenanthrene
				4,6-Dinitro-2-methylphenol	Butylbenzylphthalate	Phenol
				4-Bromophenyl-phenyl ether	Chrysene	Pyrene
				4-Chloro-3-methylphenol	Di-n-butylphthalate	

Table 4-1
RFI Analytical Methods
Armco Kansas City Facility

Analysis Type	Preparation Method		Analytical Method	Parameters		
	Water	Soil				
Polynuclear Aromatic Hydrocarbons	SW846-3520B	SW846-3550A	SW846-8270	Acenaphthene	Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene
				Acenaphthylene	Benzo(k)fluoranthene	Napthalene
				Anthracene	Chrysene	Phenanthrene
				Benzo(a)anthracene	Dibenzo(a,h)anthracene	Pyrene
				Benzo(a)pyrene	Fluoranthene	
				Benzo(b)fluoranthene	Fluorene	
Skinner's Volatiles	--	--	SW846-8260	1,2-Dibromomethane	Benzene	Ethylbenzene
				1,2-Dichloroethane	Carbon disulfide	Styrene
				1,4-Dioxane	Chlorobenzene	Toluene
				2-Butanone	Chloroform	Xylenes (total)
Skinner's Semivolatiles	SW846-3520B	SW846-3550A	SW846-8270	1-Methylnaphthalene	Butylbenzylphthalate	Methylchrysene
				2,4-Dimethylphenol	Chrysene	Methylphenols
				2,4-Dinitrophenol	Di-n-butylphthalate	Napthalene
				4-Nitrophenol	Di-n-octylphthalate	Phenanthrene
				7,12-Dimethylbenz(a)anthracene	Dibenz(a,h)acridine	Phenol
				Anthracene	Dibenzo(a,h)anthracene	Pyrene
				Benzo(a)anthracene	Dichlorobenzenes	Pyridine
				Benzo(a)pyrene	Diethyl phthalate	Quinoline
				Benzo(b)fluoranthene	Dimethyl phthalate	Thiophenol (Benzenthiol)
				Benzo(k)fluoranthene	Fluoranthene	
				Bis(2-ethylhexyl)phthalate	Indene	
Total Petroleum Hydrocarbons	--	--	SW846-8015M	TPH (volatile)	TPH as Gasoline	
	SW846-3550	SW846-3520	SW846-8015M	TPH (extractable)	Diesel Fuel	Motor Oil
INORGANIC ANALYSIS						
Metals	SW846-3010	SW846-3050	SW846-6010	Arsenic		
	SW846-3010	SW846-3050	SW846-6010	Barium		
	SW846-3010	SW846-3050	SW846-6010	Cadmium		
	SW846-3010	SW846-3050	SW846-6010	Chromium (total)		
	SW846-3010	SW846-3050	SW846-6010	Chromium (III)		
	--	--	SW846-7196	Hexavalent Chromium		
	SW846-3010	SW846-3050	SW846-6010	Lead		
	SW846-7470	SW846-7471	SW846-7470/7471	Mercury		
	SW846-3010	SW846-3050	SW846-6010	Selenium		
	SW846-3010	SW846-3050	SW846-6010	Silver		
MISCELLANEOUS ANALYSIS						
pH	--	--	SW846-9040/9045	pH		

Table 4-1
RFI Analytical Methods
Armco Kansas City Facility

Analysis Type	Preparation Method		Analytical Method	Parameters
	Water	Soil		
PHYSICAL ANALYSIS				
Soil	--	--	ASTM D421/D422	Sieve/Hydrometer
Properties	--	--	ASTM D4318	Atterberg Limits
	--	--	ASTM D2216 Mod.	Moisture Content
	--	--	SW846-9081	Cation Exchange Capacity
	--	--	SW846-9060	Total Organic Carbon
NATURAL ATTENUATION PARAMETERS				
Water Quality	--	--	field probe	pH
			field probe	Dissolved oxygen
			field probe	Oxidation-reduction potential
			field Hach	Ferrous iron
			RSK 175	Methane, ethane, and ethene
			SM-2320B	Alkalinity
			SW846-9056	Chloride
			SW846-9056	Nitrate
			SW846-9056	Nitrite as Nitrogen
			SW846-9056	Sulfate
			SW846-9030B	Sulfide
			SW846-9060M	Total Organic Carbon

Notes:

ASTM = Methods prefaced by "ASTM" are from the American Society for Testing and Materials

RSK = Methods prefaced by "RSK" are from USEPA's Robert S. Kerr Environmental Research Center

SM = Methods prefaced by "SM-" are from *Standard Methods for the Examination of Water and Wastewater* (APHA, 1992)

SW846 = Methods prefaced by "SW846-" are from *Test Methods for Evaluating Solid Waste* (USEPA, 1997)

Table 4-2
Slag Sample Results
Armco Kansas City Facility

Sample Point:		SL1/SR1	SL2/SR1	SL3/SR1	SL4/SR1	SL5/SR1	SL6/SR1	SL7/SR1
Date Sampled:		4/25/97	4/25/97	4/25/97	4/25/97	12/21/98	12/21/98	12/21/98
Sample Depth From:		0	0	0	0	0	0	0
Sample Depth To:		1	1	1	1	1	1	1
Laboratory Number:		D97-5144-21	D97-5144-22	D97-5144-23	D97-5144-24	36888.01	36888.02	36888.03
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	***9.08 D***	***2.99 D***	***6.77 D***	***8.3 D***	***7.5***	***5.8***	***4***
Barium, Total	mg/Kg	***248 J****	***354 J****	***245 J****	***216 J****	***206***	***162***	***274***
Cadmium, Total	mg/Kg	2.15 U	2.09 U	2.09 U	2.09 U	***4.2***	***3.7***	***4.4***
Chromium, Hexavalent	mg/Kg	***1.44***	0.1 U	0.1 U	0.1 U	***0.72***	***0.32***	***0.32***
Chromium, Total	mg/Kg	***1,500 J****	***1,290 J****	***1,280 J****	***1,330 J****	***3,630***	***1,250***	***2,410***
Lead, Total	mg/Kg	***65.3 J****	***28.8 J****	***47.6 J****	***45.2 J****	***8***	***24.7***	***23.4***
Mercury, Total	mg/Kg	0.129 U	0.126 U	0.125 U	0.126 U	0.033 U	0.035 U	0.036 U
Selenium, Total	mg/Kg	0.644 U	0.628 U	***2.6***	0.628 U	***11.8***	***5.4***	***7.7***
Silver, Total	mg/Kg	***3.74***	***2.46***	***3.12***	***2.73***	***1.6***	***1.2***	***1.3***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted Sample
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 4-2
Slag Sample Results
Armco Kansas City Facility

		Sample Point:	SL8/SR1	SL9/SR1	SL10/SR1
		Date Sampled:	12/21/98	12/21/98	12/21/98
		Sample Depth From:	0	0	0
		Sample Depth To:	1	1	1
		Laboratory Number:	36888.04	36888.05	36888.06
Metals, Total	UNITS				
Arsenic, Total	mg/Kg		***5.2***	***15.4***	***5.8***
Barium, Total	mg/Kg		***310***	***218***	***201***
Cadmium, Total	mg/Kg		***5.4***	***8.4***	***4.8***
Chromium, Hexavalent	mg/Kg		***0.33***	0.28 U	***0.32***
Chromium, Total	mg/Kg		***2,600***	***1,770***	***1,690***
Lead, Total	mg/Kg		***22.8***	***51.6***	***59.6***
Mercury, Total	mg/Kg		0.037 U	0.036 U	0.035 U
Selenium, Total	mg/Kg		***8.2***	***3***	***4.2***
Silver, Total	mg/Kg		***1.4***	1.1 U	***1.1***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted Sample
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 4-3
Calculated 95% UTL Concentrations for Slag Samples
Armco Kansas City Facility

Parameter	95% UTL Value (mg/Kg)
Arsenic, Total	14
Barium, Total	352
Cadmium, Total	8.4
Chromium, Hexavalent	1.44
Chromium, Total	3540
Lead, Total	73.6
Mercury, Total	0.0365
Selenium, Total	12
Silver, Total	3.9

Notes:

1. The 95% upper tolerance limit (UTL) was statistically determined from 10 slag samples. The 95% UTL is a statistical interval that is designed to capture 95% of a population (its coverage) with a specified confidence.

2. Calculation methodologies were taken from *Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites* (USEPA, 1995), and *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (USEPA, 1989).

Table 4-4
Screening Levels for Soil and Water Used to Define the Nature and Extent of Contamination
Armco Kansas City Facility

	Soil 20 DAF SSL	Water MCL
Metals	**(mg/kg)**	**(mg/L)**
Arsenic	***29***	***0.05***
Barium	***1600***	***2***
Cadmium	***8***	***0.005***
Chromium, Hexavalent	***38***	see Total Cr
Chromium, Trivalent	none[a]	see Total Cr
Chromium, Total	***3540***[b]	***0.1***
Lead	***400***	***0.015***
Mercury	***2***	***0.002***
Selenium	***5***	***0.05***
Silver	***34***	NG
Volatiles	**(µg/kg)**	**(µg/L)**
Acetone (2-Propanone)	***16000***	NL
Benzene	***30***	***5***
Bromodichloromethane	***600***	***100/80***
Bromoform (Tribromomethane)	***800***	***100/80***
Bromomethane (Methyl bromide)	***200***	NG
Carbon Disulfide	***32000***	NL
Carbon Tetrachloride	***70***	***5***
Chlorobenzene (Monochlorobenzene)	***1000***	***100***
Chloroethane (Monochloroethane, Ethyl Chloride)	NL	NG
Chloroform	***600***	***100/80***
Chloromethane (Methyl chloride)	NL	NG
2-Chloroethyl Vinyl Ether	NL	NL
Dibromochloromethane	***400***	***100/80***
1,1-Dichloroethane	***23000***	NL
1,2-Dichloroethane (EDC)	***20***	***5***
1,1-Dichloroethene (1,1-Dichloroethylene)	***60***	***7***
1,2-Dichloroethene (total)	see cis-/trans-	see cis-/trans-
cis-1,2-Dichloroethene	***400***	***70***
trans-1,2-Dichloroethene	***700***	***100***
1,2-Dichloropropane	***30***	***5***
cis-1,3-Dichloropropene	***4***	NG
trans-1,3-Dichloropropene	***4***	NG
Ethylbenzene	***13000***	***700***
2-Hexanone (Methyl Butyl Ketone)	NL	NL
Methylene Chloride	***20***	***5***
Methyl Ethyl Ketone (2-Butanone)	NL	NG
4-Methyl-2-Pentanone (Hexone, MIBK)	NL	NL
Styrene	***4000***	***100***
1,1,2,2-Tetrachloroethane	***3***	NG
Tetrachloroethene	***60***	***5***
Toluene	***12000***	***1000***
1,1,1-Trichloroethane	***2000***	***200***
1,1,2-Trichloroethane	***20***	***5***
Trichloroethene	***60***	***5***
Vinyl Acetate	***170000***	NL
Vinyl Chloride	***10***	***2***
Xylene (total)	see o-, m-, p-	***10000***
m-Xylene	***210000***	see total Xylene
o-Xylene	***190000***	see total Xylene
p-Xylene	***200000***	see total Xylene

Table 4-4
Screening Levels for Soil and Water Used to Define the Nature and Extent of Contamination
Armco Kansas City Facility

	Soil 20 DAF SSL	Water MCL
Skinner's Volatiles	**(µg/kg)**	**(µg/L)**
Benzene	***30***	***5***
Carbon Disulfide	***32000***	NL
Chlorobenzene (Monochlorobenzene)	***1000***	***100***
Chloroform	***600***	***100/80***
1,2-Dichloroethane	***20***	***5***
1,4-Dioxane	NL	NG
Ethylbenzene	***13000***	***700***
Ethylene Dibromide (1,2)	NL	***0.05***
Methyl Ethyl Ketone (2-Butanone)	NL	NG
Styrene	***4000***	***100***
Toluene	***12000***	***1000***
Xylene (total)	see o-, m-, p-	***10000***
m-Xylene	***210000***	see total Xylene
o-Xylene	***190000***	see total Xylene
p-Xylene	***200000***	see total Xylene
Semivolatiles	**(mg/kg)**	**(µg/L)**
Acenaphthene	***570***	NG
Acenaphthylene	NL	NL
Anthracene	***12000***	NG
Benzo(a)anthracene (Benz(a)anthracene)	***2***	NG
Benzo(b)fluoranthene	***5***	NG
Benzo(k)fluoranthene	***49***	NG
Benzo(g,h,i)perylene	NL	NG
Benzo(a)pyrene	***8***	***0.2***
Benzoic Acid	***400***	NL
Benzyl alcohol	NL	NL
4-Bromophenyl phenyl ether	NL	NL
Butyl benzyl phthalate	***930***	NG
4-Chloroaniline (p-Chloroaniline)	***0.7***	NL
bis(2-Chloroethoxy)methane	NL	NL
bis(2-Chloroethyl)ether	***0.0004***	NL
bis(2-Chloroisopropyl)ether	NL	NG
bis(2-ethylhexyl)phthalate	***3600***	***6***
4-Chloro-3-methylphenol	NL	NL
2-Chloronaphthalene	NL	NL
2-Chlorophenol	***4***	NG
4-Chlorophenyl phenyl ether	NL	NL
Chrysene	***160***	NG
Dibenzo(a,h)anthracene	***2***	NL
Dibenzofuran	NL	NL
Di-n-butyl phthalate	***2300***	NL
1,2-Dichlorobenzene (ortho-dichlorobenzene)	***17***	***600***
1,3-Dichlorobenzene (meta-dichlorobenzene)	NL	NL
1,4-Dichlorobenzene (para-dichlorobenzene)	***2***	***75***
3,3'-Dichlorobenzidine	***0.007***	NL
2,4-Dichlorophenol	***1***	NG
Diethyl phthalate	***470***	NG
2,4-Dimethylphenol	***9***	NL
Dimethylphthalate	NL	NG
4,6-Dinitro-2-methylphenol	NL	NL
2,4-Dinitrophenol	***0.3***	NL

Table 4-4
Screening Levels for Soil and Water Used to Define the Nature and Extent of Contamination
Armco Kansas City Facility

	Soil 20 DAF SSL	Water MCL
Semivolatiles (continued)	**(mg/kg)**	**(µg/L)**
2,4-Dinitrotoluene	***0.0008***	NG
2,6-Dinitrotoluene	***0.0007***	NG
Di-n-octylphthalate	***10000***	NL
Fluoranthene	***4300***	NL
Fluorene	***560***	NG
Hexachlorobenzene	***2***	***1***
Hexachlorobutadiene	***2***	NG
Hexachlorocyclopentadiene	***400***	***50***
Hexachloroethane	***0.5***	NG
Indeno(1,2,3-cd)pyrene	***14***	NG
Isophorone	***0.5***	NG
2-Methylnaphthalene	NL	NL
2-Methylphenol (o-Cresol)	***15***	NL
4-Methylphenol (p-Cresol)	NL	NL
Naphthalene	***84***	NG
2-Nitroaniline	NL	NL
3-Nitroaniline	NL	NL
4-Nitroaniline	NL	NL
Nitrobenzene	***0.1***	NL
2-Nitrophenol	NL	NL
4-Nitrophenol	NL	NG
N-Nitroso-di-n-propylamine	***0.00005***	NL
N-Nitrosodiphenylamine	***1***	NL
Pentachlorophenol	***0.03***	***1***
Phenanthrene	NL	NG
Phenol	***100***	NG
Pyrene	***4200***	NG
1,2,4-Trichlorobenzene	***5***	***70***
2,4,5-Trichlorophenol	***270***	NL
2,4,6-Trichlorophenol	***0.2***	NG
Skinner's Semivolatiles	**(mg/kg)**	**(µg/L)**
Benzenethiol	NL	NL
Cresols (Methylphenols, as 2-methylphenol))	***15***	NL
2,4-Dimethylphenol	***9***	NL
2,4-Dinitrophenol	***0.3***	NL
4-Nitrophenol	NL	NG
Phenol	***100***	NG
Anthracene	***12000***	NG
Benzo(a)anthracene	***2***	NG
Benzo(b)fluoranthene	***5***	NG
Benzo(k)fluoranthene	***49***	NG
Benzo(a)pyrene	***8***	***0.2***
Bis(2-ethylhexyl)phthalate	***3600***	***6***
Butyl benzyl phthalate	***930***	NG
Chrysene	***160***	NG
Dibenz(a,j)acridine	NL	NL
Dibenz(a,h)anthracene	***2***	NL
Dichlorobenzenes (listed individually under SVOCs)	***2-17***	***75-600***
Diethyl phthalate	***470***	NG
7,12-Dimethylbenz(a)anthracene	NL	NL
Dimethyl phthalate	NL	NG
Di-n-butyl phthalate	***2300***	NG

Table 4-4
Screening Levels for Soil and Water Used to Define the Nature and Extent of Contamination
Armco Kansas City Facility

	Soil 20 DAF SSL	Water MCL
Skinner's Semivolatiles (continued)	**(mg/kg)**	**(µg/L)**
Di-n-octyl phthalate	***10000***	NL
Fluoranthene	***4300***	NL
Indene	NL	NL
Methyl chrysene	NL	NL
1-Methylnaphthalene	NL	NL
Naphthalene	***84***	NG
Phenanthrene	NL	NG
Pyrene	***4200***	NG
Pyridine	NL	NL
Quinoline	NL	NL

Notes:

[a] = For trivalent chromium, chemical-specific properties are such that the migration to groundwater pathway is not of concern at any soil concentration.

[b] = Total Chromium SSL is derived from the 95% UTL calculations for slag samples (see Subection 4.2.3) and Table 4-3.

DAF = Dilution Attenuation Factor

MCL = Maximum Contaminant Level

NG = Compound listed in Guidance Document, but MCL was not given.

NL = Compound not listed in Guidance Document

SSL = Soil Screening Level

Sources

Soil Screening Guidance: Technical Background Document
USEPA. April 1996. Office of Emergency And Remedial Response.

Drinking Water Regulations and Health Advisories
USEPA. September 1998. Office of Water.

5.0 SWMU 2 – OLD BLUE RIVER "W" LANDFILL

5.1 SWMU BACKGROUND

5.1.1 Description of SWMU

The Old Blue River "W" Landfill (SWMU 2), located on Armco property (see Figure 1-2), is a closed landfill previously utilized to manage emission control dust and solid waste. The SWMU was created in the summer of 1965 as part of the rechannelization work on the Old Blue River. A portion of the old riverbed, which is in the shape of a "W", was used to dispose of emission control dust generated in the No. 1 and No. 2 Melt Shop electric arc furnaces. In addition, general plant and office trash was also disposed of in this SWMU. This SWMU is estimated to contain approximately 185,000 cubic yards of material.

The SWMU, which covers an area of approximately 15 acres, was operated until 1980 when Armco began managing their emission control dust in the RCRA landfill. Following the completion of the disposal activities, the SWMU 2 landfill was closed through construction of a soil cap (approximately three feet of compacted soil) and a vegetative cover. The soil cover and vegetative stand remain in good condition.

This site has been classified as a Class III Site on the Missouri Registry of Confirmed Abandoned or Uncontrolled Sites. Class III is defined as "does not present a significant threat to public health or the environment – action may be deferred."

Based on the types of materials handled at SWMU 2, the primary constituents of potential concern were lead and cadmium associated with emission control dust.

5.1.2 Release Potential

There are no records of any spills or releases associated with this SWMU. Currently there is limited potential for release due to the nature of the material contained in the landfill and the soil

cap and vegetative cover which have been constructed over the SWMU. Potential media of concern include subsurface soil and groundwater.

5.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was assessed through the collection of groundwater samples. Table 5-1 presents a summary of the investigation activities for SWMU 2. Figure 5-1 depicts the sampling locations.

Groundwater samples were collected from nine direct-push borings (Borings 02B01 through 02B09), field filtered, and analyzed for dissolved lead and cadmium during RFI Phase 1. To further define the extent of dissolved lead, groundwater was sampled and analyzed for dissolved lead from an additional nine direct-push borings (Boring 02B04A and 02B10 through 02B17) during RFI Phase 2. Due to odors encountered during conductivity probing in the SWMU 2 area, VOCs were also analyzed for the Phase 2 RFI groundwater samples. In addition, SVOCs were analyzed for the groundwater sample collected from Boring 02B16.

5.3 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

Table 5-2 presents the analytical results for SWMU 2. The following subsections summarize the nature and extent of groundwater contamination by analysis type for SWMU 2.

5.3.1 Dissolved Metals

Figure 5-2 presents the dissolved lead and cadmium results for SWMU 2.

Dissolved cadmium was not detected in the groundwater samples. Since no detections of dissolved cadmium occurred, its groundwater screening MCL was not exceeded. As shown on Figure 5-2, the extent of dissolved cadmium in groundwater was adequately characterized at SWMU 2.

Dissolved lead was detected in 11 of the 18 groundwater samples, and exceeded the groundwater screening MCL of 0.015 milligrams per liter (mg/L) in seven of the groundwater samples. Table 5-3 presents the groundwater results that exceeded screening levels at SWMU 2. As shown, dissolved lead concentrations above the MCLs were located primarily in the central and eastern portions of the SWMU. The groundwater sample from Boring 02B04 contained an anomalously high concentration of dissolved lead at 18.1 mg/L. To confirm this detection, Boring 02B04A was installed. Its dissolved lead concentration was 0.116 mg/L. However, groundwater in this boring was encountered at a shallower depth (at 4 feet bgs) than is typically encountered for the saturated zone (typically between 15 to 20 feet bgs), and Boring 02B04A appears to have been a perched groundwater occurrence. With these exceptions, remaining dissolved lead detections above the MCL, ranged up to 0.069 mg/L. Two of these detections (at Borings 02B16 and 02B17) also appeared to have been perched groundwater occurrences.

As shown on Figure 5-2, the extent of dissolved lead was adequately characterized to the south (upgradient), west, and east of SWMU 2. Dissolved lead concentrations in the surrounding borings ranged from non-detect to 0.012 mg/L.

Accessibility problems limited sampling downgradient (i.e. on the north side of the Levee) of Boring 02B17, whose dissolved lead concentration of 0.0337 mg/L exceeded the groundwater screening MCL. Access to the north side of the levee was feasible on the west end of SWMU 2 in the area north of SWMU 4. Groundwater samples collected in that area (as part of the SWMU 4 investigation activities; see Chapter 7.0) did not show dissolved lead detections.

5.3.2 VOCs

Figure 5-3 presents the total VOC groundwater results for SWMU 2.

During RFI Phase 2, odors were encountered during conductivity probing in the SWMU 2 area. Therefore, groundwater samples were collected for VOC analysis from all nine RFI Phase 2 direct-push borings.

VOCs were not detected at three of the nine locations (Borings 02B10, 02B13, and 02B14) where samples were collected in the main aquifer at 20 to 24 feet bgs. VOCs were also not detected in the sample collected at Boring 02B17; however, the results for this sample were rejected during the QC evaluation due to a possible low-bias for the VOC data (as indicated on Table 5-2 by the "R" qualifier) (see Appendix W for the RFI Phase 2 Quality Control Evaluation Report).

VOCs were detected at concentrations below the groundwater screening MCLs at locations 02B11 and 02B12 where samples were collected in the saturated zone at 18 to 22 feet bgs. Trans-1,2-dichloroethene (trans-1,2-DCE) was detected at an estimated concentration of 2.6 JT micrograms per liter (µg/L) at location 02B11; however, trans-1,2-DCE was also detected in the trip blank, which indicates possible sample contamination. 1,1-Dichloroethene (1,1-DCE) was detected at an estimated concentration of 3.78 J µg/L at location 02B12. No other VOCs were detected in groundwater samples collected from Borings 02B11 and 02B12.

Samples from Borings 02B04A, 02B15, and 02B16 were collected from the apparent perched groundwater occurrences at depths ranging from 3 to 8 feet bgs. At each of these locations, one or more of the detected VOCs exceeded the groundwater screening MCLs. These exceedences are presented in Table 5-3. Total VOC concentrations in these three borings were 784.3, 413.2, and 26,240 µg/L, respectively.

The groundwater sample from Boring 02B04A contained the only detections of 1,1-dichloroethane (1,1-DCA) (52.7 µg/L), acetone (26.8 J µg/L), and benzene (5.79 µg/L) at SWMU 2, and the benzene detection exceeded its groundwater screening MCL of 5 µg/L. Methylene chloride (33.7 µg/L) was only detected at Boring 02B15, and its concentration exceeded the 5 µg/L groundwater screening MCL. Toluene was detected in the samples collected from Borings 02B15 (9.77 µg/L) and 02B04A (118 µg/L), and did not exceed screening levels. Ethylbenzene was detected in samples from all three borings at concentrations ranging from 61.4 to 4,140 µg/L. Only the sample from 02B16 exceeded the ethylbenzene groundwater screening MCL (700 µg/L). Xylenes (m,p-xylene and/or o-xylene) were detected

in samples from all three borings at concentrations ranging from 87.3 µg/L to 16,700 µg/L. Only the sample from 02B16 exceeded the xylene (total) groundwater screening MCL (10,000 µg/L). The nature and extent of VOC detections were adequately characterized to the south (upgradient), west, and east of SWMU 2. Physical accessibility problems limited sampling in the area downgradient of 02B15 (i.e. north of the levee). All VOC exceedences of groundwater screening MCLs were limited to the apparent perched groundwater. No exceedences of the VOC groundwater screening MCLs were noted in the saturated zone groundwater samples.

5.3.3 SVOCs

During RFI Phase 2, odors were encountered during conductivity probing in the SWMU 2 area. Therefore, a groundwater sample was collected for SVOC analysis from the first boring installed at SWMU 2 during RFI Phase 2 (Boring 02B16). The sample from the boring was collected from the apparent perched groundwater occurrence at 3 to 7 feet bgs. 2,4-Dimethylphenol (67 DJ µg/L) and isophorone (52 DJ µg/L) were the only SVOCs detected. No groundwater MCLs exist for either of these compounds. No additional SVOC samples were subsequently collected at SWMU 2.

5.4 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 2, as summarized in Table 3-1, include subsurface (soil transfer to groundwater and groundwater transport) and air (volatilization). A soil cap with vegetative cover is constructed over SWMU 2 that limits storm water runoff contacting landfill materials and prevents landfill materials from becoming airborne. Therefore, storm water runoff, surface water transport, and airborne dust transport are not considered pathways for constituent migration at SWMU 2.

The nature and extent of contamination at SWMU 2 was assessed through the collection of groundwater samples. Dissolved lead and VOCs were detected in the groundwater beneath SWMU 2, suggesting that vertical migration from soil to water may have occurred. The tendency for metals to strongly adsorb to soil and the presence of the soil cap constructed over the SWMU that minimizes storm water infiltration should limit the potential for release from the

landfill. Several of the dissolved lead detections and all of the VOC detections at concentrations above MCLs occurred in perched groundwater samples (Borings 02B04A, 02B15, 02B16, and 02B17) encountered at shallow depths (0 to 8 feet bgs; approximate elevations ranging from 729 to 732 feet above MSL). The saturated zone at SWMU 2 is typically encountered at approximate elevations ranging from 711 to 719 feet above MSL. SWMU 2 is located approximately 600 to 700 feet south of the Blue River. Groundwater is expected to flow toward the Blue River in a north-northeast direction. VOCs, given their chemical and physical characteristics, are expected to degrade and/or volatilize as they move in the direction of groundwater flow. Metals, given their strong adsorption to soil, are not expected to migrate significantly with groundwater movement.

VOCs in the subsurface may partition to the gas phase and may migrate to the air pathway. Given the nature of the landfill cap (soil material), the potential for vapor migration through this cap is decreased and the air pathway is not expected to be a significant route for constituent migration.

5.5 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted for SWMU 2.

5.5.1 Human Health Evaluation

Groundwater samples from perched water zones, as opposed to the saturated zone, were not considered part of the groundwater for purposes of the human health risk assessment (HHRA). Although lead was identified as a chemical of potential concern (COPC) in groundwater at SWMU 2, there were no completed exposure pathways. Therefore, further human health risk evaluation was not performed.

5.5.2 Ecological Evaluation

Since SWMU 2 is a capped landfill, no significant ecological exposure pathways were completed. Therefore, an ecological risk evaluation was not conducted for SWMU 2.

5.6 SUMMARY

SWMU 2, located in the eastern portion of the Facility, is a closed landfill previously utilized to manage emission control dust and solid waste. It covers an area of approximately 15 acres. Groundwater samples were collected around the SWMU for dissolved cadmium, dissolved lead, VOC, and/or SVOC analyses. As shown on Figures 5-2 and 5-3, the horizontal extent of groundwater contamination at SWMU 2 was adequately defined by sampling locations around the perimeter of the area.

Dissolved cadmium was not detected at any of the sampling locations. Dissolved lead was detected below the 0.015 mg/L groundwater screening MCL in 11 of the 18 groundwater samples and primarily surrounded dissolved lead detections above the MCL. Four of the seven samples with concentrations above the MCL were collected from encountered perched groundwater. Dissolved lead concentrations from the saturated zone samples ranged up to 0.069 mg/L (not including the one detection at 18.1 mg/L that is an apparent anomaly).

VOCs were detected in five out of nine groundwater samples, but only three samples had one or more VOC detections that exceeded screening levels. One detection each of benzene (5.79 µg/L), ethylbenzene (4,140D µg/L), total xylenes (22,100 µg/L), and methylene chloride (33.7 µg/L) exceeded groundwater screening MCLs (5, 700, 10,000, and 5 µg/L, respectively). All VOC exceedences occurred in perched groundwater samples, and samples from the saturated zone contained either non-detections or detections of VOCs at concentrations below groundwater screening MCLs. SVOC analysis was performed on one groundwater sample and only one detection each of 2,4-dimethylphenol and isophorone occurred (no MCLs exist for these compounds).

Potential migration pathways at SWMU 2 include soil transfer to groundwater, groundwater transport, and volatilization to the air. The potential for both soil transfer to groundwater and volatilization to air is limited due to the soil cap and vegetative cover constructed over the landfill that limits infiltration of storm water through the landfill and contact with landfill contents. Based on the data, soil transfer to groundwater may have occurred due to the presence of VOCs and dissolved lead in the groundwater at SWMU 2. SWMU 2 is located approximately 600 to 700 feet south of the Blue River, and groundwater is expected to flow in a north-northeast direction toward the Blue River. VOCs are expected to degrade as they migrate in the direction of groundwater flow. However, VOCs were primarily detected in groundwater samples collected from the perched groundwater, and VOCs were either not-detected or detected in concentrations below MCLs in groundwater samples collected from the saturated zone. Dissolved lead in groundwater is not expected to migrate significantly with groundwater given its strong soil adsorption properties. Several of the higher concentrations of dissolved lead (above the MCL) were also from samples collected from the encountered perched groundwater.

A risk evaluation was conducted for SWMU 2. For the human health evaluation, lead in groundwater was identified as a COPC. There were no completed exposure pathways; therefore, further human health risk evaluation was not performed. There were no significant ecological exposure pathways completed; therefore, an ecological risk evaluation was not conducted.

* * * * *

Table 5-1
SWMU 2 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Chemical Analysis					
					Dissolved					
Point	Designator	(ft)	Collected	Phase	Lead	Cadmium	VOC	SVOC	Comments	Lab ID Number
DIRECT-PUSH GROUNDWATER SAMPLES										
02B01	DW1	16-18	3/17/1997	1	X	X				D97-3254-1
02B02	DW1	17-19	3/17/1997	1	X	X				D97-3254-2
	DW1D	17-19	3/17/1997	1	X	X			Field Duplicate	D97-3254-3
02B03	DW1	17-19	3/18/1997	1	X	X				D97-3254-4
02B04	DW1	16-18	3/18/1997	1	X	X				D97-3254-5
02B04A	DW1	4-8	5/15/1998	2	X		X			D98-3702-11
02B05	DW1	16-18	3/18/1997	1	X	X				D97-3254-6
02B06	DW1	16-18	3/18/1997	1	X	X				D97-3254-7
02B07	DW1	15-17	3/18/1997	1	X	X				D97-3254-8
	DW1MS	15-17	3/18/1997	1	X	X			Matrix Spike	D97-3254-9
	DW1MSD	15-17	3/18/1997	1	X	X			Matrix Spike Duplicate	D97-3254-10
02B08	DW1	13-15	3/18/1997	1	X	X				D97-3254-11
02B09	DW1	18-20	3/18/1997	1	X	X				D97-3254-12
02B10	DW1	20-24	5/15/1998	2	X		X			D98-3702-10
02B11	DW1	18-22	5/15/1998	2	X		X			D98-3702-2
02B12	DW1	18-22	5/15/1998	2	X		X			D98-3702-3
	DW1MS	18-22	5/15/1998	2	X		X		Matrix Spike	D98-3702-4
	DW1MSD	18-22	5/15/1998	2	X		X		Matrix Spike Duplicate	D98-3702-5
02B13	DW1	20-24	5/15/1998	2	X		X			D98-3702-6
	DW1D	20-24	5/15/1998	2	X		X		Field Duplicate	D98-3702-7
02B14	DW1	20-24	5/15/1998	2	X		X			D98-3702-8
02B15	DW1	4-8	5/15/1998	2	X		X			D98-3702-9
02B16	DW1	3-7	5/7/1998	2	X		X	X		D98-3498-1
02B17	DW1	0-3	5/15/1998	2	X		X			D98-3702-12

Notes:
ft = feet
SVOC = Semivolatile Organic Compounds
VOC = Volatile Organic Compounds

Table 5-2
SWMU 2 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		02B01/DW1	02B02/DW1	02B02/DW1D	02B03/DW1	02B04/DW1	02B04A/DW1	02B05/DW1
Date Sampled:		03/17/1997	03/17/1997	03/17/1997	03/18/1997	03/18/1997	05/15/1998	03/18/1997
Sample Depth From:		16	17	17	17	16	4	16
Sample Depth To:		18	19	19	19	18	8	18
Laboratory Number:		D97-3254-1	D97-3254-2	D97-3254-3	D97-3254-4	D97-3254-5	D98-3702-11	D97-3254-6
Sample Type:				Duplicate				
Volatiles	UNITS							
1,1-Dichloroethane	ug/L	NA	NA	NA	NA	NA	***52.7***	NA
1,1-Dichloroethene	ug/L	NA	NA	NA	NA	NA	5 U U	NA
Acetone	ug/L	NA	NA	NA	NA	NA	***26.8*** J	NA
Benzene	ug/L	NA	NA	NA	NA	NA	***5.79*** 5U	NA
Ethylbenzene	ug/L	NA	NA	NA	NA	NA	***123*** 48	NA
m,p-Xylene	ug/L	NA	NA	NA	NA	NA	***291***	NA
Methylene chloride	ug/L	NA	NA	NA	NA	NA	5 U	NA
o-Xylene	ug/L	NA	NA	NA	NA	NA	***167*** 46.9	NA
Toluene	ug/L	NA	NA	NA	NA	NA	***118*** 76.6	NA
trans-1,2-Dichloroethene	ug/L	NA	NA	NA	NA	NA	5 U	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	NA	NA	NA	NA	NA	***784.29***	NA
Semivolatiles	UNITS							
2,4-Dimethylphenol	ug/L	NA	NA	NA	NA	NA	NA	NA
Isophorone	ug/L	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	NA	NA	NA	NA	NA	NA
Metals, Dissolved	UNITS							
Lead, Dissolved	mg/L	***0.012***	0.003 U	0.003 U	***0.029***	***18.1***	***0.116***	0.003 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 5-2
SWMU 2 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		02B06/DW1	02B07/DW1	02B08/DW1	02B09/DW1	02B10/DW1	02B11/DW1	02B12/DW1
Date Sampled:		03/18/1997	03/18/1997	03/18/1997	03/18/1997	05/15/1998	05/15/1998	05/15/1998
Sample Depth From:		16	15	13	18	20	18	18
Sample Depth To:		18	17	15	20	24	22	22
Laboratory Number:		D97-3254-7	D97-3254-8	D97-3254-11	D97-3254-12	D98-3702-10	D98-3702-2	D98-3702-3
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
Acetone	ug/L	NA	NA	NA	NA	100 U	100 U	100 U
Benzene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
Ethylbenzene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
m,p-Xylene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
Methylene chloride	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
o-Xylene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
Toluene	ug/L	NA	NA	NA	NA	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	NA	NA	NA	NA	5 U	*2.6 JT*	5 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	NA	NA	NA	NA	ND	*2.6*	ND
Semivolatiles	UNITS							
2,4-Dimethylphenol	ug/L	NA	NA	NA	NA	NA	NA	NA
Isophorone	ug/L	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	NA	NA	NA	NA	NA	NA
Metals, Dissolved	UNITS							
Lead, Dissolved	mg/L	*0.047*	0.003 U	*0.069*	*0.003*	0.005 U	0.005 U	*0.0032 J*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 5-2
SWMU 2 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		02B12/DW1	02B13/DW1	02B13/DW1D	02B14/DW1	02B15/DW1	02B16/DW1	02B17/DW1
Date Sampled:		05/15/1998	05/15/1998	05/15/1998	05/15/1998	05/15/1998	05/07/1998	05/15/1998
Sample Depth From:		18	20	20	20	4	3	0
Sample Depth To:		22	24	24	24	8	7	3
Laboratory Number:		D98-3702-3R2	D98-3702-6	D98-3702-7	D98-3702-8	D98-3702-9	D98-3498-1	D98-3702-12
Sample Type:		Reanalysis		Duplicate				
Volatiles	UNITS							
1,1-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1,250 DU	10 DUR
1,1-Dichloroethene	ug/L	***3.78*** ***J***	5 U	5 U	5 U	5 U	1,250 DU	10 DUR
Acetone	ug/L	100 U	100 U	100 U	100 U	100 U	25,000 DU	200 DUR
Benzene	ug/L	5 U	5 U	5 U	5 U	5 U	1,250 DU	10 DUR
Ethylbenzene	ug/L	5 U	5 U	5 U	5 U	***61.4***	***4,140*** ***D***	10 DUR
m,p-Xylene	ug/L	5 U	5 U	5 U	5 U	***221***	***16,700*** ***D***	10 DUR
Methylene chloride	ug/L	5 U	5 U	5 U	5 U	***33.7***	1,250 DU	10 DUR
o-Xylene	ug/L	5 U	5 U	5 U	5 U	***87.3***	***5,400*** ***D***	10 DUR
Toluene	ug/L	5 U	5 U	5 U	5 U	***9.77***	1,250 DU	10 DUR
trans-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1,250 DU	10 DUR
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	***3.78***	ND	ND	ND	***413.17***	***26,240***	ND
Semivolatiles	UNITS							
2,4-Dimethylphenol	ug/L	NA	NA	NA	NA	NA	***67*** ***DJ***	NA
Isophorone	ug/L	NA	NA	NA	NA	NA	***52*** ***DJ***	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	NA	NA	NA	NA	***119***	NA
Metals, Dissolved	UNITS							
Lead, Dissolved	mg/L	NA	0.005 U	0.005 U	0.005 U	***0.009***	***0.0197***	***0.0337***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 5-3
SWMU 2 Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Volatiles	**(µg/L)**			**(µg/L)**
Benzene	5	02B04A / DW1	4 - 8	5.79
Ethylbenzene	700	02B16 / DW1	3 - 7	4140 D
Methylene chloride	5	02B15 / DW1	4 - 8	33.7
m,p-Xylene	10000	02B16 / DW1	3 - 7	16700 D
o-Xylene	(total xylenes)			5400 D
Metals, Dissolved	**(mg/L)**			**(mg/L)**
Lead, Dissolved	0.015	02B03 / DW1	17 - 19	0.029
		02B04 / DW1	16 - 18	18.1
		02B04A / DW1	4 - 8	0.116
		02B06 / DW1	16 - 18	0.047
		02B08 / DW1	13 - 15	0.069
		02B16 / DW1	3 - 7	0.0197
		02B17 / DW1	0 - 3	0.0337

Notes:

D = Sample was diluted prior to analysis.

ft = feet

MCL = Maximum Contaminant Level

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k:\armcorfi\austn.sup\site.dgn
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SWMU2.DGN/8-APR-99 16:11/DLS

BIG BLUE RIVER

SWMU 4

SWMU 2

02B01
02B02
02B03
02B04
02B04A
02B05
02B06
02B07
02B08
02B09
02B10
02B11
02B12
02B13
02B14
02B15
02B16
02B17

720
730
740

LEGEND

- DIRECT-PUSH BORING LOCATION
- SWMU BOUNDARY
- RAILROAD

NORTH

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 5-1
SWMU 2 GROUNDWATER SAMPLING LOCATIONS

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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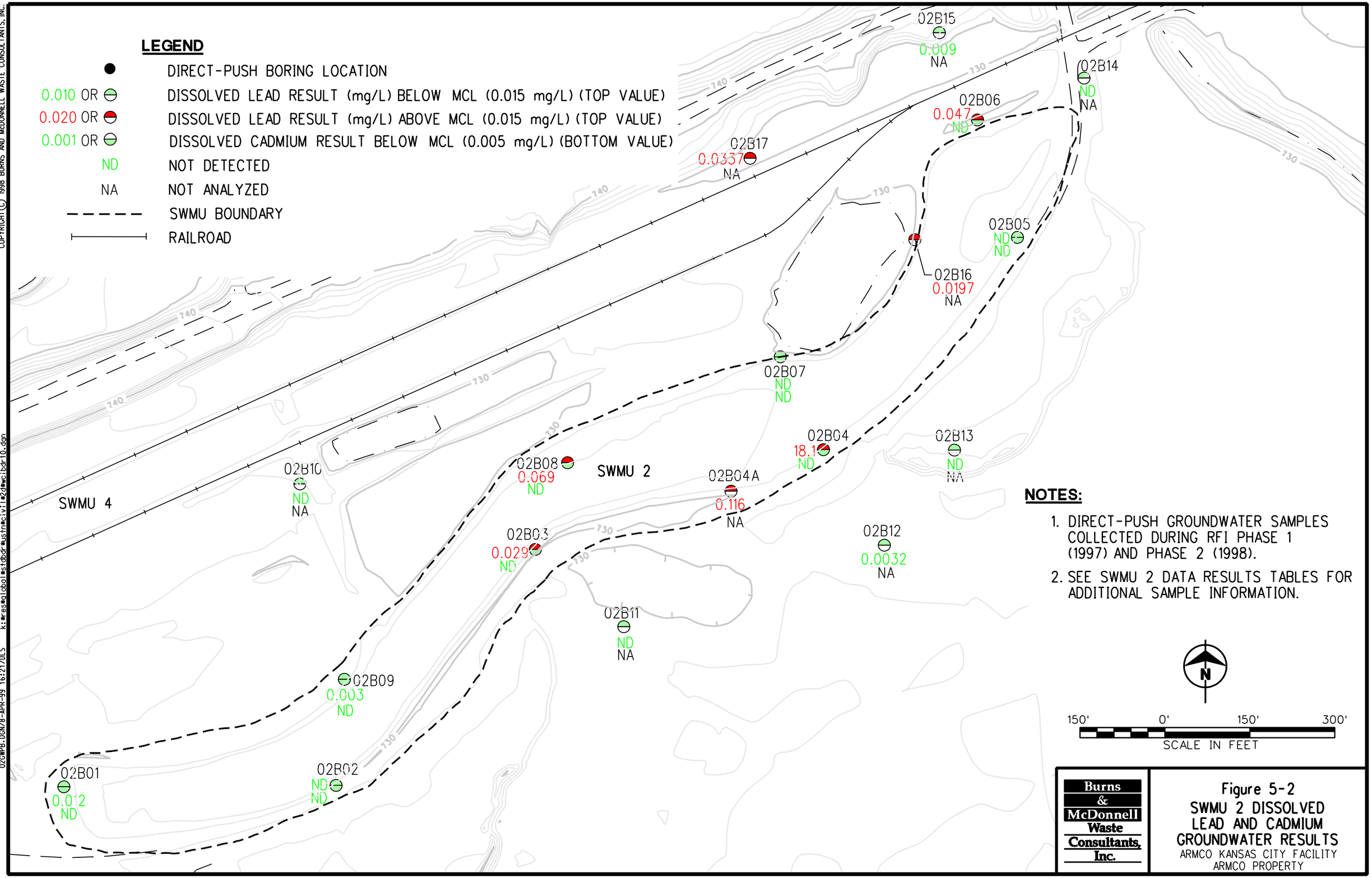
LEGEND

- ● DIRECT-PUSH BORING LOCATION
- 0.010 OR ⊖ DISSOLVED LEAD RESULT (mg/L) BELOW MCL (0.015 mg/L) (TOP VALUE)
- 0.020 OR ◓ DISSOLVED LEAD RESULT (mg/L) ABOVE MCL (0.015 mg/L) (TOP VALUE)
- 0.001 OR ⊖ DISSOLVED CADMIUM RESULT BELOW MCL (0.005 mg/L) (BOTTOM VALUE)
- ND NOT DETECTED
- NA NOT ANALYZED
- SWMU BOUNDARY
- RAILROAD



NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
2. SEE SWMU 2 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 5-2
SWMU 2 DISSOLVED LEAD AND CADMIUM GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\kcmcorfi\ustn.sup\site.dgn
k:\kcmcorfi\ustn\ref98\swmu0001.dgn
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02GWPB.DGN/8-APR-99 16:21/DLS

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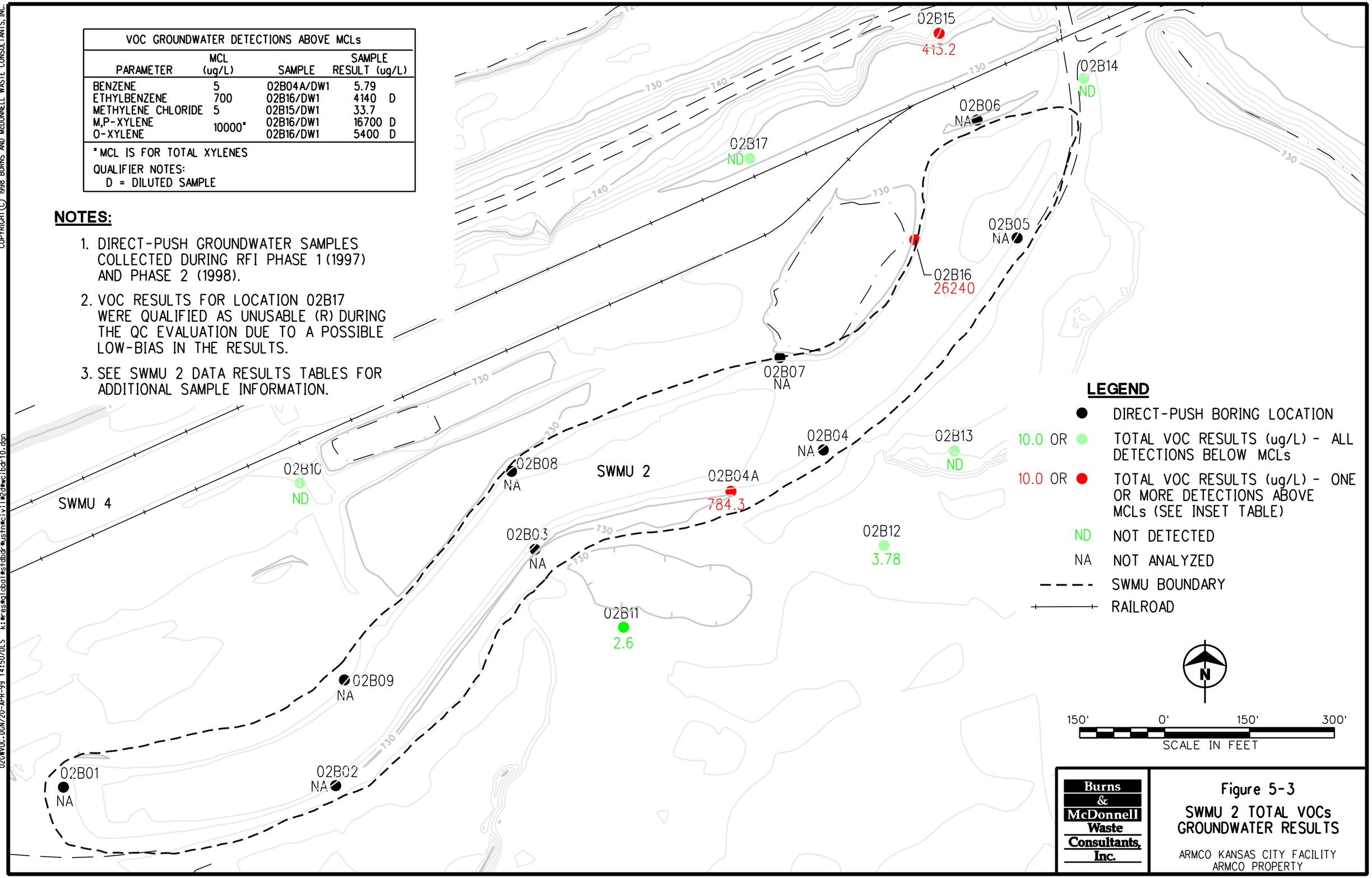
VOC GROUNDWATER DETECTIONS ABOVE MCLs				
PARAMETER	MCL (ug/L)	SAMPLE	SAMPLE RESULT (ug/L)	
BENZENE	5	02B04A/DW1	5.79	
ETHYLBENZENE	700	02B16/DW1	4140	D
METHYLENE CHLORIDE	5	02B15/DW1	33.7	
M,P-XYLENE	10000*	02B16/DW1	16700	D
O-XYLENE		02B16/DW1	5400	D

*MCL IS FOR TOTAL XYLENES

QUALIFIER NOTES:
D = DILUTED SAMPLE

NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
2. VOC RESULTS FOR LOCATION 02B17 WERE QUALIFIED AS UNUSABLE (R) DURING THE QC EVALUATION DUE TO A POSSIBLE LOW-BIAS IN THE RESULTS.
3. SEE SWMU 2 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.



LEGEND

- DIRECT-PUSH BORING LOCATION
- 10.0 OR — TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR — TOTAL VOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE)
- ND NOT DETECTED
- NA NOT ANALYZED
- SWMU BOUNDARY
- RAILROAD

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 5-3
SWMU 2 TOTAL VOCs GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:*armcorfi*usfn.sup*site.dgn
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k:*armcorfi\usfn.sup*armcona.dgn
u:*armco*speed*f11-well.dgn
k:*armcorfi*usfn.sup*3dswmu.dgn
k:*es*gl0001*stdbor*usfn*civil*2d*wcibdr10.dgn
026WVOC.DGN/20-APR-99 14:50/DLS

6.0 SWMU 3 – SOUTH OF BAR FAB LANDFILL

6.1 SWMU BACKGROUND

6.1.1 Description of SWMU

The South of Bar Fab Landfill (SWMU 3) is located partially on Armco property (see Figure 1-2) and partially on property owned by the City of Kansas City, Missouri. SWMU 3 is a closed landfill previously utilized to manage emission control dust and various solid waste. The SWMU became operational in 1962 when baghouses were installed to collect emission control dust generated in the No. 1 Melt Shop electric arc furnaces.

SWMU 3, which covers an area of just over 1 acre, was operated until 1965 when Armco began managing their emission control dust in the Old Blue River "W" Landfill (SWMU 2). In 1980, the South of Bar Fab Landfill (SWMU 3) was closed through construction of a soil cap (approximately three feet of compacted soil) and a vegetative cover. A portion of the area in the general vicinity of the SWMU, including a portion of the landfill itself, was deeded to the City in 1983 for completion of channel work on the adjacent Blue River. In 1988, Armco became aware that the cap had been disturbed during additional channel improvements. The cap was subsequently upgraded on the western portion of the landfill to a concrete cover, which was also extended across a drainage culvert located along the northern edge of the landfill. Detailed information concerning the concrete capping activities was provided in Appendix BB to the Permit Application (BMcD, 1987).

An investigation was conducted by Remcor in September 1988 to define the limits of the landfill and characterize the landfill wastes. The investigation indicated that the landfill consists of emission control dust, mill scale, and inert construction debris. The landfill was found to encompass approximately 44,000 square feet and with a maximum thickness of 17 feet. Total volume of the landfill was estimated to be approximately 14,000 cubic yards (Remcor, 1988). Analytical metals data for soil samples collected during this investigation were provided in Appendix A of the RFI Workplan (BMWCI, 1996a).

In the spring of 1998, modifications were made in the SWMU 3 area as Armco constructed a paved access road over the top of the closed landfill. The pavement was placed over the existing ground surface, and no subsurface excavations were conducted. Armco notified USEPA of these modifications in a letter dated January 21, 1998, and USEPA and MDNR acknowledged the modifications in a letter dated January 29, 1998.

Based on the types of materials handled at SWMU 3 and previous sampling and analyses activities conducted by Remcor, the primary constituents of potential concern were lead and cadmium associated with emission control dust.

6.1.2 Release Potential

There are no records of any spills or releases associated with SWMU 3. Currently there is limited potential for release due to the nature of the material contained in the landfill and the soil/concrete cap that covers the SWMU. Potential media of concern include subsurface soil and groundwater.

6.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was evaluated through the collection of groundwater samples. Table 6-1 presents a summary of the investigation activities for SWMU 3. Figure 6-1 depicts the sampling locations.

Groundwater samples were collected from six direct-push boring locations (Borings 03B01 through 03B05, and 03B08) around the perimeter of SWMU 3 as specified in the RFI Workplan. Two additional Borings (Boring 03B06 and 03B07) were advanced until direct-push refusal was encountered, but these Borings remained dry and no groundwater sample could be collected. Samples were collected from the upper 10 feet of the water table (from 16 to 30 feet bgs). Samples were field filtered and analyzed for dissolved cadmium and lead.

6.3 NATURE AND EXTENT OF DISSOLVED METALS CONTAMINATION IN GROUNDWATER

Table 6-2 and Figure 6-2 present the analytical results for SWMU 3. Dissolved cadmium was not detected in the groundwater samples. Since no detections of dissolved cadmium occurred, its groundwater screening MCL (0.005 mg/L) was not exceeded. Dissolved lead was detected in four of the six samples, and concentrations ranged from 0.005 mg/L to 0.012 mg/L. None of the groundwater sample results exceeded the MCL for lead (0.015 mg/L). As shown on Figure 6-2, the nature and extent for dissolved cadmium and lead in groundwater was adequately characterized at SWMU 3.

6.4 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 3, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater and groundwater transport). A soil cap with vegetative cover is constructed over SWMU 3 that limits storm water runoff contacting landfill materials and prevents landfill materials from becoming airborne. In addition, a portion of SWMU 3 is paved with asphalt. Therefore, storm water runoff, surface water transport, and airborne dust transport are not considered pathways for contaminant migration at SWMU 3.

The nature and extent of contamination at SWMU 3 was assessed through the collection of groundwater samples. Limited detections of dissolved lead occurred at low concentrations (below the MCL). Metals such as lead have a limited potential to migrate from soil to groundwater. This, in conjunction with the asphalt and soil cap constructed over the SWMU that minimizes storm water infiltration, limits the potential for release from the landfill. Based on these factors, contaminant migration via soil transfer to groundwater and groundwater transport is not expected for SWMU 3.

6.5 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted for SWMU 3.

6.5.1 Human Health Evaluation

Since no chemicals were detected at concentrations exceeding risk screening levels, further human health risk evaluation was not conducted for SWMU 3.

6.5.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 3. Therefore, an ecological risk evaluation was not conducted for SWMU 3.

6.6 SUMMARY

SWMU 3, located in the western portion of the Facility, is a closed landfill previously utilized to manage emission control dust and various solid waste. It covers an approximate area of just over 1 acre. Groundwater samples were collected around the SWMU. Groundwater samples were collected from around the SWMU for dissolved cadmium and lead analyses.

As shown on Figure 6-2, SWMU 3 was adequately characterized by the analytical data collected. Dissolved cadmium was not detected. Dissolved lead was detected in four of the six samples, and all detections were below the groundwater screening MCL (0.015 mg/L).

Potential migration pathways at SWMU 3 include soil transfer to groundwater and groundwater transport. The potential for soil transfer to groundwater is limited due to the asphalt and soil cap with vegetative cover constructed over the landfill. Based on the groundwater data collected at SWMU 3, it does not appear that soil transfer to groundwater has occurred. Therefore, contaminant migration via soil transfer to groundwater and groundwater transport is not expected for SWMU 3.

A risk evaluation was conducted for SWMU 3. For the human health evaluation, no COPCs were identified. Therefore, further human health risk evaluation was not performed. Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted.

* * * * *

Table 6-1
SWMU 3 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Chemical Analysis			
					Dissolved			Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Cadmium	Comments	Number
DIRECT-PUSH GROUNDWATER SAMPLES[1]								
03B01	DW1	28 - 30	3/20/1997	1	X	X		D97-3397-1
03B02	DW1	16 - 18	3/20/1997	1	X	X		D97-3397-2
03B03	DW1	16 - 18	3/20/1997	1	X	X	Sampled Dry[2]	D97-3397-3
03B04	DW1	26 - 28	3/20/1997	1	X	X		D97-3397-5
	DW1MS	26 - 28	3/20/1997	1	X	X		D97-3397-7
	DW1MSD	26 - 28	3/20/1997	1	X	X		D97-3397-8
03B05	DW1	27 - 29	3/20/1997	1	X	X	Sampled Dry[3]	D97-3397-6
03B08	DW1	18 - 20	3/20/1997	1	X	X		D97-3397-9
	DW1D	18 - 20	3/20/1997	1	X	X		D97-3397-4

Notes:

ft = feet

[1] = Boring 03B06 and 03B07 were advanced on 3/20/97. These borings were advanced until direct-push refusal was encountered, but remained dry and no groundwater samples could be collected.

[2] = 500 ml water was planned for collection, only 300 ml could be collected.

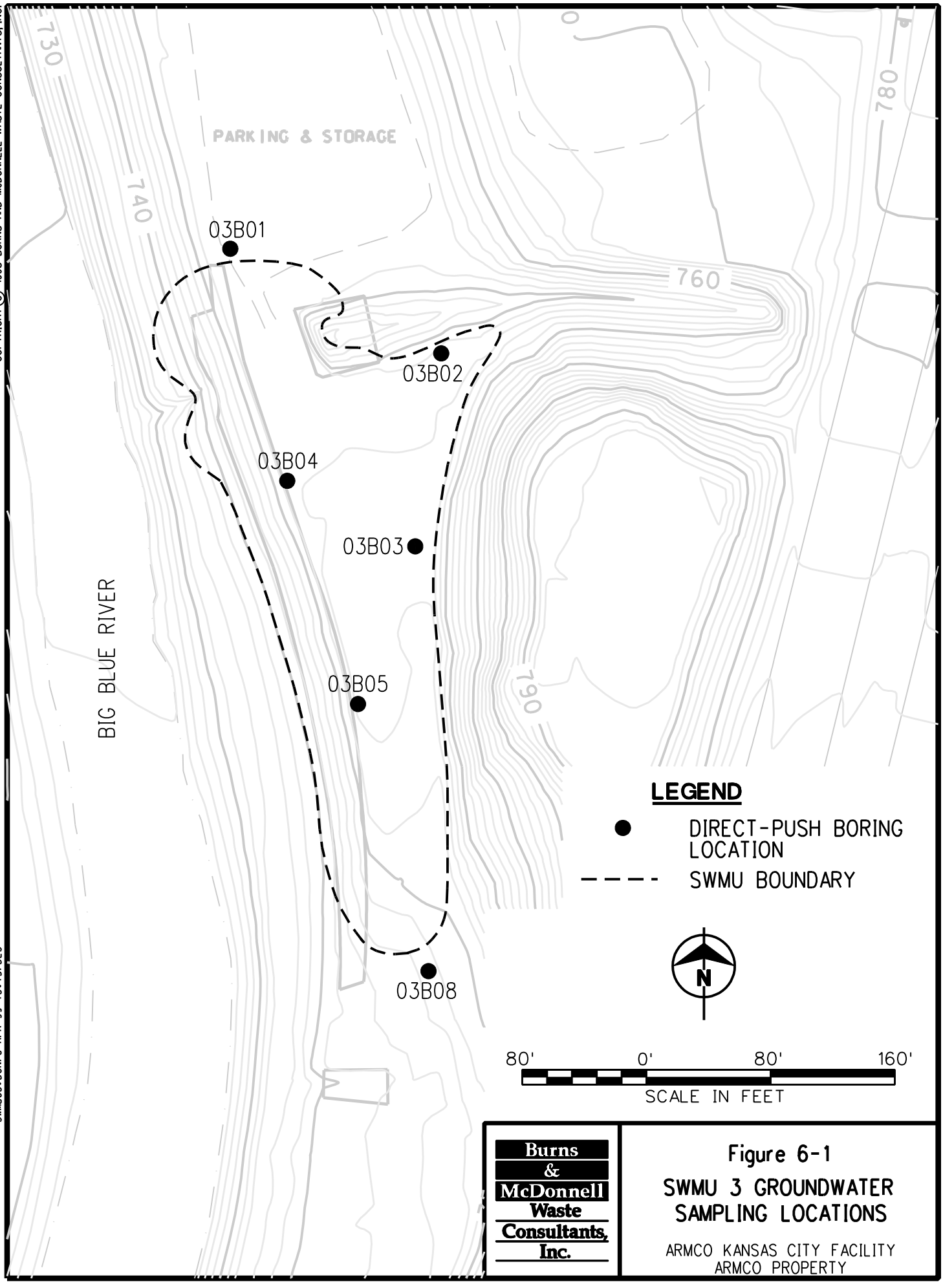
[3] = 500 ml water was planned for collection, only 350 ml could be collected.

Table 6-2
SWMU 3 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		03B01/DW1	03B02/DW1	03B03/DW1	03B04/DW1	03B05/DW1	03B08/DW1	03B08/DW1D
Date Sampled:		03/20/1997	03/20/1997	03/20/1997	03/20/1997	03/20/1997	03/20/1997	03/20/1997
Sample Depth From:		28	16	16	26	27	18	18
Sample Depth To:		30	18	18	28	29	20	20
Laboratory Number:		D97-3397-1	D97-3397-2	D97-3397-3	D97-3397-5	D97-3397-6	D97-3397-9	D97-3397-4
Sample Type:								Duplicate
Metals, Dissolved	UNITS							
Cadmium, Dissolved	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Lead, Dissolved	mg/L	***0.005***	***0.006***	0.003 U	0.003 U	***0.012***	***0.005***	***0.008***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation



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SWMU03.DGN/6-APR-99 13:15/DLS

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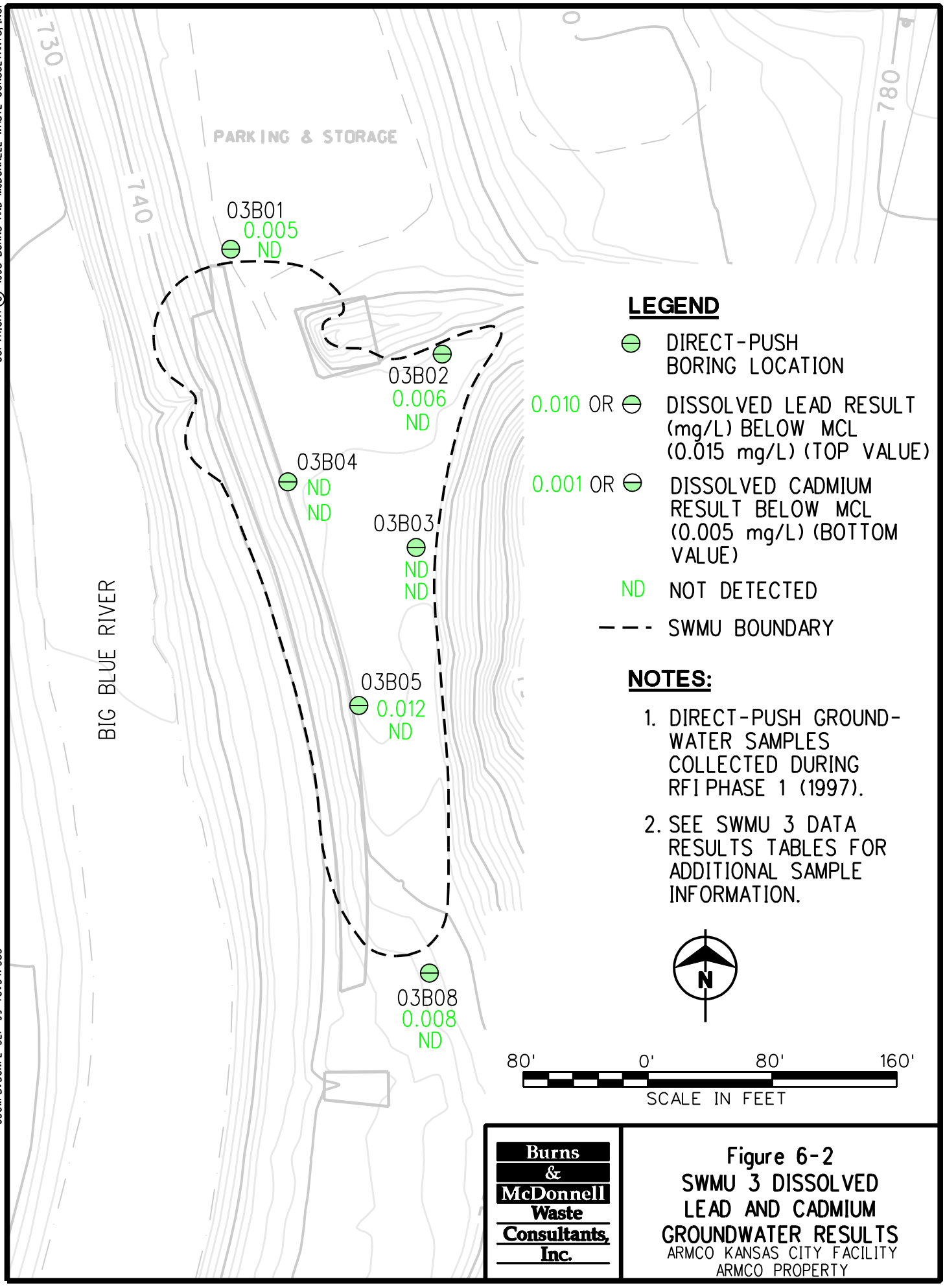

LEGEND

- DIRECT-PUSH BORING LOCATION
- 0.010 OR — DISSOLVED LEAD RESULT (mg/L) BELOW MCL (0.015 mg/L) (TOP VALUE)
- 0.001 OR — DISSOLVED CADMIUM RESULT BELOW MCL (0.005 mg/L) (BOTTOM VALUE)
- ND — NOT DETECTED
- SWMU BOUNDARY

NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. SEE SWMU 3 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

80' 0' 80' 160'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 6-2
SWMU 3 DISSOLVED LEAD AND CADMIUM GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

03GWPB.DGN/2-SEP-99 10:34/SOS
k:*res*global*stdbdr*ustn*civil*2d*wcibdr03.dgn
k:*armcorfi*ustn.sup*site.dgn
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k:*armcorfi*ustn.sup*swmu0001.dgn

9.0 SWMU 6 – RCRA PERMITTED BAGHOUSE DUST STORAGE TANKS AND AOC 4 – BOILER FURNACE AREA

9.1 SWMU 6 AND AOC 4 BACKGROUND

9.1.1 Description of SWMU 6 and AOC 4

SWMU 6 and AOC 4 are located adjacent to each other in an area often referred to as the "tank farm area." Due to their proximity, they are presented together in this chapter for the sake of brevity and ease of understanding. The combined area of the defined boundaries of SWMU 6 and AOC 4 was approximately 3 acres.

SWMU 6

The RCRA Permitted Baghouse Dust Storage Tanks (SWMU 6), located on Armco property (see Figure 1-2), were four aboveground storage tanks (ASTs). These ASTs were known as Tanks 1, 2, 3, and 5. The ASTs were originally constructed for fuel oil storage and were used for oil storage from their initial construction between 1947 and 1953 through the early 1980s. Tanks 2, 3, and 5 were approximately 100 feet in diameter with a height of approximately 40 feet, and each had a capacity of approximately 2,350,000 gallons. Tank 1 was approximately 100 feet in diameter with a height of 30 feet and had a capacity of approximately 1,750,000 gallons.

During their use for fuel oil storage, the ASTs stored No. 2 and No. 6 fuel oil. A central aboveground pipeline connected each of the tanks with the pumphouse which was located south of Tanks 1 and 2. Tanks 1, 2, and 3 were installed sometime between 1947 and 1953, and Tank 5 was installed in 1975. At some point, a new pumphouse was installed to the northwest of Tank 3 to replace the old pumphouse. The old pumphouse was cleaned in 1994 and removed in 1997/1998. The new pumphouse was demolished along with the tanks in 1998.

In January of 1983, landfill closure activities began at the RCRA Landfill, and the emission control dust generated at the No. 1 and No. 2 Melt Shops began being stored in the ASTs at SWMU 6. A hazardous waste permit issued to Armco in February 1985 allowed the storage of K061 waste (i.e. emission control dust) in these ASTs. On July 15, 1986, Armco ceased adding K061 to the tanks. Between 1987 and June 1991, the tanks were emptied and emission control dust was transported off-site for reclamation utilizing the Dust Railcar Loading Area – Bar Joist Building (SWMU 10). On November 19, 1990, certifications of closure were submitted to MDNR for Tanks 3 and 5, and on August 2, 1991, certifications of closure were submitted to MDNR for Tanks 1 and 2. These ASTs were not used for any other purpose after they were cleaned and closed. The hazardous waste permit expired in February 1992. A renewal application for a hazardous waste permit was submitted in January 1992 but was subsequently withdrawn.

As part of the closure activities, emission control dust was removed from the tanks and the interior walls were vacuumed. A high-powered wash followed the vacuum procedure. Post-cleaning wipe samples were collected and analyzed for cadmium. Results of this analysis for the tanks were located in Appendix A of the RFI Workplan (BMWCI, 1996a).

AOC 4

The Boiler Furnace Area (AOC 4), located on Armco property (see Figure 1-2), represents an area containing boilers that were supplied with natural gas supplemented by on-site fuel oil. In the past, fuel oil burned in the boilers was supplied from Tank 4 at the Fuel Storage Tank Farm and transported by aboveground piping to the Boiler Furnace Area. During this time, waste oil accumulated at SWMU 24 and was pumped to Tank No. 4 for inclusion in the fuel oil. This practice was performed until 1991 when Armco began transporting waste oil off site for fuel blending. In 1993, the boilers were shut down and the transfer of fuel oil from Tank 4 ceased. The associated equipment was thoroughly cleaned in 1994.

Various records indicate that for a brief time in the 1980s, 1,1,1-TCA may have been mixed into the waste oil and subsequently mixed with the fuel oil and utilized in the boiler furnaces. There was no mechanism at the Boiler Furnace Area to incorporate the addition of any material to the fuel oil supply.

In early 1998, modifications were made in the SWMU 6 and AOC 4 area. These modifications involved the removal of Tanks 1, 2, 3, and 5 (SWMU 6) and Tank 4 (located near AOC 4) along with the associated piping formerly used to supply fuel oil to the tanks. These tanks were demolished, the associated steel was cut up, and the materials were sold as prepared scrap for resmelting. The bases of Tanks 1, 2, 3, and 4 have been partially backfilled. The base of Tank 5 has been filled with approximately 1-foot of slag. Armco notified USEPA of these modifications in a letter dated January 20, 1998, and USEPA and MDNR acknowledged the modifications in a letter dated January 29, 1998.

In a letter dated March 9, 1999, Armco advised USEPA that a strip of land adjacent to the KCT's right-of-way was transferred by deed to the KCT for construction of the Flyover Project to relieve transportation congestion and public safety issues in the area. Armco also granted ingress/egress easements to KCT in the tank farm area (SWMU 6 and AOC 4) for surface use during the construction phase of the Flyover Project. As indicated on Figures 1-2 and 9-1, the easement parcel contains both SWMU 6 and AOC 4.

Based on the types of materials handled at SWMU 6, the primary constituents of potential concern were lead and cadmium associated with emission control dust, and possibly petroleum hydrocarbons associated with fuel oil. Based on the types of materials handled at AOC 4, the primary constituents of potential concern were petroleum hydrocarbons associated with fuel oil, cadmium, lead, and VOCs.

9.1.2 Release Potential

The primary release potential at SWMU 6 and AOC 4 was to the surrounding surface and subsurface soils. The following paragraphs provide a brief description of any known releases that occurred in the area.

SWMU 6

Several minor (less than two cubic yards) dust spills occurred during the time the ASTs were used for dust storage. The spills occurred in the area of Tanks 1 and 2 on April 30, 1984, February 21, 1985, March 6, 1986, and March 26, 1987. The spill areas were cleaned in accordance with Armco's contingency plan, and the spilled dust was returned to the electric arc furnace. For a July 1987 spill that occurred around Tanks 1 and 2, cleanup involved removal and replacement of the contaminated material with aggregate fill.

The potential for releases to have occurred was minimized by the fact that the transport mechanisms and trucks used to transport the emission control dust both into and out of the tanks were totally enclosed. Potential for release was generally limited to the time when the transfer equipment was engaged or disengaged.

AOC 4

There are no records of any spills or releases associated with AOC 4.

9.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at SWMU 6 and AOC 4 was evaluated through the collection of surface and subsurface soil samples. Tables 9-1 and 9-2 present a summary of the investigation activities for SWMU 6 and AOC 4, respectively. Figure 9-1 shows the sampling locations.

During RFI Phase 1, 14 direct-push borings (06B01 through 06B14) were installed at SWMU 6 around the perimeter of Tanks 1, 2, 3, and 5. Two additional borings (06B15 and 06B16) were planned for the north and west sides of Tank 5, but could not be installed due to inaccessibility of the sampling locations. Subsurface soil samples were collected from one depth interval (typically 1 to 3 feet bgs) from each boring and analyzed for cadmium, lead, PAHs, and TPH. Due to odors and elevated PID readings, a sample was collected from an additional depth interval (4 to 5.5 feet bgs) at Boring 06B01.

Three direct-push borings (A04B02 through A04B04) were installed at AOC 4 around the perimeter of Tank 4 during RFI Phase 1. Boring A04B01 was planned for the southwestern side of Tank 4, but could not be installed due to inaccessibility of the sampling location. Subsurface soil samples were collected from one to two depth intervals (2 to 4 and/or 4 to 6 feet bgs) from each boring and analyzed for cadmium, lead, VOCs, PAHs, and TPH.

During RFI Phase 2 from May to June 1998, XRF screening was used to aid in the characterization of soil samples in the field to more thoroughly define the extent of lead. Once the XRF screening indicated that the extent of lead had been defined, samples were sent to the analytical laboratory for confirmatory analysis. At SWMU 6 and AOC 4, the majority of the samples from the impacted areas were also sent to the analytical laboratory for confirmatory analysis to assist in the calibration of the XRF instrument during its initial use in the field.

During RFI Phase 2, Borings 06B14A and A04B03A were installed adjacent to their RFI Phase 1 Borings (06B14 and A04B03, respectively) to further define the vertical extent of cadmium and lead. Subsurface soil samples were collected from two to three depth intervals (2 to 4, 4 to 6, 6 to 8, and/or 8 to 10 feet bgs) from each boring and initially screened for lead using XRF spectroscopy. These samples were also submitted to the analytical laboratory for cadmium and lead analysis.

To further define the horizontal extent of cadmium and lead, eight trenches (A04T01, A04T02, 06T03A and 06T01 through 06T05) were installed during RFI Phase 2. As indicated in *Addendum No. 3 to the RFI Workplan* (BMWCI, 1997d), Trenches A04T01 and 06T01 through

06T03 were planned. Due to XRF lead results above screening limits, Trench 06T03A was installed adjacent to Trench 06T03 in an attempt to define the extent of contamination. During installation of Trench 06T03A between Tank 4 (AOC 4) and Tank 5 (SWMU 6), nine drums of apparent paint materials and other debris were uncovered. The drums appeared to be in excess of 25 years old, and no historical information is available regarding their placement in this area. Additional paint related-materials were encountered in Trench 06T01. Trench 06T04 was installed to better define the extent of the paint-related materials and other debris. Approximately six additional drums were encountered in Trench 06T04. All drums were removed and overpacked in new drums. Soils that appeared to have been impacted were excavated and placed on two layers of plastic and covered with more plastic. Approximately 380 cubic yards of soil and other materials were removed and disposed. Armco contracted Heritage Environmental Services, Inc. of Kansas City, Missouri to properly dispose of the materials.

Soil samples were collected from various depth intervals along the length of each trench. Samples collected from Trenches 06T02, 06T03 and A04T01 were collected prior to the discovery of the paint materials, and these soil samples were analyzed for cadmium and lead. Soil samples collected from Trenches 06T01 and 06T03A were analyzed for RCRA metals and VOCs due to the paint materials encountered in these trenches. To better characterize the waste materials, a sample (06T03A/SBD) of apparent paint waste mixed with soil was collected from Trench 06T03A and analyzed for RCRA metals and VOCs. In addition, an unfiltered groundwater sample was collected from the bottom of Trench 06T01. Soil samples were not collected from the west end of Trench 06T01 (as proposed in Addendum No. 3) because it was similar to the east end of the trench. Two Shelby tube soil samples were collected from the bottom of Trenches 06T01 (19 to 21 feet bgs) and 06T03A (17 to 19 feet bgs) for physical analysis and permeameter testing. No samples were collected from Trench 06T04 because it was located between trenches 06T01 and 06T03A and similar paint related materials were encountered there.

In the fall of 1998, Trenches 06T05 and A04T02 were installed to further define the extent of the paint materials and other debris. No additional paint drums were encountered in these trenches, but wire, wood, metal, and other debris were encountered on the east end of Trench 06T05.

Subsurface soil samples were collected from five to seven depth intervals (up to 22 feet bgs) at various locations along the length of each trench. All subsurface soil samples collected from Trenches 06T05 and A04T02 were analyzed for RCRA metals and VOCs. Due to odors encountered during the installation of Trench 06T05, additional soil samples were collected and analyzed for SVOCs and TPH. At most trenches installed during the RFI, soil sampling began when native soil was encountered below the uppermost slag-fill material.

During RFI Phase 2, demolition activities were concurrently occurring at Tanks 1 through 5. Material with an appearance similar to emission control dust was observed on the remaining metal base of demolished Tank 5. Six surface soil samples were collected from this area and analyzed for lead with XRF spectroscopy. Four samples were sent to the analytical laboratory for confirmatory analysis of cadmium and lead. Based upon the analytical results, Armco contracted EnviroKlean, Inc. of Kansas City, Kansas to provide cleaning of the area. EnviroKlean used a vacuum truck to remove visible dust contamination. The vacuum truck contained seven cyclones to filter out large particles from the air brought into the storage compartment followed by a series of bag house filters for fine particles. Approximately 87 tons of material were removed from the Tank 5 area, and placed in an area protected from weather to prevent further dispersion. After the dust vacuuming activities, three confirmatory surface soil samples (AST5/SR1C through SR3C) were collected from the Tank 5 area and analyzed for cadmium and lead. Armco contracted Heritage Environmental Services, Inc. of Kansas City, Missouri to properly dispose of the materials.

USEPA was notified of these unanticipated field conditions in a letter from Armco dated June 1, 1998. Further information regarding the discovery, removal, and disposal of the paint related and dust-like materials was also presented in Armco's Second Quarter 1998 Progress Report dated July 15, 1998 and Armco's Third Quarter 1998 Progress Report dated October 14, 1998.

Berms of gravel to cobble sized slag fill surround the former AST pits at SWMU 6 and AOC 4. Exploratory trenches were utilized to sample this material since it was impenetrable by direct-push or hollow-stem auger boring methods. On the floor of the AST pits, there is a 1 to 2 ft. layer of pea gravel-size slag fill underlain by silty clay. Direct-push borings were able to

penetrate through this material. Perched groundwater was occasionally encountered above the slag fill / silty clay contact as a result of the lower permeability (and resultant lower infiltration rate) of the silty clay.

9.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Tables 9-3 through 9-7 present the analytical results of the soil samples collected from SWMU 6 and AOC 4. Figures 9-2, 9-3, and 9-4 show the soil analytical result for metals, VOCs, PAHs/SVOCs, respectively. TPH results are presented in Appendix U.

9.3.1 Metals

Figure 9-2 shows the analytical results for metals at SWMU 6 and AOC 4. Table 9-8 presents the metal results that exceeded screening limits at SWMU 6 and AOC 4.

Following dust-vacuuming activities in the base of demolished Tank 5, three confirmatory surface soil samples were collected and analyzed for cadmium and lead. Cadmium and lead detections in each of these confirmation samples exceeded their 20 DAF SSLs (8 and 400 mg/Kg, respectively). The highest concentrations of cadmium and lead for these confirmation samples were 342 D and 12,700 mg/Kg, respectively. The base of demolished Tank 5 has been filled with approximately 1-foot of slag. The vertical extent of cadmium and lead was defined by subsurface soil samples collected from direct-push Boring 06B14A.

During RFI Phases 1 and 2, 24 subsurface soil samples were collected from direct-push borings and analyzed for cadmium and lead. Cadmium was detected in 17 of the samples at concentrations from 0.34 J to 62.6 D mg/Kg. Lead was detected in all of the samples at concentrations from 11.6 to 3,620 D mg/Kg. Cadmium and lead concentrations exceeded their 20 DAF SSLs in six and five samples, respectively. Cadmium and lead exceedences were typically noted in samples collected from the vicinity of Tanks 4 and Tank 5. The vertical extent of the cadmium and lead exceedences was limited to the upper 4 to 6 feet of soil at these direct-push boring locations.

Exploratory trenches were installed in the vicinity of Tanks 4 and 5 during RFI Phase 2 to further define the horizontal extent of cadmium and lead. Samples collected from Trenches A04T01, 06T02, and 06T03 were analyzed for cadmium and lead. Due to the discovery of paint-related materials during the installation of Trench 06T03A, samples from Trenches 06T03A, 06T05, and A04T02 were analyzed for RCRA metals. Ninety-four subsurface soil samples were collected from the trenches and analyzed for cadmium and lead or RCRA metals. As shown on Figure 9-2, samples with exceedences of 20 DAF SSLs were typically encountered in the vicinity of paint-related materials between Tanks 4 and 5. Each of the RCRA metals was detected in at least one sample. None of the barium or chromium detections exceeded their screening limits (1,600 and 3,540 mg/Kg, respectively); the highest detections of barium and chromium were 1,370 and 2,480 D mg/Kg, respectively.

Arsenic was detected in 51 of the trench subsurface soil samples. The 20 DAF SSL for arsenic (29 mg/Kg) was exceeded in four samples collected from centrally located Trenches 06T01, 06T03A, and 06T05. The highest arsenic concentration (58.7 D mg/Kg) was detected in the sample collected from the 8 feet bgs depth interval at Trench 06T01, but exceedence of the 20 DAF SSL was noted up to 14 feet bgs.

Cadmium was detected in 72 of the trench subsurface samples, and approximately half of the detections were below the 20 DAF SSL (8 mg/Kg). The highest cadmium concentration (112 D mg/Kg) was detected in the 10 to 12 feet bgs depth interval at Trench 06T03A, but exceedence of the 20 DAF SSL was noted up to 18 to 20 feet bgs at Trench 06T03A.

Lead was detected in all of the trench subsurface soil samples, and approximately 60 percent of the detections were below the 20 DAF SSL (400 mg/Kg). The highest lead concentration (8,210 D mg/Kg) was detected in the 5 feet bgs depth interval at Trench 06T01, but exceedence of the 20 DAF SSL was noted up to 18 to 20 feet bgs at Trench 06T03A.

Mercury was detected in 31 of the trench subsurface soil samples. The 20 DAF SSL for mercury (2 mg/Kg) was exceeded in three samples collected from centrally located Trench 06T03A. The

highest mercury concentration (9.87 D mg/Kg) was detected in the sample collected from the 8 to 10 feet bgs depth interval.

Selenium was detected in 20 of the trench subsurface soil samples. The 20 DAF SSL for selenium (5 mg/Kg) was exceeded in five samples collected from Trenches 06T03A and 06T05. The highest selenium concentration (96 D mg/Kg) was detected in the sample collected from the 6 to 8 feet bgs depth interval at Trench 06T03A north of the water line, but exceedence of the 20 DAF SSL was noted up to 14 to 16 feet bgs at Trench 06T05.

Silver was detected in 30 of the trench subsurface soil samples. The 20 DAF SSL for silver (34 mg/Kg) was exceeded in one sample collected from Trench 06T05. This exceedence (180 mg/Kg) was detected in the sample collected from the 12 to 14 feet bgs depth interval. All other silver detections were equal to or less than 10 mg/Kg.

The horizontal extent of metals was defined to the north, south, and west by samples collected from trenches around the perimeter of Tanks 4 and 5. The horizontal extent of metals was less clearly defined to the east at Trench 06T03A; further sampling could not be implemented to the east due to restrictions caused by the nearby railroad.

During the removal of drums from Trench 06T03A, a sample (06T03A/SBD) of apparent paint waste mixed with soil was collected and analyzed for RCRA metals. With the exception of selenium and silver, each of the RCRA metals was detected in this sample. However, only the cadmium (15.1 D mg/Kg) and lead (625 D mg/Kg) results exceeded their 20 DAF SSLs. Soils impacted by apparent paint materials were subsequently removed from the trench and properly disposed.

9.3.2 VOCs

Figure 9-3 presents the analytical results for VOCs in soil at SWMU 6 and AOC 4. During RFI Phase 1, four direct-push subsurface soil samples were collected around the perimeter of Tank 4

and analyzed for VOCs, including 1,1,1-TCA. No VOC detections were reported in these samples.

After the discovery of paint related materials in Trench 06T03A, 57 additional subsurface soil samples were collected from Trenches 06T01, 06T03A, 06T05, and A04T02 and analyzed for VOCs. Total VOC detections ranged from 1.6 to 746.7 µg/Kg. The most commonly detected VOCs were 2-butanone, acetone, carbon disulfide, ethylbenzene, methylene chloride, toluene, TCE, and xylenes. The 20 DAF SSL for methylene chloride (20 µg/Kg) was exceeded in four samples collected from Trenches 06T01 and 06T03A (ranging up to 53.6 J* µg/Kg). No other 20 DAF SSL exceedences occurred. As shown on Figure 9-3, the horizontal and vertical extent of VOC detections was well defined by sampling locations surrounding Trenches 06T01 and 06T03A. Therefore, the majority of the VOCs appear to be contained between Tanks 4 and 5 from the railroad to Trench 06T05.

During the removal of drums from Trench 06T03A, a sample (06T03A/SBD) of apparent paint waste mixed with soil was collected and analyzed for VOCs. The Total VOC concentration for this sample was 796,300 µg/Kg. Ethylbenzene (165,000 µg/Kg), m,p-xylene (419,000 µg/Kg), methylene chloride (7,260 DJ µg/Kg), o-xylene (176,000 D µg/Kg), styrene (5,490 µg/Kg), toluene (19,700 D µg/Kg), and TCE (3,850 DJ µg/Kg) were detected in this sample, and all detected compounds exceeded their respective 20 DAF SSLs (Table 9-8). Soils impacted by apparent paint materials were subsequently removed from the trench and properly disposed.

9.3.3 PAHs/SVOCs

Figure 9-4 presents the analytical results for PAHs/SVOCs in soil at SWMU 6 and AOC 4. During RFI Phase 1, 19 direct-push subsurface soil samples were collected around the perimeter of Tanks 1 through 5 and analyzed for PAHs. Total PAH detections ranged from 0.467 to 10.91 mg/Kg. None of the direct-push subsurface soil samples had PAH detections that exceeded their 20 DAF SSLs. Therefore, the vertical and horizontal extent of PAHs was well defined by the sampling locations.

During RFI Phase 2, odors were encountered during the installation of Trench 06T05. Therefore, 21 samples were collected from seven depth intervals (up to 20 feet bgs) at three locations along the trench and analyzed for SVOCs. Six samples were non-detect for SVOCs. Total SVOC detections ranged from 0.443 to 89.21 mg/Kg. Benzo(a)anthracene (7.8 and 4.1 mg/Kg) and benzo(b)fluoranthene (7.8 mg/Kg) were the only SVOCs with detections that exceeded their 20 DAF SSLs (2 and 5 mg/Kg, respectively). These exceedences were limited to the 8 to 12 feet bgs interval in the easternmost vertical profile in Trench 06T05. Therefore, the vertical and horizontal extent of SVOCs was defined by the sampling locations.

9.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

During RFI Phase 2, perched groundwater seeped into Trench 06T01 and a single groundwater sample was collected and analyzed for RCRA metals and VOCs. Due to incorrect sample preservation, the RCRA metals results were subsequently rejected. Ethylbenzene (5.31 J* µg/L), m,p-xylene (20.6 J* µg/L), and o-xylene (4.65 J µg/L) were the only VOCs detected; however, none of these detections exceeded their groundwater screening MCLs.

9.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 6 and AOC 4, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater and groundwater transport), the surface pathway (storm water runoff), and air pathways (volatilization and airborne dust).

The nature and extent of contamination at SWMU 6 and AOC 4 were assessed through the collection of subsurface soil samples. Only limited surface soil samples (at the locations of the former Tank 5) were collected. The constituents detected included metals (primarily cadmium and lead), VOCs, and PAHs. Metals in subsurface soil were located throughout the area around Tanks 4 and 5, and 20 DAF SSL exceedences (based on soil migration to groundwater) occurred to depths of 20 feet bgs (approximate deepest elevation 730 feet above MSL). VOC and SVOC exceedences were more limited (two sampling locations and one sampling location, respectively) and occurred to depths of 12 feet bgs (approximate deepest elevation 739 feet above MSL). Surface soil exceedences at Tank 5 included cadmium and lead. Based on the data, soil transfer

to groundwater could occur. The tendency of metals and PAHs to strongly adsorb to soil and the typical slightly basic to basic pH soil conditions at the Facility should limit vertical migration.

The groundwater table was not encountered during SWMU 6 and AOC 4 investigation activities and groundwater samples were not collected. Perched groundwater seeped into one trench (Trench 06T01) during soil sampling activities, and concentrations of VOCs below MCLs were detected. During direct-push groundwater sampling at nearby SWMU 24, groundwater was typically encountered between 24 to 40 feet bgs (approximate elevations ranging from 708 [deepest] to 722 [shallowest] feet above MSL). Based on the vertical definition of subsurface soil contamination at depths shallower than the saturated zone, the groundwater transport pathway is not expected to be significant for SWMU 6 and AOC 4.

Surface cover material at SWMU 6 and AOC 4 is primarily slag fill, and the former tank bases have been partially (Tanks 1, 2, 3, and 4) or completely (Tank 5) backfilled. Storm water runoff at SWMU 6 and AOC 4 ponds and infiltrates in low-lying areas in the immediate SWMU/AOC area; therefore, storm water runoff should not provide a significant route for contaminant migration. Surface soil particulate (dust) could become airborne. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Due to the presence of the surrounding slag berms around the former tank locations airborne dust would likely be trapped in the immediate area, therefore limiting the potential for migration of surface contaminants via airborne particulate. VOCs in the subsurface may partition to the gas phase and migrate to the air pathway. However, based on the limited areas of VOC contamination, contaminant migration via volatilization to the air pathway is not expected to be significant for this area.

9.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at SWMU 6 and AOC 4.

9.6.1 Human Health Evaluation

Metals in surface soil, VOCs, SVOCs, and metals in subsurface soil exceeded risk screening levels. A HHRA and lead modeling were conducted for SWMU 6 and AOC 4 to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. For the exposure scenarios evaluated, it was determined that there are no significant noncarcinogenic health effects or carcinogenic risks posed by the COPCs detected in soil at SWMU 6 and AOC 4. Assumptions and variables used in risk calculations are discussed further in Chapter 4.0 of Appendix X. The results of risk characterization and lead modeling are presented in Chapter 5.0 of Appendix X.

9.6.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 6 and AOC 4. Therefore, an ecological risk evaluation was not conducted for SWMU 6 and AOC 4.

9.7 SUMMARY

SWMU 6 and AOC 4, located in the western portion of the Facility, are often referred to as the tank farm area. SWMU 6 was four former aboveground storage tanks (ASTs 1, 2, 3, and 5) used for fuel oil storage and later used for emission control dust storage. AOC 4 included former AST 4, used for storage of fuel oil and waste oil for use by the boiler furnaces. The defined SWMU and AOC areas were approximately 3 acres in size. The investigation area expanded in size around the defined SWMU and AOC areas. Surface soil, subsurface soil, and groundwater samples were collected at SWMU 6 and AOC 4 for RCRA metals, VOCs, SVOCs and/or PAHs.

Figures 9-2 through 9-4 summarize the extent of metals, VOCs, and PAHs/SVOCs detections, respectively, in soil at SWMU 6 and AOC 4. During RFI Phase 2, demolition activities were concurrently occurring at Tanks 1 through 5. Material with an appearance similar to emission control dust was observed on the remaining metal base of demolished Tank 5. Based upon the analytical results of surface soil samples collected from the base of former Tank 5, Armco contracted EnviroKlean, Inc. of Kansas City, Kansas to remove visible dust contamination using

a vacuum truck. Three confirmatory surface soil samples were collected following the dust vacuuming activities, and cadmium and lead were detected at concentrations above their respective 20 DAF SSLs (highest concentrations 342 D and 12,700 mg/Kg, respectively). The former Tank 5 area has been backfilled with approximately 1-foot of slag.

Subsurface soil samples were collected from direct-push borings and exploratory trenches. Sampling was primarily focused around the vicinity of Tanks 4 and 5 for cadmium, lead, and SVOC analyses. However, due to the discovery of paint-related materials during the installation of Trench 06T03A, RCRA metals and VOC analyses were also performed on a portion of the samples. As shown on the Figures, samples with exceedences of 20 DAF SSLs were typically encountered in the vicinity of paint-related materials between Tanks 4 and 5 and occurred to depths of 20 feet bgs. Lead and cadmium or RCRA metals analyses were performed on 118 subsurface soil samples. 20 DAF exceedences were primarily of cadmium and lead (highest concentrations 112 D and 8,210 D mg/Kg, respectively), with more limited exceedences (5 or fewer samples each) of the other RCRA metals such as arsenic, mercury, selenium, and silver. Nineteen subsurface soil samples were analyzed for PAHs or SVOCs, and only limited detections of benzo(a)anthracene (two detections at 4.1 and 7.8 mg/Kg) and benzo(b)fluoranthene (one detection at 7.8 mg/Kg) exceeded 20 DAF SSLs (2 and 5 mg/Kg, respectively). VOCs were analyzed for in 61 subsurface soil samples. Only four detections of methylene chloride (ranging up to 53.6 J* µg/Kg) exceeded the 20 DAF SSLs (20 µg/Kg). The extent of VOCs was limited to a smaller area between Tanks 4 and 5. During exploratory trenching activities, encountered paint drums and surrounding soil were removed from the subsurface and properly disposed of at an off-site facility.

During RFI Phase 2, perched groundwater seeped into Trench 06T01 and a single groundwater sample was collected and analyzed for RCRA metals and VOCs. Due to incorrect sample preservation, the RCRA metals results were subsequently rejected. Only limited detections of VOCs (ethylbenzene and xylenes) occurred and were all below groundwater screening MCLs.

Potential migration pathways at SWMU 6 and AOC 4 include soil transfer to groundwater, groundwater transport, storm water runoff, volatilization to the air, and airborne dust migration.

Soil detections of VOCs, PAHs, and metals exceeded 20 DAF SSLs (based on soil migration to groundwater); thus indicating that soil transfer to groundwater could occur. The tendency for metals and PAHs to strongly adsorb to soil and the typical slightly basic to basic soil pH conditions at the Facility are expected to limit vertical migration in soil. The saturated zone groundwater table was not encountered during subsurface soil sample collection and groundwater samples were not collected. Based on the vertical definition of subsurface soil contamination at depths shallower than the saturated zone, the groundwater transport pathway is not expected to be significant for SWMU 6 and AOC 4.

Storm water runoff ponds and infiltrates in low-lying areas in the immediate SWMU 6 and AOC 4 area. Airborne dust is expected to be trapped in the immediate area due to the presence of the slag berms surrounding the former tank locations and partial backfilling of the area, which should limit airborne dust migration of surface soil particulate. The limited detections of VOCs in the subsurface soil have the potential to partition to the gas phase and migrate to and via the air pathway; however, this pathway is not expected to be significant.

A risk evaluation was conducted for SWMU 6 and AOC 4. For the human health evaluation, metals, VOCs, and PAHs were identified as COPCs in subsurface soil and metals were identified as COPCs in surface soil. Therefore, a HHRA and lead modeling were conducted to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. No significant risk was posed by the COPCs in soil at SWMU 6 and AOC 4 for these exposure scenarios. Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted for SWMU 6 and AOC 4.

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Table 9-1
SWMU 6 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field	Chemical Analysis									
		Sample	Date	RFI	XRF	Total				RCRA			Physical		Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Analysis[1]	Comments	Number
DIRECT-PUSH SUBSURFACE SOIL SAMPLES[2]															
06B01	DP1	0.8 - 2.8	3/24/97	1		X	X				X	X			D97-3627-1
	DP2	4 - 5.5	3/24/97	1		X	X				X	X			D97-3627-19
06B02	DP1	2.2 - 4.2	3/24/97	1		X	X				X	X			D97-3627-2
	DP1R		3/24/97	1		X	X				X	X		Rinsate	D97-3627-3
06B03	DP1	1.4 - 3.4	3/24/97	1		X	X				X	X			D97-3627-4
06B04	DP1	1 - 3	3/24/97	1		X	X				X	X			D97-3627-5
06B05	DP1	1.5 - 3.5	3/24/97	1		X	X				X	X			D97-3627-6
06B06	DP1	1 - 3	3/24/97	1		X	X				X	X			D97-3627-7
06B07	DP1	1 - 3	3/24/97	1		X	X				X	X			D97-3627-8
	DP1D	1 - 3	3/24/97	1		X	X				X	X		Field Duplicate	D97-3627-9
06B08	DP1	1 - 3	3/24/97	1		X	X				X	X			D97-3627-10
06B09	DP1	2 - 4	3/24/97	1		X	X				X	X			D97-3627-11
06B10	DP1	1 - 3	3/24/97	1		X	X				X	X			D97-3627-12
06B11	DP1	1.2 - 3.2	3/24/97	1		X	X				X	X			D97-3627-13
06B12	DP1	5 - 7	3/24/97	1		X	X				X	X			D97-3627-14
06B13	DP1	0 - 2	3/24/97	1		X	X				X	X			D97-3627-15
06B14	DP1	0 - 2	3/24/97	1		X	X				X	X			D97-3627-16
	DP1MS	0 - 2	3/24/97	1		X	X				X			Matrix Spike	D97-3627-17
	DP1MDS	0 - 2	3/24/97	1		X	X				X			Matrix Spike Duplicate	D97-3627-18
06B14A	DP2	2 - 4	5/26/98	2	X	X	X								D98-3897-3
	DP3	4 - 6	5/26/98	2	X	X	X								D98-3897-4
	DP4	6 - 8	5/26/98	2	X	X	X								D98-3897-5
TRENCH 06T01 SUBSURFACE SOIL SAMPLES															
06T01	SB1	5	5/26/98	2	X			X		X					D98-3898-4 / 9
	SB2	6.75	5/26/98	2	X			X		X					D98-3898-4 / 10
	SB3	8	5/26/98	2	X			X		X					D98-3898-4 / 11
	SB4	6.25	5/26/98	2	X			X		X					D98-3898-4 / 12
	GW1[3]	10 - 12	5/20/98	2				X	X						D98-3837-9
06T01	ST-1	19 - 21	5/26/98	2									X		
TRENCH 06T02 SUBSURFACE SOIL SAMPLES															
06T02	SB1	8 - 10	5/18/98	2	X	X	X								D98-3723-1
	SB1D	8 - 10	5/18/98	2	X	X	X							Field Duplicate	D98-3723-9
	SB2	10 - 12	5/18/98	2		X	X								D98-3723-2
	SB3	12 - 14	5/18/98	2		X	X								D98-3723-3
	SB4	14 - 16	5/18/98	2		X	X								D98-3723-4
06T02	SB11	8 - 10	5/18/98	2	X	X	X								D98-3723-5

Table 9-1
SWMU 6 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field	Chemical Analysis									
		Sample	Date	RFI	XRF	Total				RCRA			Physical		Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Analysis[1]	Comments	Number
06T02 (cont.)	SB12	10 - 12	5/18/98	2		X	X								D98-3723-6
	SB13	12 - 14	5/18/98	2		X	X								D98-3723-7
	SB14	14 - 16	5/18/98	2		X	X								D98-3723-8
TRENCH 06T03 SUBSURFACE SOIL SAMPLES															
06T03	SB1	5 - 7	5/18/98	2	X	X	X								D98-3723-10
	SB2	7 - 9	5/18/98	2	X	X	X								D98-3723-11
	SB2D	7 - 9	5/18/98	2	X	X	X							Field Duplicate	D98-3723-12
	SB11	5 - 7	5/18/98	2	X	X	X								D98-3723-13
	SB12	7 - 9	5/18/98	2	X	X	X								D98-3723-14
TRENCH 06T03A SUBSURFACE SOIL SAMPLES[4]															
06T03A	SBD[5]	11	5/18/98	2	X			X		X					D98-3743-1
	SB1	6 - 8	5/18/98	2	X	X	X								D98-3723-15
	SB1D	6 - 8	5/18/98	2	X	X	X							Field Duplicate	D98-3723-16
	SB2	8 - 10	5/18/98	2	X	X	X								D98-3766-1
	SB3	10 - 12	5/18/98	2	X	X	X								D98-3766-2
	SB4	12 - 14	5/18/98	2	X	X	X								D98-3766-3
	SB5	14 - 16	5/19/98	2	X	X	X								D98-3766-4
	SB6	16 - 18	5/19/98	2	X	X	X								D98-3766-5
	SB7	18 - 20	5/19/98	2	X	X	X								D98-3766-6
	SB1B	6 - 8	5/29/98	2	X			X		X					D98-4020-1
	SB2B	8 - 10	5/29/98	2	X			X		X					D98-4020-2
	SB3B	10 - 12	5/29/98	2	X			X		X					D98-4020-3
	SB11	6 - 8	5/19/98	2	X	X	X								D98-3766-7
	SB12	8 - 10	5/19/98	2	X	X	X								D98-3766-8
	SB13	10 - 12	5/19/98	2	X	X	X								D98-3766-9
	SB14	12 - 14	5/19/98	2	X	X	X								D98-3766-10
	SB15	14 - 16	5/19/98	2	X	X	X								D98-3766-11
	SB16	16 - 18	5/19/98	2	X	X	X								D98-3766-12
	SB17	18 - 20	5/19/98	2	X	X	X								D98-3766-13
	SB14A	12 - 14	5/19/98	2	X	X	X								D98-3766-15
	SB15A	14 - 16	5/19/98	2	X	X	X								D98-3766-14
	SB11B	6 - 8	5/29/98	2	X			X		X					D98-4020-4
	SB12B	8 - 10	5/29/98	2	X			X		X					D98-4020-5
	SB13B	10 - 12	5/29/98	2	X			X		X					D98-4020-6
	SB11C	6 - 8	06/01/98	2	X			X		X					D98-4070-1
	SB12C	8 - 10	06/01/98	2				X		X					D98-4070-2
	SB13C	10 - 12	06/01/98	2				X		X					D98-4070-3

Table 9-1
SWMU 6 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field	Chemical Analysis									
		Sample	Date	RFI	XRF	Total				RCRA			Physical		Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Analysis[1]	Comments	Number
06T03A	ST-1	17 - 19	05/29/98	2									X		
TRENCH 06T04 SUBSURFACE SOIL SAMPLES[6]															
TRENCH 06T05 SUBSURFACE SOIL SAMPLES[7]															
06T05	SB1	6 - 8	9/15/98	2				X		X					366017
	SB2	8 - 10	9/15/98	2				X		X					366018
	SB3	10 - 12	9/15/98	2				X		X					366019
	SB4	12 - 14	9/15/98	2				X		X					366020
	SB5	14 - 16	9/15/98	2				X		X					366021
	SB6	16 - 18	9/15/98	2				X		X					366022
	SB7	18 - 20	9/15/98	2				X		X					366023
	SB11	6 - 8	9/15/98	2				X	X	X		X			366025
	SB12	8 - 10	9/15/98	2				X	X	X		X			366026
	SB13	10 - 12	9/15/98	2				X	X	X		X			366027
	SB14	12 - 14	9/15/98	2				X	X	X		X			366028
	SB15	14 - 16	9/15/98	2				X	X	X		X			366029
	SB16	16 - 18	9/15/98	2				X	X	X		X			366030
	SB17	18 - 20	9/15/98	2				X	X	X		X			366031
	SB21	6 - 8	9/15/98	2				X	X	X		X			366032
	SB22	8 - 10	9/15/98	2				X	X	X		X			366033
	SB23	10 - 12	9/15/98	2				X	X	X		X			366034
	SB23D	10 - 12	9/15/98	2				X	X	X		X		Field Duplicate	366035
	SB23MS	10 - 12	9/15/98	2				X	X	X		X		Matrix Spike	366034MS
	SB23MSD	10 - 12	9/15/98	2				X	X			X		Matrix Spike Duplicate	366034MSD
	SB24	12 - 14	9/15/98	2				X	X	X		X			366036
	SB25	14 - 16	9/15/98	2				X	X	X		X			366037
	SB26	16 - 18	9/15/98	2				X	X	X		X			366038
	SB27	18 - 20	9/15/98	2				X	X	X		X			366039
	SB31	6 - 8	9/16/98	2				X	X	X		X			366181
	SB32	8 - 10	9/16/98	2				X	X	X		X			366182
	SB33	10 - 12	9/16/98	2				X	X	X		X			366183
	SB34	12 - 14	9/16/98	2				X	X	X		X			366184
	SB35	14 - 16	9/16/98	2				X	X	X		X			366185
	SB36	16 - 18	9/16/98	2				X	X	X		X			366186
	SB37	18 - 20	9/16/98	2				X	X	X		X			366187
TANK NO. 5 SURFACE SOIL SAMPLES[8]															
AST5	SR1	0 - 0.5	5/21/98	2	X	X	X								D98-3939-1
	SR1A	0.5 - 1	5/21/98	2	X	X	X								D98-3939-2

Table 9-1
SWMU 6 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field	Chemical Analysis									
		Sample	Date	RFI	XRF	Total				RCRA			Physical		Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Analysis[1]	Comments	Number
AST5 (cont.)	SR2	0 - 0.5	5/21/98	2	X	X	X								D98-3939-3
	SR2A	0.5 - 1	5/21/98	2	X										
	SR3	0 - 0.5	5/21/98	2	X										
	SR4	0 - 0.5	5/21/98	2	X	X	X								D98-3939-4
	SR1C	0 - 0.5	7/2/98	2		X	X								D98-4837-1
	SR2C	0 - 0.5	7/2/98	2		X	X								D98-4837-2
	SR3C	0 - 0.5	7/2/98	2		X	X								D98-4837-3
DIRECT-PUSH GROUNDWATER SAMPLES[9]															
06B06A	DW1	30 - 32	5/22/1998	2				X							D98-3877-5
06B07A	DW1	30 - 32	5/22/1998	2				X							D98-3877-6
06B10A	DW1	30 - 32	5/22/1998	2				X							D98-3877-2
	DW1MS	30 - 32	5/22/1998	2				X							D98-3877-3
	DW1MSD	30 - 32	5/22/1998	2				X							D98-3877-4
06B11A	DW1	35 - 37	5/22/1998	2				X							D98-3742-2

Notes:

ft = feet

PAH = Polynuclear Aromatic Hydrocarbons

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

SVOC = Semivolatile Organic Compounds

TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)

VOC = Volatile Organic Compounds

XRF = X-Ray Fluorescence Spectroscopy

[1] = Soil Physical Characteristics: Moisture content, Atterburg Limits, Percent passing No. 200 Sieve, Cation Exchange Capacity, Total Organic Carbon, and Hydraulic Conductivity.

[2] = Samples 06B15 and 06B16 were not collected due to inaccesible sampling location.

[3] = A groundwater sample was collected from perched groundwater seeping into Trench 06T01. Due to incorrect sample preservation, only the VOC results are usable.

[4] = Two trenches divided by a water line were placed at this location. Unless designated, the samples were taken from the trench south of the water line. Sample locations are presented from northernmost profile to the southernmost profile.

[5] = Sample 06T03A / SBD represents a sample of apparent paint waste collected from a drum unearthed in the trench.

[6] = No samples were collected from trench 06T04. Debris field was present at this location.

[7] = Trench 06T05 was placed in three segments (A,B,C) from East to West. Sample locations are presented from the easternmost to the westernmost profile.

[8] = Surface soil samples were collected from the floor of Tank No. 5 following its demolition. Based upon the results of those samples, the area was cleaned with a vacuum truck. Confirmation samples were collected after vacuuming activities and are labelled SR1C through SR3C.

[9] = Direct-push groundwater sample results are presented and discussed with the SWMU 24 groundwater results (Chapter 18.0).

Table 9-2
AOC 4 Investigation Activities
Armco Kansas City Facility

Sample Location		Total			Field	Chemical Analysis								
		Depth	Date	RFI	XRF	Total				RCRA				Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Comments	Number
DIRECT-PUSH SUBSURFACE SOIL SAMPLES														
A04B01[1]	DP1			1										
	DP1D			1									Field Duplicate	
A04B02	DP1	2 - 4	3/24/97	1		X	X	X			X	X		
A04B03	DP1	4 - 6	3/25/97	1		X	X	X			X	X		
	DP1R		3/25/97	1									Rinsate	
A04B03A	DP2	6 - 8	5/26/98	2	X	X	X							
	DP3	8 - 10	5/26/98	2	X	X	X							
A04B04	DP1	2 - 4	3/25/97	1		X	X	X			X	X		
	DP2	4 - 6	3/25/97	1		X	X	X			X	X		
	DP2D	4 - 6	3/25/97	1		X	X	X			X	X	Field Duplicate	
TRENCH A04T01 SUBSURFACE SOIL SAMPLES														
A04T01	SB1	10 - 12	5/19/98	2	X	X	X							D98-3766-18
	SB2	12 - 14	5/19/98	2	X	X	X							D98-3766-19
	SB3	14 - 16	5/19/98	2	X	X	X							D98-3766-20
	SB4	16 - 18	5/19/98	2	X	X	X							D98-3766-21
	SB11	10 - 12	5/19/98	2	X	X	X							D98-3766-16
	SB12	12 - 14	5/19/98	2	X	X	X							D98-3766-17
	SB13	14 - 16	5/19/98	2	X	X	X							D98-3766-22
	SB13MS	14 - 16	5/19/98	2	X	X	X						Matrix Spike	D98-3766-23
	SB13MSD	14 - 16	5/19/98	2	X	X	X						Matrix Spike Duplicate	D98-3766-24
	SB14	16 - 18	5/19/98	2	X									
	SB11A	10 - 12	5/19/98	2	X	X	X							D98-3766-25
	SB12A	12 - 14	5/19/98	2	X	X	X							D98-3766-26
TRENCH A04T02 SUBSURFACE SOIL SAMPLES														
A04T02	SB1	12 - 14	9/14/98	2				X		X				365710
	SB2	14 - 16	9/14/98	2				X		X				365711
	SB3	16 - 18	9/14/98	2				X		X				365712
	SB4	18 - 20	9/14/98	2				X		X				365713
	SB5	20 - 22	9/14/98	2				X		X				365714
	SB11	12 - 14	9/14/98	2				X		X				365715
	SB12	14 - 16	9/14/98	2				X		X				365716
	SB13	16 - 18	9/14/98	2				X		X				365717
	SB14	18 - 20	9/14/98	2				X		X				365718
	SB15	20 - 22	9/14/98	2				X		X				365719

Table 9-2
AOC 4 Investigation Activities
Armco Kansas City Facility

Sample Location		Total			Field	Chemical Analysis								
		Depth	Date	RFI	XRF	Total				RCRA				Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	Cadmium	VOC	SVOC	Metals	PAH	TPH	Comments	Number
A04T02	SB21	12 - 14	9/14/98	2				X		X				365720
	SB21D	12 - 14	9/14/98	2				X		X			Field Duplicate	365721
	SB21MS	12 - 14	9/14/98	2				X		X			Matrix Spike	365720MS
	SB21MSD	12 - 14	9/14/98	2				X		X			Matrix Spike Duplicate	365720DP
	SB22	14 - 16	9/14/98	2				X		X				365722
	SB23	16 - 18	9/14/98	2				X		X				365723
	SB24	18 - 20	9/14/98	2				X		X				365724
	SB25	20 - 22	9/14/98	2				X		X				365725

Notes:

ft = feet

PAH = Polynuclear Aromatic Hydrocarbons

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

SVOC = Semivolatile Organic Compounds

TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)

VOC = Volatile Organic Compounds

XRF = X-Ray Fluorescence Spectroscopy

[1] = Sample A04B01 was not collected due to inaccessibility of sample location.

Table 9-3
SWMU 6 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		06B01/DP1	06B01/DP2	06B02/DP1	06B03/DP1	06B04/DP1	06B05/DP1	06B06/DP1
Date Sampled:		3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997
Sample Depth From:		0.8	4	2.2	1.4	1	1.5	1
Sample Depth To:		2.8	5.5	4.2	3.4	3	3.5	3
Laboratory Number:		D97-3627-1	D97-3627-19	D97-3627-2	D97-3627-4	D97-3627-5	D97-3627-6	D97-3627-7
Sample Type:								
Semivolatiles	UNITS							
Acenaphthene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Anthracene	mg/Kg	***0.268 J***	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Benzo(a)anthracene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Benzo(a)pyrene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Benzo(b)fluoranthene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	***0.136 J***	0.402 U
Benzo(k)fluoranthene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Chrysene	mg/Kg	0.409 U	0.398 U	0.411 U	***0.141 J***	0.406 U	***0.143 J***	0.402 U
Fluoranthene	mg/Kg	0.409 U	0.398 U	0.411 U	***0.24 J***	0.406 U	***0.231 J***	***0.217 J***
Fluorene	mg/Kg	0.409 U	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Naphthalene	mg/Kg	***1.26***	0.398 U	0.411 U	0.394 U	0.406 U	0.393 U	0.402 U
Phenanthrene	mg/Kg	***2.59***	0.398 U	0.411 U	***0.333 J***	0.406 U	***0.296 J***	***0.128 J***
Pyrene	mg/Kg	0.409 U	0.398 U	0.411 U	***0.222 J***	0.406 U	***0.21 J***	***0.183 J***
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	***4.118***	ND	ND	***0.936***	ND	***1.016***	***0.528***
Metals, Total	UNITS							
Cadmium, Total	mg/Kg	2.48 U	2.41 U	2.49 U	***2.54***	2.46 U	***2.41***	2.44 U
Lead, Total	mg/Kg	***19 J****	***20.9 J****	***19.9 J****	***106 J****	***17.2 J****	***64.6 J****	***28.2 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-3
SWMU 6 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		06B07/DP1	06B07/DP1D	06B08/DP1	06B09/DP1	06B10/DP1	06B11/DP1	06B12/DP1
Date Sampled:		3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997	3/24/1997
Sample Depth From:		1	1	1	2	1	1.2	5
Sample Depth To:		3	3	3	4	3	3.2	7
Laboratory Number:		D97-3627-8	D97-3627-9	D97-3627-10	D97-3627-11	D97-3627-12	D97-3627-13	D97-3627-14
Sample Type:			Duplicate					
Semivolatiles	UNITS							
Acenaphthene	mg/Kg	0.403 U	0.409 U	3.83 DU	0.389 U	0.41 U	***0.205 J***	0.399 U
Anthracene	mg/Kg	0.403 U	0.409 U	3.83 DU	0.389 U	0.41 U	***0.435***	0.399 U
Benzo(a)anthracene	mg/Kg	***0.255 J***	***0.201 J***	3.83 DU	***0.248 J***	0.41 U	***0.585***	0.399 U
Benzo(a)pyrene	mg/Kg	***0.345 J***	***0.244 J***	3.83 DU	***0.152 J***	0.41 U	***0.258 J***	0.399 U
Benzo(b)fluoranthene	mg/Kg	***0.362 J***	***0.27 J***	3.83 DU	***0.256 J***	***0.169 J***	***0.56***	0.399 U
Benzo(k)fluoranthene	mg/Kg	0.403 U	0.409 U	3.83 DU	0.389 U	0.41 U	***0.278 J***	0.399 U
Chrysene	mg/Kg	***0.302 J***	***0.278 J***	3.83 DU	***0.325 J***	***0.193 J***	***0.596***	0.399 U
Fluoranthene	mg/Kg	***0.336 J***	***0.37 J***	3.83 DU	***0.421***	***0.177 J***	***1.39***	0.399 U
Fluorene	mg/Kg	0.403 U	0.409 U	3.83 DU	0.389 U	0.41 U	***0.601***	0.399 U
Naphthalene	mg/Kg	0.403 U	0.409 U	3.83 DU	0.389 U	***0.16 J***	***2.67***	0.399 U
Phenanthrene	mg/Kg	***0.33 J***	***0.292 J***	3.83 DU	***0.363 J***	***0.342 J***	***2.39***	0.399 U
Pyrene	mg/Kg	***0.501***	***0.391 J***	***2.53 DJ***	***0.574***	***0.162 J***	***0.938***	0.399 U
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	***2.431***	***2.046***	***2.53***	***2.339***	***1.203***	***10.906***	ND
Metals, Total	UNITS							
Cadmium, Total	mg/Kg	***7.98***	2.48 U	***1.83 J***	***3.09***	***8.02***	***3.23***	2.42 U
Lead, Total	mg/Kg	***260 J****	***41.3 J****	***107 J****	***298 J****	***365 J****	***291 J****	***20.3 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-3
SWMU 6 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		06B13/DP1	06B14/DP1	06B14A/DP2	06B14A/DP3	06B14A/DP4
Date Sampled:		3/24/1997	3/24/1997	5/26/1998	5/26/1998	5/26/1998
Sample Depth From:		0	0	2	4	6
Sample Depth To:		2	2	4	6	8
Laboratory Number:		D97-3627-15	D97-3627-16	D98-3897-3	D98-3897-4	D98-3897-5
Sample Type:						
Semivolatiles	UNITS					
Acenaphthene	mg/Kg	0.386 U	0.387 U	NA	NA	NA
Anthracene	mg/Kg	0.386 U	0.387 U	NA	NA	NA
Benzo(a)anthracene	mg/Kg	***0.155 J***	0.387 U	NA	NA	NA
Benzo(a)pyrene	mg/Kg	***0.155 J***	0.387 U	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	***0.228 J***	0.387 U	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	***0.131 J***	0.387 U	NA	NA	NA
Chrysene	mg/Kg	***0.204 J***	***0.197 J***	NA	NA	NA
Fluoranthene	mg/Kg	***0.308 J***	0.387 U	NA	NA	NA
Fluorene	mg/Kg	0.386 U	0.387 U	NA	NA	NA
Naphthalene	mg/Kg	0.386 U	0.387 U	NA	NA	NA
Phenanthrene	mg/Kg	***0.208 J***	0.387 U	NA	NA	NA
Pyrene	mg/Kg	***0.31 J***	***0.27 J***	NA	NA	NA
Total Detected SVOCs	UNITS					
Total Semi-Volatiles	mg/Kg	***1.699***	***0.467***	NA	NA	NA
Metals, Total	UNITS					
Cadmium, Total	mg/Kg	***10.2***	***22.6***	***62.6 D***	***3.42***	***0.73***
Lead, Total	mg/Kg	***456 J****	***1,550 J****	***3,620 D***	***124***	***24.7***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-4
AOC 4 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A04B02/DP1	A04B03/DP1	A04B03A/DP2	A04B03A/DP3	A04B04/DP1	A04B04/DP2	A04B04/DP2D
Date Sampled:		03/24/1997	03/25/1997	05/26/1998	05/26/1998	03/25/1997	03/25/1997	03/25/1997
Sample Depth From:		2	4	6	8	2	4	4
Sample Depth To:		4	6	8	10	4	6	6
Laboratory Number:		D97-3627-20	D97-3602-4	D98-3897-1	D98-3897-2	D97-3602-7	D97-3602-1	D97-3602-2
Sample Type:								Duplicate
Volatiles	UNITS							
		ND	ND	NA	NA	ND	ND	ND
Semivolatiles	UNITS							
Benzo(b)fluoranthene	mg/Kg	***0.111 J***	0.395 U	NA	NA	***0.365 J***	0.402 U	0.407 U
Chrysene	mg/Kg	***0.142 J***	0.395 U	NA	NA	***0.26 J***	0.402 U	0.407 U
Fluoranthene	mg/Kg	***0.117 J***	0.395 U	NA	NA	***0.321 J***	0.402 U	0.407 U
Phenanthrene	mg/Kg	***0.11 J***	0.395 U	NA	NA	***0.242 J***	0.402 U	0.407 U
Pyrene	mg/Kg	***0.13 J***	0.395 U	NA	NA	***0.261 J***	0.402 U	0.407 U
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	***0.61***	ND	NA	NA	***1.449***	ND	ND
Metals, Total	UNITS							
Cadmium, Total	mg/Kg	***6.96 J****	***12.3 J****	0.65 U	***0.34 J***	***9.6 J****	***3.13 J****	***2.24 J***
Lead, Total	mg/Kg	***293***	***1,070***	***11.6***	***12.2***	***732***	***202***	***197***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T01/SB1	06T01/SB1	06T01/SB2	06T01/SB2	06T01/SB3	06T01/SB3	06T01/SB4
Date Sampled:		5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998
Sample Depth From:		5	5	6.75	6.75	8	8	6.25
Sample Depth To:		5	5	6.75	6.75	8	8	6.25
Laboratory Number:		D98-3898-9	D98-3898-4	D98-3898-10	D98-3898-5	D98-3898-11	D98-3898-6	D98-3898-12
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	5.88 U	NA	5.48 U	NA	27 DU	NA	28.2 DU
2-Butanone	ug/Kg	***50.7 J****	NA	***70.9***	NA	***60.9 DJ****	NA	***25.9 DJ***
2-Hexanone	ug/Kg	58.8 U	NA	54.8 U	NA	***194 DJ***	NA	282 DU
4-Methyl-2-pentanone	ug/Kg	118 U	NA	110 U	NA	***21.3 DJ***	NA	564 DU
Acetone	ug/Kg	***43.1 J***	NA	***44.9 J***	NA	***214 DJ***	NA	564 DU
Benzene	ug/Kg	5.88 U	NA	5.48 U	NA	27 DU	NA	28.2 DU
Carbon disulfide	ug/Kg	***5.08 J***	NA	***2.77 J***	NA	***36.8 DJ****	NA	28.2 DU
Chlorobenzene	ug/Kg	5.88 U	NA	5.48 U	NA	27 DU	NA	28.2 DU
Ethylbenzene	ug/Kg	***1.51 J***	NA	1.8 JU*	NA	***21.8 DJ***	NA	***6.59 DJ***
m,p-Xylene	ug/Kg	***2.91 J***	NA	2.02 JU*	NA	***72.2 DJ****	NA	***16.1 DJ***
Methylene chloride	ug/Kg	***24.9 J****	NA	***15.4***	NA	***20.5 DJ***	NA	***9.63 DJ***
o-Xylene	ug/Kg	***4.12 J***	NA	5.48 U	NA	***69.8 DJ****	NA	***23.7 DJ***
Styrene	ug/Kg	5.88 U	NA	5.48 U	NA	27 DU	NA	28.2 DU
Tetrachloroethene	ug/Kg	5.88 U	NA	5.48 U	NA	***17.2 DJ***	NA	28.2 DU
Toluene	ug/Kg	***5.2 J***	NA	***3.13 J***	NA	***18.2 DJ***	NA	28.2 DU
Trichloroethene	ug/Kg	***1.84 J***	NA	***22.9***	NA	27 DU	NA	28.2 DU
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***139.36***	NA	***160***	NA	***746.7***	NA	***81.92***
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T01/SB1	06T01/SB1	06T01/SB2	06T01/SB2	06T01/SB3	06T01/SB3	06T01/SB4
Date Sampled:		5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998	5/26/1998
Sample Depth From:		5	5	6.75	6.75	8	8	6.25
Sample Depth To:		5	5	6.75	6.75	8	8	6.25
Laboratory Number:		D98-3898-9	D98-3898-4	D98-3898-10	D98-3898-5	D98-3898-11	D98-3898-6	D98-3898-12
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	*20.4 D*	NA	*10.5 D*	NA	*58.7 D*	NA
Barium, Total	mg/Kg	NA	*973 D*	NA	*252 D*	NA	*158 D*	NA
Cadmium, Total	mg/Kg	NA	*61.1 D*	NA	*9 D*	NA	5.5 DU	NA
Chromium, Total	mg/Kg	NA	*346 D*	NA	*372 D*	NA	*181 D*	NA
Lead, Total	mg/Kg	NA	*8,210 D*	NA	*727 D*	NA	*339 D*	NA
Mercury, Total	mg/Kg	NA	*0.0487 J*	NA	*0.0644 J*	NA	*0.0887 J*	NA
Selenium, Total	mg/Kg	NA	6.08 DU	NA	5.72 DU	NA	11.1 DU	NA
Silver, Total	mg/Kg	NA	*3.73 D*	NA	*1.2 DJ*	NA	5.5 DU	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T01/SB4	06T02/SB1	06T02/SB1D	06T02/SB2	06T02/SB3	06T02/SB4	06T02/SB11
Date Sampled:		5/26/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998
Sample Depth From:		6.25	8	8	10	12	14	8
Sample Depth To:		6.25	10	10	12	14	16	10
Laboratory Number:		D98-3898-7	D98-3723-1	D98-3723-9	D98-3723-2	D98-3723-3	D98-3723-4	D98-3723-5
Sample Type:				Duplicate				
Volatiles	**UNITS**							
1,1-Dichloroethane	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	NA	NA	NA	NA	NA	NA
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	**UNITS**							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Semivolatiles	**UNITS**							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T01/SB4	06T02/SB1	06T02/SB1D	06T02/SB2	06T02/SB3	06T02/SB4	06T02/SB11
Date Sampled:		5/26/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998
Sample Depth From:		6.25	8	8	10	12	14	8
Sample Depth To:		6.25	10	10	12	14	16	10
Laboratory Number:		D98-3898-7	D98-3723-1	D98-3723-9	D98-3723-2	D98-3723-3	D98-3723-4	D98-3723-5
Sample Type:				Duplicate				
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	*13.1 D*	NA	NA	NA	NA	NA	NA
Barium, Total	mg/Kg	*172 D*	NA	NA	NA	NA	NA	NA
Cadmium, Total	mg/Kg	*5.1 DJ*	*0.66*	3.15 DU	*2.54 DJ*	*18.1 D*	*4.39 D*	3.08 DU
Chromium, Total	mg/Kg	*272 D*	NA	NA	NA	NA	NA	NA
Lead, Total	mg/Kg	*1,730 D*	*20.6*	*20 D*	*156 D*	*108 D*	*78.5 D*	*19.6 D*
Mercury, Total	mg/Kg	*0.103 J*	NA	NA	NA	NA	NA	NA
Selenium, Total	mg/Kg	11.2 DU	NA	NA	NA	NA	NA	NA
Silver, Total	mg/Kg	5.6 DU	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T02/SB12	06T02/SB13	06T02/SB14	06T03/SB1	06T03/SB2	06T03/SB2D	06T03/SB11
Date Sampled:		5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998
Sample Depth From:		10	12	14	5	7	7	5
Sample Depth To:		12	14	16	7	9	9	7
Laboratory Number:		D98-3723-6	D98-3723-7	D98-3723-8	D98-3723-10	D98-3723-11	D98-3723-12	D98-3723-13
Sample Type:							Duplicate	
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	NA	NA	NA	NA	NA	NA
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T02/SB12	06T02/SB13	06T02/SB14	06T03/SB1	06T03/SB2	06T03/SB2D	06T03/SB11
Date Sampled:		5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/18/1998
Sample Depth From:		10	12	14	5	7	7	5
Sample Depth To:		12	14	16	7	9	9	7
Laboratory Number:		D98-3723-6	D98-3723-7	D98-3723-8	D98-3723-10	D98-3723-11	D98-3723-12	D98-3723-13
Sample Type:							Duplicate	
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Barium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Cadmium, Total	mg/Kg	***4.22 D***	***3.06 D***	***3.58 D***	***17.7 D***	***19.9 D***	***9.49 D***	***46.2 D***
Chromium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Lead, Total	mg/Kg	***135 D***	***144 D***	***201 D***	***1,090 D***	***1,040 D***	***511 D***	***1,300 D***
Mercury, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Selenium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Silver, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03/SB12	06T03A/SBD	06T03A/SB1	06T03A/SB1D	06T03A/SB2	06T03A/SB3	06T03A/SB4
Date Sampled:		5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/19/1998	5/19/1998	5/19/1998
Sample Depth From:		7	11	6	6	8	10	12
Sample Depth To:		9	11	8	8	10	12	14
Laboratory Number:		D98-3723-14	D98-3743-1	D98-3723-15	D98-3723-16	D98-3766-1	D98-3766-2	D98-3766-3
Sample Type:					Duplicate			
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
2-Hexanone	ug/Kg	NA	163,000 DU	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/Kg	NA	327,000 DU	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	327,000 DU	NA	NA	NA	NA	NA
Benzene	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
Carbon disulfide	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
Chlorobenzene	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
Ethylbenzene	ug/Kg	NA	***165,000 D***	NA	NA	NA	NA	NA
m,p-Xylene	ug/Kg	NA	***419,000 D***	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	***7,260 DJ***	NA	NA	NA	NA	NA
o-Xylene	ug/Kg	NA	***176,000 D***	NA	NA	NA	NA	NA
Styrene	ug/Kg	NA	***5,490 DJ***	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	16,300 DU	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	***19,700 D***	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	***3,850 DJ***	NA	NA	NA	NA	NA
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	***796,300***	NA	NA	NA	NA	NA
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03/SB12	06T03A/SBD	06T03A/SB1	06T03A/SB1D	06T03A/SB2	06T03A/SB3	06T03A/SB4
Date Sampled:		5/18/1998	5/18/1998	5/18/1998	5/18/1998	5/19/1998	5/19/1998	5/19/1998
Sample Depth From:		7	11	6	6	8	10	12
Sample Depth To:		9	11	8	8	10	12	14
Laboratory Number:		D98-3723-14	D98-3743-1	D98-3723-15	D98-3723-16	D98-3766-1	D98-3766-2	D98-3766-3
Sample Type:					Duplicate			
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	*11.7 D*	NA	NA	NA	NA	NA
Barium, Total	mg/Kg	NA	*310 D*	NA	NA	NA	NA	NA
Cadmium, Total	mg/Kg	*43 D*	*15.1 D*	*14 D*	*13.6 D*	*61.8 DJ**	*42.9 DJ**	*46.6 DJ**
Chromium, Total	mg/Kg	NA	*1,110 DJ**	NA	NA	NA	NA	NA
Lead, Total	mg/Kg	*2,010 D*	*625 D*	*1,870 D*	*841 D*	*3,550 DJ**	*1,860 DJ**	*2,140 DJ**
Mercury, Total	mg/Kg	NA	*1.56 D*	NA	NA	NA	NA	NA
Selenium, Total	mg/Kg	NA	6.53 DU	NA	NA	NA	NA	NA
Silver, Total	mg/Kg	NA	3.27 DU	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Sample Depth From: / Sample Depth To: / Laboratory Number: / Sample Type:		06T03A/SB5 5/19/1998 14 16 D98-3766-4	06T03A/SB6 5/19/1998 16 18 D98-3766-5	06T03A/SB7 5/19/1998 18 20 D98-3766-6	06T03A/SB1B 5/29/1998 6 8 D98-4020-1	06T03A/SB2B 5/29/1998 8 10 D98-4020-2	06T03A/SB3B 5/29/1998 10 12 D98-4020-3	06T03A/SB11 5/19/1998 6 8 D98-3766-7
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
2-Butanone	ug/Kg	NA	NA	NA	***5.53***	***13.9 J****	***20.5 J****	NA
2-Hexanone	ug/Kg	NA	NA	NA	54.3 U	59.1 UJ*	56.3 UJ*	NA
4-Methyl-2-pentanone	ug/Kg	NA	NA	NA	109 U	118 UJ*	113 UJ*	NA
Acetone	ug/Kg	NA	NA	NA	109 U	118 UJ*	113 UJ*	NA
Benzene	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Carbon disulfide	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Chlorobenzene	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Ethylbenzene	ug/Kg	NA	NA	NA	***2.05 J***	5.91 UJ*	5.63 UJ*	NA
m,p-Xylene	ug/Kg	NA	NA	NA	***2.79 J***	***3.79 J***	5.63 UJ*	NA
Methylene chloride	ug/Kg	NA	NA	NA	***7.61***	***5 J***	***3.24 J***	NA
o-Xylene	ug/Kg	NA	NA	NA	***3.62 J***	***1.37 J***	5.63 UJ*	NA
Styrene	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Toluene	ug/Kg	NA	NA	NA	***2.66 J***	***2.01 J***	5.63 UJ*	NA
Trichloroethene	ug/Kg	NA	NA	NA	5.43 U	5.91 UJ*	5.63 UJ*	NA
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	***24.26***	***26.07***	***23.74***	NA
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03A/SB5	06T03A/SB6	06T03A/SB7	06T03A/SB1B	06T03A/SB2B	06T03A/SB3B	06T03A/SB11
Date Sampled:		5/19/1998	5/19/1998	5/19/1998	5/29/1998	5/29/1998	5/29/1998	5/19/1998
Sample Depth From:		14	16	18	6	8	10	6
Sample Depth To:		16	18	20	8	10	12	8
Laboratory Number:		D98-3766-4	D98-3766-5	D98-3766-6	D98-4020-1	D98-4020-2	D98-4020-3	D98-3766-7
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	NA	NA	*9.62*	*8.35*	*7.8 D*	NA
Barium, Total	mg/Kg	NA	NA	NA	*297*	*351*	*596 D*	NA
Cadmium, Total	mg/Kg	*13 DJ**	*1.88 DJ*	*24.2 DJ**	*7.3*	*18.9*	*24.5 D*	*6.85 DJ**
Chromium, Total	mg/Kg	NA	NA	NA	*708*	*595*	*1,760 D*	NA
Lead, Total	mg/Kg	*630 DJ**	*73.7 DJ**	*872 DJ**	*402 J**	*670 J**	*1,050 DJ**	*338 DJ**
Mercury, Total	mg/Kg	NA	NA	NA	*0.507 D*	*0.301*	*0.368 D*	NA
Selenium, Total	mg/Kg	NA	NA	NA	1.09 U	1.18 U	5.63 DU	NA
Silver, Total	mg/Kg	NA	NA	NA	*1.34*	*2.12*	*3.73 D*	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03A/SB12	06T03A/SB13	06T03A/SB14	06T03A/SB15	06T03A/SB16	06T03A/SB17	06T03A/SB14A
Date Sampled:		5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998
Sample Depth From:		8	10	12	14	16	18	12
Sample Depth To:		10	12	14	16	18	20	14
Laboratory Number:		D98-3766-8	D98-3766-9	D98-3766-10	D98-3766-11	D98-3766-12	D98-3766-13	D98-3766-15
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	NA	NA	NA	NA	NA	NA
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03A/SB12		06T03A/SB13		06T03A/SB14		06T03A/SB15		06T03A/SB16		06T03A/SB17		06T03A/SB14A	
Date Sampled:		5/19/1998		5/19/1998		5/19/1998		5/19/1998		5/19/1998		5/19/1998		5/19/1998	
Sample Depth From:		8		10		12		14		16		18		12	
Sample Depth To:		10		12		14		16		18		20		14	
Laboratory Number:		D98-3766-8		D98-3766-9		D98-3766-10		D98-3766-11		D98-3766-12		D98-3766-13		D98-3766-15	
Sample Type:															
Semivolatiles	UNITS														
- CONTINUED -															
Fluoranthene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Fluorene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Naphthalene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Phenanthrene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Phenol	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Pyrene	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Total Detected SVOCs	UNITS														
Total Semi-Volatiles	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Metals, Total	UNITS														
Arsenic, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Barium, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Cadmium, Total	mg/Kg	***68.3***	***DJ****	***112***	***DJ****	***42***	***DJ****	***6.82***	***DJ****	3.11	DUJ*	3.17	DU	***52.8***	***DJ****
Chromium, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Lead, Total	mg/Kg	***1,380***	***DJ****	***1,750***	***DJ****	***1,240***	***DJ****	***273***	***DJ****	***14.1***	***DJ****	***30.3***	***DJ****	***2,500***	***DJ****
Mercury, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Selenium, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	
Silver, Total	mg/Kg	NA		NA		NA		NA		NA		NA		NA	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03A/SB15A	06T03A/SB11B	06T03A/SB12B	06T03A/SB13B	06T03A/SB11C	06T03A/SB12C	06T03A/SB13C
Date Sampled:		5/19/1998	5/29/1998	5/29/1998	5/29/1998	6/1/1998	6/1/1998	6/1/1998
Sample Depth From:		14	6	8	10	6	8	10
Sample Depth To:		16	8	10	12	8	10	12
Laboratory Number:		D98-3766-14	D98-4020-4	D98-4020-5	D98-4020-6	D98-4070-1	D98-4070-2	D98-4070-3
Sample Type:								
Volatiles	**UNITS**							
1,1-Dichloroethane	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
2-Butanone	ug/Kg	NA	***25.3 J****	5.76 U	5.86 U	NA	NA	5.64 U
2-Hexanone	ug/Kg	NA	55 UJ*	57.6 U	58.6 U	NA	NA	56.4 U
4-Methyl-2-pentanone	ug/Kg	NA	110 UJ*	115 U	117 U	NA	NA	***3.76 J***
Acetone	ug/Kg	NA	110 UJ*	115 U	117 U	NA	NA	113 U
Benzene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Carbon disulfide	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Chlorobenzene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Ethylbenzene	ug/Kg	NA	***1.2 J***	5.76 U	5.86 U	NA	NA	5.64 U
m,p-Xylene	ug/Kg	NA	***3.39 J***	***1.52 J***	***1.48 J***	NA	NA	5.64 U
Methylene chloride	ug/Kg	NA	***5.01 J***	***53.6 J****	***38.8***	NA	NA	***5.79***
o-Xylene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Styrene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Tetrachloroethene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Toluene	ug/Kg	NA	***3.17 J***	***5.87 J****	***2.84 J***	NA	NA	5.64 U
Trichloroethene	ug/Kg	NA	5.5 UJ*	5.76 U	5.86 U	NA	NA	5.64 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	**UNITS**							
Total Volatiles	ug/Kg	NA	***38.07***	***60.99***	***43.12***	NA	NA	***9.55***
Semivolatiles	**UNITS**							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T03A/SB15A	06T03A/SB11B	06T03A/SB12B	06T03A/SB13B	06T03A/SB11C	06T03A/SB12C	06T03A/SB13C
Date Sampled:		5/19/1998	5/29/1998	5/29/1998	5/29/1998	6/1/1998	6/1/1998	6/1/1998
Sample Depth From:		14	6	8	10	6	8	10
Sample Depth To:		16	8	10	12	8	10	12
Laboratory Number:		D98-3766-14	D98-4020-4	D98-4020-5	D98-4020-6	D98-4070-1	D98-4070-2	D98-4070-3
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	*9.82*	*36.7 D*	*32.4 D*	*21.1 D*	5.29 DU	*7.91 D*
Barium, Total	mg/Kg	NA	*304*	*591 D*	*508 D*	*543 DJ**	*486 DJ**	*356 D*
Cadmium, Total	mg/Kg	3.17 DU	*17*	*73 D*	*80.5 D*	*61.5 D*	*4.51 D*	*5.02 D*
Chromium, Total	mg/Kg	NA	*986*	*599 D*	*318 D*	*648 D*	*2,480 D*	*2,120 D*
Lead, Total	mg/Kg	*104 DJ**	*413 J**	*2,480 DJ**	*1,860 DJ**	*1,790 D*	*216 D*	*223 D*
Mercury, Total	mg/Kg	NA	*1.17 D*	*9.87 D*	*8.68 D*	0.127 U	0.127 U	*2.56 D*
Selenium, Total	mg/Kg	NA	1.1 U	5.76 DU	5.86 DU	*96 D*	5.29 DU	5.64 DU
Silver, Total	mg/Kg	NA	*2*	*3.09 D*	*10.1 D*	*4.7 D*	*2.61 DJ*	*2.91 D*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB1	06T05/SB1	06T05/SB2	06T05/SB2	06T05/SB3	06T05/SB3	06T05/SB4
Date Sampled:		9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998
Sample Depth From:		6	6	8	8	10	10	12
Sample Depth To:		8	8	10	10	12	12	14
Laboratory Number:		366017	366017R1	366018	366018D1	366019	366019R1	366020
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	*12 J**	*13 J**	*3 J*	13 DU	*2.3 J*	*1.9 J*	5.8 U
2-Butanone	ug/Kg	*11 J**	*11 J**	*56 J**	*38 DJ**	*20 J**	*15 J**	*57 J**
2-Hexanone	ug/Kg	6.2 U	6.2 U	6.3 U	13 DU	6 U	6 U	5.8 U
4-Methyl-2-pentanone	ug/Kg	6.2 U	6.2 U	6.3 U	13 DU	6 U	6 U	5.8 U
Acetone	ug/Kg	*62 J**	*65 J**	*300 E*	*230 DJ**	*120 J**	*86 J**	*340 E*
Benzene	ug/Kg	*2.2 J*	*2.2 J*	6.3 U	13 DU	6 U	*1.1 J*	5.8 U
Carbon disulfide	ug/Kg	*7 J**	*7.3 J**	*4.4 J*	*3 JD*	*6.1 J**	*10 J**	*8.7 J**
Chlorobenzene	ug/Kg	*33 J**	*25 J**	*14 J**	13 DU	6 U	6 U	5.8 U
Ethylbenzene	ug/Kg	*2.9 J*	*2.4 J*	*11 J**	*2.6 JD*	6 U	6 U	5.8 U
m,p-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	6.2 U	6.2 U	*3.3 J*	13 DU	6 U	6 U	*2.3 J*
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	6.2 U	6.2 U	6.3 U	13 DU	6 U	6 U	5.8 U
Tetrachloroethene	ug/Kg	6.2 U	6.2 U	6.3 U	13 DU	6 U	6 U	5.8 U
Toluene	ug/Kg	*1.4 J*	*1.1 J*	6.3 U	13 DU	6 U	6 U	5.8 U
Trichloroethene	ug/Kg	6.2 U	6.2 U	6.3 U	13 DU	6 U	6 U	5.8 U
Xylenes (total)	ug/Kg	*16 J**	*13 J**	*36 J**	*7.7 JD*	6 U	6 U	5.8 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	*147.5*	*140*	*427.7*	*281.3*	*148.4*	*114*	*408*
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB1	06T05/SB1	06T05/SB2	06T05/SB2	06T05/SB3	06T05/SB3	06T05/SB4
Date Sampled:		9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998
Sample Depth From:		6	6	8	8	10	10	12
Sample Depth To:		8	8	10	10	12	12	14
Laboratory Number:		366017	366017R1	366018	366018D1	366019	366019R1	366020
Sample Type:								
Semivolatiles	**UNITS**							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Phenol	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	**UNITS**							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	**UNITS**							
Arsenic, Total	mg/Kg	***22.5*** J*	NA	***17.1*** J*	NA	***13.9*** J*	NA	***21.7*** J*
Barium, Total	mg/Kg	***185*** J*	NA	***246*** J*	NA	***276*** J*	NA	***297*** J*
Cadmium, Total	mg/Kg	***90.1*** J*	NA	***7.5*** J*	NA	***9*** J*	NA	***9.5*** J*
Chromium, Total	mg/Kg	***236*** J*	NA	***27.3*** J*	NA	***473*** J*	NA	***35.2*** J*
Lead, Total	mg/Kg	***3,040***	NA	***2,050***	NA	***1,810***	NA	***3,410***
Mercury, Total	mg/Kg	***0.56*** J*	NA	***0.26*** J*	NA	***0.73*** J*	NA	***0.37*** J*
Selenium, Total	mg/Kg	***0.93*** J*	NA	0.46 UJ*	NA	0.39 UJ*	NA	0.45 UJ*
Silver, Total	mg/Kg	***6.6*** J*	NA	***1.4*** J*	NA	***3.5*** J*	NA	***2.4*** J*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB4		06T05/SB5		06T05/SB6		06T05/SB7		06T05/SB11		06T05/SB11		06T05/SB12	
Date Sampled:		9/14/1998		9/15/1998		9/15/1998		9/15/1998		9/15/1998		9/15/1998		9/15/1998	
Sample Depth From:		12		14		16		18		6		6		8	
Sample Depth To:		14		16		18		20		8		8		10	
Laboratory Number:		366020R1		366021		366022		366023		366025		366025D1		366026	
Sample Type:															
Volatiles	**UNITS**														
1,1-Dichloroethane	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
2-Butanone	ug/Kg	*42*	*J**	*32*	*J**	*15*		*5.8*	*J*	*31*	*J**	*19*	*DJ**	*12*	
2-Hexanone	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
4-Methyl-2-pentanone	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Acetone	ug/Kg	*270*	*E*	*210*	*J**	*100*		*35*		*130*	*J**	*110*	*DJ**	*56*	
Benzene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Carbon disulfide	ug/Kg	*5.7*	*J*	*5.7*	*J*	6.8	U	6.5	U	*10*	*J*	*4.7*	*JD*	6.5	U
Chlorobenzene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Ethylbenzene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	*9.2*	*J*	*4.5*	*JD*	6.5	U
m,p-Xylene	ug/Kg	NA		5.8	U	6.8	U	6.5	U	*32*	*J**	*16*	*DJ**	6.5	U
Methylene chloride	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
o-Xylene	ug/Kg	NA		NA		NA		NA		NA		NA		NA	
Styrene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Tetrachloroethene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Toluene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	*3.8*	*J*	14	DU	6.5	U
Trichloroethene	ug/Kg	5.8	U	5.8	U	6.8	U	6.5	U	14	U	14	DU	6.5	U
Xylenes (total)	ug/Kg	5.8	U	NA		NA		NA		NA		NA		NA	
Total Detected VOCs	**UNITS**														
Total Volatiles	ug/Kg	*317.7*		*247.7*		*115*		*40.8*		*216*		*154.2*		*68*	
Semivolatiles	**UNITS**														
1,2,4-Trichlorobenzene	mg/Kg	NA		NA		NA		NA		0.92	U	NA		2.8	U
2,4-Dimethylphenol	mg/Kg	NA		NA		NA		NA		0.92	U	NA		2.8	U
2-Methylnaphthalene	mg/Kg	NA		NA		NA		NA		*4.8*		NA		*0.34*	*J*
4-Methylphenol	mg/Kg	NA		NA		NA		NA		*0.07*	*J*	NA		2.8	U
Acenaphthene	mg/Kg	NA		NA		NA		NA		*0.83*	*J*	NA		*1.5*	*J*
Acenaphthylene	mg/Kg	NA		NA		NA		NA		0.92	U	NA		2.8	U
Anthracene	mg/Kg	NA		NA		NA		NA		*0.47*	*J*	NA		*2.7*	*J*
Benzo(a)anthracene	mg/Kg	NA		NA		NA		NA		*0.42*	*J*	NA		*7.8*	
Benzo(a)pyrene	mg/Kg	NA		NA		NA		NA		*0.38*	*J*	NA		*7*	
Benzo(b)fluoranthene	mg/Kg	NA		NA		NA		NA		*0.44*	*J*	NA		*7.8*	
Benzo(g,h,i)perylene	mg/Kg	NA		NA		NA		NA		*0.3*	*J*	NA		*3.7*	
Benzo(k)fluoranthene	mg/Kg	NA		NA		NA		NA		*0.4*	*J*	NA		*6.3*	
Bis(2-ethylhexyl)phthalate	mg/Kg	NA		NA		NA		NA		*0.24*	*J*	NA		2.8	U
Butylbenzylphthalate	mg/Kg	NA		NA		NA		NA		0.92	U	NA		2.8	U
Chrysene	mg/Kg	NA		NA		NA		NA		*0.48*	*J*	NA		*7.6*	
Di-n-butylphthalate	mg/Kg	NA		NA		NA		NA		0.92	U	NA		2.8	U
Dibenzo(a,h)anthracene	mg/Kg	NA		NA		NA		NA		*0.14*	*J*	NA		*1.5*	*J*
Dibenzofuran	mg/Kg	NA		NA		NA		NA		*0.41*	*J*	NA		*0.58*	*J*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB4	06T05/SB5	06T05/SB6	06T05/SB7	06T05/SB11	06T05/SB11	06T05/SB12
Date Sampled:		9/14/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998
Sample Depth From:		12	14	16	18	6	6	8
Sample Depth To:		14	16	18	20	8	8	10
Laboratory Number:		366020R1	366021	366022	366023	366025	366025D1	366026
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	NA	NA	NA	***0.9 J***	NA	***17***
Fluorene	mg/Kg	NA	NA	NA	NA	***1.2***	NA	***1.2 J***
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	NA	NA	NA	***0.26 J***	NA	***3.5***
Naphthalene	mg/Kg	NA	NA	NA	NA	***0.46 J***	NA	***0.59 J***
Phenanthrene	mg/Kg	NA	NA	NA	NA	***5.3***	NA	***9.1***
Phenol	mg/Kg	NA	NA	NA	NA	***0.079 J***	NA	2.8 U
Pyrene	mg/Kg	NA	NA	NA	NA	***1.1***	NA	***11***
Total Detected SVOCs	UNITS							
Total Semi-Voiatiles	mg/Kg	NA	NA	NA	NA	***18.679***	NA	***89.21***
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	***22.8***	***3.7***	***3.4***	***8.5***	NA	***26***
Barium, Total	mg/Kg	NA	***233***	***214***	***177***	***170***	NA	***260***
Cadmium, Total	mg/Kg	NA	***14.1 J***	***6.6 J***	***0.88 J***	***21 J***	NA	***55.5 J***
Chromium, Total	mg/Kg	NA	***80.3***	***22.3***	***17.6***	***132***	NA	***212***
Lead, Total	mg/Kg	NA	***3,270 J***	***48.4 J***	***48.3 J***	***825 J***	NA	***2,060 J***
Mercury, Total	mg/Kg	NA	***0.21 J***	0.02 U	0.02 U	***0.27 J***	NA	***0.57 J***
Selenium, Total	mg/Kg	NA	***3***	***0.79***	0.62 U	***2.1***	NA	***5.6***
Silver, Total	mg/Kg	NA	***1.3***	0.31 U	0.29 U	***1.1***	NA	***8.9***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB13	06T05/SB13	06T05/SB14	06T05/SB14	06T05/SB15	06T05/SB16	06T05/SB17
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998
Sample Depth From:		10	10	12	12	14	16	18
Sample Depth To:		12	12	14	14	16	18	20
Laboratory Number:		366027	366027R1	366028	366028R1	366029	366030	366031
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
2-Butanone	ug/Kg	*8.9*	NA	*33 J**	*33 J**	*45*	*7*	*16*
2-Hexanone	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
4-Methyl-2-pentanone	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Acetone	ug/Kg	*47*	NA	*200 J**	*200 J**	*200*	*34*	*72*
Benzene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Carbon disulfide	ug/Kg	6.6 U	NA	*4.2 J*	*5 J*	6.7 U	6.4 U	6.4 U
Chlorobenzene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Ethylbenzene	ug/Kg	6.6 U	NA	6.1 U	*1.3 J*	6.7 U	6.4 U	*5 J*
m,p-Xylene	ug/Kg	6.6 U	NA	*5.9 J*	*6.5 J**	6.7 U	6.4 U	*32*
Methylene chloride	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Tetrachloroethene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Toluene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	*1.7 J*
Trichloroethene	ug/Kg	6.6 U	NA	6.1 U	6.1 U	6.7 U	6.4 U	6.4 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	*55.9*	NA	*243.1*	*245.8*	*245*	*41*	*126.7*
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	2 U	2 U	0.83 U	0.83 U	0.44 U	0.43 U	0.42 U
2,4-Dimethylphenol	mg/Kg	*0.17 J*	*0.18 J*	*0.11 J*	*0.1 J*	0.44 U	0.43 U	0.42 U
2-Methylnaphthalene	mg/Kg	*0.36 J*	*0.35 J*	*0.28 J*	*0.28 J*	0.44 U	0.43 U	*6.9 E*
4-Methylphenol	mg/Kg	2 U	2 U	*0.043 J*	*0.044 J*	0.44 U	0.43 U	0.42 U
Acenaphthene	mg/Kg	*1.4 J*	*1.4 J*	*0.11 J*	*0.1 J*	0.44 U	0.43 U	*0.86*
Acenaphthylene	mg/Kg	2 U	2 U	0.83 U	0.83 U	0.44 U	0.43 U	0.42 U
Anthracene	mg/Kg	*1.9 J*	*2 J*	*0.12 J*	*0.13 J*	0.44 U	0.43 U	*0.57*
Benzo(a)anthracene	mg/Kg	*4.1*	*4*	*0.38 J*	*0.38 J*	0.44 U	0.43 U	*0.16 J*
Benzo(a)pyrene	mg/Kg	*3.6*	*3.6*	*0.36 J*	*0.38 J*	0.44 U	0.43 U	*0.15 J*
Benzo(b)fluoranthene	mg/Kg	*3.3*	*3.4*	*0.41 J*	*0.39 J*	0.44 U	0.43 U	*0.18 J*
Benzo(g,h,i)perylene	mg/Kg	*2 J*	*2.1*	*0.32 J*	*0.34 J*	0.44 U	0.43 U	*0.13 J*
Benzo(k)fluoranthene	mg/Kg	*4.3*	*3.5*	*0.36 J*	*0.37 J*	0.44 U	0.43 U	*0.14 J*
Bis(2-ethylhexyl)phthalate	mg/Kg	2 U	*0.17 J*	0.83 U	0.83 U	0.44 U	0.43 U	0.42 U
Butylbenzylphthalate	mg/Kg	*1.9 J*	*1.7 J*	*0.12 J*	*0.13 J*	0.44 U	0.43 U	0.42 U
Chrysene	mg/Kg	*4*	*4*	*0.54 J*	*0.51 J*	0.44 U	0.43 U	*0.2 J*
Di-n-butylphthalate	mg/Kg	2 U	2 U	*0.044 J*	*0.05 J*	0.44 U	0.43 U	0.42 U
Dibenzo(a,h)anthracene	mg/Kg	*0.82 J*	*0.86 J*	*0.096 J*	*0.12 J*	0.44 U	0.43 U	*0.052 J*
Dibenzofuran	mg/Kg	*0.76 J*	*0.74 J*	*0.21 J*	*0.19 J*	0.44 U	0.43 U	*0.52*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB13	06T05/SB13	06T05/SB14	06T05/SB14	06T05/SB15	06T05/SB16	06T05/SB17
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998
Sample Depth From:		10	10	12	12	14	16	18
Sample Depth To:		12	12	14	14	16	18	20
Laboratory Number:		366027	366027R1	366028	366028R1	366029	366030	366031
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	*11*	*9.9*	*0.77 J*	*0.78 J*	0.44 U	0.43 U	*0.35 J*
Fluorene	mg/Kg	*1.3 J*	*1.2 J*	*0.14 J*	*0.14 J*	0.44 U	0.43 U	*1.2*
Indeno(1,2,3-cd)pyrene	mg/Kg	*1.8 J*	*2 J*	*0.26 J*	*0.23 J*	0.44 U	0.43 U	*0.12 J*
Naphthalene	mg/Kg	*0.52 J*	*0.53 J*	*0.32 J*	*0.32 J*	0.44 U	0.43 U	*0.5*
Phenanthrene	mg/Kg	*6.8*	*6.8*	*0.76 J*	*0.78 J*	0.44 U	0.43 U	*8.2 E*
Phenol	mg/Kg	2 U	2 U	0.83 U	0.83 U	0.44 U	0.43 U	0.42 U
Pyrene	mg/Kg	*11*	*9.7*	*1.2*	*1.2*	0.44 U	0.43 U	*0.43*
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	*61.03*	*58.13*	*6.953*	*6.964*	ND	ND	*20.662*
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	*20.9*	NA	*43.3*	NA	*5*	*4*	*3.2*
Barium, Total	mg/Kg	*264*	NA	*274*	NA	*176*	*212*	*236*
Cadmium, Total	mg/Kg	*41.1 J**	NA	*45.5 J**	NA	*1.6 J**	*0.86 J**	*1.6 J**
Chromium, Total	mg/Kg	*177*	NA	*86.1*	NA	*18.8*	*19.9*	*11.6*
Lead, Total	mg/Kg	*1,580 J**	NA	*1,760 J**	NA	*28.1 J**	*11.5 J**	*24.4 J**
Mercury, Total	mg/Kg	*0.36 J**	NA	*0.22 J**	NA	*0.02 BJ**	0.02 U	0.02 U
Selenium, Total	mg/Kg	*5.2*	NA	*6.5*	NA	0.6 U	0.57 U	0.61 U
Silver, Total	mg/Kg	*3.2*	NA	*2.1*	NA	0.28 U	0.27 U	0.29 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB17	06T05/SB21	06T05/SB21	06T05/SB22	06T05/SB23	06T05/SB23	06T05/SB23D
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998
Sample Depth From:		18	6	6	8	10	10	10
Sample Depth To:		20	8	8	10	12	12	12
Laboratory Number:		366031D1	366032	366032R1	366033	366034	366034R1	366035
Sample Type:								Duplicate
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
2-Butanone	ug/Kg	NA	*5.5 J*	NA	*14*	6.6 U	NA	6.2 U
2-Hexanone	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
4-Methyl-2-pentanone	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Acetone	ug/Kg	NA	*100*	NA	*190*	*12 J**	NA	*11 J**
Benzene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Carbon disulfide	ug/Kg	NA	6.2 U	NA	*1.3 J*	6.6 U	NA	6.2 U
Chlorobenzene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Ethylbenzene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
m,p-Xylene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Methylene chloride	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	*1.8 J*
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Tetrachloroethene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Toluene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Trichloroethene	ug/Kg	NA	6.2 U	NA	6.4 U	6.6 U	NA	6.2 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	*105.5*	NA	*205.3*	*12*	NA	*12.8*
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	1.7 DU	2.1 U	0.42 UR	2.1 U	0.44 U	NA	0.44 U
2,4-Dimethylphenol	mg/Kg	1.7 DU	2.1 U	0.42 UR	2.1 U	0.44 U	NA	0.44 U
2-Methylnaphthalene	mg/Kg	*8.6 D*	*0.17 J*	*0.021 J*	*0.86 J*	*0.43 J*	NA	*0.14 J*
4-Methylphenol	mg/Kg	1.7 DU	2.1 U	*0.019 J*	2.1 U	0.44 U	NA	0.44 U
Acenaphthene	mg/Kg	*1.2 JD*	2.1 U	0.42 UR	*0.91 J*	0.44 U	NA	0.44 U
Acenaphthylene	mg/Kg	1.7 DU	2.1 U	0.42 UR	*0.12 J*	0.44 U	NA	0.44 U
Anthracene	mg/Kg	*0.67 JD*	2.1 U	0.42 UR	*0.63 J*	*0.034 J*	NA	0.44 U
Benzo(a)anthracene	mg/Kg	*0.2 JD*	2.1 U	0.42 UR	*0.63 J*	*0.33 J*	NA	*0.077 J*
Benzo(a)pyrene	mg/Kg	*0.21 JD*	2.1 U	0.42 UR	*0.87 J*	*0.42 J*	NA	*0.1 J*
Benzo(b)fluoranthene	mg/Kg	*0.21 JD*	2.1 U	0.42 UR	*1 J*	*0.34 J*	NA	*0.095 J*
Benzo(g,h,i)perylene	mg/Kg	*0.11 JD*	2.1 U	0.42 UR	*0.5 J*	*0.3 J*	NA	*0.065 J*
Benzo(k)fluoranthene	mg/Kg	*0.19 JD*	2.1 U	0.42 UR	*1.1 J*	*0.44*	NA	*0.1 J*
Bis(2-ethylhexyl)phthalate	mg/Kg	1.7 DU	2.1 U	0.42 UR	2.1 U	0.44 U	NA	0.44 U
Butylbenzylphthalate	mg/Kg	1.7 DU	2.1 U	0.42 UR	2.1 U	*0.28 J*	NA	0.44 U
Chrysene	mg/Kg	*0.23 JD*	2.1 U	*0.026 J*	*0.72 J*	*0.39 J*	NA	*0.095 J*
Di-n-butylphthalate	mg/Kg	1.7 DU	2.1 U	0.42 UR	2.1 U	0.44 U	NA	0.44 U
Dibenzo(a,h)anthracene	mg/Kg	1.7 DU	2.1 U	0.42 UR	*0.18 J*	*0.077 J*	NA	0.44 U
Dibenzofuran	mg/Kg	*0.56 JD*	2.1 U	0.42 UR	*0.84 J*	*0.22 J*	NA	*0.064 J*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB17	06T05/SB21	06T05/SB21	06T05/SB22	06T05/SB23	06T05/SB23	06T05/SB23D
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998
Sample Depth From:		18	6	6	8	10	10	10
Sample Depth To:		20	8	8	10	12	12	12
Laboratory Number:		366031D1	366032	366032R1	366033	366034	366034R1	366035
Sample Type:								Duplicate
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	***0.36 JD***	2.1 U	***0.031 J***	***2.5***	***0.65***	NA	***0.16 J***
Fluorene	mg/Kg	***1.8 D***	2.1 U	0.42 UR	***0.81 J***	0.44 U	NA	0.44 U
Indeno(1,2,3-cd)pyrene	mg/Kg	***0.1 JD***	2.1 U	0.42 UR	***0.35 J***	***0.24 J***	NA	***0.046 J***
Naphthalene	mg/Kg	***0.59 JD***	2.1 U	0.42 UR	***0.68 J***	***0.21 J***	NA	***0.056 J***
Phenanthrene	mg/Kg	***8.6 D***	***0.17 J***	***0.034 J***	***3.7***	***0.6***	NA	***0.19 J***
Phenol	mg/Kg	1.7 DU	***1.2 J***	***1 J****	***1.8 J***	***0.085 J***	NA	***0.089 J***
Pyrene	mg/Kg	***0.34 JD***	2.1 U	***0.026 J***	***1.2 J***	***0.65***	NA	***0.13 J***
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	***23.97***	***1.54***	***1.157***	***19.4***	***5.696***	NA	***1.407***
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	0.75 U	NA	***6.4***	***7.9***	NA	***12.8***
Barium, Total	mg/Kg	NA	***122***	NA	***100***	***161***	NA	***151***
Cadmium, Total	mg/Kg	NA	***3.7 J****	NA	***7.9 J****	***2.9 J****	NA	***11.5 J****
Chromium, Total	mg/Kg	NA	***720***	NA	***292***	***15.6***	NA	***43.3***
Lead, Total	mg/Kg	NA	***60.7 J****	NA	***434 J****	***79.6 J****	NA	***421 J****
Mercury, Total	mg/Kg	NA	0.02 U	NA	***0.03 BJ****	0.02 U	NA	***0.14 J****
Selenium, Total	mg/Kg	NA	***4.2***	NA	***2.7***	0.64 U	NA	***1.4***
Silver, Total	mg/Kg	NA	***0.49 B***	NA	***1.2 B***	0.3 U	NA	***0.77 B***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB23D	06T05/SB24	06T05/SB25	06T05/SB26	06T05/SB26	06T05/SB27	06T05/SB31
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/16/1998
Sample Depth From:		10	12	14	16	16	18	6
Sample Depth To:		12	14	16	18	18	20	8
Laboratory Number:		366035R1	366036	366037	366038	366038R1	366039	366181
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
2-Butanone	ug/Kg	6.2 U	6.3 U	*74*	*56*	NA	6.8 U	9.7 U
2-Hexanone	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
4-Methyl-2-pentanone	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Acetone	ug/Kg	*11* J*	*4.9* J	*350*	*270*	NA	*8.6*	9.7 U
Benzene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Carbon disulfide	ug/Kg	6.2 U	6.3 U	*2.4* J	11 U	NA	6.8 U	9.7 U
Chlorobenzene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Ethylbenzene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
m,p-Xylene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Methylene chloride	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Tetrachloroethene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Toluene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Trichloroethene	ug/Kg	6.2 U	6.3 U	12 U	11 U	NA	6.8 U	9.7 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	*11*	*4.9*	*426.4*	*326*	NA	*8.6*	ND
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
2,4-Dimethylphenol	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
2-Methylnaphthalene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.06* J
4-Methylphenol	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Acenaphthene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Acenaphthylene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Anthracene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Benzo(a)anthracene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.076* J
Benzo(a)pyrene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.11* J
Benzo(b)fluoranthene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.12* J
Benzo(g,h,i)perylene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.12* J
Benzo(k)fluoranthene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.11* J
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.07* J
Butylbenzylphthalate	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.48*
Chrysene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.098* J
Di-n-butylphthalate	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Dibenzo(a,h)anthracene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.035* J
Dibenzofuran	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	*0.017* J

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB23D	06T05/SB24	06T05/SB25	06T05/SB26	06T05/SB26	06T05/SB27	06T05/SB31
Date Sampled:		9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/15/1998	9/16/1998
Sample Depth From:		10	12	14	16	16	18	6
Sample Depth To:		12	14	16	18	18	20	8
Laboratory Number:		366035R1	366036	366037	366038	366038R1	366039	366181
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	***0.12 J***
Fluorene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	***0.08 J***
Naphthalene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	***0.02 J***
Phenanthrene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	***0.091 J***
Phenol	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	0.37 U
Pyrene	mg/Kg	NA	0.4 U	0.42 U	0.41 U	NA	0.45 U	***0.098 J***
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	ND	ND	ND	NA	ND	***1.705***
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	***5.3***	***4.7***	***5.8***	NA	***3***	***8.7***
Barium, Total	mg/Kg	NA	***217***	***189***	***164***	NA	***163***	***171***
Cadmium, Total	mg/Kg	NA	***6.5 J****	***1.3 J****	***1.8 J****	NA	***0.57 BJ****	***9.7 J****
Chromium, Total	mg/Kg	NA	***18.4***	***17***	***15.9***	NA	***12.9***	***127***
Lead, Total	mg/Kg	NA	***40.3 J****	***13.2 J****	***24.1 J****	NA	***9.7 J****	***529 J****
Mercury, Total	mg/Kg	NA	0.02 U	0.02 U	0.02 U	NA	0.02 U	***0.18***
Selenium, Total	mg/Kg	NA	0.54 U	0.56 U	***0.78***	NA	0.59 U	***1.9***
Silver, Total	mg/Kg	NA	0.25 U	0.26 U	0.29 U	NA	0.28 U	***0.92***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB31	06T05/SB32	06T05/SB32	06T05/SB33	06T05/SB33	06T05/SB34	06T05/SB35
Date Sampled:		9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998
Sample Depth From:		6	8	8	10	10	12	14
Sample Depth To:		8	10	10	12	12	14	16
Laboratory Number:		366181R1	366182	366182R1	366183	366183R1	366184	366185
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethane	ug/Kg	9.7 U	6.8 U	*1.4 J*	*1.6 J*	6.2 U	6.1 U	6.5 U
2-Butanone	ug/Kg	9.7 U	*17*	*21*	6.2 U	6.2 U	6.1 U	6.5 U
2-Hexanone	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
4-Methyl-2-pentanone	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Acetone	ug/Kg	*12*	*86*	*100*	6.2 U	*5.2 J*	6.1 U	6.5 U
Benzene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Carbon disulfide	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Chlorobenzene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Ethylbenzene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
m,p-Xylene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Methylene chloride	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
o-Xylene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Tetrachloroethene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Toluene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Trichloroethene	ug/Kg	9.7 U	6.8 U	6.8 U	6.2 U	6.2 U	6.1 U	6.5 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	*12*	*103*	*122.4*	*1.6*	*5.2*	ND	ND
Semivolatiles	UNITS							
1,2,4-Trichlorobenzene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
2,4-Dimethylphenol	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
2-Methylnaphthalene	mg/Kg	NA	*0.092 J*	NA	0.41 U	NA	*0.021 J*	0.41 U
4-Methylphenol	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
Acenaphthene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
Acenaphthylene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
Anthracene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	*0.056 J*	0.41 U
Benzo(a)anthracene	mg/Kg	NA	0.41 U	NA	*0.038 J*	NA	*0.3 J*	*0.16 J*
Benzo(a)pyrene	mg/Kg	NA	*0.04 J*	NA	*0.041 J*	NA	*0.29 J*	*0.28 J*
Benzo(b)fluoranthene	mg/Kg	NA	*0.035 J*	NA	*0.043 J*	NA	*0.29 J*	*1.5 Y*
Benzo(g,h,i)perylene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	*0.18 J*	*0.42*
Benzo(k)fluoranthene	mg/Kg	NA	*0.04 J*	NA	*0.065 J*	NA	*0.38 J*	0.41 U
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	0.41 U	NA	0.41 U	NA	*0.096 J*	*0.048 J*
Butylbenzylphthalate	mg/Kg	NA	0.41 U	NA	0.41 U	NA	*0.62*	*0.14 J*
Chrysene	mg/Kg	NA	0.41 U	NA	*0.064 J*	NA	*0.36 J*	*0.44*
Di-n-butylphthalate	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
Dibenzo(a,h)anthracene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	*0.086 J*	*0.18 J*
Dibenzofuran	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB31	06T05/SB32	06T05/SB32	06T05/SB33	06T05/SB33	06T05/SB34	06T05/SB35
Date Sampled:		9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998	9/16/1998
Sample Depth From:		6	8	8	10	10	12	14
Sample Depth To:		8	10	10	12	12	14	16
Laboratory Number:		366181R1	366182	366182R1	366183	366183R1	366184	366185
Sample Type:								
Semivolatiles	UNITS							
- CONTINUED -								
Fluoranthene	mg/Kg	NA	***0.052 J***	NA	***0.062 J***	NA	***0.61***	***0.14 J***
Fluorene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	***0.019 J***	0.41 U
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	0.41 U	NA	0.41 U	NA	***0.16 J***	***0.28 J***
Naphthalene	mg/Kg	NA	***0.024 J***	NA	0.41 U	NA	0.4 U	0.41 U
Phenanthrene	mg/Kg	NA	***0.089 J***	NA	***0.054 J***	NA	***0.3 J***	***0.06 J***
Phenol	mg/Kg	NA	0.41 U	NA	0.41 U	NA	0.4 U	0.41 U
Pyrene	mg/Kg	NA	***0.075 J***	NA	***0.076 J***	NA	***0.53***	***0.1 J***
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	***0.447***	NA	***0.443***	NA	***4.298***	***3.748***
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	***9.6***	NA	***6.3***	NA	***23.7***	0.52 U
Barium, Total	mg/Kg	NA	***101***	NA	***140***	NA	***1,370***	0.73 U
Cadmium, Total	mg/Kg	NA	***1.4 J****	NA	0.05 UJ*	NA	***13.2 J****	***25.5 J****
Chromium, Total	mg/Kg	NA	***31.4***	NA	***19.2***	NA	***376***	0.11 U
Lead, Total	mg/Kg	NA	***105 J****	NA	***30.2 J****	NA	***1,350 J****	***3,520 J****
Mercury, Total	mg/Kg	NA	***0.06***	NA	0.02 U	NA	***1.4***	***0.28***
Selenium, Total	mg/Kg	NA	***1.2***	NA	0.56 U	NA	***1.2***	***5.2***
Silver, Total	mg/Kg	NA	0.24 U	NA	0.26 U	NA	***180***	0.2 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB35	06T05/SB36	06T05/SB36	06T05/SB37
Date Sampled:		9/16/1998	9/16/1998	9/16/1998	9/16/1998
Sample Depth From:		14	16	16	18
Sample Depth To:		16	18	18	20
Laboratory Number:		366185R1	366186	366186R1	366187
Sample Type:					
Volatiles	UNITS				
1,1-Dichloroethane	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
2-Butanone	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
2-Hexanone	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
4-Methyl-2-pentanone	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Acetone	ug/Kg	6.5 U	6.6 U	6.6 U	***20***
Benzene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Carbon disulfide	ug/Kg	6.5 U	6.6 U	6.6 U	***1.4 J***
Chlorobenzene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Ethylbenzene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
m,p-Xylene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Methylene chloride	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
o-Xylene	ug/Kg	NA	NA	NA	NA
Styrene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Tetrachloroethene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Toluene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Trichloroethene	ug/Kg	6.5 U	6.6 U	6.6 U	6.7 U
Xylenes (total)	ug/Kg	NA	NA	NA	NA
Total Detected VOCs	UNITS				
Total Volatiles	ug/Kg	ND	ND	ND	***21.4***
Semivolatiles	UNITS				
1,2,4-Trichlorobenzene	mg/Kg	NA	***0.021 J***	NA	0.45 U
2,4-Dimethylphenol	mg/Kg	NA	0.4 U	NA	0.45 U
2-Methylnaphthalene	mg/Kg	NA	***0.035 J***	NA	0.45 U
4-Methylphenol	mg/Kg	NA	0.4 U	NA	0.45 U
Acenaphthene	mg/Kg	NA	***0.019 J***	NA	***0.026 J***
Acenaphthylene	mg/Kg	NA	0.4 U	NA	0.45 U
Anthracene	mg/Kg	NA	***0.035 J***	NA	***0.056 J***
Benzo(a)anthracene	mg/Kg	NA	***0.15 J***	NA	***0.15 J***
Benzo(a)pyrene	mg/Kg	NA	***0.18 J***	NA	***0.15 J***
Benzo(b)fluoranthene	mg/Kg	NA	***0.22 J***	NA	***0.16 J***
Benzo(g,h,i)perylene	mg/Kg	NA	***0.16 J***	NA	***0.1 J***
Benzo(k)fluoranthene	mg/Kg	NA	***0.18 J***	NA	***0.12 J***
Bis(2-ethylhexyl)phthalate	mg/Kg	NA	0.4 U	NA	0.45 U
Butylbenzylphthalate	mg/Kg	NA	0.4 U	NA	0.45 U
Chrysene	mg/Kg	NA	***0.18 J***	NA	***0.17 J***
Di-n-butylphthalate	mg/Kg	NA	0.4 U	NA	0.45 U
Dibenzo(a,h)anthracene	mg/Kg	NA	***0.063 J***	NA	***0.041 J***
Dibenzofuran	mg/Kg	NA	0.4 U	NA	0.45 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-5
SWMU 6 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		06T05/SB35	06T05/SB36	06T05/SB36	06T05/SB37
Date Sampled:		9/16/1998	9/16/1998	9/16/1998	9/16/1998
Sample Depth From:		14	16	16	18
Sample Depth To:		16	18	18	20
Laboratory Number:		366185R1	366186	366186R1	366187
Sample Type:					
Semivolatiles	UNITS				
- CONTINUED -					
Fluoranthene	mg/Kg	NA	***0.24 J***	NA	***0.3 J***
Fluorene	mg/Kg	NA	***0.022 J***	NA	***0.032 J***
Indeno(1,2,3-cd)pyrene	mg/Kg	NA	***0.14 J***	NA	***0.09 J***
Naphthalene	mg/Kg	NA	0.4 U	NA	0.45 U
Phenanthrene	mg/Kg	NA	***0.17 J***	NA	***0.23 J***
Phenol	mg/Kg	NA	0.4 U	NA	0.45 U
Pyrene	mg/Kg	NA	***0.2 J***	NA	***0.25 J***
Total Detected SVOCs	UNITS				
Total Semi-Volatiles	mg/Kg	NA	***2.015***	NA	***1.875***
Metals, Total	UNITS				
Arsenic, Total	mg/Kg	NA	0.67 U	NA	0.67 U
Barium, Total	mg/Kg	NA	0.94 U	NA	0.94 U
Cadmium, Total	mg/Kg	NA	***2.9 J****	NA	***0.24 BJ****
Chromium, Total	mg/Kg	NA	0.14 U	NA	0.15 U
Lead, Total	mg/Kg	NA	***162 J****	NA	***26.8 J****
Mercury, Total	mg/Kg	NA	***0.05***	NA	***0.08***
Selenium, Total	mg/Kg	NA	***1.3***	NA	***0.76***
Silver, Total	mg/Kg	NA	0.26 U	NA	0.26 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
Z - Peak not a typical fuel pattern
Y - Peak not within 90% calibration range
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation
E - Concentration exceeds calibration range

Table 9-6
AOC 4 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		A04T01/SB1	A04T01/SB2	A04T01/SB3	A04T01/SB4	A04T01/SB11	A04T01/SB12	A04T01/SB13
Date Sampled:		5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998	5/19/1998
Sample Depth From:		10	12	14	16	10	12	14
Sample Depth To:		12	14	16	18	12	14	16
Laboratory Number:		D98-3766-18	D98-3766-19	D98-3766-20	D98-3766-21	D98-3766-16	D98-3766-17	D98-3766-22
Sample Type:								
Volatiles	UNITS							
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Barium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Cadmium, Total	mg/Kg	3.18 DU	3.07 DU	3.13 DU	3.26 DU	***24.9 DJ****	3.12 DU	***3.55 D***
Chromium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Lead, Total	mg/Kg	***12.9 D***	***21.8 D***	***15.1 D***	***24.3 D***	***681 DJ****	***16.6 DJ****	***144 D***
Mercury, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Selenium, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Silver, Total	mg/Kg	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-6
AOC 4 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		A04T01/SB11A		A04T01/SB12A		A04T02/SB1		A04T02/SB2		A04T02/SB3		A04T02/SB4		A04T02/SB5	
Date Sampled:		5/19/1998		5/19/1998		9/14/1998		9/14/1998		9/14/1998		9/14/1998		9/14/1998	
Sample Depth From:		10		12		12		14		16		18		20	
Sample Depth To:		12		14		14		16		18		20		22	
Laboratory Number:		D98-3766-25		D98-3766-26		365710		365711		365712		365713		365714	
Sample Type:															
Volatiles	UNITS														
Acetone	ug/Kg	NA		NA		***7.4***		***8.6***		6.5	U	6.5	U	***9.1***	
Trichloroethene	ug/Kg	NA		NA		6.3	U	6.4	U	6.5	U	6.5	U	6.6	U
Total Detected VOCs	UNITS														
Total Volatiles	ug/Kg	NA		NA		***7.4***		***8.6***		ND		ND		***9.1***	
Metals, Total	UNITS														
Arsenic, Total	mg/Kg	NA		NA		***5.1***	***J****	***5***	***J****	***5.9***	***J****	***5.1***	***J****	***5.7***	***J****
Barium, Total	mg/Kg	NA		NA		***161***	***J****	***119***	***J****	***176***	***J****	***143***	***J****	***197***	***J****
Cadmium, Total	mg/Kg	3.14	DU	3.13	DU	0.04	UJ*	***1.2***	***J****	***0.53***	***BJ****	0.05	UJ*	0.05	UJ*
Chromium, Total	mg/Kg	NA		NA		***20.8***	***J****	***24.6***	***J****	***34.9***	***J****	***19***	***J****	***18.1***	***J****
Lead, Total	mg/Kg	***12.3***	***D***	***20.6***	***D***	***12.6***		***39.5***		***42.4***		***11.6***		***15.4***	
Mercury, Total	mg/Kg	NA		NA		0.03	BU*	0.03	BU*	0.05	U*	0.06	U*	0.02	UJ*
Selenium, Total	mg/Kg	NA		NA		0.41	UJ*	0.46	UJ*	0.43	UJ*	0.47	UJ*	***0.66***	***J****
Silver, Total	mg/Kg	NA		NA		0.16	UJ*	0.18	UJ*	***0.19***	***BJ****	***0.24***	***BJ****	0.19	UJ*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-6
AOC 4 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		A04T02/SB11	A04T02/SB12	A04T02/SB13	A04T02/SB14	A04T02/SB15	A04T02/SB21	A04T02/SB21D
Date Sampled:		9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998	9/14/1998
Sample Depth From:		12	14	16	18	20	12	12
Sample Depth To:		14	16	18	20	22	14	14
Laboratory Number:		365715	365716	365717	365718	365719	365720	365721
Sample Type:								Duplicate
Volatiles	UNITS							
Acetone	ug/Kg	6.5 U	6.6 U	6.7 U	6.4 U	6.5 U	***10*** ***J****	6.8 U
Trichloroethene	ug/Kg	6.5 U	6.6 U	6.7 U	6.4 U	6.5 U	***9.1*** ***J****	6.8 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	ND	ND	ND	ND	ND	***19.1***	ND
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	***5.8*** ***J****	***5.5*** ***J****	***4.2*** ***J****	***5.7*** ***J****	***5*** ***J****	***22.5*** ***J****	***16.2*** ***J****
Barium, Total	mg/Kg	***137*** ***J****	***170*** ***J****	***146*** ***J****	***119*** ***J****	***151*** ***J****	***265*** ***J****	***221*** ***J****
Cadmium, Total	mg/Kg	0.05 UJ*	0.05 UJ*	0.05 UJ*	0.05 UJ*	0.05 UJ*	***37*** ***J****	***10.2*** ***J****
Chromium, Total	mg/Kg	***19.8*** ***J****	***23.3*** ***J****	***19.7*** ***J****	***16*** ***J****	***17.2*** ***J****	***229*** ***J****	***121*** ***J****
Lead, Total	mg/Kg	***15.5***	***19.9***	***17.2***	***10.6***	***13.5***	***1,470***	***470***
Mercury, Total	mg/Kg	0.04 BU*	0.02 UJ*	0.02 BU*	0.02 UJ*	0.02 UJ*	***0.35*** ***J****	***0.18*** ***J****
Selenium, Total	mg/Kg	0.47 UJ*	0.47 UJ*	0.44 UJ*	0.46 UJ*	0.44 UJ*	***2*** ***J****	***0.78*** ***J****
Silver, Total	mg/Kg	0.19 UJ*	0.19 UJ*	0.17 UJ*	0.18 UJ*	0.18 UJ*	***3.3*** ***J****	***1.2*** ***BJ****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-6
AOC 4 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		A04T02/SB22		A04T02/SB23		A04T02/SB24		A04T02/SB25	
Date Sampled:		9/14/1998		9/14/1998		9/14/1998		9/14/1998	
Sample Depth From:		14		16		18		20	
Sample Depth To:		16		18		20		22	
Laboratory Number:		365722		365723		365724		365725	
Sample Type:									
Volatiles	UNITS								
Acetone	ug/Kg	6.6	U	6.5	U	6.6	U	6.3	U
Trichloroethene	ug/Kg	6.6	U	6.5	U	6.6	U	6.3	U
Total Detected VOCs	UNITS								
Total Volatiles	ug/Kg	ND		ND		ND		ND	
Metals, Total	UNITS								
Arsenic, Total	mg/Kg	***5***	***J****	***3.9***	***J****	***5.3***	***J****	***6***	***J****
Barium, Total	mg/Kg	***153***	***J****	***185***	***J****	***164***	***J****	***174***	***J****
Cadmium, Total	mg/Kg	***0.45***	***BJ****	***0.15***	***BJ****	0.04	UJ*	***1.1***	***J****
Chromium, Total	mg/Kg	***27.5***	***J****	***15.4***	***J****	***18.5***	***J****	***70.8***	***J****
Lead, Total	mg/Kg	***31.8***		***13.2***		***12.1***		***70.1***	
Mercury, Total	mg/Kg	0.02	UJ*	0.03	BU*	0.02	BU*	0.03	BU*
Selenium, Total	mg/Kg	0.48	UJ*	0.49	UJ*	0.43	UJ*	0.44	UJ*
Silver, Total	mg/Kg	***0.22***	***BJ****	0.19	UJ*	0.17	UJ*	***0.3***	***BJ****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-7
SWMU 6 Phase 2 Discrete Surface Soil Results
Armco Kansas City Facility

		Sample Point:	AST05/SR1C		AST05/SR2C		AST05/SR3C	
		Date Sampled:	07/02/1998		07/02/1998		07/02/1998	
		Sample Depth From:	0		0		0	
		Sample Depth To:	0.5		0.5		0.5	
		Laboratory Number:	D98-4837-1		D98-4837-2		D98-4837-3	
		Sample Type:						
Metals, Total	UNITS							
Cadmium, Total	mg/Kg		***19.2***	***D***	***342***	***D***	***337***	***D***
Lead, Total	mg/Kg		***798***	***D***	***12,100***	***D***	***12,700***	***D***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 9-8
SWMU 6/AOC 4 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result
Volatiles	**(µg/kg)**			**(µg/kg)**
Ethylbenzene	13000	06T03A / SBD	11-11	165000 D
Methylene chloride	20	06T01 / SB1	5-5	24.9 J*
		06T01 / SB3	8-8	20.5 DJ
		06T03A / SB12B	8-10	53.6 J*
		06T03A / SB13B	10-12	38.8
		06T03A / SBD	11-11	7260 DJ
Styrene	4000	06T03A / SBD	11-11	5490 DJ
Toluene	12000	06T03A / SBD	11-11	19700 D
Trichloroethene	60	06T03A / SBD	11-11	3850 DJ
m,p-Xylene	200000	06T03A / SBD	11-11	419000 D
Semivolatiles	**(mg/kg)**			**(mg/kg)**
Benzo(a)anthracene	2	06T05 / SB12	8 - 10	7.8
		06T05 / SB13**	10 - 12	4.1
		06T05 / SB13	10 - 12	4
Benzo(b)fluoranthene	5	06T05 / SB12	8 - 10	7.8
Metals	**(mg/kg)**			**(mg/kg)**
Arsenic	29	06T01 / SB3	8-8	58.7 D
		06T03A / SB12B	8-10	36.7 D
		06T03A / SB13B	10-12	32.4 D
		06T05 / SB14	12-14	43.3
Cadmium	8	06B10 / DP1	1-3	8.02
		06B13 / DP1	0-2	10.2
		06B14 / DP1	0-2	22.6
		06B14A / DP2	2-4	62.6 D
		06T01 / SB1	5-5	61.1 D
		06T01 / SB2	6.75-6.75	9 D
		06T02 / SB3	12-14	18.1 D
		06T03A / SB1	6-8	14 D
		06T03A / SB11B	6-8	17
		06T03A / SB11C	6-8	61.5 D
		06T03A / SB12	8-10	68.3 DJ*
		06T03A / SB12B	8-10	73 D
		06T03A / SB13	10-12	112 DJ*
		06T03A / SB13B	10-12	80.5 D
		06T03A / SB14	12-14	42 DJ*
		06T03A / SB14A	12-14	52.8 DJ*
		06T03A / SB1D	6-8	13.6 D
		06T03A / SB2	8-10	61.8 DJ*
		06T03A / SB2B	8-10	18.9
		06T03A / SB3	10-12	42.9 DJ*
		06T03A / SB3B	10-12	24.5 D
		06T03A / SB4	12-14	46.6 DJ*
		06T03A / SB5	14-16	13 DJ*
		06T03A / SB7	18-20	24.2 DJ*
		06T03A / SBD	11-11	15.1 D
		06T03 / SB1	5-7	17.7 D
		06T03 / SB11	5-7	46.2 D
Cadmium, Total	8	06T03 / SB12	7-9	43 D
(continued)		06T03 / SB2	7-9	19.9 D
		06T03 / SB2D	7-9	9.49 D

Table 9-8
SWMU 6/AOC 4 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result
		06T05 / SB1	6-8	90.1 J*
		06T05 / SB11	6-8	21 J*
		06T05 / SB12	8-10	55.5 J*
		06T05 / SB13	10-12	41.1 J*
		06T05 / SB14	12-14	45.5 J*
		06T05 / SB23D	10-12	11.5 J*
		06T05 / SB3	10-12	9 J*
		06T05 / SB31	6-8	9.7 J*
		06T05 / SB34	12-14	13.2 J*
		06T05 / SB35	14-16	25.5 J*
		06T05 / SB4	12-14	9.5 J*
		06T05 / SB5	14-46	14.1 J*
		A04B03 / DP1	4-6	12.3 J*
		A04B04 / DP1	2-4	9.6 J*
		A04T01 / SB11	10-12	24.9 J*
		A04T02 / SB21	12-14	37 J*
		A04T02 / SB21D	12-14	10.2 J*
		AST05 / SRIC	0-0.5	19.2 D
		AST05 / SR2C	0-0.5	342 D
		AST05 / SR3C	0-0.5	337 D
Lead	400	06B13 / DP1	0-2	456 J*
		06B14 / DP1	0-2	1550 J*
		06B14A / DP2	2-4	3620 D
		06T01 / SB1	5-5	8210 D
		06T01 / SB2	6.75-6.75	727 D
		06T01 / SB4	6.25-6.25	1730 D
		06T03A / SB1	6-8	1870 D
		06T03A / SB11B	6-8	413 J*
		06T03A / SB11C	6-8	1790 DJ*
		06T03A / SB12	8-10	1380 DJ*
		06T03A / SB12B	8-10	2480 DJ*
		06T03A / SB13	10-12	1750 DJ*
		06T03A / SB13B	10-12	1860 DJ*
		06T03A / SB14	12-14	1240 DJ*
		06T03A / SB14A	12-14	2500 DJ*
		06T03A / SB1B	6-8	402 J*
		06T03A / SB1D	6-8	841 D
		06T03A / SB2	8-10	3550 DJ*
		06T03A / SB2B	8-10	670 J*
		06T03A / SB3	10-12	1860 DJ*
		06T03A / SB3B	10-12	1050 DJ*
		06T03A / SB4	12-14	2140 DJ*
		06T03A / SB5	14-16	630 DJ*
		06T03A / SB7	18-20	872 DJ*
		06T03A / SBD	11-11	625 D
Lead, Total	400	06T03 / SB1	5-7	1090 D
(continued)		06T03 / SB11	5-7	1300 D
		06T03 / SB12	7-9	2010 D
		06T03 / SB2	7-9	1040 D
		06T03 / SB2D	7-9	511 D
		06T05 / SB1	6-8	3040

Table 9-8
SWMU 6/AOC 4 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result
		06T05 / SB11	6-8	825 J*
		06T05 / SB12	8-10	2060 J*
		06T05 / SB13	10-12	1580 J*
		06T05 / SB14	12-14	1760 J*
		06T05 / SB2	8-10	2050
		06T05 / SB22	8-10	434 J*
		06T05 / SB23D	10-12	421 J*
		06T05 / SB3	10-12	1810
		06T05 / SB31	6-8	529 J*
		06T05 / SB34	12-14	1350 J*
		06T05 / SB35	14-16	3520 J*
		06T05 / SB4	12-14	3410
		06T05 / SB5	14-16	3270 J*
		A04B03 / DP1	4-6	1070
		A04B04 / DP1	2-4	732
		A04T01 / SB11	10-12	681 DJ*
		A04T02 / SB21	12-14	1470
		A04T02 / SB21D	12-14	470
		AST05 / SRIC	0-0.5	798 D
		AST05 / SR2C	0-0.5	12100 D
		AST05 / SR3C	0-0.5	12700 D
Mercury	2	06T03A / SB12B	8-10	9.87 D
		06T03A / SB13B	10-12	8.68 D
		06T03A / SB13C	10-12	2.56 D
Selenium	5	06T03A / SB11C	6-8	96 D
		06T05 / SB12	8-10	5.6
		06T05 / SB13	10-12	5.2
		06T05 / SB14	12-14	6.5
		06T05 / SB35	14-16	5.2
Silver	34	06T05 / SB34	12-14	180

Notes:

D = Sample was diluted prior to analysis.

DAF = Dilution Attenuation Factor

ft = feet

J = Estimated value; concentration below practical quantitation limit.

J* = Qualified as estimated by BMWCI during the QC evaluation.

SSL = Soil Screening Level

** = Value represents a reanalyzed sample result.

Table 9-9
SWMU 6 Groundwater Trench Sample Results
Armco Kansas City Facility

	Sample Point:	06T01/GW1	
	Date Sampled:	05/20/1998	
	Sample Depth From:	10	
	Sample Depth To:	12	
	Laboratory Number:	D98-3837-9	
	Sample Type:		
Volatiles	**UNITS**		
Ethylbenzene	ug/L	***5.31***	***J****
m,p-Xylene	ug/L	***20.6***	***J****
o-Xylene	ug/L	***4.65***	***J***
Total Detected VOCs	**UNITS**		
Total Volatiles	ug/L	***30.56***	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

k:*armcorfi*ustn.sup*armconb.dgn

k:*res*global*stdbdr*ustn*civil*2d*wci18x24.dgn
k:*armcorfi*ustn.sup*swmu0001.dgn
k:*armcorfi*ustn.sup*site.dgn

A04SWMU6.DGN/24-APR-99 09:22/DLS

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SWMU 6
AST5-SR3
AST5-SR4
AST5-SR3C
TANK NO. 5 (REMOVED)
AST5-SR2C
AST5-SR2 & 2A
AST5-SR1C
AST5-SR1 & 1A
06B13
06B14
06B14A
TRENCH 06T02
TRENCH 06T03A
TRENCH 06T04
544 Sq. Ft. METAL BUILDING (REMOVED)
TRENCH 06T01
BURIED WATER LINE
OVERHEAD PIPE BRIDGE
KANSAS CITY SOUTHERN RAILROAD
TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C
A04B02
A04B03A
A04B03
TANK NO. 4 (REMOVED)
AOC 4
A04B01
A04B04
TRENCH A04T02
TRENCH A04T01
OVERHEAD PIPE BRIDGE (REMOVED)
GRAVEL
750
1 STORY METAL BUILDING 1694 Sq. Ft. (REMOVED)
SWMU 6
06B09
06B12
TANK NO. 3 (REMOVED)
06B11
06B11A
06B10
06B10A
GRAVEL DRIVE
06B08
TANK NO. 2 (REMOVED)
06B05
06B07
06B07A
06B04
TANK NO. 1 (REMOVED)
06B03
06B06
06B06A
06B02
06B01
METAL BUILDING 276 Sq. Ft. (REMOVED)
PIPE BRIDGE
PARCEL 3A
PARCEL 10A
PARCEL 10
PARCEL 11

LEGEND

- DIRECT-PUSH BORING LOCATION
- DISCRETE SURFACE SOIL SAMPLING LOCATION
- TRENCH LOCATION
- SWMU OR AOC BOUNDARY
- RAILROAD
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- BOUNDARY OF TEMPORARY EASEMENT FOR KC TERMINAL RAILROAD

NOTES:

1. LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24.
2. SAMPLE LOCATIONS AST5-SR1, AST5-SR1A, AST5-SR2, AST5-SR2A, AST5-SR3, AND AST5-SR4 WERE REMOVED BY VACUUM TRUCK DURING RFI PHASE 2 (1998).

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-1

SWMU 6/AOC 4 SOIL SAMPLING LOCATIONS

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\armcorfi\ustn.sup\armconb.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\armcorfi\ustn\gisfig9\tankcanal.dgn
u:\armco\dgn\a04met.dgn
k:\res\global\stdbdr\ustn\civil\2d\wci22x34.dgn
k:\armcorfi\ustn.sup\site.dgn
A04MET.DGN/24-APR-99 10:03/DLS

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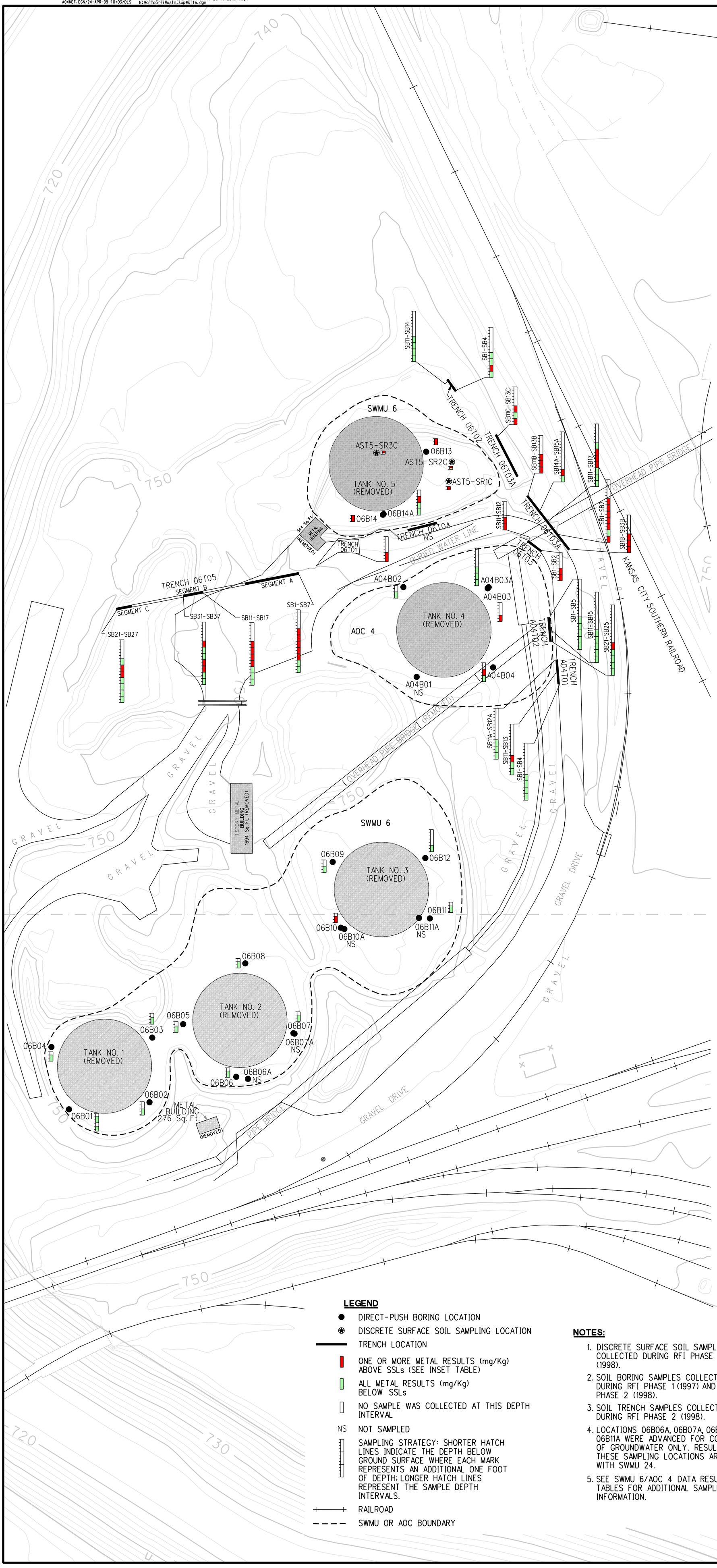

METALS SOIL DETECTIONS ABOVE SSLs					
PARAMETER	SSL (mg/Kg)	SAMPLE	DEPTH (FT BGS)	SAMPLE RESULT (mg/Kg)	
ARSENIC	29	06T01/ SB3	8-8	58.7 D	
		06T03A/ SB12B	8-10	36.7 D	
		06T03A/ SB13B	10-12	32.4 D	
		06T05/ SB14	12-14	43.3	
CADMIUM	8	06B10/ DP1	1-3	8.02	
		06B13/ DP1	0-2	10.2	
		06B14/ DP1	0-2	22.6	
		06B14A/DP2	2-4	62.6 D	
		06T01/ SB1	5-5	61.1D	
		06T01/ SB2	6.75-6.75	9 D	
		06T02/ SB3	12-14	18.1D	
		06T03/ SB1	5-7	17.7D	
		06T03/ SB2	7-9	19.9 D	
		06T03/ SB2D	7-9	9.49 D	
		06T03/ SB11	5-7	46.2 D	
		06T03/ SB12	7-9	43 D	
		06T03A/ SBD	11-11	15.1D	
		06T03A/ SB1	6-8	14 D	
		06T03A/ SB1D	6-8	13.6 D	
		06T03A/ SB2	8-10	61.8 D	J*
		06T03A/ SB3	10-12	42.9 D	J*
		06T03A/ SB4	12-14	46.6 D	J*
		06T03A/ SB5	14-16	13 D	J*
		06T03A/ SB7	18-20	24.2 D	J*
		06T03A/ SB2B	8-10	18.9	
		06T03A/ SB3B	10-12	24.5 D	
		06T03A/ SB12	8-10	68.3 D	J*
		06T03A/ SB13	10-12	112 D	J*
		06T03A/ SB14	12-14	42 D	J*
		06T03A/ SB14A	12-14	52.8 D	J*
		06T03A/ SB11B	6-8	17	
		06T03A/ SB12B	8-10	73 D	
		06T03A/ SB13B	10-12	80.5 D	
		06T03A/ SB11C	6-8	61.5 D	
		06T05/ SB1	6-8	90.1 J*	
		06T05/ SB3	10-12	9 J*	
		06T05/ SB4	12-14	9.5 J*	
		06T05/ SB5	14-16	14.1J*	
		06T05/ SB11	6-8	21 J*	
		06T05/ SB12	8-10	55.5 J*	
		06T05/ SB13	10-12	41.1J*	
		06T05/ SB14	12-14	45.5 J*	
		06T05/ SB23D	10-12	11.5 J*	
		06T05/ SB31	6-8	9.7 J*	
		06T05/ SB34	12-14	13.2 J*	
		06T05/ SB35	14-16	25.5 J*	
		A04B03/ DP1	4-6	12.3 J*	
		A04B04/ DP1	2-4	9.6 J*	
		A04T01/ SB11	10-12	24.9 J*	
		A04T02/ SB21	12-14	37 J*	
		A04T02/ SB21D	12-14	10.2 J*	
		AST05/ SR1C	0-0.5	19.2 D	
		AST05/ SR2C	0-0.5	342 D	
		AST05/ SR3C	0-0.5	337 D	
LEAD	400	06B13/ DP1	0-2	456 J*	
		06B14/ DP1	0-2	1,550 J*	
		06B14A/DP2	2-4	3,620 D	
		06T01/ SB1	5-5	8,210 D	
		06T01/ SB2	6.75-6.75	727 D	
		06T01/ SB4	6.25-6.25	1,730 D	
		06T03/ SB1	5-7	1,090 D	
		06T03/ SB2	7-9	1,040 D	
		06T03/ SB2D	7-9	511D	
		06T03/ SB11	5-7	1,300 D	
		06T03/ SB12	7-9	2,010 D	
		06T03A/ SBD	11-11	625 D	
		06T03A/ SB1	6-8	1,870 D	
		06T03A/ SB1D	6-8	841D	
		06T03A/ SB2	8-10	3,550 D	J*
		06T03A/ SB3	10-12	1,860 D	J*
		06T03A/ SB4	12-14	2,140 D	J*
		06T03A/ SB5	14-16	630 D	J*
		06T03A/ SB7	18-20	872 D	J*
		06T03A/ SB1B	6-8	402 J*	
		06T03A/ SB2B	8-10	670 J*	
		06T03A/ SB3B	10-12	1,050 D	J*
		06T03A/ SB12	8-10	1,380 D	J*
		06T03A/ SB13	10-12	1,750 D	J*
		06T03A/ SB14	12-14	1,240 D	J*
		06T03A/ SB14A	12-14	2,500 D	J*
		06T03A/ SB11B	6-8	413 J*	
		06T03A/ SB12B	8-10	2,480 D	J*
		06T03A/ SB13B	10-12	1,860 D	J*
		06T03A/ SB11C	6-8	1,790 D	
		06T05/ SB1	6-8	3,040	
		06T05/ SB2	8-10	2,050	
		06T05/ SB3	10-12	1,810	
		06T05/ SB4	12-14	3,410	
		06T05/ SB5	14-16	3,270 J*	
		06T05/ SB11	6-8	825 J*	
		06T05/ SB12	8-10	2,060 J*	
		06T05/ SB13	10-12	1,580 J*	
		06T05/ SB14	12-14	1,760 J*	
		06T05/ SB22	8-10	434 J*	
		06T05/ SB23D	10-12	421 J*	
		06T05/ SB31	6-8	529 J*	
		06T05/ SB34	12-14	1,350 J*	
		06T05/ SB35	14-16	3,520 J*	
		A04B03/ DP1	4-6	1,070	
		A04B04/ DP1	2-4	732	
		A04T01/ SB11	10-12	681 D	J*
		A04T02/ SB21	12-14	1,470	
		A04T02/ SB21D	12-14	470	
		AST05/ SR1C	0-0.5	798 D	
		AST05/ SR2C	0-0.5	12,100D	
		AST05/ SR3C	0-0.5	12,700D	
MERCURY	2	06T03A/ SB12B	8-10	9.87 D	
		06T03A/ SB13B	10-12	8.68 D	
		06T03A/ SB13C	10-12	2.56 D	
SELENIUM	5	06T03A/ SB11C	6-8	96 D	
		06T05/ SB12	8-10	5.6	
		06T05/ SB13	10-12	5.2	
		06T05/ SB14	12-14	6.5	
		06T05/ SB35	14-16	5.2	
SILVER	34	06T05/ SB34	12-14	180.0	

QUALIFIER NOTES:
D = Diluted Sample
DAF = Dilution Attenuation Factor
J* = Qualified as estimated by BMWCI during the QC evaluation.
SSL = Soil Screening Level
** = Value represents a reanalyzed sample result.

LEGEND

- DIRECT-PUSH BORING LOCATION
- DISCRETE SURFACE SOIL SAMPLING LOCATION
- TRENCH LOCATION
- ONE OR MORE METAL RESULTS (mg/Kg) ABOVE SSLs (SEE INSET TABLE)
- ALL METAL RESULTS (mg/Kg) BELOW SSLs
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- NS NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- RAILROAD
- SWMU OR AOC BOUNDARY

NOTES:

1. DISCRETE SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
2. SOIL BORING SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
3. SOIL TRENCH SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
4. LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24.
5. SEE SWMU 6/AOC 4 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-2
SWMU 6/AOC 4 METALS SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:#armcorfi#ustn.sup#armconb.dgn
k:#armcorfi#ustn.sup#swmu0001.dgn
k:#armcorfi#ustn#gisfig8#tank_angl.dgn
k:#res#global#stdbdr#ustn#civil#2d#wci22x34.dgn
k:#armcorfi#ustn.sup#site.dgn
A04VOCSO.DGN/24-MAY-99 08:06/DLS

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BIG BLUE RIVER

740

720

750

730

SWMU 6

AST5-SR3C
NA

AST5-SR2C
NA

AST5-SR1C
NA

06B13
NA

TANK NO. 5
(REMOVED)

06B14
NA

06B14A
NA

544 Sq. Ft.
METAL BUILDING
(REMOVED)

TRENCH 06T01

TRENCH 06T02

TRENCH 06T03A

TRENCH 06T04
NS

TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C

SB1-SB7
SB11-SB17
SB31-SB37
SB21-SB27

SB11C-SB13C
SB11B-SB13B
SB14A-SB15A
SB11-SB17
SB1-SB7
SB1B-SB3B

BURIED WATER LINE

OVERHEAD PIPE BRIDGE

GRAVEL

GRAVEL DRIVE

KANSAS CITY SOUTHERN RAILROAD

AOC 4

TANK NO. 4
(REMOVED)

A04B01
NS

A04B02
NA

A04B03
NA

A04B03A
NA

A04B04
NA

TRENCH A04T01
NA

TRENCH A04T02
NA

SB1-SB5
SB11-SB15
SB21-SB25

1 STORY METAL BUILDING
1694 Sq. Ft. (REMOVED)

SWMU 6

TANK NO. 3
(REMOVED)

06B09
NA

06B12
NA

06B11
NA

06B11A
NS

06B10
NA

06B10A
NS

TANK NO. 2
(REMOVED)

06B08
NA

06B05
NA

06B07
NA

06B07A
NS

06B06
NA

06B06A
NS

TANK NO. 1
(REMOVED)

06B04
NA

06B03
NA

06B02
NA

06B01
NA

METAL BUILDING
276 Sq. Ft.
(REMOVED)

PIPE BRIDGE

VOC SOIL DETECTIONS ABOVE SSLs					
PARAMETER	20 DAF SSL (mg/Kg)	SAMPLE	DEPTH (FT BGS)	SAMPLE RESULT (mg/Kg)	
METHYLENE CHLORIDE	20	06T01/SB1	5-5	24.9	J*
		06T01/SB3	8-8	20.5	DJ
		06T03A/SB12B	8-10	53.6	J*
		06T03A/SB13B	10-12	38.8	
QUALIFIER NOTES: D = DILUTED SAMPLE J* = QUALIFIED AS ESTIMATED BY BMWCI DURING THE QC EVALUATION.					

LEGEND

- DIRECT-PUSH BORING LOCATION
- DISCRETE SURFACE SOIL SAMPLING LOCATION
- TRENCH LOCATION
- ONE OR MORE VOC RESULTS (mg/Kg) ABOVE SSLs (SEE INSET TABLE)
- ALL VOC RESULTS (mg/Kg) BELOW SSLs
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- NS NOT SAMPLED
- NA NOT ANALYZED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU OR AOC BOUNDARY
- RAILROAD

NOTES:

1. DISCRETE SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
2. SOIL BORING SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
3. SOIL TRENCH SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
4. LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24.
5. SEE SWMU 6/AOC 4 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell
SINCE 1898

Figure 9-3
SWMU 6/AOC 4 TOTAL VOCs SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\armcorfi\ustn.sup\armconb.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\armcorfi\ustn\gisfig9\tank_nail.dgn
k:\armcorfi\ustn\gisfig98\a04met.dgn
k:\res\global\std_dgn\ustn\civil\2d\wci22x34.dgn
k:\armcorfi\ustn.sup\site.dgn
A04PAHSO.DGN/6-MAY-99 10:11/DLS

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BIG BLUE RIVER

740

720

750

SWMU 6

AST5-SR3C
NA

TANK NO. 5
(REMOVED)

1.69
06B13

AST5-SR2C
NA

AST5-SR1C
NA

0.46
06B14

06B14A
NA

544 Sq. Ft.
METAL BUILDING
(REMOVED)

TRENCH 06T01
NA

TRENCH 06T02
NA

TRENCH 06T03A
NA

TRENCH 06T04
NS

BURIED WATER LINE

OVERHEAD PIPE BRIDGE

TRENCH 06T03
NA

NA

GRAVEL

KANSAS CITY SOUTHERN RAILROAD

TRENCH 06T05
SEGMENT A
SEGMENT B
SEGMENT C

SB1-SB7
NA

SB11-SB17

SB21-SB27
1.54
19.4
5.70
ND
ND
ND
ND

SB31-SB37
1.71
0.45
0.44
4.30
3.75
2.02
1.88

18.68
89.21
61.03
6.96
ND
ND
23.97

AOC 4

TANK NO. 4
(REMOVED)

A04B02
0.61

NA
A04B03A

A04B03
ND

A04B04
1.44
ND

A04B01
NS

TRENCH A04T02
NA

TRENCH A04T01
NA

1 STORY METAL BUILDING
1694 Sq. Ft. (REMOVED)

PIPE BRIDGE (REMOVED)

GRAVEL DRIVE

SWMU 6

TANK NO. 3
(REMOVED)

06B09
2.33

06B12
ND
10.9

06B11

1.2
06B10

06B10A
NS

06B11A
NS

2.53
06B08

TANK NO. 2
(REMOVED)

1.01
06B05

2.43
06B07

06B07A
NS

TANK NO. 1
(REMOVED)

06B04
ND

06B03
0.93

0.52
06B06

06B06A
NS

06B02
ND

06B01
4.11
ND

METAL BUILDING
276 Sq. Ft.
(REMOVED)

730

PAH AND SVOC SOIL DETECTIONS ABOVE SSLs				
PARAMETER	20 DAF SSL (mg/Kg)	SAMPLE	DEPTH (FT BGS)	SAMPLE RESULT (mg/Kg)
BENZO(A)ANTHRACINE	2			
		06T05/SB12	8-10	7.8
		06T05/SB13**	10-12	4.1
		06T05/SB13	10-12	4
BENZO(B)FLUORANTHENE	5			
		06T05/SB12	8-10	7.8

LEGEND

- ● DIRECT-PUSH BORING LOCATION
- ★ DISCRETE SURFACE SOIL SAMPLING LOCATION
- TRENCH LOCATION
- 10.0 OR — ONE OR MORE PAH/SVOC RESULTS (mg/Kg) ABOVE SSLs (SEE INSET TABLE)
- 10.0 OR — ALL PAH/SVOC RESULTS (mg/Kg) BELOW SSLs
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- NS NOT SAMPLED
- NA NOT ANALYZED
- ND NOT DETECTED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU OR AOC BOUNDARY
- RAILROAD

NOTES:

1. DISCRETE SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
2. SOIL BORING SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
3. SOIL TRENCH SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
4. PAHs WERE ANALYZED DURING RFI PHASE 1 (1997) FROM SOIL BORING SAMPLES.
5. SVOCs WERE ANALYZED DURING RFI PHASE 2 (1998) FOR TRENCH SOIL SAMPLES COLLECTED FROM 06T05.
6. LOCATIONS 06B06A, 06B07A, 06B10A, AND 06B11A WERE ADVANCED FOR COLLECTION OF GROUNDWATER ONLY. RESULTS FOR THESE SAMPLING LOCATIONS ARE PRESENTED WITH SWMU 24.
7. SEE SWMU 6/AOC 4 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

NORTH

50' 0' 50' 100'
SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9-4

SWMU 6/AOC 4 TOTAL PAH AND SVOC SOIL RESULTS

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

14.0 SWMU 12 – AMOCO LANDFARM

14.1 SWMU BACKGROUND

14.1.1 Description of SWMU

SWMU 12 (see Figure 1-2) was utilized by Amoco from 1975 through 1979 for the landfarming of petroleum refining waste generated at the Amoco Sugar Creek Refinery. SWMU 12 is located on Armco property that was leased to Amoco from December 1973 through September 1980. SWMU 12 covers an area of approximately ten acres.

Amoco hauled petroleum refining waste to SWMU 12 by truck from the refinery which is located east of SWMU 12. The waste was incorporated into the soil by surface spreading and discing. Based upon information provided to Armco by Amoco, approximately 30,000 tons of petroleum refining waste were placed in SWMU 12 during its five years of operation. It has been estimated that 3 to 8 inches of petroleum refining waste were incorporated into the soil each year (WWC, 1980). An estimated total of 24 inches of waste, having a wet weight of 30,000 tons and a dry weight of 15,000 tons, was managed at SWMU 12. Water decanted from the sludge material and precipitation falling on the SWMU were controlled by a dike that surrounds the SWMU. Two culverts were located through the dike so that surface water could be discharged from the area, as necessary. No information is available regarding the quality or quantity of water discharged from SWMU 12 during operation. The culvert gates appeared to be closed during a visit by Armco and BMWCI personnel to the SWMU in early 1995; however, one of the culverts had been silted in and was not visible from the ground surface.

The only known waste activity conducted by Armco at SWMU 12 involved a one-time land application of liquid and sludge sediment generated during the cleaning of a No. 2 fuel oil tank. This activity is believed to have taken place in 1976 or 1977. Although the exact quantity of material associated with this activity cannot be determined, it is anticipated that the quantity was much less than 10,000 gallons. The capacity of a No. 2 fuel oil tank was 10,000 gallons, and it is known that the product was removed from the tank long before this activity took place. The

material transported to SWMU 12 was limited to the residual material remaining at the bottom of the tank. The material was transported to SWMU 12 in a single trip by a vacuum truck. Although the actual quantity of material is unknown, it is not anticipated to have exceeded a few hundred gallons.

In a 103(c) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) notification to USEPA, Amoco classified the materials disposed in SWMU 12 under hazardous waste codes K048, K049, K050, and K051 (Helffrich, 1981). The basis for the listing of these waste codes is the presence of lead and hexavalent chromium. At the time that the petroleum refining waste was managed at SWMU 12, it was not classified as hazardous waste. Samples taken from sludge-incorporated soil passed the Extraction Procedure for Toxicity (EP-Toxicity) testing for chromium and lead, two of the constituents for which such waste was subsequently listed by USEPA (WWC, 1980).

During the flood of 1993, SWMU 12 was covered by floodwaters. The SWMU may have been affected by water and silt carried in during the flood conditions. The surface of SWMU 12 does not appear to be eroded; however, the presence of approximately 6-inches of sediment deposited during the flood conditions of 1993 is evident.

In November 1998, Armco personnel observed deterioration of the dike located around SWMU 12. Armco and BMWCI personnel performed an engineering evaluation of the dike failure. A slope failure occurred on the southern portion of the dike, directly north of the relocated Rock Creek and the Independence Sewage Treatment Plant outfall location. The failure was approximately 140 feet long and extended back into the bank approximately 40 feet from the toe of the slope at its deepest point. It appeared that the failure was a result of extensive erosion on the supporting toe of the slope and scouring of the dike due to Rock Creek flow combined with discharge from the Sewage Plant outfall. Based on the site evaluation, it did not appear that contents of the SWMU have been released due to this condition. USEPA was notified of these conditions in Armco's Fourth Quarter 1998 Progress Report dated January 11, 1999.

Based on the types of materials handled at SWMU 12 and previous sampling and analysis activities completed by Amoco, the primary constituents of potential concern were those associated with petroleum refining waste: chromium (both trivalent and hexavalent), lead, VOCs, and SVOCs.

SWMU 12 was designated in the Permit as an IM SWMU. IM activities were completed as described in Section 14.2.

14.1.2 Release Potential

Management practices associated with SWMU 12 involved direct contact with surface water and surface soil within the dike boundaries. The primary release potential for SWMU 12 was to the surrounding surface soil, subsurface soil, and groundwater.

14.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was evaluated through the collection of surface soil, subsurface soil, and groundwater samples. Table 14-1 presents a summary of the investigation activities completed for SWMU 12, and Figure 14-1 presents the sampling and monitoring well locations.

14.2.1 Interim Measures Activities

Four additional monitoring wells (Monitoring Wells 12MW1 through 12MW4) were installed at SWMU 12 to supplement existing Monitoring Wells OWA5 and OWA6. Groundwater samples were collected from each of the six monitoring wells and analyzed for TPH, dissolved lead, dissolved chromium (trivalent and hexavalent), and Skinner's List of VOCs and SVOCs.

Subsurface soil samples from three depth intervals were collected from Monitoring Well Borings 12MW1 and 12MW3 to determine the general physical and chemical characteristics of the subsurface materials at SWMU 12. To differentiate these types of samples from those associated with contaminant characterization, these analyses are typically referred to as physical analyses

(see Subsection 2.5.2.2). Results for the physical analyses were presented in Appendix G of the *Interim Measures Investigation Report* (BMWCI, 1997a), and Appendix D of this Report.

Subsurface soil for chemical analysis was collected from monitoring well borings where signs of soil contamination (organic odors and/or elevated PID readings) were present. Subsurface soil samples were collected from two depth intervals each in Monitoring Well Borings 12MW3 and 12MW4. Subsurface soil samples were analyzed for TPH, lead, chromium (trivalent and hexavalent), and Skinner's List of VOCs and SVOCs.

14.2.2 RFI Activities

To further define the nature and extent of soil contamination at SWMU 12, surface soil samples were collected during RFI Phase 1 from four grids (Grids 12G01 through 12G04), and were composites of five aliquot locations from within each grid. Due to the presence of approximately 6 inches of silt from the 1993 flood, surface soil samples were collected from 6 to 12 inches bgs to obtain soil containing representative landfarmed materials. Surface soil samples were analyzed for Skinner's List of SVOCs, chromium (hexavalent and trivalent), lead, and TPH.

Three direct-push soil borings (Borings 12B01 through 12B03) were placed in the center of surface soil grids 12G01, 12G02, and 12G03, and samples were collected from two depth intervals (0 to 4 feet and 4 to 7 feet bgs). Subsurface soil samples were analyzed for Skinner's List of VOCs and SVOCs, chromium (hexavalent, trivalent, and total), lead, and TPH.

Four soil borings completed as monitoring wells at the former Amoco Landfarm (SWMU 12) during the RFI penetrated through the alluvial sediments to bedrock. Depth to bedrock at SWMU 12 ranges from 25 to 50 feet bgs. The SWMU 12 subsurface is characterized by clays and silts to a depth of 15 to 25 feet bgs where there is a transition to fine sand. Below 30 to 35 feet, fine sand is replaced by coarser sands and gravels. Depth to groundwater at SWMU 12 ranges from 17 to 26 feet bgs although subtracting the height of the slag berm upon which the wells are located, the actual depth to groundwater from undisturbed ground surface is probably

13 to 14 feet bgs. Bedrock topography appears to exert strong influence on groundwater flow patterns and gradients.

14.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Tables 14-2 through 14-4 present the soil analytical results for SWMU 12. Figures 14-2 through 14-4 present the soil analytical results for lead, Skinner's List of VOCs, and Skinner's List of SVOCs, respectively. TPH results are presented in Appendix U.

14.3.1 Metals

Hexavalent chromium was not detected in any of the soil samples collected at SWMU 12. Trivalent chromium was detected in all of the samples collected from SWMU 12. Trivalent chromium results were highest in the surface soil samples, and the highest concentration (1,330 mg/Kg) was detected in the sample collected from Grid 12G03 inside the dike. Trivalent chromium concentrations decreased with increasing depth. In the samples collected from the 4 to 7 feet bgs interval, trivalent chromium concentrations ranged from 19.2 mg/Kg to 76.4 mg/Kg, and in the deepest sampling interval (12MW3, 19 to 21 feet bgs), the trivalent chromium concentration was 14.6 mg/Kg. No 20 DAF SSL exists for trivalent chromium. Therefore, the vertical and horizontal extent of hexavalent and trivalent chromium in soil were adequately defined by the sampling locations.

Figure 14-2 presents the soil analytical results for lead. Lead was detected in all of the soil samples except the subsurface soil sample collected from the 15 to 16 feet bgs sampling interval at Well 12MW4. The highest lead concentrations (up to 6,080 DJ* mg/Kg) were found in the surface soil grids located inside the dike, and the lowest detected concentrations were found in the deepest soil boring samples (18.6 mg/Kg at 12MW3, 19 to 21 feet bgs). Lead concentrations decreased with increasing depth. Lead exceeded the 20 DAF SSL (400 mg/Kg) in samples collected from each of the surface grids inside the dike. However, lead concentrations were below the 20 DAF SSL in the surface soil sample collected outside of the dike near the culvert outfall. Therefore, the horizontal extent of lead was well defined by the dike. The vertical extent of lead exceedences of the 20 DAF SSL was limited to the upper 4 feet of soil. Table 14-6

shows the soil results that exceeded screening limits for SWMU 12. Since surface soil samples were collected below a 6-inch layer of silt from the 1993 flood, surface soil results are not indicative of metal concentrations at the ground surface.

14.3.2 VOCs

Ten subsurface soil samples were analyzed for Skinner's List of VOCs. VOCs were not detected in any of the soil samples collected at SWMU 12. As shown on Figure 14-3, the vertical and horizontal extent of VOCs in soil was adequately defined by the sampling locations.

14.3.3 SVOCs

Four surface soil and ten subsurface soil samples were collected and analyzed for Skinner's List of SVOCs. Since surface soil samples were collected below a 6-inch layer of silt from the 1993 flood, surface soil results are not indicative of SVOC concentrations at the ground surface. Figure 14-4 presents the Total SVOC results for the soil samples. Surface soil concentrations of Total SVOCs ranged from 27,800 µg/Kg to 79,640 µg/Kg inside the dike and were nondetect outside of the dike. SVOC concentrations were highest in the surface soil samples, and Total SVOC concentrations decreased with increasing depth. In the 4 to 7 feet bgs sampling interval, Total SVOC concentrations were non-detect except at Boring 12B03 (387 µg/Kg). SVOCs were not detected in any sample collected from greater than 8 feet bgs.

PAHs were the only SVOCs detected. Table 14-6 presents the soil samples with SVOC results that exceeded the 20 DAF SSLS. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were the only SVOCs with detections above their 20 DAF SSLs (2,000, 8,000, 5,000, and 2,000 µg/Kg, respectively); the highest concentrations of these compounds were 6,740, 14,200, 15,700, and 17,300 µg/Kg, respectively. All exceedences were limited to surface soil samples collected within the dike boundary, and SVOCs were not detected in the surface soil sample collected outside of the dike near the culvert outfall. Therefore, the vertical and horizontal extent of SVOCs in soil was adequately characterized at SWMU 12.

14.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

A limited amount of information concerning the nature and extent of contamination in groundwater at SWMU 12 was available at the onset of the RFI. Two monitoring wells, OWA-5 and OWA-6, believed to have been installed in 1980, still exist at SWMU 12. Groundwater data had been collected from these wells on various historic occasions including June 3, 1980, August 26, 1980, and October 14, 1994. Data associated with these sampling events was provided in Appendix A of the RFI Workplan (BMWCI, 1996a). Total chromium, lead, and Skinner's List of VOCs and SVOCs were not detected in the October 1994 groundwater samples.

Table 14-5 presents the analytical results for the groundwater samples collected at SWMU 12 during IM. Figures 14-5 and 14-6 present the analytical results for dissolved metals and Skinner's List of VOCs and SVOCs, respectively. TPH results are presented in Appendix U.

14.4.1 Dissolved Metals

Groundwater samples were collected from six wells during IM. As shown on Figure 14-5, none of the samples contained detections of dissolved chromium, dissolved hexavalent chromium, dissolved trivalent chromium, or dissolved lead. Therefore, none of the groundwater screening MCLs for these metals were exceeded, and the nature and extent of dissolved metals in groundwater at SWMU 12 was adequately characterized by the sampling locations.

14.4.2 VOCs

As shown in Figure 14-6, compounds on Skinner's List of VOCs were not detected in the groundwater samples collected at SWMU 12. Therefore, the nature and extent of VOCs in groundwater was adequately characterized by the sampling locations.

14.4.3 SVOCs

The common laboratory contaminant bis(2-ethylhexyl)phthalate (BEHP) was detected in groundwater samples collected from Wells 12MW1 (26.5 µg/L) and 12MW3 (4 J µg/L). As shown on Table 14-7, BEHP results slightly exceeded the MCL (6 µg/L) for the sample collected

from Well 12MW1. BEHP was the only compound on the Skinner's List of SVOCs that was detected in the monitoring well samples. The nature and extent of SVOCs in groundwater was adequately characterized by the remaining sampling locations.

14.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 12, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater and groundwater transport), the surface pathway (storm water runoff), and the air pathway (airborne dust).

The nature and extent of contamination at SWMU 12 was assessed through the collection of surface soil, subsurface soil, and groundwater samples. In soil, lead and PAHs exceeded 20 DAF SSLs to depths of 4 feet bgs (approximate deepest elevation 724 ft above MSL) and 1 foot bgs (approximate deepest elevation 727 ft above MSL), respectively. Therefore, soil transfer to groundwater could occur. The tendency for metals and PAHs to strongly adsorb to soil is expected to limit vertical migration.

Groundwater samples did not have detections of dissolved metals or PAHs. One other SVOC (BEHP) was detected at a concentration exceeding the MCL and surrounding groundwater samples contained non-detections or low concentrations (below the MCL). The saturated zone is typically encountered at approximate elevations ranging from 714 to 718 feet above MSL. Based on the vertical definition of subsurface soil constituents at depths shallower than the saturated zone and the limited detections in the groundwater, the groundwater transport pathway is not expected to be significant for SWMU 12. Groundwater flow direction at SWMU 12 is influenced by Rock Creek (adjacent to the south side of the SWMU) and the Blue River (approximately 1200 feet north of the SWMU).

SWMU 12 is a vegetated area. Storm water received within the diked area of the SWMU ponds and infiltrates. The culverts at the east side of the SWMU are kept closed; therefore, storm water runoff is not expected to travel outside of the diked area. Based on these factors, storm water runoff should not provide a significant route for constituent migration. Surface soil particulate

(dust) could become airborne. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. However, based on the dike surrounding the SWMU (which is expected to trap some airborne dust), the vegetative cover, and a 6-inch silt layer from the 1993 flood, airborne dust transport is not expected to be significant at SWMU 12.

14.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted for SWMU 12.

14.6.1 Human Health Evaluation

SVOCs and lead were identified as COPCs in both surface and subsurface soil. BEHP was identified as a COPC in groundwater. A HHRA and lead modeling were conducted for SWMU 12 to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. For the exposure scenarios evaluated, it was determined that there are no significant noncarcinogenic health effects or carcinogenic risks posed by the chemicals of concern detected in soil or groundwater at SWMU 12. Assumptions and variables used in risk calculations are discussed in Chapter 4.0 of Appendix X. Results of the risk characterization and lead modeling are presented in Chapter 5.0 of Appendix X.

14.6.2 Ecological Evaluation

COPECs identified for SWMU 12 included PAHs, trivalent chromium, and lead. The majority of the benchmarks were exceeded during the preliminary screening for the COPECs. During the site-specific screening, chromium (total and trivalent) was the only COPEC detected at concentrations that exceeded the soil nematodes and small mammal (rabbit and shrew) benchmarks. As such, chromium was the only chemical retained as a COPEC after the site-specific screening. No indications of metal toxicity were observed during the RFI field activities or the field site visit in October 1998. Since the pH of the soil is basic, chromium is probably not available to the ecological receptors inhabiting this area. Although chromium exceeded some of

the benchmarks, chromium is not expected to negatively impact the ecological community at SWMU 12. Details of the ecological risk evaluation for SWMU 12 are provided in Appendix Y.

14.7 SUMMARY

SWMU 12, located in the eastern portion of the Facility, was utilized by Amoco for landfarming of petroleum refining waste. SWMU 12 covers an area of approximately 10 acres. Surface soil, subsurface soil, and groundwater samples were collected at SWMU 12 for metals (hexavalent chromium, trivalent chromium, and lead), VOCs (Skinner's List), and SVOCs (Skinner's List).

As shown on Figures 14-2 through 14-4, the horizontal and vertical extent of lead, hexavalent chromium, trivalent chromium, and Skinner's List of VOCs and SVOCs was adequately characterized in soil by the sampling locations at SWMU 12. Hexavalent chromium was not detected in any of the soil samples. Trivalent chromium was detected at concentrations up to 1,330 mg/Kg, and no 20 DAF SSL exists for trivalent chromium. Lead detections exceeded the 20 DAF SSL (400 mg/Kg) for six of the 14 surface and subsurface soil samples, at concentrations ranging up to 6,080 DJ* mg/Kg. These exceedences were all contained within the SWMU 12 dike boundary and limited to the upper four feet of soil sampled. Lead results for the surface soil sample collected outside of the dike boundary near the culvert outfall were below the 20 DAF SSL. Therefore, the vertical and horizontal extent of lead detections was well defined by the sampling locations.

Skinner's List of VOCs were not detected in any of the soil samples collected at SWMU 12, and the vertical and horizontal extent of VOCs in soil was adequately defined by the sampling locations.

PAHs were the only Skinner's List of SVOCs detected. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene were the only SVOCs with detections above their 20 DAF SSLs (2,000, 8,000, 5,000, and 2,000 µg/Kg, respectively); the highest concentrations of these compounds were 6,740, 14,200, 15,700, and 17,300 µg/Kg, respectively, in samples collected from Grid 12G01. All detections were limited to surface soil samples

collected within the dike boundary below the 6-inch layer of silt. No 20 DAF SSL exceedences were noted in samples collected from the 4 to 7 feet bgs depth interval. Therefore, the vertical and horizontal extent of SVOCs in soil was adequately characterized at SWMU 12.

Groundwater analytical results are presented on Figures 14-5 (dissolved lead, dissolved trivalent chromium, dissolved hexavalent chromium) and 14-6 (Skinner's List of VOCs and SVOCs). Six groundwater samples were collected from the monitoring wells located around SWMU 12. The common laboratory contaminant BEHP was the only SVOC detected, and was detected above the groundwater screening MCL (6 µg/L) in the sample from Well 12MW1 (26.5 µg/L). Dissolved metals and VOCs were not detected. Therefore, the nature and extent of dissolved metals, VOCs, and SVOCs in groundwater at SWMU 12 was adequately characterized by the sampling locations.

Potential migration pathways at SWMU 12 include soil transfer to groundwater, groundwater transport, storm water runoff, and airborne dust migration. Soil detections of lead and PAHs exceeded the 20 DAF SSLs (based on soil migration to groundwater), thus indicating that soil transfer to groundwater could occur. The tendency for metals and PAHs to strongly adsorb to soil is expected to limit vertical migration. Groundwater samples collected from the saturated zone showed non-detections of dissolved metals and PAHs, and one detection of another SVOC (BEHP) exceeding MCL. Based on the vertical definition of subsurface soil contamination at depths shallower than the saturated zone and the limited detections in the groundwater, the groundwater transport pathway is not expected to be significant for SWMU 12.

Storm water received within the diked area of the SWMU ponds and infiltrates, and culverts at the east side of the SWMU are kept closed. Therefore, storm water runoff is not expected to travel outside of the diked area and storm water runoff should not provide a significant route for contaminant migration. Surface soil particulate (dust) could become airborne. However, based on the dike surrounding the SWMU (which is expected to trap some airborne dust) and the vegetative cover, airborne dust transport is not expected to be significant at SWMU 12.

A risk evaluation was conducted for SWMU 12. For the human health evaluation, lead and PAHs were identified as COPCs in surface and subsurface soil, and BEHP was identified as a COPC in groundwater. Therefore, a HHRA and lead modeling were conducted to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. No significant risk was posed by the COPCs in soil or groundwater at SWMU 12 for these exposure scenarios. An ecological evaluation was also conducted for SWMU 12. Chromium, lead, and PAHs exceeded preliminary (benchmark) screening, and chromium exceeded site-specific screening for various wildlife receptors. Qualitative factors and field site visits both indicate that chromium in soil is not eliciting adverse effects on these receptors, and as such, risk to potential ecological receptors is not expected to be significant.

* * * * *

Table 14-1
SWMU 12 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Chemical Analysis						Physical		Lab ID
						Skinner's			Chromium				
Point	Designator	(ft)	Collected	Phase	Lead	VOC	SVOC	TPH	III	VI	Analysis	Comments	Number
COMPOSITE SURFACE SOIL GRIDS													
12G01	SR1	0.5 - 1	3/10/1997	1	X		X	X	X	X			D97-2852-1
	SR1D	0.5 - 1	3/10/1997	1	X		X	X	X	X		Field Duplicate	D97-2852-2
12G02	SR1	0.5 - 1	3/10/1997	1	X		X	X	X	X			D97-2852-3
12G03	SR1	0.5 - 1	3/10/1997	1	X		X	X	X	X			D97-2852-4
	SR1R		3/10/1997	1	X		X	X	X	X		Rinsate	D97-2852-5
12G04	SR1	0.5 - 1	3/10/1997	1	X		X	X	X	X			D97-2852-6
	SR1MS	0.5 - 1	3/10/1997	1	X		X		X	X		Matrix Spike	D97-2852-7
	SR1MSD	0.5 - 1	3/10/1997	1	X		X		X	X		Matrix Spike Duplicate	D97-2852-8
INTERIM MEASURES SOIL BORING SAMPLES													
12MW1	ST1	5 - 7	12/6/1996	IM							X		
	SS1	18 - 20	12/6/1996	IM							X		
	SS2	25 - 26	12/6/1996	IM							X		
12MW3	CS1	14 - 19	12/6/1996	IM	X	X	X	X	X	X			D96-14052-3
	SS1	19 - 21	12/6/1996	IM	X	X	X	X	X	X			D96-14052-4
	ST1	4 - 6	12/6/1996	IM							X		
	ST2	8 - 10	12/6/1996	IM							X		
	CS1	14 - 19	12/6/1996	IM							X		
12MW4	CS1	7 - 7.5	12/6/1996	IM	X	X	X	X	X	X			D96-14052-1
	CS2	15 - 16	12/6/1996	IM	X	X	X	X	X	X			D96-14052-2
DIRECT-PUSH SOIL SAMPLES													
12B01	DP1	0 - 4	3/17/1997	1	X	X	X	X	X	X			D97-3170-1
	DP1D	0 - 4	3/17/1997	1	X	X	X	X	X	X		Field Duplicate	D97-3170-2
	DP2	4 - 7	3/17/1997	1	X	X	X	X	X	X			D97-3170-3
12B02	DP1	0 - 4	3/17/1997	1	X	X	X	X	X	X			D97-3170-4
	DP2	4 - 7	3/17/1997	1	X	X	X	X	X	X			D97-3170-5
	DP2MS	4 - 7	3/17/1997	1	X	X	X		X	X		Matrix Spike	D97-3170-6
	DP2MSD	4 - 7	3/17/1997	1	X	X	X		X	X		Matrix Spike Duplicate	D97-3170-7
12B03	DP1	0 - 4	3/17/1997	1	X	X	X	X	X	X			D97-3170-8
	DP2	4 - 7	3/17/1997	1	X	X	X	X	X	X			D97-3170-9
	DP2R		3/17/1997	1	X	X	X	X	X	X		Rinsate	D97-3170-10

Table 14-1
SWMU 12 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Chemical Analysis						Physical		Lab ID
						Skinner's			Chromium				
Point	Designator	(ft)	Collected	Phase	Lead	VOC	SVOC	TPH	III	VI	Analysis	Comments	Number
INTERIM MEASURES GROUNDWATER SAMPLES													
12MW1	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-2
	GW1MS	NA	12/11/1996	IM	X	X	X		X	X		Matrix Spike	D96-14212-5
	GW1MSD	NA	12/11/1996	IM	X	X	X		X	X		Matrix Spike Duplicate	D96-14212-6
12MW2	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-3
12MW3	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-4
12MW4	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-7
	GW1D	NA	12/11/1996	IM	X	X	X	X	X	X		Field Duplicate	D96-14212-8
OWA5	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-9
OWA6	GW1	NA	12/11/1996	IM	X	X	X	X	X	X			D96-14212-10

Notes:
ft = feet
IM = Interim Measures
SVOC = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)
VOC = Volatile Organic Compounds

Table 14-2
SWMU 12 Phase 1 Composite Surface Soil Results
Armco Kansas City Facility

Sample Point:		12G01/SR1		12G01/SR1D		12G02/SR1		12G03/SR1		12G04/SR1	
Date Sampled:		3/10/97		3/10/97		3/10/97		3/10/97		3/10/97	
Sample Depth From:		0.5		0.5		0.5		0.5		0.5	
Sample Depth To:		1		1		1		1		1	
Laboratory Number:		D97-2852-1		D97-2852-2		D97-2852-3		D97-2852-4		D97-2852-6	
Sample Type:				Duplicate							
Semivolatiles	UNITS										
1-Methylnaphthalene	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
2,4-Dimethylphenol	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
2,4-Dinitrophenol	ug/Kg	27,200	U	27,100	U	27,200	U	27,900	U	4,340	U
4-Nitrophenol	ug/Kg	27,200	U	27,100	U	27,200	U	27,900	U	4,340	U
7,12-Dimethylbenz(a)anthracene	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Anthracene	ug/Kg	***1,190***	***J***	5,420	U	5,450	U	5,590	U	868	U
Benzo(a)anthracene	ug/Kg	***6,740***		***3,700***	***J***	5,450	U	5,590	U	868	U
Benzo(a)pyrene	ug/Kg	5,440	U	***14,200***		***7,590***		***11,700***		868	U
Benzo(b)fluoranthene	ug/Kg	***15,700***		***8,590***		***5,560***		***9,270***		868	U
Benzo(k)fluoranthene	ug/Kg	***3,790***	***J***	5,420	U	5,450	U	***3,510***	***J***	868	U
Bis(2-ethylhexyl)phthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Butylbenzylphthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Chrysene	ug/Kg	***22,900***		***12,800***		5,450	U	***11,600***		868	U
Di-n-butylphthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Di-n-octylphthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Dibenz(a,h)acridine	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Dibenzo(a,h)anthracene	ug/Kg	***17,300***		***13,000***		***7,810***		***11,800***		868	U
Dichlorobenzenes	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Diethyl phthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Dimethyl phthalate	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Fluoranthene	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Indene	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Methylchrysene	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Methylphenols	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Naphthalene	ug/Kg	***8,860***		***6,970***		***3,870***	***J***	***5,290***	***J***	868	U
Phenanthrene	ug/Kg	***3,160***	***J***	***2,260***	***J***	5,450	U	***1,510***	***J***	868	U
Phenol	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Pyrene	ug/kg	5,440	U	***5,210***	***J***	***2,970***	***J***	***1,500***	***J***	868	U
Pyridine	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Quinoline	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Thiophenol (Benzenthiol)	ug/Kg	5,440	U	5,420	U	5,450	U	5,590	U	868	U
Total Detected SVOCs	UNITS										
Total Semi-Volatiles	ug/Kg	***79,640***		***66,730***		***27,800***		***56,180***		ND	
Metals, Total	UNITS										
Chromium, Hexavalent	mg/Kg	0.14	U	0.14	U	0.14	U	0.14	U	0.13	U
Chromium, Total	mg/Kg	***1,290***		***1,260***		***1,290***		***1,330***		***30.8***	
Chromium, Trivalent	mg/Kg	***1,290***		***1,260***		***1,290***		***1,330***		***30.8***	
Lead, Total	mg/Kg	***5,480***	***DJ****	***5,340***	***DJ****	***5,610***	***DJ****	***6,080***	***DJ****	***83.8***	***J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-3
SWMU 12 Interim Measures Soil Boring Results
Armco Kansas City Facility

Sample Point:		12MW3/CS1		12MW3/SS1		12MW4/CS1		12MW4/CS2	
Date Sampled:		12/6/1996		12/6/1996		12/6/1996		12/6/1996	
Sample Depth From:		14		19		7		15	
Sample Depth To:		19		21		7.5		16	
Laboratory Number:		D96-14052-3		D96-14052-4		D96-14052-1		D96-14052-2	
Sample Type:									
Volatiles	UNITS								
1,2-Dibromoethane	ug/Kg	13.7	U	13	U	13.2	U	13	U
1,2-Dichloroethane	ug/Kg	13.7	U	13	U	13.2	U	13	U
1,4-Dioxane	ug/Kg	13.7	U	13	U	13.2	U	13	U
2-Butanone	ug/Kg	13.7	U	13	U	13.2	U	13	U
Benzene	ug/Kg	13.7	U	13	U	13.2	U	13	U
Carbon disulfide	ug/Kg	13.7	U	13	U	13.2	U	13	U
Chlorobenzene	ug/Kg	13.7	U	13	U	13.2	U	13	U
Chloroform	ug/Kg	13.7	U	13	U	13.2	U	13	U
Ethylbenzene	ug/Kg	13.7	U	13	U	13.2	U	13	U
Styrene	ug/Kg	13.7	U	13	U	13.2	U	13	U
Toluene	ug/Kg	13.7	U	13	U	13.2	U	13	U
Xylenes (total)	ug/Kg	13.7	U	13	U	13.2	U	13	U
Semivolatiles	UNITS								
1-Methylnaphthalene	ug/Kg	907	U	857	U	868	U	856	U
2,4-Dimethylphenol	ug/Kg	907	U	857	U	868	U	856	U
2,4-Dinitrophenol	ug/Kg	4,530	U	4,290	U	4,340	U	4,280	U
4-Nitrophenol	ug/Kg	4,530	U	4,290	U	4,340	U	4,280	U
7,12-Dimethylbenz(a)anthracene	ug/Kg	907	U	857	U	868	U	856	U
Anthracene	ug/Kg	907	U	857	U	868	U	856	U
Benzo(a)anthracene	ug/Kg	907	U	857	U	868	U	856	U
Benzo(a)pyrene	ug/Kg	907	U	857	U	868	U	856	U
Benzo(b)fluoranthene	ug/Kg	907	U	857	U	868	U	856	U
Benzo(k)fluoranthene	ug/Kg	907	U	857	U	868	U	856	U
Bis(2-ethylhexyl)phthalate	ug/Kg	907	U	857	U	868	U	856	U
Butylbenzylphthalate	ug/Kg	907	U	857	U	868	U	856	U
Chrysene	ug/Kg	907	U	857	U	868	U	856	U
Di-n-butylphthalate	ug/Kg	907	U	857	U	868	U	856	U
Di-n-octylphthalate	ug/Kg	907	U	857	U	868	U	856	U
Dibenz(a,h)acridine	ug/Kg	907	U	857	U	868	U	856	U
Dibenzo(a,h)anthracene	ug/Kg	907	U	857	U	868	U	856	U
Dichlorobenzenes	ug/Kg	907	U	857	U	868	U	856	U
Diethyl phthalate	ug/Kg	907	U	857	U	868	U	856	U
Dimethyl phthalate	ug/Kg	907	U	857	U	868	U	856	U
Fluoranthene	ug/Kg	907	U	857	U	868	U	856	U
Indene	ug/Kg	907	U	857	U	868	U	856	U
Methylchrysene	ug/Kg	907	U	857	U	868	U	856	U
Methylphenols	ug/Kg	907	U	857	U	868	U	856	U
Naphthalene	ug/Kg	907	U	857	U	868	U	856	U
Phenanthrene	ug/Kg	907	U	857	U	868	U	856	U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
ND - Not Detected
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-3
SWMU 12 Interim Measures Soil Boring Results
Armco Kansas City Facility

	Sample Point:	12MW3/CS1		12MW3/SS1		12MW4/CS1		12MW4/CS2	
	Date Sampled:	12/6/1996		12/6/1996		12/6/1996		12/6/1996	
	Sample Depth From:	14		19		7		15	
	Sample Depth To:	19		21		7.5		16	
	Laboratory Number:	D96-14052-3		D96-14052-4		D96-14052-1		D96-14052-2	
	Sample Type:								
Semivolatiles	UNITS								
- CONTINUED -									
Phenol	ug/Kg	907	U	857	U	868	U	856	U
Pyrene	ug/kg	907	U	857	U	868	U	856	U
Pyridine	ug/Kg	907	U	857	U	868	U	856	U
Quinoline	ug/Kg	907	U	857	U	868	U	856	U
Thiophenol (Benzenthiol)	ug/Kg	907	U	857	U	868	U	856	U
Metals, Total	UNITS								
Chromium, Hexavalent	mg/Kg	0.14	U	0.13	U	0.13	U	0.13	U
Chromium, Total	mg/Kg	***9.51***		***14.6***		***19.3***		***11.2***	
Chromium, Trivalent	mg/Kg	***9.51***		***14.6***		***19.3***		***11.2***	
Lead, Total	mg/Kg	***18.9***		***18.6***		***26***		13	U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
ND - Not Detected
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-4
SWMU 12 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		12B01/DP1		12B01/DP1		12B01/DP1D		12B01/DP1D		12B01/DP2		12B02/DP1		12B02/DP1	
Date Sampled:		3/17/1997		3/17/1997		3/17/1997		3/17/1997		3/17/1997		3/17/1997		3/17/1997	
Sample Depth From:		0		0		0		0		4		0		0	
Sample Depth To:		4		4		4		4		7		4		4	
Laboratory Number:		D97-3170-1		D97-3170-1R2		D97-3170-2		D97-3170-2R2		D97-3170-3		D97-3170-4		D97-3170-4R2	
Sample Type:				Reanalysis		Duplicate		Duplicate Reanalysis						Reanalysis	
Volatiles	UNITS														
1,2-Dibromoethane	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
1,2-Dichloroethane	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
1,4-Dioxane	ug/Kg	134	U	NA		135	U	NA		132	U	131	U	NA	
2-Butanone	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Benzene	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Carbon disulfide	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Chlorobenzene	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Chloroform	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Ethylbenzene	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Styrene	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Toluene	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Xylenes (total)	ug/Kg	6.7	U	NA		6.8	U	NA		6.6	U	6.5	U	NA	
Semivolatiles	UNITS														
1-Methylnaphthalene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
2,4-Dimethylphenol	ug/Kg	5,290	U	NA		5,350	U	53,500	DU	871	U	863	U	8,630	DU
2,4-Dinitrophenol	ug/Kg	26,400	U	NA		26,800	U	268,000	DU	4,350	U	4,310	U	43,100	DU
4-Nitrophenol	ug/Kg	26,400	U	NA		26,800	U	268,000	DU	4,350	U	4,310	U	43,100	DU
7,12-Dimethylbenz(a)anthracene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Anthracene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Benzo(a)anthracene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Benzo(a)pyrene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Benzo(b)fluoranthene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	***409***	***J***	8,630	DU
Benzo(k)fluoranthene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	***277***	***J***	8,630	DU
Bis(2-ethylhexyl)phthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Butylbenzylphthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Chrysene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Di-n-butylphthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Di-n-octylphthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Dibenz(a,h)acridine	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Dibenzo(a,h)anthracene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	***222***	***J***	8,630	DU
Dichlorobenzenes	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Diethyl phthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Dimethyl phthalate	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Fluoranthene	ug/Kg	5,290	U	52,900	DU	***4,220***	***J***	53,500	DU	871	U	863	U	8,630	DU
Indene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Methylchrysene	ug/Kg	5,290	U	52,900	DU	5,350	U	53,500	DU	871	U	863	U	8,630	DU
Methylphenols	ug/Kg	5,290	U	NA		5,350	U	53,500	DU	871	U	863	U	8,630	DU
Naphthalene	ug/Kg	***3,060***	***J***	52,900	DU	***3,070***	***J***	53,500	DU	871	U	***298***	***J***	8,630	DU

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted For Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-4
SWMU 12 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		12B01/DP1	12B01/DP1	12B01/DP1D	12B01/DP1D	12B01/DP2	12B02/DP1	12B02/DP1
Date Sampled:		3/17/1997	3/17/1997	3/17/1997	3/17/1997	3/17/1997	3/17/1997	3/17/1997
Sample Depth From:		0	0	0	0	4	0	0
Sample Depth To:		4	4	4	4	7	4	4
Laboratory Number:		D97-3170-1	D97-3170-1R2	D97-3170-2	D97-3170-2R2	D97-3170-3	D97-3170-4	D97-3170-4R2
Sample Type:			Reanalysis	Duplicate	Duplicate Reanalysis			Reanalysis
Semivolatiles	UNITS							
- CONTINUED -								
Phenanthrene	ug/Kg	5,290 U	52,900 DU	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Phenol	ug/Kg	5,290 U	NA	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Pyrene	ug/kg	5,290 U	52,900 DU	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Pyridine	ug/Kg	5,290 U	52,900 DU	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Quinoline	ug/Kg	5,290 U	52,900 DU	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Thiophenol (Benzenthiol)	ug/Kg	5,290 U	NA	5,350 U	53,500 DU	871 U	863 U	8,630 DU
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/Kg	***3,060***	ND	***7,290***	ND	ND	***1,206***	ND
Metals, Total	UNITS							
Chromium, Hexavalent	mg/Kg	0.13 U	NA	0.14 U	NA	0.13 U	0.13 U	NA
Chromium, Total	mg/Kg	***203***	NA	***217***	NA	***19.5***	***424***	NA
Chromium, Trivalent	mg/Kg	***203***	NA	***217***	NA	***19.5***	***424***	NA
Lead, Total	mg/Kg	***774***	NA	***779***	NA	***32.8***	***1,840***	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted For Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-4
SWMU 12 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		12B02/DP2		12B03/DP1		12B03/DP1		12B03/DP2		12B03/DP2	
Date Sampled:		3/17/1997		3/17/1997		3/17/1997		3/17/1997		3/17/1997	
Sample Depth From:		4		0		0		4		4	
Sample Depth To:		7		4		4		7		7	
Laboratory Number:		D97-3170-5		D97-3170-8		D97-3170-8R2		D97-3170-9		D97-3170-9R2	
Sample Type:						Reanalysis				Reanalysis	
Volatiles	UNITS										
1,2-Dibromoethane	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
1,2-Dichloroethane	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
1,4-Dioxane	ug/Kg	135	U	129	U	NA		130	U	NA	
2-Butanone	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Benzene	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Carbon disulfide	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Chlorobenzene	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Chloroform	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Ethylbenzene	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Styrene	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Toluene	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Xylenes (total)	ug/Kg	6.7	U	6.4	U	NA		6.5	U	NA	
Semivolatiles	UNITS										
1-Methylnaphthalene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
2,4-Dimethylphenol	ug/Kg	891	U	5,090	U	NA		860	U	8,600	DU
2,4-Dinitrophenol	ug/Kg	4,450	U	25,400	U	NA		4,300	U	43,000	DU
4-Nitrophenol	ug/Kg	4,450	U	25,400	U	NA		4,300	U	43,000	DU
7,12-Dimethylbenz(a)anthracene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Anthracene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Benzo(a)anthracene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Benzo(a)pyrene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Benzo(b)fluoranthene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Benzo(k)fluoranthene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Bis(2-ethylhexyl)phthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Butylbenzylphthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Chrysene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Di-n-butylphthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Di-n-octylphthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Dibenz(a,h)acridine	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Dibenzo(a,h)anthracene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Dichlorobenzenes	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Diethyl phthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Dimethyl phthalate	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Fluoranthene	ug/Kg	891	U	***2,530***	***J***	50,900	DU	***387***	***J***	8,600	DU
Indene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Methylchrysene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Methylphenols	ug/Kg	891	U	5,090	U	NA		860	U	8,600	DU
Naphthalene	ug/Kg	891	U	***1,490***	***J***	50,900	DU	860	U	8,600	DU

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted For Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-4
SWMU 12 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

	Sample Point:	12B02/DP2		12B03/DP1		12B03/DP1		12B03/DP2		12B03/DP2	
	Date Sampled:	3/17/1997		3/17/1997		3/17/1997		3/17/1997		3/17/1997	
	Sample Depth From:	4		0		0		4		4	
	Sample Depth To:	7		4		4		7		7	
	Laboratory Number:	D97-3170-5		D97-3170-8		D97-3170-8R2		D97-3170-9		D97-3170-9R2	
	Sample Type:					Reanalysis				Reanalysis	
Semivolatiles	UNITS										
- CONTINUED -											
Phenanthrene	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Phenol	ug/Kg	891	U	5,090	U	NA		860	U	8,600	DU
Pyrene	ug/kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Pyridine	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Quinoline	ug/Kg	891	U	5,090	U	50,900	DU	860	U	8,600	DU
Thiophenol (Benzenthiol)	ug/Kg	891	U	5,090	U	NA		860	U	8,600	DU
Total Detected SVOCs	UNITS										
Total Semi-Volatiles	ug/Kg	ND		***4,020***		ND		***387***		ND	
Metals, Total	UNITS										
Chromium, Hexavalent	mg/Kg	0.13	U	0.13	U	NA		0.13	U	NA	
Chromium, Total	mg/Kg	***19.2***		***173***		NA		***76.4***		NA	
Chromium, Trivalent	mg/Kg	***19.2***		***173***		NA		***76.4***		NA	
Lead, Total	mg/Kg	***24.6***		***682***		NA		***303***		NA	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted For Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-5
SWMU 12 Interim Measures Groundwater Results
Armco Kansas City Facility

Sample Point:		12MW1/GW1		12MW2/GW1		12MW3/GW1		12MW4/GW1		12MW4/GW1D		OWA05/GW1	
Date Sampled:		12/11/1996		12/11/1996		12/11/1996		12/11/1996		12/11/1996		12/11/1996	
Sample Depth From:		0		0		0		0		0		0	
Sample Depth To:		0		0		0		0		0		0	
Laboratory Number:		D96-14212-2		D96-14212-3		D96-14212-4		D96-14212-7		D96-14212-8		D96-14212-9	
Sample Type:										Duplicate			
Volatiles	UNITS												
1,2-Dibromoethane	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
1,4-Dioxane	ug/L	100	U	100	U	100	U	100	U	100	U	100	U
2-Butanone	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Carbon disulfide	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Chlorobenzene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Chloroform	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Ethylbenzene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Styrene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Toluene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Xylenes (total)	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Semivolatiles	UNITS												
1-Methylnaphthalene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
2,4-Dimethylphenol	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
2,4-Dinitrophenol	ug/L	50	U	50	U	50	U	50	U	50	U	50	U
4-Nitrophenol	ug/L	50	U	50	U	50	U	50	U	50	U	50	U
7,12-Dimethylbenz(a)anthracene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Anthracene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(a)anthracene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(a)pyrene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(b)fluoranthene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Bis(2-ethylhexyl)phthalate	ug/L	***26.5***		10	U	***4***	***J***	10	U	10	U	10	U
Butylbenzylphthalate	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Chrysene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Di-n-butylphthalate	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Di-n-octylphthalate	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Dibenz(a,h)acridine	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Dibenzo(a,h)anthracene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Dichlorobenzenes	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Diethyl phthalate	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Dimethyl phthalate	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Fluoranthene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Indene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Methylchrysene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Methylphenols	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Naphthalene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Phenanthrene	ug/L	10	U	10	U	10	U	10	U	10	U	10	U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-5
SWMU 12 Interim Measures Groundwater Results
Armco Kansas City Facility

Sample Point:		12MW1/GW1	12MW2/GW1	12MW3/GW1	12MW4/GW1	12MW4/GW1D	OWA05/GW1
Date Sampled:		12/11/1996	12/11/1996	12/11/1996	12/11/1996	12/11/1996	12/11/1996
Sample Depth From:		0	0	0	0	0	0
Sample Depth To:		0	0	0	0	0	0
Laboratory Number:		D96-14212-2	D96-14212-3	D96-14212-4	D96-14212-7	D96-14212-8	D96-14212-9
Sample Type:						Duplicate	
Semivolatiles	UNITS						
- CONTINUED -							
Phenol	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Pyridine	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Quinoline	ug/L	10 U	10 U	10 U	10 U	10 U	10 U
Thiophenol (Benzenthiol)	ug/L	20 U	20 U	20 U	20 U	20 U	20 U
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	ug/L	***26.5***	ND	***4***	ND	ND	ND
Metals, Dissolved	UNITS						
Chromium, Dissolved	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
Chromium, Hexavalent	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Trivalent	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Lead, Dissolved	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-5
SWMU 12 Interim Measures Groundwater Results
Armco Kansas City Facility

	Sample Point:	OWA06/GW1	
	Date Sampled:	12/11/1996	
	Sample Depth From:	0	
	Sample Depth To:	0	
	Laboratory Number:	D96-14212-10	
	Sample Type:		
Volatiles	UNITS		
1,2-Dibromoethane	ug/L	10	U
1,2-Dichloroethane	ug/L	10	U
1,4-Dioxane	ug/L	100	U
2-Butanone	ug/L	10	U
Benzene	ug/L	10	U
Carbon disulfide	ug/L	10	U
Chlorobenzene	ug/L	10	U
Chloroform	ug/L	10	U
Ethylbenzene	ug/L	10	U
Styrene	ug/L	10	U
Toluene	ug/L	10	U
Xylenes (total)	ug/L	10	U
Semivolatiles	UNITS		
1-Methylnaphthalene	ug/L	10	U
2,4-Dimethylphenol	ug/L	10	U
2,4-Dinitrophenol	ug/L	50	U
4-Nitrophenol	ug/L	50	U
7,12-Dimethylbenz(a)anthracene	ug/L	10	U
Anthracene	ug/L	10	U
Benzo(a)anthracene	ug/L	10	U
Benzo(a)pyrene	ug/L	10	U
Benzo(b)fluoranthene	ug/L	10	U
Benzo(k)fluoranthene	ug/L	10	U
Bis(2-ethylhexyl)phthalate	ug/L	10	U
Butylbenzylphthalate	ug/L	10	U
Chrysene	ug/L	10	U
Di-n-butylphthalate	ug/L	10	U
Di-n-octylphthalate	ug/L	10	U
Dibenz(a,h)acridine	ug/L	10	U
Dibenzo(a,h)anthracene	ug/L	10	U
Dichlorobenzenes	ug/L	10	U
Diethyl phthalate	ug/L	10	U
Dimethyl phthalate	ug/L	10	U
Fluoranthene	ug/L	10	U
Indene	ug/L	10	U
Methylchrysene	ug/L	10	U
Methylphenols	ug/L	10	U
Naphthalene	ug/L	10	U
Phenanthrene	ug/L	10	U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-5
SWMU 12 Interim Measures Groundwater Results
Armco Kansas City Facility

	Sample Point:	OWA06/GW1	
	Date Sampled:	12/11/1996	
	Sample Depth From:	0	
	Sample Depth To:	0	
	Laboratory Number:	D96-14212-10	
	Sample Type:		
Semivolatiles	UNITS		
- CONTINUED -			
Phenol	ug/L	10	U
Pyrene	ug/L	10	U
Pyridine	ug/L	10	U
Quinoline	ug/L	10	U
Thiophenol (Benzenthiol)	ug/L	20	U
Total Detected SVOCs	UNITS		
Total Semi-Volatiles	ug/L	ND	
Metals, Dissolved	UNITS		
Chromium, Dissolved	mg/L	NA	
Chromium, Hexavalent	mg/L	0.01	U
Chromium, Trivalent	mg/L	0.01	U
Lead, Dissolved	mg/L	0.003	U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 14-6
SWMU 12 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result
Skinner's Semivolatiles	**(µg/kg)**			**(µg/kg)**
Benzo(a)anthracene	2000	12G01 / SR1	0.5 - 1	6740
		12G01 / SR1D	0.5 - 1	3700 J
Benzo(a)pyrene	8000	12G01 / SR1D	0.5 - 1	14200
		12G03 / SR1	0.5 - 1	11700
Benzo(b)fluoranthene	5000	12G01 / SR1	0.5 - 1	15700
		12G01 / SR1D	0.5 - 1	8590
		12G02 / SR1	0.5 - 1	5560
		12G03 / SR1	0.5 - 1	9270
Dibenzo(a,h)anthracene	2000	12G01 / SR1	0.5 - 1	17300
		12G01 / SR1D	0.5 - 1	13000
		12G02 / SR1	0.5 - 1	7810
		12G03 / SR1	0.5 - 1	11800
Metals	**(mg/kg)**			**(mg/kg)**
Lead, Total	400	12G01 / SR1	0.5 - 1	5480 DJ*
		12G01 / SR1D	0.5 - 1	5340 DJ*
		12G02 / SR1	0.5 - 1	5610 DJ*
		12G03 / SR1	0.5 - 1	6080 DJ*
		12B01 / DP1	0 - 4	774
		12B01 / DP1D	0 - 4	779
		12B02 / DP1	0 - 4	1840
		12B03 / DP1	0 - 4	682

Notes:

D = Sample was diluted prior to analysis.

DAF = Dilution Attenuation Factor

ft = feet

J = Estimated value; concentration below practical quantitation limit.

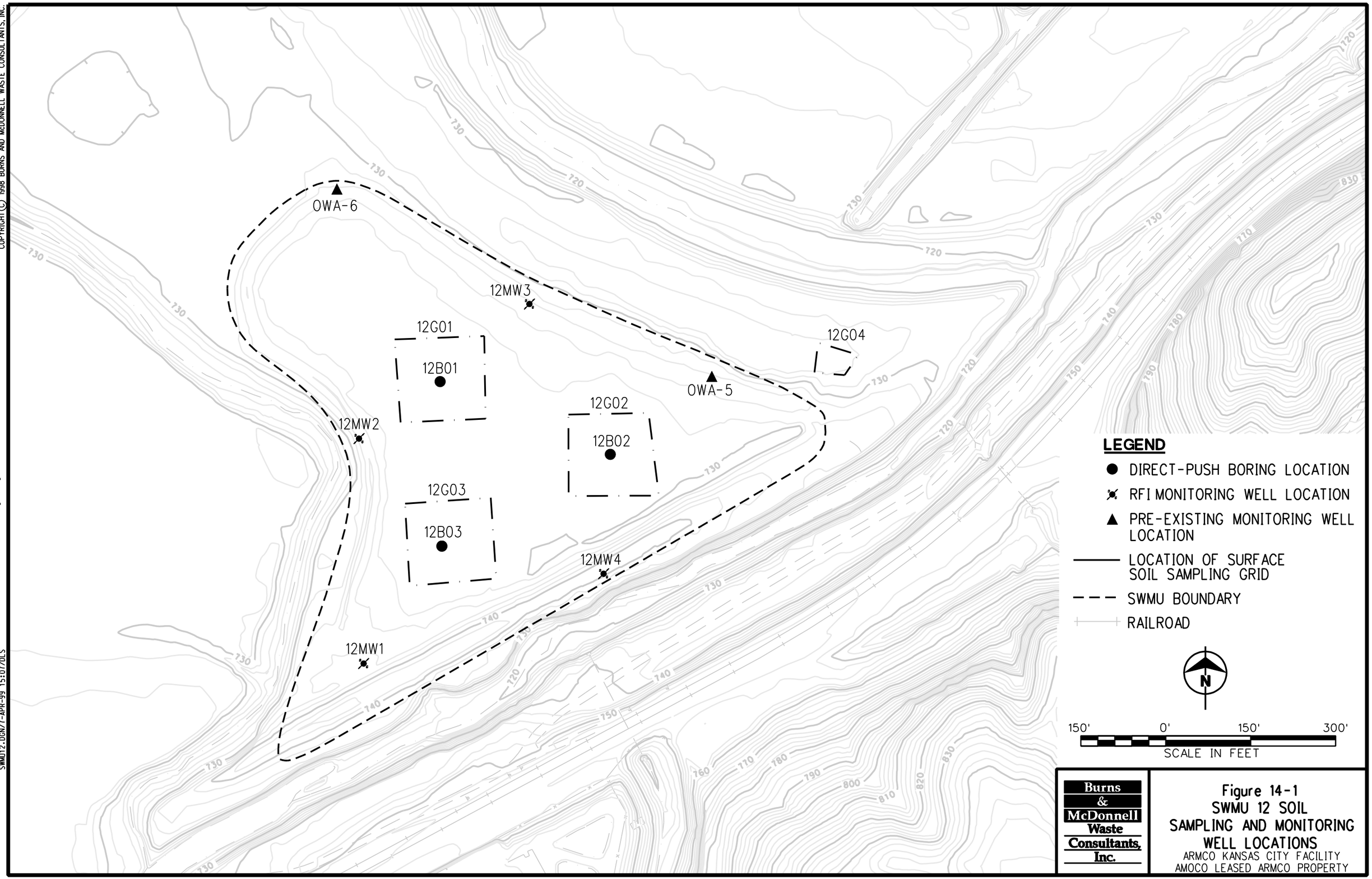
J* = Qualified as estimated by BMWCI during the QC evaluation; matrix spike and/or matrix spike duplicate percent recoveries were below QC limits.

SSL = Soil Screening Level

Table 14-7
SWMU 12 Groundwater Results Exeeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Skinner's Semivolatiles	**(µg/L)**			**(µg/L)**
bis(2-ethylhexyl)phthalate	6	12MW1 / GW1	NA	26.5

Notes:
ft = feet
MCL = Maximum Contaminant Level



Burns & McDonnell Waste Consultants, Inc.

Figure 14-1
SWMU 12 SOIL SAMPLING AND MONITORING WELL LOCATIONS
ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

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k:*res*global*stdbdr*ustn*civil*d*wcibdr10.dgn
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SWMU12.DGN/7-APR-99 15:07/DLS

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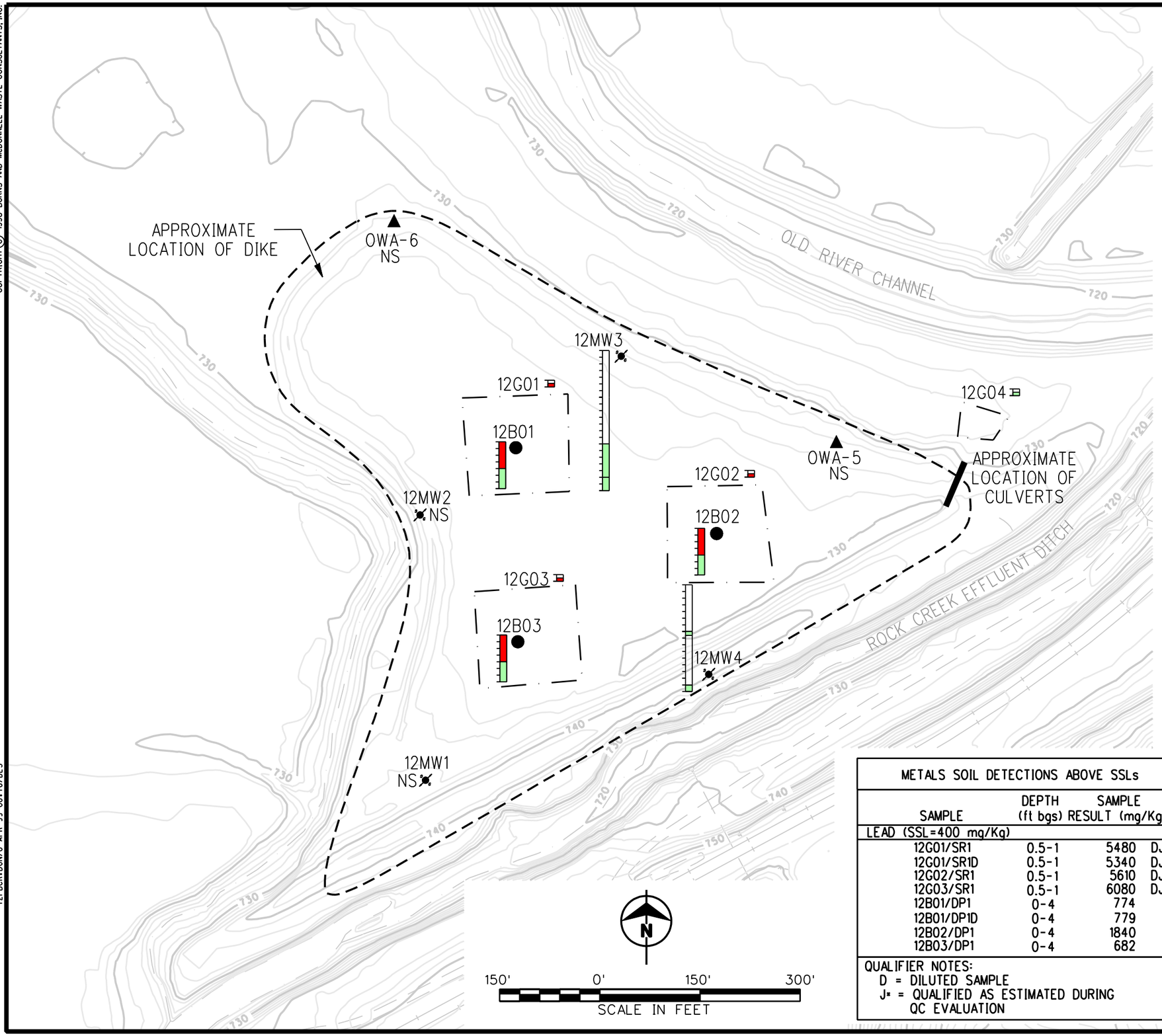

LEGEND

- DIRECT-PUSH BORING LOCATION
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- LOCATION OF SURFACE SOIL SAMPLING GRID
- SWMU BOUNDARY
- RAILROAD
- NS NOT SAMPLED
- LEAD RESULT (mg/Kg) ABOVE SSL (400 mg/Kg) (SEE INSET TABLE)
- LEAD RESULT (mg/Kg) BELOW SSL (400 mg/Kg)
- NO SAMPLE COLLECTED AT THIS DEPTH INTERVAL
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.

METALS SOIL DETECTIONS ABOVE SSLs

SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (mg/Kg)	
LEAD (SSL=400 mg/Kg)			
12G01/SR1	0.5-1	5480	DJ*
12G01/SR1D	0.5-1	5340	DJ*
12G02/SR1	0.5-1	5610	DJ*
12G03/SR1	0.5-1	6080	DJ*
12B01/DP1	0-4	774	
12B01/DP1D	0-4	779	
12B02/DP1	0-4	1840	
12B03/DP1	0-4	682	

QUALIFIER NOTES:
D = DILUTED SAMPLE
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION

NOTES:

1. COMPOSITE GRID SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. DIRECT-PUSH SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
3. SOIL FROM MONITORING WELL INSTALLATION COLLECTED DURING RFI INTERIM MEASURES (1996).
4. SEE SWMU 12 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

Burns & McDonnell Waste Consultants, Inc.

Figure 14-2
SWMU 12 LEAD SOIL RESULTS
ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

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k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\res\global\stdbdr\ustn\civil\22d\wc1bdr10.dgn
k:\armcorfi\ustn.sup\armcona.dgn
k:\armcorfi\ustn\intrmeas\swmfg19a.dgn
12VOCS0.DGN/27-APR-99 11:11/DLS

APPROXIMATE LOCATION OF DIKE

OWA-6 NS

OWA-5 NS

12MW1 NS

12MW2 NS

12MW3

12MW4

NS 12G01

NS 12G02

NS 12G03

NS 12G04

12B01 ND ND ND

12B02 ND ND ND

12B03 ND ND

APPROXIMATE LOCATION OF CULVERTS

OLD RIVER CHANNEL

ROCK CREEK EFFLUENT DITCH

730 720 740 750 760

LEGEND

- DIRECT-PUSH BORING LOCATION
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- LOCATION OF SURFACE SOIL SAMPLING GRID
- SWMU BOUNDARY
- RAILROAD
- TOTAL VOC RESULT BELOW SSL
- NO SAMPLE COLLECTED AT THIS DEPTH INTERVAL
- ND NOT DETECTED
- NS NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.

NOTES:

1. COMPOSITE GRID SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. DIRECT-PUSH SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
3. SOIL FROM MONITORING WELL INSTALLATION COLLECTED DURING RFI INTERIM MEASURES (1996).
4. SEE SWMU 12 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

150' 0' 150' 300'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 14-3

SWMU 12 TOTAL VOC SOIL RESULTS

ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

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k:\armcorfi\austn.sup\swmu0001.dgn
k:\res\global\stddbd\austn\civil\2d\wcibdr10.dgn
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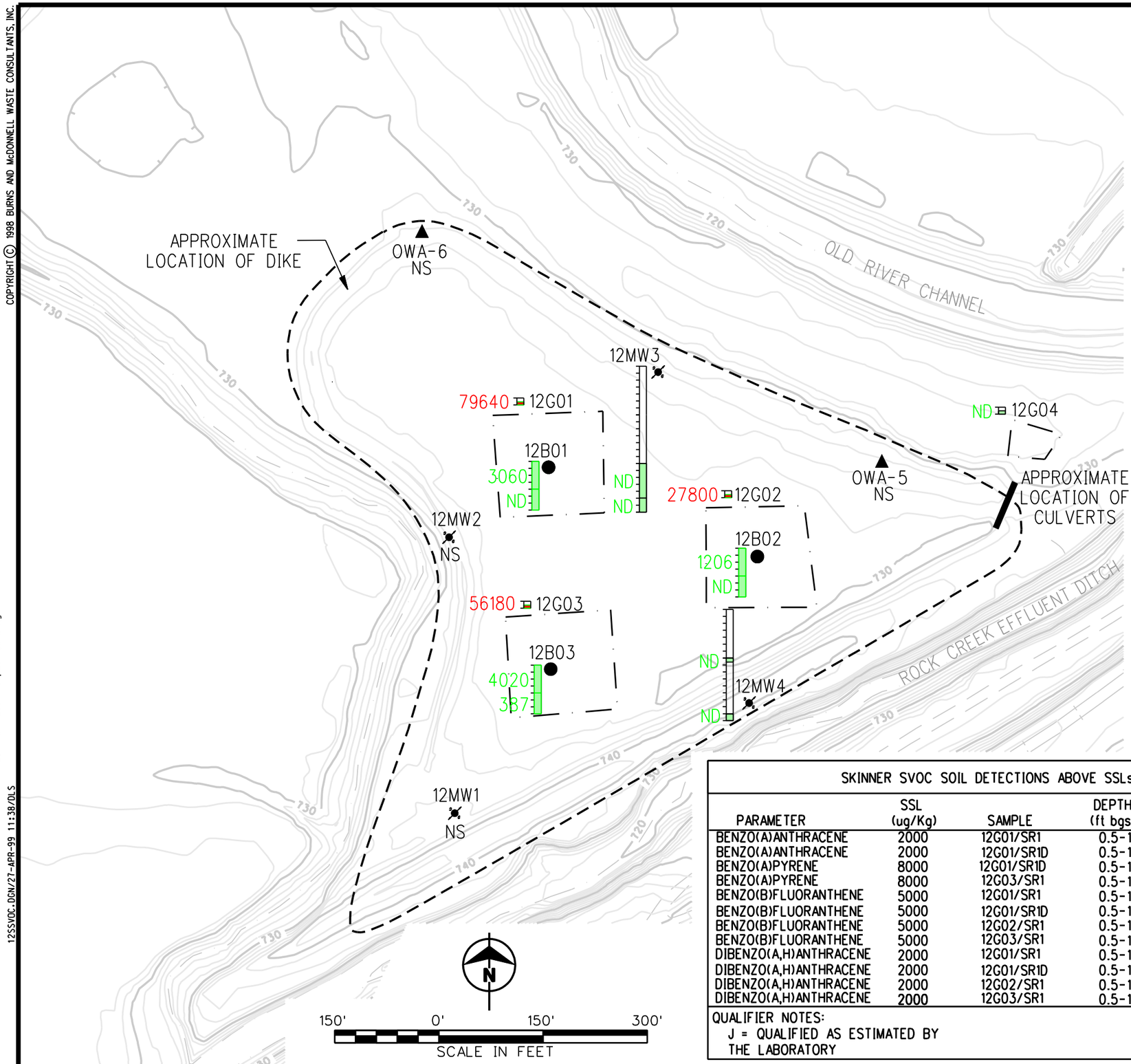
12SSVOC.DGN/27-APR-99 11:38/DLS



LEGEND

- DIRECT-PUSH BORING LOCATION
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- LOCATION OF SURFACE SOIL SAMPLING GRID
- SWMU BOUNDARY
- RAILROAD
- 10 OR — TOTAL SVOC RESULTS (ug/Kg) - ONE OR MORE SVOC DETECTIONS ABOVE SSLs (SEE INSET TABLE)
- 10 OR — TOTAL SVOC RESULTS (ug/Kg) - ALL DETECTIONS BELOW SSLs
- NO SAMPLE COLLECTED AT THIS DEPTH INTERVAL
- ND NOT DETECTED
- NS NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.

NOTES:

1. COMPOSITE GRID SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. DIRECT-PUSH SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
3. SOIL FROM MONITORING WELL INSTALLATION COLLECTED DURING RFI INTERIM MEASURES (1996).
4. SEE SWMU 12 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

SKINNER SVOC SOIL DETECTIONS ABOVE SSLs

PARAMETER	SSL (ug/Kg)	SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (ug/Kg)	
BENZO(A)ANTHRACENE	2000	12G01/SR1	0.5-1	6740	
BENZO(A)ANTHRACENE	2000	12G01/SR1D	0.5-1	3700	J
BENZO(A)PYRENE	8000	12G01/SR1D	0.5-1	14200	
BENZO(A)PYRENE	8000	12G03/SR1	0.5-1	11700	
BENZO(B)FLUORANTHENE	5000	12G01/SR1	0.5-1	15700	
BENZO(B)FLUORANTHENE	5000	12G01/SR1D	0.5-1	8590	
BENZO(B)FLUORANTHENE	5000	12G02/SR1	0.5-1	5560	
BENZO(B)FLUORANTHENE	5000	12G03/SR1	0.5-1	9270	
DIBENZO(A,H)ANTHRACENE	2000	12G01/SR1	0.5-1	17300	
DIBENZO(A,H)ANTHRACENE	2000	12G01/SR1D	0.5-1	13000	
DIBENZO(A,H)ANTHRACENE	2000	12G02/SR1	0.5-1	7810	
DIBENZO(A,H)ANTHRACENE	2000	12G03/SR1	0.5-1	11800	

QUALIFIER NOTES:
J = QUALIFIED AS ESTIMATED BY THE LABORATORY

Burns & McDonnell Waste Consultants, Inc.

Figure 14-4
SWMU 12 TOTAL SVOC SOIL RESULTS
ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

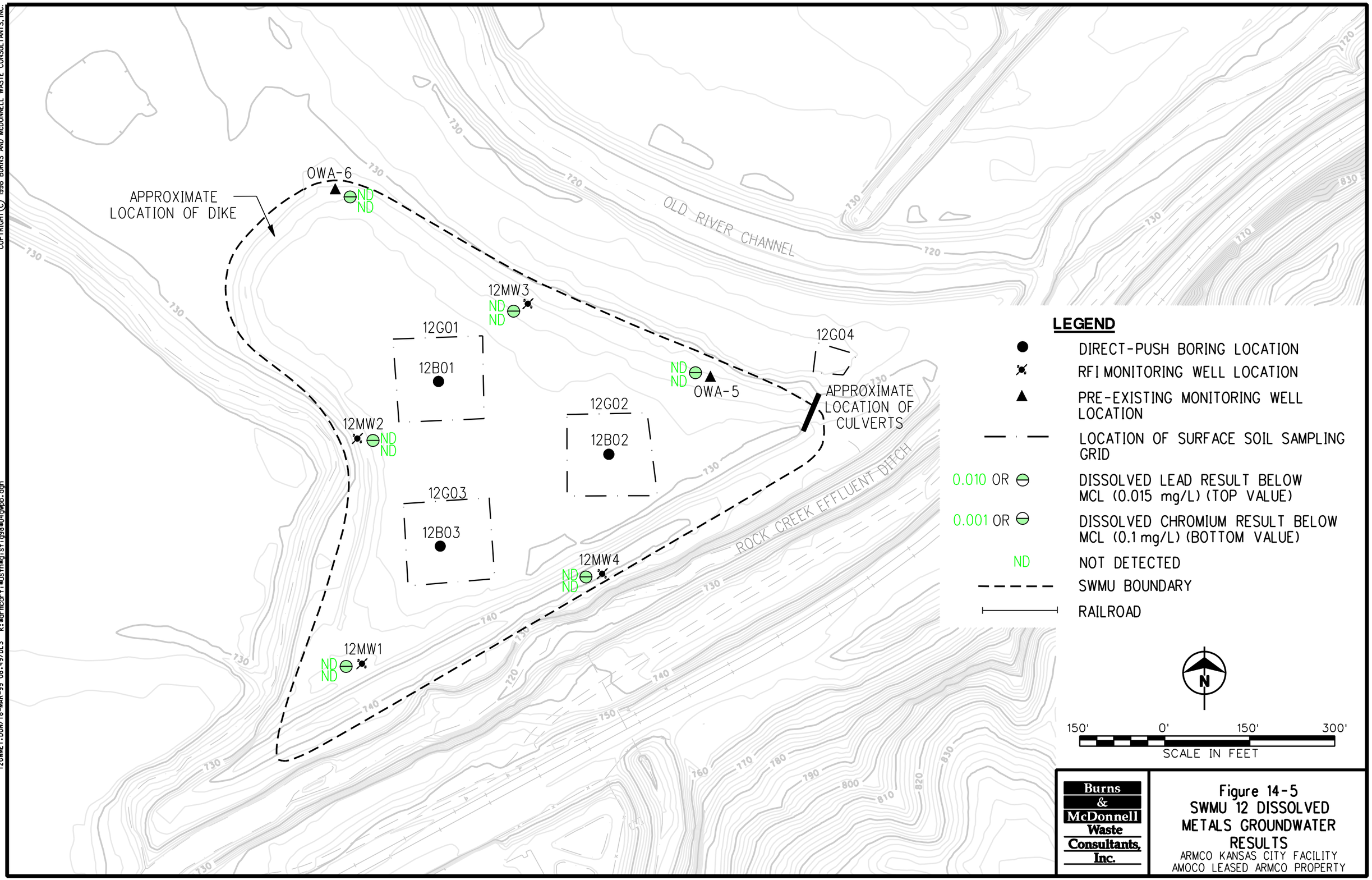


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Figure 14-5
SWMU 12 DISSOLVED METALS GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

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12GWMET.DGN/18-MAR-99 08:49/DLS

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OWA-6
ND
ND

APPROXIMATE LOCATION OF DIKE

OLD RIVER CHANNEL

12MW3
ND
4.0

12G01
12B01

12G04

ND
ND
OWA-5

APPROXIMATE LOCATION OF CULVERTS

12G02
12B02

12MW2
ND
ND

12G03
12B03

ROCK CREEK EFFLUENT DITCH

12MW4
ND
ND

12MW1
ND
26.5
(BIS(2-ETHYLHEXYL)PHTHALATE MCL = 6ug/L
12MW1/GW1 RESULT = 26.5 ug/L)

730 720 740 750 760 770 780 790 800 810 820 830 120

LEGEND

- DIRECT-PUSH BORING LOCATION
- RFI MONITORING WELL LOCATION
- PRE-EXISTING MONITORING WELL LOCATION
- LOCATION OF SURFACE SOIL SAMPLING GRID
- 0.010 OR — TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs (TOP VALUE)
- 0.001 OR — TOTAL SVOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs (BOTTOM VALUE)
- 10.0 OR — TOTAL SVOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (BOTTOM VALUE); COMPOUND, MCL, AND SAMPLE RESULT PROVIDED
- ND — NOT DETECTED
- SWMU BOUNDARY
- RAILROAD

N

150' 0' 150' 300'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 14-6
SWMU 12 TOTAL VOC AND TOTAL SVOC GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
AMOCO LEASED ARMCO PROPERTY

k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\res\glopai\stddgn\ustn\civil\2d\wcibdr10.dgn
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k:\armcorfi\ustn\inframeas\swmfg19a.dgn
12TVOCS.DGN/27-APR-99 13:04/DLS

15.0 SWMU 13 – PICKLE LIQUOR TANKS

15.1 SWMU BACKGROUND

15.1.1 Description of SWMU

The pickle liquor tanks (SWMU 13), located on Armco property (see Figure 1-2), were operated from May of 1971 to 1989 and were removed in 1992. As part of the steel rod cleaning operation, sulfuric acid was used to clean iron oxide from steel rods prior to the production of nails, fence, and wire. The term used to describe this process is pickling, and the waste sulfuric acid generated by these pickling activities is referred to as spent pickle liquor.

In 1980, spent pickle liquor became a RCRA-listed hazardous waste with the waste code K062. Prior to 1981, the spent pickle liquor accumulated at this SWMU was sent off site for treatment and disposal. In 1981, Armco installed a recycling system for the spent pickle liquor that remained in use until 1989 when the steel rod cleaning operation ceased and the Cleaning House closed.

Spent pickle liquor was stored in three tanks at different times during the operational life of SWMU 13. These tanks were of varying capacities and dimensions and were located on the east side of the Cleaning House, also known as the Rod Cleaning Building. The spent pickle liquor was transferred from brick-lined acid tubs in the production line by means of overhead piping. Regeneration was accomplished by cooling the spent pickle liquor in a 3,000-gallon, rubber-lined, steel, above ground cooling tank located adjacent to the AST. The cooling caused ferrous sulfate heptahydrate to precipitate from the spent pickle liquor. From the cooling system, regenerated acid was returned to the tubs in the production line. The ferrous sulfate heptahydrate precipitant was sold to chemical supply companies for a number of uses. The most significant use was as a wastewater treatment chemical. The amount of spent pickle liquor generated during cleaning activities varied with the amount of rod cleaned.

The defined SWMU 13 area is approximately less than 0.1 acres in size. In August 1998, modifications were made in the vicinity of SWMU 13 as Armco extended Wilson Avenue in an east-west direction. As part of this modification, various concrete basement walls near SWMU 13 were lowered to below ground surface. The concrete from the walls and other imported aggregate materials were used to fill any voids in the subsurface.

Based on the types of materials handled at SWMU 13, the primary constituents of potential concern were sulfuric acid and metals. A decrease in soil or groundwater pH, or the presence of elevated concentrations of metals in groundwater suggest the presence of acids.

15.1.2 Release Potential

The only documented release of spent pickle liquor during the operational life of the SWMU involved the loss of approximately 3,000 gallons of spent pickle liquor in September 1987. The actual amount released at this SWMU was larger in volume; however all but 3,000 gallons were contained by SWMU 17 to the north of SWMU 13. After that event, procedures and secondary containment measures (additional curbing) were implemented to reduce the potential for a release to the environment, particularly the nearby surface water outfall.

The primary release potential for this SWMU was to the surrounding surface soils, subsurface soils, and groundwater. Due to the closure and removal of the SWMU, there is no ongoing potential for a release to the environment.

15.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was evaluated through the collection of subsurface soil and groundwater samples. Table 15-1 presents a summary of the investigation activities for SWMU 13, and Figure 15-1 presents the sampling locations. Based on information obtained during RFI Phase 1 concerning the actual Pickle Liquor Tank locations, the SWMU boundary and sampling locations were moved approximately 60 feet west of the boundary and locations defined in the RFI Workplan. The SWMU boundary shown on Figures 15-1 through 15-5 reflects this adjustment.

Subsurface soil samples were collected from 13 direct-push borings (Borings 13B01 through 13B11, 13B03A, and 13B07A) during RFI Phase 1. Eight of the borings (13B03A, 13B07A, and 13B06 through 13B11) were added due to signs of contamination encountered in Boring 13B02 (organic odors and PID readings up to 138 ppm) near the water table. Three to four samples were collected from each boring from the following depth intervals: 0 to 4 feet, 4 to 8 feet, 8 to 12 feet, and 12 to 16 feet bgs. For the subsurface soil samples, the original scope for SWMU 13 was for pH analysis. VOC and TPH analyses were added to samples collected from borings installed after the identification of contamination in Boring 13B02. Borings 13B03A and 13B07A were completed near their original boring locations (13B03 and 13B07, respectively) in order to collect additional subsurface soil samples for VOC, TPH (Boring 13B03A), and SVOC (Boring 13B07A) analyses.

Groundwater samples were collected from 15 direct-push borings (Borings 13B01 through 13B09, 13B11 through 13B15, and 13B07A) at SWMU 13 during RFI Phase 1. Ten of these samples were added due to signs of contamination encountered in Boring 13B02 near the water table. A water sample could not be collected from Boring 13B10 because refusal was encountered prior to reaching the water table. Groundwater samples were analyzed for dissolved RCRA metals and pH. VOC and TPH analyses were added to groundwater samples from Borings 13B01 through 13B09 and Boring 13B11 following the completion of Boring 13B02, which showed signs of organic contamination. VOC analysis was discontinued prior to the completion of Borings 13B07A and 13B12 through 13B14 due to the lack of VOC detections in the other samples; however, SVOC analysis was added to these samples. VOC and TPH analyses were added to Boring 13B15 due to a PID reading of 63 ppm. Metals analysis was not performed on the groundwater sample from Boring 13B12.

Several groundwater monitoring wells associated with SWMU 33 (see Chapter 22.0) are located in the direct vicinity of SWMU 13. Therefore, these monitoring wells (33MW5S/5I/5D, 33MW11S/11D, 33MW12S/12D, and 33MW13S/13D) were specifically sampled during RFI Phase 2 for dissolved RCRA metals and pH analyses to obtain additional information regarding SWMU 13.

This area is underlain by approximately 10 feet of gravel to boulder size slag and refractory brick fragments in a silty to sandy clay matrix. There are extensive areas of intact concrete floor remaining from demolished former mill buildings in this area. The fill layer generally thins closer to the Blue River and is thicker in buried creek channels and in buried basements below the former mill building footprints. Below the fill material is silty clay typical of Blue River alluvium. The silty clay alluvium with local, discontinuous interbeds of fine sandy clay is approximately 50 feet thick. Below the silty clay is approximately 5 feet of clayey to sandy gravel directly overlying the Pennsylvanian shale bedrock. There are two saturated zones within the unconsolidated materials. There is a shallow, unconfined saturated zone with a static groundwater surface approximately 5 to 15 feet bgs and a deeper, semi-confined saturated zone with a groundwater surface approximately 20 to 30 feet bgs.

15.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Table 15-2 presents the analytical results for the SWMU 13 soil samples. The following subsections present the results of the pH, VOC, and SVOC soil analyses. TPH results are presented in Appendix U.

15.3.1 pH

Figure 15-2 presents the soil pH results for 40 soil samples collected at SWMU 13. The pH results for the upper soil interval (0 to 4 feet bgs) were slightly basic to basic and ranged from pH 8.4 to 12.3. Soil pH values were neutral to acidic in the lower soil interval (12 to 16 feet bgs) and ranged from pH 7.1 to 3 at the more centrally located soil borings (Borings 13B01, 13B02, 13B03A, 13B07, and 13B09). For these borings, pH decreased with increasing sample depth. At sampling locations toward the perimeter of the area (Borings 13B04, 13B06, 13B08, and 13B11) soil pH values were slightly basic to basic throughout the entire depth interval sampled (0 to 16 feet bgs), ranging from pH 8 to pH 11.1.

15.3.2 VOCs

Figure 15-2 presents the soil VOC analytical results for the 34 soil samples collected at SWMU 13. With the exception of Boring 13B06, VOCs were detected in one or more samples collected from each boring location. VOC detections were limited to 4-methyl-2-pentanone (19.9 J µg/Kg) plus the common lab contaminants acetone (41.3 J to 167 µg/Kg), 2-butanone (16.5 to 27.9 µg/Kg), and methylene chloride (9.1 T to 12.8 µg/Kg). Acetone was the predominant constituent and was detected in 11 samples. The remaining three VOC compounds were detected in three or fewer samples each. Neither the acetone nor methylene chloride detections exceeded their 20 DAF SSLs (16,000 and 20 µg/Kg, respectively). There are no 20 DAF SSLs for 4-methyl-2-pentanone or 2-butanone. Since no 20 DAF SSLs were exceeded, the nature and extent of VOCs in soils was adequately characterized at SWMU 13.

15.3.3 SVOCs

Figure 15-3 presents the SVOC analytical results for two samples collected from Boring 13B07A at SWMU 13. The SVOCs anthracene and fluoranthene were detected at estimated concentrations below the laboratory practical quantitation limit (0.235 J and 0.223 J mg/Kg, respectively) in the sample collected from 3 to 4 feet bgs. SVOCs were not detected in the sample from the lower soil interval (4.8 to 5.8 feet bgs). Neither the anthracene nor fluoranthene detections exceeded their 20 DAF SSLs (12,000 and 4,300 mg/Kg, respectively); therefore, the nature and extent of SVOC contamination in soil was adequately characterized at SWMU 13.

15.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

Table 15-3 presents the analytical results of the groundwater sampling at SWMU 13. Table 15-4 presents the dissolved RCRA metals and pH analytical results for groundwater samples collected from wells at SWMU 33 that are in the vicinity of SWMU 13. VOC analytical data for these wells is presented and discussed with SWMU 33 (Chapter 22.0). The following subsections present the results of the dissolved RCRA metals, pH, VOC, and SVOC analyses. TPH results are presented in Appendix U.

15.4.1 Dissolved Metals and pH

Tables 15-3 and 15-4 and Figure 15-4 present the pH and dissolved RCRA metals groundwater results for SWMU 13. Table 15-5 presents the groundwater results that exceeded screening limits at SWMU 13. A total of 13 direct-push groundwater and nine monitoring well groundwater samples were collected and analyzed for pH and dissolved RCRA metals.

Groundwater pH results ranged from pH 3.9 to 8.2. Neutral pH values (pH 6 to 8) were noted for 17 of the 23 samples. Acidic pH values (below pH 6) were typically encountered toward the center of the sampling area (Well 33MW13S and Borings 13B01, 13B02, 13B04, 13B05, 13B09, and 13B15). Neutral pH values were encountered at locations around the perimeter of the sampling area (Wells 33MW11S/11D, 33MW5S/5I/5D, and 33MW12S/12D and Borings 13B06, 13B13, and 13B14). Therefore, the extent of acidic pH values in groundwater was adequately characterized at SWMU 13.

With the exception of dissolved mercury, all of the RCRA metals were detected in at least one groundwater sample. However, none of the dissolved barium, chromium, or silver detections exceeded their groundwater screening MCLs; the highest concentrations for each of these dissolved metals was 1.31, 0.0778, and 0.0266 mg/L, respectively.

Dissolved arsenic was detected in nine of the groundwater samples at concentrations up to 0.138 mg/L, and five samples had dissolved arsenic concentrations which exceeded the groundwater screening MCL (0.05 mg/L). Dissolved cadmium and lead were each detected in 10 of the groundwater samples at concentrations up to 0.0543 and 0.198 mg/L, respectively. Six samples had dissolved cadmium and lead concentrations which exceeded their groundwater screening MCLs (0.005 and 0.015 mg/L, respectively). Dissolved selenium was detected in eight groundwater samples at concentrations up to 0.187 mg/L, and six samples had dissolved selenium concentrations which exceeded the groundwater screening MCL (0.05 mg/L). As shown on Figure 15-4, these exceedences were typically limited to the central portion of the sampling area where acidic pH values were encountered. No exceedences of groundwater screening MCLs were noted in the sampling locations to the north (Wells 33MW11S/11D and Boring 13B13), west (Wells 33MW5S/5I/5D and Boring 13B11) and south (Wells

33MW12S/12D). Arsenic slightly exceeded the MCL in the sample collected from easternmost Boring 13B14. Due to direct-push refusal and physical restrictions caused by the Blue River, further sampling could not be implemented to the east.

15.4.2 VOCs

Figure 15-5 presents the VOC analytical results for groundwater at SWMU 13. Eleven direct-push groundwater samples were collected and analyzed for VOCs during RFI Phase 1.

VOCs were largely undetected in the groundwater samples. Chloroform was detected in the samples collected from Borings 13B04 (11.2 µg/L) and 13B08 (8.08 µg/L). Neither detection exceeded the groundwater screening MCL for chloroform (100 µg/L). No other VOC detections occurred in the groundwater. Therefore, the nature and extent of VOCs in groundwater was adequately defined by the sampling locations.

15.4.3 SVOCs

Figure 15-5 presents the SVOC analytical results, and Table 15-5 presents the groundwater results that exceeded screening limits for SWMU 13. Five direct-push groundwater samples were collected and analyzed for SVOCs during RFI Phase 1.

The groundwater sample collected from Boring 13B12 was the only sample with SVOC detections. PAHs (benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene) were detected at estimated concentrations below the laboratory reporting limit (J qualified) and ranged from 9.8 J µg/L for benzo(k)fluoranthene to 18.4 J µg/L for pyrene. Benzo(a)pyrene was detected at 11.2 J µg/L, and is the only SVOC compound to exceed a groundwater screening MCL (0.2 µg/L). MCLs have not been established for the other detected SVOC compounds. The horizontal extent of SVOCs in groundwater was well defined by samples collected to the north (Boring 13B13), east (Boring 13B14), and south (Boring 13B15) of Boring 13B12. To the west, the horizontal extent of SVOCs in groundwater was defined by Well 33MW5S whose RFI Phase 1 groundwater sample was non-detect for SVOCs (see Chapter 22.0).

15.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 13, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater, groundwater transport, and storm sewers), surface pathways (storm water runoff and surface water transport), and the air pathway (airborne dust).

The nature and extent of contamination at SWMU 13 w assessed through the collection of subsurface soil and groundwater samples. Subsurface soil samples were analyzed for pH and neutral to acidic conditions (pH values 7.1 to 3) were noted in subsurface soil (12 to 16 feet bgs) at the location of the former pickle liquor tanks. Shallower and surrounding subsurface soils were typically slightly basic to basic (pH values 8 to 12.3). VOCs and SVOCs were detected in subsurface soil but did not exceed 20 DAF SSLs (based on soil migration to groundwater). Because of this, soil transfer to groundwater of VOCs and SVOCs is not expected to be significant for SWMU 13.

Dissolved metals, VOCs, and SVOCs were detected in groundwater. Dissolved metals exceeded MCLs in samples near the central portion of the sampling area, and groundwater pH values in these locations were typically acidic (pH 6.3 or less). As is typically expected when a decrease in pH occurs, higher concentrations of metals are dissolved into the groundwater and pH appears to have affected the mobility of naturally occurring metals in the subsurface. Perimeter samples at SWMU 13 showed neutral to basic pH values and metals typically were detected at lower concentrations (below MCLs). Limited detections of VOCs and SVOCs occurred, typically at low concentrations (below MCLs), and only one SVOC detection exceeded an MCL. Based on the limited detections of VOCs and SVOCs in groundwater and the tendency of metals to strongly adsorb to soil at neutral to basic pH values (that occur around the perimeter of SWMU 13), groundwater transport is not expected to be a significant migration pathway at SWMU 13. (Note that VOCs in groundwater will be discussed in more detail in Chapter 22.0 as part of SWMU 33.)

Surface cover material at SWMU 13 is primarily slag fill. Storm water runs toward a storm drain to the southeast of the SWMU and storm sewers discharge to the Blue River. Surface soil particulate (dust) could become airborne. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Thus, storm water runoff, storm sewer transport, surface water transport, and airborne dust transport are potential routes for constituent migration at SWMU 13. Based on the limited detections of constituents at SWMU 13, these pathways are not expected to be significant.

15.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at SWMU 13.

15.6.1 Human Health Evaluation

Although SVOCs and metals were identified as COPCs in groundwater at SWMU 13, there were no completed exposure pathways. Therefore, further human health risk evaluation was not performed.

15.6.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 13. Therefore, an ecological risk evaluation was not conducted for SWMU 13.

15.7 SUMMARY

SWMU 13, located in the western portion of the Facility, were former pickle liquor tanks used for steel rod cleaning. The defined SWMU 13 area is approximately less than 0.1 acres in size. Subsurface soil and groundwater samples were collected at SWMU 13 for pH, VOC, and/or SVOC analyses.

As shown on Figures 15-2 and 15-3 the horizontal and vertical extent of soil contamination at SWMU 13 was adequately defined. Forty subsurface soil samples were analyzed for pH. Soil pH values were acidic to neutral (pH 3 to 7.1) in the soil samples near the former tank locations (at 12 to 16 feet bgs). Soil pH exhibited neutral to basic conditions (pH 8 to 12.3) in shallow soil samples collected above the former tank locations and in soil samples around the perimeter of the SWMU area. Soil VOC detections were limited to acetone (in 11 of the 34 samples) and 4-methyl-2-pentanone, 2-butanone, and methylene chloride (each in 3 or fewer of the 34 samples). Soil SVOC analysis was performed on two samples, and detections were limited to the PAH compounds anthracene and fluoranthene. None of the detected VOC or SVOC compounds exceeded their respective 20 DAF SSLs.

Thirteen direct-push and nine monitoring well groundwater samples were collected at SWMU 13 and analyzed for dissolved RCRA metals and pH. Figure 15-4 presents the extent of dissolved RCRA metals and pH in groundwater at SWMU 13. Acidic pH values (pH 3.9 to 5.9) were typically encountered in the groundwater toward the center of the sampling area, and increased to more neutral pH values (pH 6.1 to 8.2) for sampling locations toward the perimeter of the SWMU 13 area. Each of the RCRA metals except dissolved mercury was detected in at least one groundwater sample. Dissolved arsenic exceeded its groundwater screening MCL (0.05 mg/L) in five samples, ranging up to 0.138 mg/L. Dissolved cadmium, lead, and selenium exceeded their groundwater screening MCLs (0.005, 0.015, and 0.05 mg/L, respectively), in six samples each, ranging up to 0.0543, 0.177, and 0.187 mg/L, respectively. The horizontal extent of dissolved metals was adequately defined by surrounding groundwater sample locations. The eastern extent of dissolved arsenic was less clearly defined; however, further sampling could not be implemented to the east due to direct-push refusal and physical restrictions caused by the Blue River.

Figure 15-5 presents the extent of VOC and SVOC detections in groundwater at SWMU 13. Groundwater VOC detections were limited to chloroform (in 2 of 11 samples), and neither detection exceeded the groundwater screening MCL (100 µg/L). Groundwater SVOC detections were limited to PAH compounds (benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene) in one of the five samples. All of these

compounds were detected below the laboratory reporting limit (J qualified), and the benzo(a)pyrene result (11.2 µg/L) exceeded the 0.2 µg/L groundwater screening MCL. The horizontal extent of VOCs and SVOCs was adequately defined by surrounding groundwater sample locations in which these constituents were not detected.

Potential migration pathways at SWMU 13 include soil transfer to groundwater, groundwater transport, storm sewer transport, storm water runoff, surface water transport, and airborne dust migration. Subsurface soil samples showed only low concentrations of VOCs and SVOCs below 20 DAF SSLs (based on soil migration to groundwater). Groundwater samples showed detections of dissolved metals at higher concentrations in the area near the former tanks (where acidic pH conditions exist). Only limited detections of VOCs and SVOCs occurred in the groundwater. Based on the data, contaminant migration via soil transfer to groundwater and groundwater transport is not expected to be significant for SWMU 13. Based on the limited detections, contaminant migration via storm water runoff, storm sewer transport, surface water transport, and airborne dust transport is also not expected to be significant at SWMU 13.

A risk evaluation was conducted for SWMU 13. For the human health evaluation, no COPCs were identified for subsurface soil and dissolved metals and SVOCs were identified as COPCs in groundwater. There were no completed exposure pathways for the groundwater; therefore, further human health risk evaluation was not performed. Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted for SWMU 13.

* * * * *

Table 15-1
SWMU 13 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Chemical Analysis						
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC	SVOC	TPH	RCRA Metals	pH	Comments	Lab ID Number
DIRECT-PUSH SUBSURFACE SOIL SAMPLES											
13B01	DP1	0 - 4	3/26/1997	1	X		X		X		D97-3689-1
	DP2	4 - 8	3/26/1997	1	X		X		X		D97-3689-2
	DP2MS	4 - 8	3/26/1997	1	X					Matrix Spike	D97-3689-27
	DP2MSD	4 - 8	3/26/1997	1	X					Matrix Spike Duplicate	D97-3689-28
	DP3	8 - 12	3/26/1997	1	X		X		X		D97-3689-3
	DP4	12 - 16	3/26/1997	1	X		X		X		D97-3689-26
13B02	DP1	0 - 4	3/26/1997	1	X		X		X		D97-3689-4
	DP2	4 - 8	3/26/1997	1	X		X		X		D97-3689-5
	DP3	8 - 12	3/26/1997	1	X		X		X		D97-3689-6
	DP4	12 - 16	3/26/1997	1	X		X		X		D97-3689-12
13B03	DP1	0 - 4	3/26/1997	1					X		D97-3689-8
	DP2	4 - 8	3/26/1997	1					X		D97-3689-9
	DP3	8 - 12	3/26/1997	1					X		D97-3689-10
13B03A	DP1	0 - 4	3/27/1997	1	X		X				D97-3771-21
	DP2	4 - 8	3/27/1997	1	X		X				D97-3771-22
	DP3	8 - 12	3/27/1997	1	X		X				D97-3771-23
	DP4	12 - 16	3/27/1997	1	X		X		X		D97-3771-25
	DP4R		3/27/1997	1	X		X	X	X	Rinsate	D97-3771-26
13B04	DP1	0 - 4	3/26/1997	1					X		D97-3689-15
	DP1D	0 - 4	3/26/1997	1					X	Field Duplicate	D97-3689-16
	DP2	4 - 8	3/26/1997	1					X		D97-3689-17
	DP3	8 - 12	3/26/1997	1					X		D97-3689-18
13B05	DP1	0 - 4	3/26/1997	1					X		D97-3689-20
	DP2	4 - 8	3/26/1997	1					X		D97-3689-21
	DP3	8 -12	3/26/1997	1					X		D97-3689-22
13B06	DP1	0 - 4	3/27/1997	1	X		X		X		D97-3771-3
	DP1R		3/27/1997	1	X		X	X	X	Rinsate	D97-3771-4
	DP2	4 - 8	3/27/1997	1	X		X		X		D97-3771-5
	DP3	8 - 12	3/27/1997	1	X		X		X		D97-3771-6
	DP4	12 - 16	3/27/1997	1	X		X		X		D97-3771-7
13B07	DP1	0 - 4	3/27/1997	1	X		X		X		D97-3771-8
	DP2	4 - 8	3/27/1997	1	X		X		X		D97-3771-9
	DP3	8 - 12	3/27/1997	1	X		X		X		D97-3771-10
	DP4	12 - 16	3/27/1997	1	X		X		X		D97-3771-12
13B07A	DP1	3 - 4	4/22/1997	1		X					D97-4913-1
	DP2	4.8 - 5.8	4/22/1997	1		X					D97-4913-2
13B08	DP1	0 - 4	3/27/1997	1	X		X		X		D97-3771-13
	DP2	4 - 8	3/27/1997	1	X		X		X		D97-3771-14
	DP2D	4 - 8	3/27/1997	1	X		X		X	Field Duplicate	D97-3771-15
	DP3	8 - 12	3/27/1997	1	X		X		X		D97-3771-16
	DP4	12 - 16	3/27/1997	1	X		X		X		D97-3771-17
	DP4MS	12 - 16	3/27/1997	1	X					Matrix Spike	D97-3771-18
	DP4MSD	12 - 16	3/27/1997	1	X					Matrix Spike Duplicate	D97-3771-19
13B09	DP1	0 - 4	3/27/1997	1	X		X		X		D97-3771-29
	DP2	4 - 8	3/27/1997	1	X		X		X		D97-3771-30
	DP3	8 - 12	3/27/1997	1	X		X		X		D97-3771-31
	DP4	12 - 16	3/27/1997	1	X		X		X		D97-3771-32
13B10	DP1	0 - 4	3/28/1997	1	X		X		X		D97-3802-14
	DP2	4 - 8	3/28/1997	1	X		X		X		D97-3802-15
13B11	DP1	0 - 4	3/28/1997	1	X		X		X		D97-3802-16
	DP2	4 - 8	3/28/1997	1	X		X		X		D97-3802-17
	DP3	8 - 12	3/28/1997	1	X		X		X		D97-3802-18
	DP4	12 - 16	3/28/1997	1	X		X		X		D97-3802-19
DIRECT-PUSH GROUNDWATER SAMPLES											
13B01	DW1	24 - 26	3/27/1997	1	X		X	X	X		D97-3771-1
	DW1D	24 - 26	3/27/1997	1	X		X	X	X	Field Duplicate	D97-3771-2

Table 15-1
SWMU 13 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Chemical Analysis						Lab ID
Point	Designator	(ft)	Collected	Phase	VOC	SVOC	TPH	RCRA Metals	pH	Comments	Number
13B02	DW1	24 - 26	3/26/1997	1	X		X	X	X		D97-3689-7
13B03	DW1	43 - 45	3/26/1997	1				X	X		D97-3689-11
	DW1	43 - 45	3/27/1997	1	X		X				D97-3771-28
13B04	DW1	31 - 33	3/26/1997	1				X	X		D97-3689-19
	DW1	31 - 33	3/27/1997	1	X		X				D97-3771-20
13B05	DW1	24 - 26	3/26/1997	1	X		X	X	X		D97-3689-23
	DW1MS	24 - 26	3/26/1997	1	X		X	X		Matrix Spike	D97-3689-24
	DW1MSD	24 - 26	3/26/1997	1			X	X		Matrix Spike Duplicate	D97-3689-25
	DW1MSD	24 - 26	3/27/1997	1	X					Matrix Spike Duplicate	D97-3689-25
13B06	DW1	24 - 26	3/27/1997	1	X		X	X	X		D97-3771-11
13B07	DW1	24 - 26	3/27/1997	1	X		X	X	X		D97-3771-24
13B07A	DW1	27 - 29	4/22/1997	1		X					D97-4913-3
13B08	DW1	24 - 26	3/27/1997	1	X		X	X	X		D97-3771-27
13B09	DW1	24 - 26	3/27/1997	1	X		X	X	X		D97-3771-33
13B11	DW1	24 - 26	3/28/1997	1	X		X	X	X		D97-3802-20
13B12	DW1	28 - 30	4/22/1997	1		X	X		X		D97-4913-16
13B13	DW1	8 - 18.5	5/8/1997	1		X	X	X	X		D97-5706-2
13B14	DW1	9 - 17.5	5/8/1997	1		X	X	X	X		D97-5706-3
13B15	DW1	13 - 21	5/8/1997	1	X	X	X	X	X		D97-5706-4
MONITORING WELL GROUNDWATER SAMPLES[1]											
33MW5S	GW2	NA	7/17/1998	2	X			X	X		D98-4944-4
	GW2D	NA	7/17/1998	2	X			X	X		D98-4944-5
33MW5I	GW2	NA	7/17/1998	2	X			X	X		D98-4944-6
33MW5D	GW2	NA	7/16/1998	2	X			X	X		D98-4917-5
33MW11S	GW2	NA	7/14/1998	2	X			X	X		D98-4875-6
33MW11D	GW2	NA	7/14/1998	2	X			X	X		D98-4875-7
	GW2MS	NA	7/14/1998	2	X			X	X		D98-4875-8
	GW2MSD	NA	7/14/1998	2	X			X	X		D98-4875-9
33MW12S	GW2	NA	7/16/1998	2	X			X	X		D98-4917-7
33MW12D	GW2	NA	7/16/1998	2	X			X	X		D98-4917-6
33MW13S	GW2	NA	7/17/1998	2	X			X	X		D98-4944-2
33MW13D	GW2	NA	7/17/1998	2	X			X	X		D98-4944-3

Notes:

ft = feet

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

SVOC = Semivolatile Organic Compounds

TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)

VOC = Volatile Organic Compounds

[1] = Groundwater samples were collected from selected wells in the SWMU 33 area and analyzed for RCRA metals and pH.

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B01/DP1	13B01/DP2	13B01/DP3	13B01/DP4	13B02/DP1	13B02/DP2	13B02/DP3
Date Sampled:		3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997
Sample Depth From:		0	4	8	12	0	4	8
Sample Depth To:		4	8	12	16	4	8	12
Laboratory Number:		D97-3689-1	D97-3689-2	D97-3689-3	D97-3689-26	D97-3689-4	D97-3689-5	D97-3689-6
Sample Type:								
Volatiles	UNITS							
2-Butanone	ug/Kg	5.43 U	6.2 U	***18.6***	6.47 U	5.69 U	5.53 U	29.6 DU
4-Methyl-2-pentanone	ug/Kg	109 U	124 U	137 U	129 U	114 U	111 U	592 DU
Acetone	ug/Kg	109 U	***55.3 J***	***139***	129 U	***43.3 J***	***60.3 J***	592 DU
Methylene chloride	ug/Kg	5.43 U	6.2 U	6.83 U	6.47 U	5.69 U	5.53 U	29.6 DU
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	ND	***55.3***	***157.6***	ND	***43.3***	***60.3***	ND
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	***11.3 J****	***9.7 J****	***7.3 J****	***6.1 J****	***8.4 J****	***9.9 J****	***7.3 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B02/DP4	13B03/DP1	13B03/DP2	13B03/DP3	13B03A/DP1	13B03A/DP2	13B03A/DP3
Date Sampled:		3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/27/1997	3/27/1997	3/27/1997
Sample Depth From:		12	0	4	8	0	4	8
Sample Depth To:		16	4	8	12	4	8	12
Laboratory Number:		D97-3689-12	D97-3689-8	D97-3689-9	D97-3689-10	D97-3771-21	D97-3771-22	D97-3771-23
Sample Type:								
Volatiles	UNITS							
2-Butanone	ug/Kg	6.31 U	NA	NA	NA	5.46 U	6.35 U	6.38 U
4-Methyl-2-pentanone	ug/Kg	126 U	NA	NA	NA	109 U	127 U	128 U
Acetone	ug/Kg	126 U	NA	NA	NA	109 U	127 U	128 U
Methylene chloride	ug/Kg	6.31 U	NA	NA	NA	5.46 U	6.35 U	6.38 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	ND	NA	NA	NA	ND	ND	ND
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	*7.1 J**	*10.1 J**	*7.5 J**	*6.5 J**	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B03A/DP4	13B04/DP1	13B04/DP1D	13B04/DP2	13B04/DP3	13B05/DP1	13B05/DP2
Date Sampled:		3/27/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997	3/26/1997
Sample Depth From:		12	0	0	4	8	0	4
Sample Depth To:		16	4	4	8	12	4	8
Laboratory Number:		D97-3771-25	D97-3689-15	D97-3689-16	D97-3689-17	D97-3689-18	D97-3689-20	D97-3689-21
Sample Type:				Duplicate				
Volatiles	UNITS							
2-Butanone	ug/Kg	6.65 U	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/Kg	133 U	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	***134***	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	***9.1 T***	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***143.1***	NA	NA	NA	NA	NA	NA
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	***3***	***10.6 J****	***10.6 J****	***9.8 J****	***9.7 J****	***10.4 J****	***8.2 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B05/DP3	13B06/DP1	13B06/DP2	13B06/DP3	13B06/DP4	13B07/DP1	13B07/DP2
Date Sampled:		3/26/1997	3/27/1997	3/27/1997	3/27/1997	3/27/1997	3/27/1997	3/27/1997
Sample Depth From:		8	0	4	8	12	0	4
Sample Depth To:		12	4	8	12	16	4	8
Laboratory Number:		D97-3689-22	D97-3771-3	D97-3771-5	D97-3771-6	D97-3771-7	D97-3771-8	D97-3771-9
Sample Type:								
Volatiles	UNITS							
2-Butanone	ug/Kg	NA	5.5 U	6.16 U	6.61 U	6.76 U	6.05 U	6.38 U
4-Methyl-2-pentanone	ug/Kg	NA	110 U	123 U	132 U	135 U	121 U	***19.9 J***
Acetone	ug/Kg	NA	110 U	123 U	132 U	135 U	121 U	128 U
Methylene chloride	ug/Kg	NA	5.5 U	6.16 U	6.61 U	6.76 U	6.05 U	6.38 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	ND	ND	ND	ND	ND	***19.9***
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	***7.9 J****	***10.7 J****	***9.2***	***9.7 J****	***10.2 J****	***10 J****	***7.1 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B07/DP3	13B07/DP4	13B07A/DP1	13B07A/DP2	13B08/DP1	13B08/DP2	13B08/DP2D
Date Sampled:		3/27/1997	3/27/1997	4/22/1997	4/22/1997	3/27/1997	3/27/1997	3/27/1997
Sample Depth From:		8	12	3	4.8	0	4	4
Sample Depth To:		12	16	4	5.8	4	8	8
Laboratory Number:		D97-3771-10	D97-3771-12	D97-4913-1	D97-4913-2	D97-3771-13	D97-3771-14	D97-3771-15
Sample Type:								Duplicate
Volatiles	UNITS							
2-Butanone	ug/Kg	6.26 U	6.84 U	NA	NA	5.54 U	6.29 U	6.31 U
4-Methyl-2-pentanone	ug/Kg	125 U	137 U	NA	NA	111 U	126 U	126 U
Acetone	ug/Kg	125 U	*41.3 J*	NA	NA	111 U	126 U	126 U
Methylene chloride	ug/Kg	6.26 U	6.84 U	NA	NA	5.54 U	6.29 U	6.31 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	ND	*41.3*	NA	NA	ND	ND	ND
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	*0.235 J*	3.8 DU	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	*0.223 J*	3.8 DU	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	*0.458*	ND	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	*8.9 J**	*6.2 J**	NA	NA	*10.4 J**	*8 J**	*7.9 J**

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B08/DP3	13B08/DP4	13B09/DP1	13B09/DP2	13B09/DP3	13B09/DP4	13B10/DP1
Date Sampled:		3/27/1997	3/27/1997	3/27/1997	3/27/1997	3/27/1997	3/27/1997	3/28/1997
Sample Depth From:		8	12	0	4	8	12	0
Sample Depth To:		12	16	4	8	12	16	4
Laboratory Number:		D97-3771-16	D97-3771-17	D97-3771-29	D97-3771-30	D97-3771-31	D97-3771-32	D97-3802-14
Sample Type:								
Volatiles	UNITS							
2-Butanone	ug/Kg	6.6 U	6.11 U	5.3 U	6.71 U	6.56 U	***27.9***	5.27 U
4-Methyl-2-pentanone	ug/Kg	132 U	122 U	106 U	134 U	131 U	128 U	105 U
Acetone	ug/Kg	132 U	122 U	106 U	134 U	***106 J***	***167***	105 U
Methylene chloride	ug/Kg	***12.8***	6.11 U	5.3 U	6.71 U	6.56 U	6.41 U	5.27 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***12.8***	ND	ND	ND	***106***	***194.9***	ND
Semivolatiles	UNITS							
Anthracene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	***8.2 J****	***10.3 J****	***9.6 J****	***7.6 J****	***5.7 J****	***4.8 J****	***12.3 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-2
SWMU 13 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		13B10/DP2	13B11/DP1	13B11/DP2	13B11/DP3	13B11/DP4
Date Sampled:		3/28/1997	3/28/1997	3/28/1997	3/28/1997	3/28/1997
Sample Depth From:		4	0	4	8	12
Sample Depth To:		8	4	8	12	16
Laboratory Number:		D97-3802-15	D97-3802-16	D97-3802-17	D97-3802-18	D97-3802-19
Sample Type:						
Volatiles	UNITS					
2-Butanone	ug/Kg	6.51 U	5.38 U	6.22 U	6.41 U	***16.5***
4-Methyl-2-pentanone	ug/Kg	130 U	108 U	124 U	128 U	130 U
Acetone	ug/Kg	***47.1 J***	108 U	124 U	***65.6 J***	***137***
Methylene chloride	ug/Kg	6.51 U	5.38 U	6.22 U	6.41 U	6.5 U
Total Detected VOCs	UNITS					
Total Volatiles	ug/Kg	***47.1***	ND	ND	***65.6***	***153.5***
Semivolatiles	UNITS					
Anthracene	mg/Kg	NA	NA	NA	NA	NA
Fluoranthene	mg/Kg	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS					
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS					
pH	SU	***7.9 J****	***11.1 J****	***10.7 J****	***10.7 J****	***8 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-3
SWMU 13 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		13B01/DW1	13B01/DW1D	13B02/DW1	13B03/DW1	13B03/DW1	13B04/DW1	13B04/DW1
Date Sampled:		3/27/97	3/27/97	3/26/97	3/27/97	3/26/97	3/26/97	3/27/97
Sample Depth From:		24	24	24	43	43	31	31
Sample Depth To:		26	26	26	45	45	33	33
Laboratory Number:		D97-3771-1	D97-3771-2	D97-3689-7	D97-3771-28	D97-3689-11	D97-3689-19	D97-3771-20
Sample Type:			Duplicate					
Volatiles	UNITS							
Chloroform	ug/L	5 U	5 U	5 U	5 U	NA	NA	***11.2***
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	ND	ND	ND	ND	NA	NA	***11.2***
Semivolatiles	UNITS							
Benzo(a)pyrene	ug/L	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/L	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/L	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	ug/L	NA	NA	NA	NA	NA	NA	NA
Pyrene	ug/L	NA	NA	NA	NA	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	NA	NA	NA	NA	NA	NA
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	0.01 U	0.01 U	***0.0937***	NA	0.01 U	***0.115***	NA
Barium, Dissolved	mg/L	***0.0859***	***0.0878***	***0.0853 J****	NA	***0.63 J****	***0.0684 J****	NA
Cadmium, Dissolved	mg/L	***0.0538***	***0.0543***	0.005 UJ*	NA	0.005 UJ*	***0.045 J****	NA
Chromium, Dissolved	mg/L	***0.0389***	***0.0363***	***0.0236 J****	NA	0.01 UJ*	***0.0778 J****	NA
Lead, Dissolved	mg/L	***0.177***	***0.189***	***0.0112 J****	NA	0.003 UJ*	***0.0206 J****	NA
Selenium, Dissolved	mg/L	***0.168***	***0.187***	***0.06***	NA	0.01 U	***0.0855***	NA
Silver, Dissolved	mg/L	0.02 U	0.02 U	***0.0266 J****	NA	0.02 UJ*	***0.0241 J****	NA
Water Quality Parameters	UNITS							
pH	SU	***6.3 J****	***5.9 J****	***5.7 J****	NA	***6.8 J****	***3.9 J****	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-3
SWMU 13 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		13B05/DW1	13B06/DW1	13B07/DW1	13B07A/DW1	13B08/DW1	13B09/DW1	13B11/DW1
Date Sampled:		3/26/97	3/27/97	3/27/97	4/22/97	3/27/97	3/27/97	3/28/97
Sample Depth From:		24	24	24	27	24	24	24
Sample Depth To:		26	26	26	29	26	26	26
Laboratory Number:		D97-3689-23	D97-3771-11	D97-3771-24	D97-4913-3	D97-3771-27	D97-3771-33	D97-3802-20
Sample Type:								
Volatiles	UNITS							
Chloroform	ug/L	5 U	5 U	5 U	NA	***8.08***	5 U	5 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	ND	ND	ND	NA	***8.08***	ND	ND
Semivolatiles	UNITS							
Benzo(a)pyrene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Benzo(b)fluoranthene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Benzo(k)fluoranthene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Chrysene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Fluoranthene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Phenanthrene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Pyrene	ug/L	NA	NA	NA	20 U	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	NA	NA	ND	NA	NA	NA
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	***0.137***	0.01 U	***0.0185***	NA	0.01 U	0.01 U	0.01 U
Barium, Dissolved	mg/L	***0.0571 J****	***0.123***	***0.062***	NA	***0.0934***	***0.0889***	***0.0809***
Cadmium, Dissolved	mg/L	***0.0216 J****	0.005 U	***0.0189***	NA	***0.0103***	***0.0529***	0.005 U
Chromium, Dissolved	mg/L	***0.0942 J****	***0.0029 J***	***0.0201***	NA	***0.0122***	***0.0419***	0.01 U
Lead, Dissolved	mg/L	***0.0223 J****	0.003 U	***0.0801***	NA	***0.043***	***0.198***	0.003 U
Selenium, Dissolved	mg/L	***0.0815***	0.01 U	***0.0637***	NA	***0.0325***	***0.162***	0.01 U
Silver, Dissolved	mg/L	***0.0248 J****	0.02 U	0.02 U	NA	0.02 U	0.02 U	***0.0073 J***
Water Quality Parameters	UNITS							
pH	SU	***4.1 J****	***8.2 J****	***6.3 J****	NA	***6.1***	***5.9 J****	***6.5 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-3
SWMU 13 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		13B12/DW1	13B12/DW1	13B13/DW1	13B14/DW1	13B15/DW1
Date Sampled:		4/22/97	4/22/97	5/8/97	5/8/97	5/8/97
Sample Depth From:		28	28	8	9	13
Sample Depth To:		30	30	18.5	17.5	21
Laboratory Number:		D97-4913-16	D97-4913-16R2	D97-5706-2	D97-5706-3	D97-5706-4
Sample Type:			Reanalysis			
Volatiles	UNITS					
Chloroform	ug/L	NA	NA	NA	NA	5 U
Total Detected VOCs	UNITS					
Total Volatiles	ug/L	NA	NA	NA	NA	ND
Semivolatiles	UNITS					
Benzo(a)pyrene	ug/L	400 DU	***11.2 J***	10 U	10.6 U	10.5 U
Benzo(b)fluoranthene	ug/L	400 DU	***13.2 J***	10 U	10.6 U	10.5 U
Benzo(k)fluoranthene	ug/L	400 DU	***9.8 J***	10 U	10.6 U	10.5 U
Chrysene	ug/L	400 DU	***10.4 J***	10 U	10.6 U	10.5 U
Fluoranthene	ug/L	400 DU	***17.6 J***	10 U	10.6 U	10.5 U
Phenanthrene	ug/L	400 DU	***11 J***	10 U	10.6 U	10.5 U
Pyrene	ug/L	400 DU	***18.4 J***	10 U	10.6 U	10.5 U
Total Detected SVOCs	UNITS					
Total Semi-Volatiles	ug/L	ND	***91.6***	ND	ND	ND
Metals, Dissolved	UNITS					
Arsenic, Dissolved	mg/L	NA	NA	***0.0167***	***0.0646***	***0.138***
Barium, Dissolved	mg/L	NA	NA	***0.0863***	***0.159***	***0.0364***
Cadmium, Dissolved	mg/L	NA	NA	***0.0026 J***	0.005 U	0.005 U
Chromium, Dissolved	mg/L	NA	NA	0.01 U	0.01 U	***0.0154***
Lead, Dissolved	mg/L	NA	NA	0.003 U	0.003 U	***0.0082***
Selenium, Dissolved	mg/L	NA	NA	0.01 U	0.01 U	***0.0277***
Silver, Dissolved	mg/L	NA	NA	0.0036 JU*	0.0068 JU*	0.0188 JU*
Water Quality Parameters	UNITS					
pH	SU	***6 J****	NA	***6.2 J****	***6.2 J****	***4 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-4
SWMU 33 Phase 2 Groundwater Results for Metals
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:		33MW5S/GW2 07/17/1998 D98-4944-4	33MW5S/GW2D 07/17/1998 D98-4944-5 Duplicate	33MW5I/GW2 07/17/1998 D98-4944-6	33MW5D/GW2 07/16/1998 D98-4917-5	33MW11S/GW2 07/14/1998 D98-4875-6	33MW11D/GW2 07/14/1998 D98-4875-7	33MW12S/GW2 07/16/1998 D98-4917-7
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	0.01 U	0.01 U	***0.0148***	***0.021***	0.01 U	0.01 U	0.01 U
Barium, Dissolved	mg/L	***0.235***	***0.225***	***0.315***	***1.31***	***0.47***	***0.858***	***0.0837***
Cadmium, Dissolved	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	***0.0035 J***
Chromium, Dissolved	mg/L	***0.0023 J***	***0.0025 J***	***0.0026 J***	***0.0023 J***	***0.0029 J***	***0.0023 J***	***0.0035 J***
Lead, Dissolved	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	***0.0026 J***
Mercury, Dissolved	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Selenium, Dissolved	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Silver, Dissolved	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	***0.0024 J***	0.005 U	***0.0046 J***
Water Quality Parameters	UNITS							
pH	SU	***6.8 J****	***7.4 J****	***6.9 J****	***6.8 J****	***6.7 J****	***7 J****	***6 J****

LEGEND:

B - Detected in the associated laboratory method blank
F - Detected in the associated equipment rinsate blank
J - Qualified as estimated by the laboratory
J* - Qualified as estimated in the QC evaluation
R - Qualified as unusable in the QC evaluation
T - Detected in associated trip blank
U - Qualified as undetected by the laboratory
U* - Qualified as undetected in the QC evaluation
NA - Not Analyzed
ND - Not Detected

Table 15-4
SWMU 33 Phase 2 Groundwater Results for Metals
Armco Kansas City Facility

	Sample Point:	33MW12D/GW2	33MW13S/GW2	33MW13D/GW2
	Date Sampled:	07/16/1998	07/17/1998	07/17/1998
	Laboratory Number:	D98-4917-6	D98-4944-2	D98-4944-3
	Sample Type:			
Metals, Dissolved	UNITS			
Arsenic, Dissolved	mg/L	0.01 U	0.01 U	0.01 U
Barium, Dissolved	mg/L	***0.677***	***0.047***	***0.61***
Cadmium, Dissolved	mg/L	***0.0013 J***	0.005 U	0.005 U
Chromium, Dissolved	mg/L	0.005 U	***0.004 J***	0.005 U
Lead, Dissolved	mg/L	***0.0146***	0.003 U	0.003 U
Mercury, Dissolved	mg/L	0.0002 U	0.0002 U	0.0002 U
Selenium, Dissolved	mg/L	0.01 U	0.01 U	0.01 U
Silver, Dissolved	mg/L	***0.0108***	0.005 U	0.005 U
Water Quality Parameters	UNITS			
pH	SU	***6.9 J****	***5.1 J****	***6.8 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 15-5
SWMU 13 Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Semivolatiles	**(µg/L)**			**(µg/L)**
Benzo(a)pyrene	0.2	13B12 / DW1	28 - 30	11.2 J
Metals	**(mg/L)**			**(mg/L)**
Arsenic, Dissolved	0.05	13B02 / DW1	24 - 26	0.0937
		13B04 / DW1	31 - 33	0.115
		13B05 / DW1	24 - 26	0.137
		13B14 / DW1	9 - 17.5	0.0646
		13B15 / DW1	13 - 21	0.138
Cadmium, Dissolved	0.005	13B01 / DW1	24 - 26	0.0538
		13B01 / DW1D	24 - 26	0.0543
		13B04 / DW1	31 - 33	0.045 J*
		13B05 / DW1	24 - 26	0.0216 J*
		13B07 / DW1	24 - 26	0.0189
		13B08 / DW1	24 - 26	0.0103
		13B09 / DW1	24 - 26	0.0529
Lead, Dissolved	0.015	13B01 / DW1	24 - 26	0.177
		13B01 / DW1D	24 - 26	0.189
		13B04 / DW1	31 - 33	0.0206 J*
		13B05 / DW1	24 - 26	0.0223 J*
		13B07 / DW1	24 - 26	0.0801
		13B08 / DW1	24 - 26	0.043
		13B09 / DW1	24 - 26	0.198
Selenium, Dissolved	0.05	13B01 / DW1	24 - 26	0.168
		13B01 / DW1D	24 - 26	0.187
		13B02 / DW1	24 - 26	0.06
		13B04 / DW1	31 - 33	0.0855
		13B05 / DW1	24 - 26	0.0815
		13B07 / DW1	24 - 26	0.0637
		13B09 / DW1	24 - 26	0.162

Notes:

ft = feet

J = Estimated value; concentration below practical quantitation limit.

J* = Qualified as estimated by BMWCI during the QC evaluation.

MCL = Maximum Contaminant Level

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WILSON ROAD BRIDGE

720

13B13

13B08

13B12

13B11

13B09

13B07A

13B10

13B07

13B06

13B02

13B14

13B01

SWMU 13

13B03

13B03A

13B05

13B04

13B15

LEGEND

- DIRECT-PUSH BORING LOCATION
- SWMU BOUNDARY
- RAILROAD

N

25' 0' 25' 50'

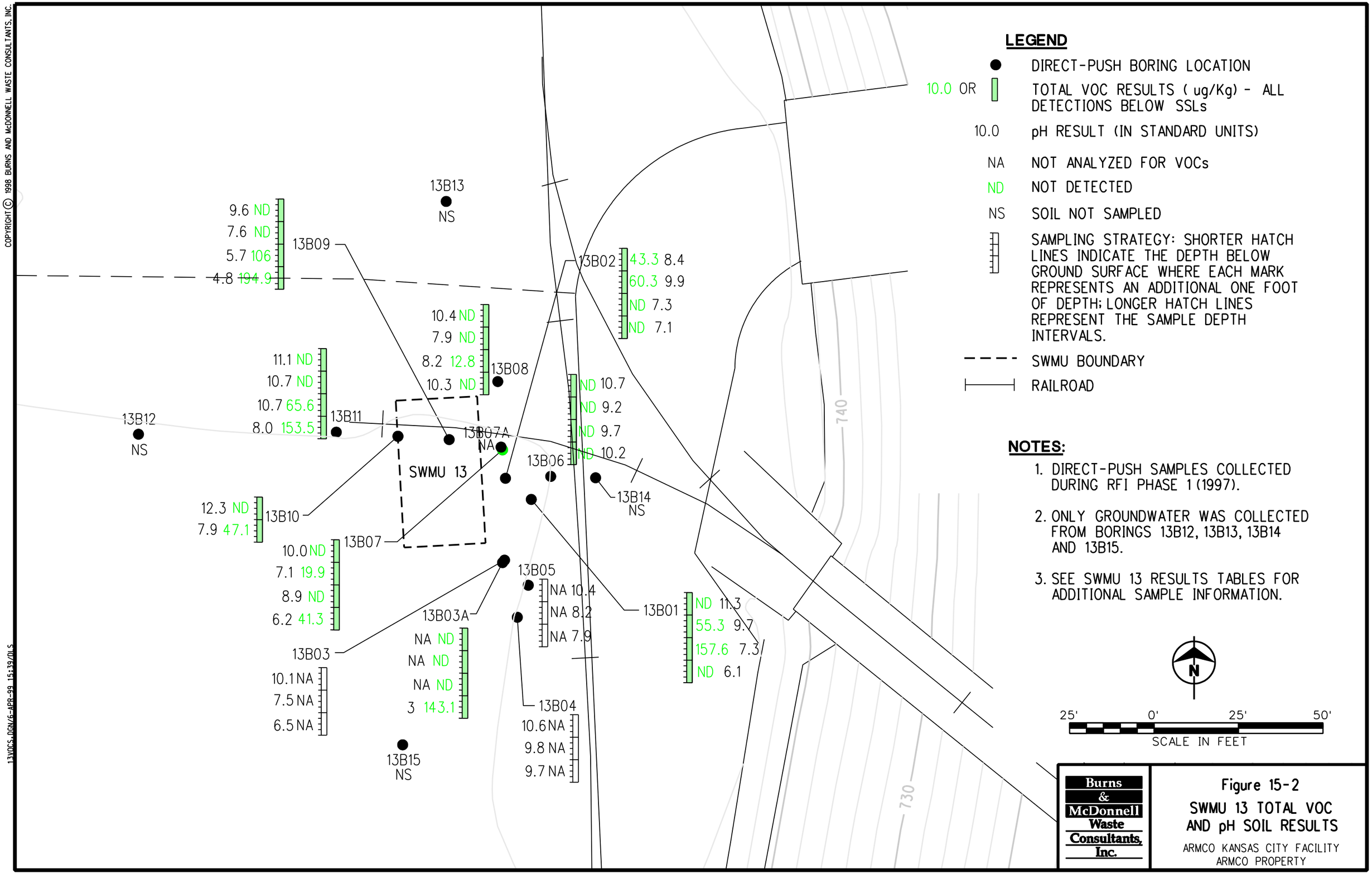
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 15-1
SWMU 13 SOIL AND GROUNDWATER SAMPLING LOCATIONS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\armcorfi\ustn.sup\armconb.dgn
k:\armcorfi\ustn.sup\site.dgn
k:\res\global\stddgn\ustn\civil\20\wcibdr10.dgn
k:\armcorfi\ustn.sup\swmu0001.dgn

SWMU13.DGN/24-AUG-99 09:20/DLS



LEGEND

- ● DIRECT-PUSH BORING LOCATION
- 10.0 OR TOTAL VOC RESULTS (ug/Kg) - ALL DETECTIONS BELOW SSLs
- 10.0 pH RESULT (IN STANDARD UNITS)
- NA NOT ANALYZED FOR VOCs
- ND NOT DETECTED
- NS SOIL NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. ONLY GROUNDWATER WAS COLLECTED FROM BORINGS 13B12, 13B13, 13B14 AND 13B15.
3. SEE SWMU 13 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

25' 0' 25' 50'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 15-2
SWMU 13 TOTAL VOC AND pH SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\armconb.dgn
k:\res\global\stdbdr\ustn\civil\2d\wcibdr10.dgn
13VOCS.DGN/6-APR-99 15:39/DLS

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k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\armcomb.dgn
k:\res\global\stdbdf\ustn\civil\2d\wcibdr10.dgn

13SVOCS.DGN/24-AUG-99 10:02/OLS

13B13
NS

13B07A
0.46
ND

13B08
NA

13B12
NS

13B11
NA

13B10
NA

13B09
NA

13B06
NA

13B14
NS

13B02
NA

13B01
NA

SWMU 13

13B03
NA

13B07
NA

13B03A
NA

13B05
NA

13B04
NA

13B15
NS

740

730

LEGEND

- DIRECT-PUSH BORING LOCATION
- 10.0 OR — TOTAL SVOC RESULTS (mg/Kg) - ALL DETECTIONS BELOW SSLs
- NA — NOT ANALYZED FOR SVOCs
- ND — NOT DETECTED
- NS — SOIL NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. ONLY GROUNDWATER WAS COLLECTED FROM BORINGS 13B12, 13B13, 13B14, AND 13B15.
3. SEE SWMU 13 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

25' 0' 25' 50'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 15-3
SWMU 13 TOTAL SVOC SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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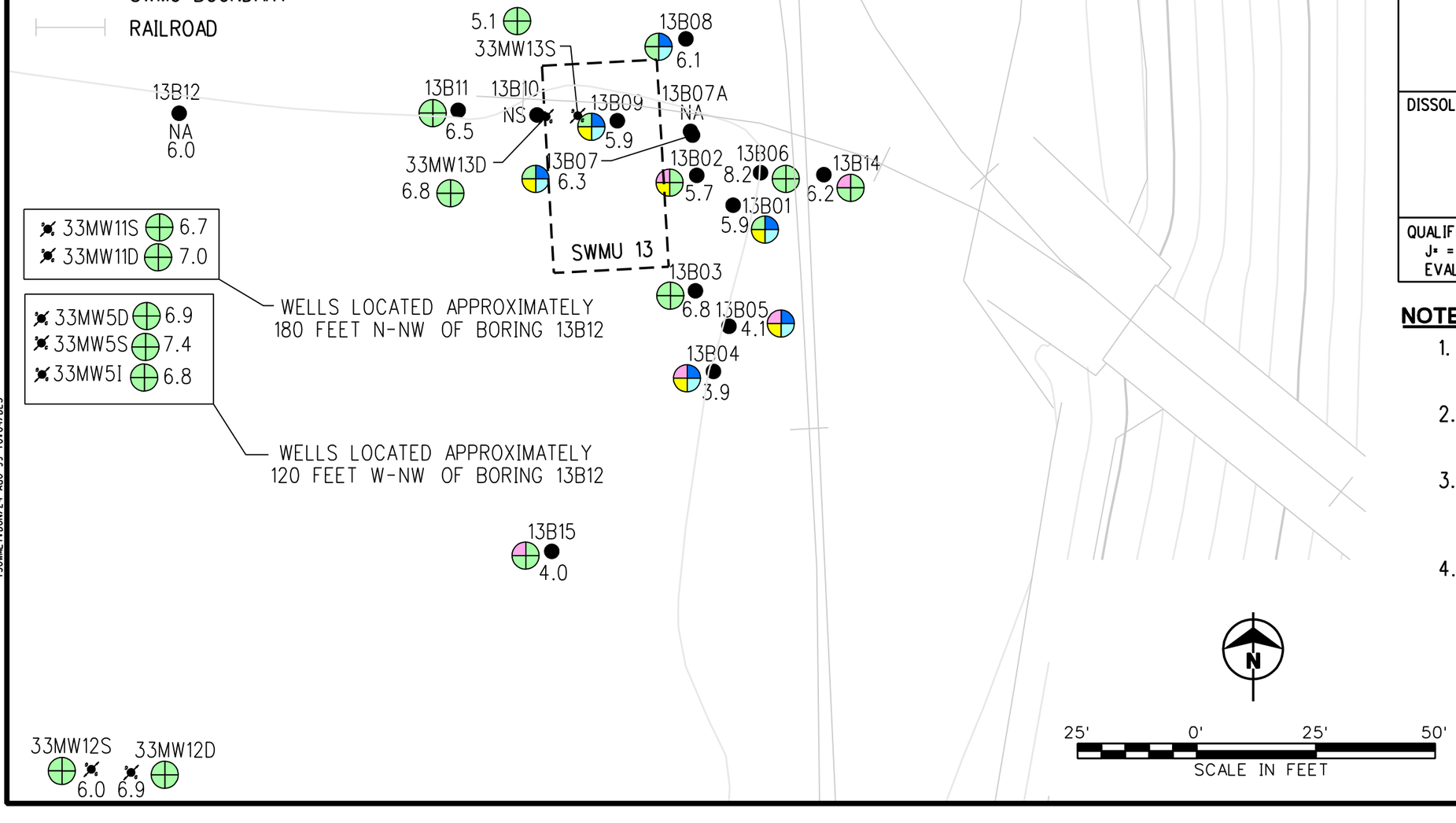
k:\armcorfi\ustn.sup\armconb.dgn
k:\armcorfi\ustn.sup\site.dgn
k:\armcorfi\ustn.sup\fig1x11.dgn
k:\res\global\stddbdr\ustn\civil\2d\wc1bdr10.dgn
13GWMET.DGN/24-AUG-99 10:04/DLS

LEGEND

- RFI MONITORING WELL LOCATION
- DIRECT-PUSH BORING LOCATION
- NA — METALS NOT ANALYZED
- NS — NOT SAMPLED
- As / Cd / Pb / Se — DISSOLVED METALS RESULTS (mg/L) BELOW MCLS
- As / Cd / Pb / Se — DISSOLVED METALS RESULTS (mg/L) ABOVE MCLS (SEE INSET TABLE)
  - ARSENIC (As)
  - CADMIUM (Cd)
  - SELENIUM (Se)
  - LEAD (Pb)
- 7.8 — pH RESULT (IN STANDARD UNITS)
- SWMU BOUNDARY
- RAILROAD



DISSOLVED METALS GROUNDWATER DETECTIONS ABOVE MCLs			
PARAMETER	MCL (mg/L)	SAMPLE	SAMPLE RESULT (mg/L)
DISSOLVED ARSENIC	0.05	13B02/DW1	0.0937
		13B04/DW1	0.115
		13B05/DW1	0.137
		13B14/DW1	0.0646
		13B15/DW1	0.138
DISSOLVED CADMIUM	0.005	13B01/DW1	0.0538
		13B01/DW1D	0.0543
		13B04/DW1	0.045 J*
		13B05/DW1	0.0216 J*
		13B07/DW1	0.0189
		13B08/DW1	00.0103
		13B09/DW1	0.0529
DISSOLVED LEAD	0.015	13B01/DW1	0.177
		13B01/DW1D	0.189
		13B04/DW1	0.0206 J*
		13B05/DW1	0.0223 J*
		13B07/DW1	0.0801
		13B08/DW1	0.043
		13B09/DW1	0.198
DISSOLVED SELENIUM	0.05	13B01/DW1	0.168
		13B01/DW1D	0.187
		13B02/DW1	0.06
		13B04/DW1	0.0855
		13B05/DW1	0.0815
		13B07/DW1	0.0637
		13B09/DW1	0.162

QUALIFIER NOTES:
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION.

NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. MONITORING WELL GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 2 (1998).
3. SEE SWMU 13 RESULTS TABLES FOR ADDITIONAL DIRECT-PUSH SAMPLE INFORMATION.
4. SEE SWMU 33 RESULTS TABLES FOR ADDITIONAL MONITORING WELL SAMPLE INFORMATION.

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Figure 15-4
SWMU 13 DISSOLVED METALS AND pH GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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33MW5S
ND

(WELL LOCATED APPROXIMATELY
120 FEET W-NW OF BORING 13B12)

13B13
NA
ND

13B08
8.08
NA

13B07A
NA
ND

13B12
NA
91.6
(BENZO(A)PYRENE MCL = 0.2 ug/L
13B12/DW1 RESULT = 11.2 ug/L)

13B11
ND
NA

13B10
NS

13B09
ND
NA

13B07
ND
NA

13B02
ND
NA

13B06
ND
NA

13B14
NA
ND

13B01
ND
NA

SWMU 13

13B03
ND
NA

13B05
ND
NA

13B04
11.2
NA

13B15
ND
ND

LEGEND

- DIRECT-PUSH BORING LOCATION
- 10.0 OR — TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs (TOP VALUE)
- 10.0 OR — TOTAL SVOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs (BOTTOM VALUE)
- 10.0 OR — TOTAL SVOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (BOTTOM VALUE); COMPOUND, MCL, AND SAMPLE RESULT PROVIDED
- NA — NOT ANALYZED
- ND — NOT DETECTED
- NS — SOIL NOT SAMPLED
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. BORING 13B10 WAS SAMPLED FOR SOIL ONLY.
3. SEE SWMU 13 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

25' 0' 25' 50'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 15-5
SWMU 13 TOTAL VOC AND TOTAL SVOC GROUNDWATER RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\armcorfi\austn.sup\armconb.dgn
k:\armcorfi\austn.sup\site.dgn
k:\res\global\stdbdr\austin\civil\2d\wcibdr10.dgn
k:\armcorfi\austn.sup\swmu0001.dgn
13GWSVOC.DGN/17-MAY-99 08:22/DLS

16.0 SWMU 17 – WIRE MILL RINSEWATER NEUTRALIZATION TANK

16.1 SWMU BACKGROUND

16.1.1 Description of SWMU

The Wire Mill Rinsewater Neutralization Tank (SWMU 17), located on Armco property (see Figure 2-1), consisted of an 18,000-gallon concrete UST with an acid-proof brick lining. The tank was open to the ground surface. The tank was installed in 1975 and was taken out of service in 1989 when operations ceased at the Cleaning House. The SWMU 17 tank was cleaned and closed in place in 1991 as part of the closure activities at the Wire Mill. The tank was located northwest of the Rod Cleaning Building under the west end of the Rod Mill Coil Conveyor Bridge (now demolished). The tank was approximately 10 feet wide, 12 feet long, and 20 feet deep.

During its operational life, this SWMU received acid rinse waters from the hydrochloric acid wire cleaning operations and the sulfuric acid rod cleaning operations. The tank was connected to the Cleaning House by a below ground pipe. The tank was used to collect acid rinse waters for treatment in the adjacent acid neutralization system. The collected rinse water was pumped from the collection tank to the neutralization system. On occasion, lime was added to the rinsewater collection tank to facilitate the neutralization process. Normally, however, lime was added to the aboveground treatment tank.

The defined SWMU area is approximately 50 feet by 80 feet (less then 0.1 acres). In August 1998, modifications were made in the area as Armco extended Wilson Avenue in an east-west direction across the west of SWMU 17. As part of this modification, the concrete walls of SWMU 17 were lowered to below ground surface. The concrete from the walls and other imported aggregate materials were used to fill the void left by the former tank. USEPA was notified of these modifications in a letter dated September 10, 1998.

Based on the types of materials handled at SWMU 17, the primary constituents of potential concern were sulfuric acid, hydrochloric acid, and possibly metals. A decrease in soil or groundwater pH, or the presence of elevated concentrations of metals in groundwater suggest the presence of acids.

16.1.2 Release Potential

The primary release potential at this SWMU was to the surrounding subsurface soils and groundwater. There are no records of any spills or releases associated with this SWMU; however, a sulfuric acid spill which occurred at SWMU 13 in 1987 flowed through acid brick lined trenches to SWMU 17. The majority of the spill was contained in this tank, which had long since ceased operation. Overflows from this tank would have flowed to nearby Outfall 006 at the Blue River. Due to the closure of the SWMU and the demolition of the wire mill and associated operations, there is no ongoing potential for a release to the environment.

16.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at SWMU 17 was evaluated through the collection of subsurface soil and groundwater samples. Table 16-1 presents a summary of the investigation activities for SWMU 17. Figure 16-1 presents the sampling locations. Based on new information obtained during RFI Phase 1 concerning the actual neutralization tank location, boring locations were moved approximately 100 feet southwest of the SWMU boundary as defined in the RFI Workplan. The SWMU boundary shown on Figures 16-1 and 16-2 reflect this adjustment.

Five soil borings (17B01 through 17B05) were installed during RFI Phase 1. Three samples were collected from each boring at four foot depth intervals (0 to 4 feet, 4 to 8 feet, and 8 to 12 feet bgs). Twelve samples were collected and analyzed for pH. Due to signs of contamination (sheen observed on water and organic odors) encountered in groundwater at the SWMU 17 area during RFI Phase 1, two additional soil borings (17B06A and 17B08A) were installed during RFI Phase 2. These borings were installed to evaluate if a source of VOC contamination existed at SWMU 17. At Boring 17B06A, a void was encountered at 4 feet bgs and water was

encountered below this void at 8 feet bgs; therefore, only one sample was collected from 0 to 4 feet bgs. Similarly, water was encountered at 8 feet bgs at Boring 17B08A, and samples could only be collected from the 0 to 4 feet and 4 to 8 feet bgs depth intervals. All three RFI Phase 2 soil samples were analyzed for VOCs.

During RFI Phase 1, groundwater samples were collected from nine direct-push borings (17B01 through 17B06, 17B04A, 17B08, and 17B09). Five direct-push groundwater samples had been planned in the RFI Workplan. The additional four borings were added due to signs of contamination (sheen observed on water and organic odors) encountered in the groundwater at Boring 17B04. All groundwater samples were analyzed for dissolved RCRA metals and pH. In addition, groundwater samples collected from Borings 17B04A, 17B06, 17B08, and 17B09 were analyzed for VOCs, SVOCs, and TPH. During RFI Phase 2, one additional groundwater sample was collected from Boring 17B10 and analyzed for VOCs.

This area is underlain by approximately 10 feet of gravel to boulder size slag and refractory brick fragments in a silty to sandy clay matrix. There are extensive areas of intact concrete floor remaining from demolished former mill buildings in this area. The fill layer generally thins closer to the Blue River and is thicker in buried creek channels and in buried basements below the former mill building footprints. Below the fill material is silty clay typical of Blue River alluvium. The silty clay alluvium with local, discontinuous interbeds of fine sandy clay is approximately 50 feet thick. Below the silty clay is approximately 5 feet of clayey to sandy gravel directly overlying the Pennsylvanian shale bedrock. There are two saturated zones within the unconsolidated materials. There is a shallow, unconfined saturated zone with a static groundwater surface approximately 5 to 15 feet bgs and a deeper, semi-confined saturated zone with a groundwater surface approximately 20 to 30 feet bgs.

16.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Figure 16-2 and Table 16-2 present the analytical results for SWMU 17. The following subsections summarize the nature and extent of soil contamination by analysis type for SWMU 17.

16.3.1 pH

Fifteen samples, from depths between 0 to 12 feet bgs, were analyzed for pH. All of the samples except one exhibited slightly basic pH values from 7.8 J* to 9.3 J*. The sample in the 8 to 12 feet bgs interval at Boring 17B03 was an exception, and exhibited a basic pH of 11.9 J*. With the exception of the samples collected from Boring 17B05, pH values tended to increase slightly as sample depth increased.

16.3.2 VOCs

During RFI Phase 2, two direct-push borings were installed in an effort to determine if a source of VOC contamination to groundwater existed in the soil at SWMU 17. Three soil samples from depths between 0 to 8 feet bgs were collected and analyzed for VOCs. VOCs were detected in all three samples and consisted primarily of halogenated VOC compounds [i.e. 1,1-DCE, chloroform, cis-1,2-dichloroethene (cis-1,2-DCE), methylene chloride, PCE, and TCE]. Acetone, 2-butanone, and toluene were also detected. Total VOC concentrations ranged from 57.4 µg/Kg in the shallow interval at Boring 17B06A to 933.7 µg/Kg in the deep interval at 17B08A.

Table 16-3 presents the soil results that exceeded the 20 DAF SSLs at SWMU 17. TCE exceeded its 20 DAF SSL (60 µg/Kg) at all three sampling locations, with concentrations ranging from 98.4 to 655 D µg/Kg.

Both borings had TCE detections that exceeded the 20 DAF SSL in the deepest sample collected. Vertical extent of subsurface soil contamination could not be pursued further due to the presence of subsurface voids, obstructions, and/or the groundwater table. Subsurface obstructions limited sampling in the area immediately surrounding SWMU 17, the horizontal extent of contamination in the immediate SWMU area could not be pursued. However, it is not anticipated that VOC contamination is widespread outside the area of the former acid pit. In addition, soil borings installed during RFI Phase 1 at this SWMU did not show signs of VOC contamination based on visual observations or PID readings.

The goal of these VOC soil samples was to determine if a source of VOC contamination existed in the soil. Since VOCs (primarily TCE) were detected in these borings, the potential for leaching of VOCs from soil to groundwater exists. However, the SWMU 17 groundwater contamination is part of a larger plume of VOCs whose source area is primarily at SWMU 33 (see Chapter 22.0).

16.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

Table 16-4 and Figure 16-3 presents the direct-push groundwater results for pH and RCRA metals at SWMU 17. Discussion of the organic constituents (i.e. VOCs and SVOCs) in groundwater is presented with the SWMU 33 groundwater data in Chapter 22.0. TPH data is provided in Appendix U.

16.4.1 pH

Eight direct-push groundwater samples were collected and analyzed for pH during RFI Phase 1. The groundwater at SWMU 17 was neutral, ranging from pH 6.6 to 6.9. pH data is shown on Figure 16-3.

16.4.2 Dissolved Metals

Eight direct-push groundwater samples were collected and analyzed for dissolved RCRA metals during RFI Phase 1. With the exception of dissolved selenium, all of the RCRA metals were detected in at least one groundwater sample. However, none of the dissolved arsenic, barium, cadmium, chromium, mercury, or silver detections exceeded the groundwater screening MCLs. Dissolved barium was detected in all of the SWMU 17 groundwater samples at concentrations ranging from 0.0268 to 0.133 mg/L. Dissolved chromium was detected in four samples at concentrations ranging from 0.0022 J to 0.0164 mg/L. Dissolved silver was detected in three samples at estimated concentrations below the laboratory reporting limit (0.0033J to 0.0044J mg/L). Dissolved arsenic, cadmium, and mercury were each detected in one sample at 0.01 J, 0.0036 J, and 0.0005 mg/L, respectively.

Dissolved lead results are shown on Figure 16-3. Dissolved lead exceeded the groundwater screening MCL (0.015 mg/L) in one sample (see Table 16-5). The sample collected from Boring 17B06 (located just north of the former neutralization tank) had a dissolved lead concentration of 0.115 mg/L. The horizontal extent of dissolved lead in groundwater is assumed to be a localized occurrence and was defined by sampling locations immediately south and east of the one exceedence and by monitoring wells located to the north and west. Dissolved metals results for groundwater samples from these monitoring wells is provided with SWMU 13 (Chapter 15.0).

16.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 17, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater, groundwater transport, and storm sewers), surface pathways (storm water runoff and surface water transport), and air pathways (volatilization and airborne dust).

The nature and extent of contamination at SWMU 17 was assessed through the collection of subsurface soil and groundwater samples. VOC concentrations in soil exceeded 20 DAF SSLs (based on soil migration to groundwater) at depths to 8 feet bgs (approximate deepest elevation 738 feet above MSL) in the immediate area of the former rinsewater neutralization tank. Therefore, soil transfer to groundwater could occur. Soil pH values in the area of the former tank were slightly basic to basic (7.8 to 11.9).

Dissolved metals, VOCs, and SVOCs were detected in groundwater (note that VOCs and SVOCs in groundwater will be discussed in Chapter 22.0 as part of SWMU 33). Only dissolved lead exceeded the MCL in one sample near the former tank location, and all other groundwater samples showed non-detections of dissolved lead. Groundwater pH values in this area were neutral (6.6 to 6.9). Groundwater is typically encountered at approximate elevations ranging from 736 to 738 feet above MSL in this area (based on nearby Monitoring Well 33MW5S). Because of the limited detections and low concentrations of dissolved metals in groundwater and the tendency of metals to strongly adsorb to soil, groundwater transport is not expected to be a significant migration pathway for metals at SWMU 17.

Surface cover material at SWMU 17 is primarily slag fill. Storm water runs toward a storm drain to the southeast of nearby SWMU 13 and storm sewers discharge to the Blue River. Surface soil particulate (dust) could become airborne. VOCs in the subsurface may partition to the gas phase and may migrate to the air pathway. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Thus, storm water runoff, storm sewer transport, surface water transport, volatilization to air, and airborne dust transport are potential routes for constituent migration at SWMU 17.

16.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at SWMU 17.

16.6.1 Human Health Evaluation

Groundwater data from SWMU 17 was evaluated with SWMU 33. Since no chemicals were detected in soil at concentrations exceeding risk screening levels, separate human health risk evaluation was not conducted for SWMU 17.

16.6.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 17. Therefore, an ecological risk evaluation was not conducted for SWMU 17.

16.7 SUMMARY

SWMU 17, located in the western portion of the Facility, was a former concrete open-topped UST that received acid rinse waters. The defined SWMU area is approximately 50 feet by 80 feet (less then 0.1 acres). Subsurface soil and groundwater samples were collected at SWMU 17 for pH, RCRA metals, and/or VOCs.

Fifteen subsurface soil samples, from depths between 0 to 12 feet bgs, were analyzed for pH. The majority of the samples exhibited neutral to slightly basic pH values (7.8 J* to 9.3 J*). One sample in the 8 to 12 feet bgs interval at Boring 17B03 exhibited a basic pH of 11.9 J*.

Two soil borings were installed during RFI Phase 2 to determine if a source of VOC groundwater contamination was present in the soil at SWMU 17. VOCs were detected in all three subsurface soil samples analyzed. TCE exceeded its 20 DAF SSL (60 µg/Kg) for all three samples, ranging up to 655 D µg/Kg. Vertical extent of subsurface soil VOCs could not be pursued further due to the presence of subsurface voids, obstructions, and/or the groundwater table. The horizontal extent of VOCs in soil in the immediate SWMU area could not be defined by additional direct-push borings due to subsurface obstructions. However, it is anticipated that the horizontal extent of VOCs in soil is not widespread outside the area of the former acid tank based on PID monitoring and visual observations made during installation of Phase 1 soil borings at the SWMU. The goal of these VOC soil samples was to determine if a source of VOC contamination existed in the soil. Since VOCs (primarily TCE) were detected in these borings, the potential for leaching of VOCs from soil to groundwater exists. However, the SWMU 17 groundwater contamination is part of a larger plume of VOCs whose source area is primarily at SWMU 33 (see Chapter 22.0).

Figure 16-3 summarizes the extent of pH and dissolved lead detections in groundwater at SWMU 17. Eight direct-push groundwater samples were analyzed for pH and RCRA metals. All pH results were neutral, ranging from pH 6.6 to 6.9. With the exception of dissolved selenium, all of the RCRA metals were detected in at least one groundwater sample; however, only one dissolved lead result (0.115 mg/L) exceeded the groundwater screening MCL (0.015 mg/L). The horizontal extent of dissolved lead in groundwater is assumed to be a localized occurrence and was defined by sampling locations immediately south and east of the one exceedence and by monitoring wells located to the north and west.

Discussion of the organic constituents (i.e. VOCs and SVOCs) in groundwater is presented with the SWMU 33 groundwater data in Chapter 22.0.

Potential migration pathways at SWMU 17 include soil transfer to groundwater, groundwater transport, storm sewer transport, storm water runoff, surface water transport, volatilization to air, and airborne dust migration. Subsurface soil detections of VOCs exceeded 20 DAF SSLs (based on soil migration to groundwater), thus indicating that soil transfer to groundwater could occur. Groundwater samples showed one detection of dissolved lead above the MCL; however, surrounding samples were all non-detect for dissolved lead. Based on the limited detections, groundwater transport of dissolved metals is not expected to be significant for SWMU 17 (see Chapter 22.0 for an assessment of VOCs in groundwater).

Storm water runs to a storm drain located southeast of adjacent SWMU 13, and storm sewers discharge to the Blue River. Surface soil particulate (dust) could become airborne. VOCs in the subsurface may partition to the gas phase and may migrate to the air pathway. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Thus, storm water runoff, storm sewer transport, surface water transport, volatilization to air, and airborne dust transport are potential routes for contaminant migration at SWMU 17.

A risk evaluation was conducted for SWMU 17. For the human health evaluation, no COPCs were identified for subsurface soil; therefore, further human health risk evaluation was not performed. Groundwater data from SWMU 17 was evaluated with SWMU 33 (see Chapter 22.0). Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted for SWMU 17.

* * * * *

Table 16-1
SWMU 17 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample (ft)	Date Collected	RFI Phase	Chemical Analysis				Comments	Lab ID Number
Point	Designator				pH	RCRA Metals	VOC	SVOC		
DIRECT-PUSH SUBSURFACE SOIL SAMPLES										
17B01	DP1	0 - 4	3/28/1997	1	X					D97-3802-1
	DP2	4 - 8	3/28/1997	1	X					D97-3802-2
	DP3	8 - 12	3/28/1997	1	X					D97-3802-3
17B02	DP1	0 - 4	3/28/1997	1	X					D97-3802-5
	DP2	4 - 8	3/28/1997	1	X					D97-3802-6
	DP3	8 - 12	3/28/1997	1	X					D97-3802-7
17B03	DP1	0 - 4	3/28/1997	1	X					D97-3802-10
	DP2	4 - 8	3/28/1997	1	X					D97-3802-11
	DP3	8 - 12	3/28/1997	1	X					D97-3802-12
17B04	DP1	0 - 4	3/31/1997	1	X					D97-3877-1
	DP2	4 - 8	3/31/1997	1	X					D97-3877-2
	DP3	8 - 12	3/31/1997	1	X					D97-3877-3
17B05	DP1	0 - 4	3/31/1997	1	X					D97-3877-5
	DP1D	0 - 4	3/31/1997	1	X				Field Duplicate	D97-3877-6
	DP2	4 - 8	3/31/1997	1	X					D97-3877-7
	DP3	8 - 12	3/31/1997	1	X					D97-3877-8
17B06A	DP1	0 - 4	5/7/1998	2			X			D98-3519-6
	DP1D	0 - 4	5/7/1998	2			X		Field Duplicate	D98-3519-7
17B08A	DP1	0 - 4	5/7/1998	2			X			D98-3519-4
	DP2	4 - 8	5/7/1998	2			X			D98-3519-5
DIRECT-PUSH GROUNDWATER SAMPLES[1]										
17B01	DW1	19 - 21	3/28/1997	1	X	X				D97-3802-4
17B02	DW1	19 - 21	3/28/1997	1	X	X				D97-3802-8
	DW1D	19 - 21	3/28/1997	1	X	X			Field Duplicate	D97-3802-9
17B03	DW1	19 - 21	3/28/1997	1	X	X				D97-3802-13
17B04	DW1	19 - 21	3/31/1997	1	X	X				D97-3877-4
17B04A	DW1	16 - 18	4/21/1997	1	X	X	X	X		D97-4833-8
17B05	DW1	19 - 21	3/31/1997	1	X	X				D97-3877-9
17B06	DW1	11.5 - 12.5	4/21/1997	1	X	X	X	X		D97-4833-2
17B07	DW1		4/21/1997						refusal	
17B08	DW1	13 - 15	4/21/1997	1	X	X	X	X		D97-4833-3
17B09	DW1	16 - 18	4/21/1997	1	X	X	X	X		D97-4833-9
17B10	DW1	15 - 17	5/14/1998	2			X			D98-3694-3

Notes:

ft = feet

SVOC = Semivolatile Organic Compounds

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

VOC = Volatile Organic Compounds

[1] = Direct-push groundwater sample results for organic analyses are presented and discussed with the SWMU 33 groundwater results (Chapter 22).

Table 16-2
SWMU 17 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		17B01/DP1	17B01/DP2	17B01/DP3	17B02/DP1	17B02/DP2	17B02/DP3	17B03/DP1
Date Sampled:		3/28/97	3/28/97	3/28/97	3/28/97	3/28/97	3/28/97	3/28/97
Sample Depth From:		0	4	8	0	4	8	0
Sample Depth To:		4	8	12	4	8	12	4
Laboratory Number:		D97-3802-1	D97-3802-2	D97-3802-3	D97-3802-5	D97-3802-6	D97-3802-7	D97-3802-10
Sample Type:								
Volatiles	UNITS							
1,1-Dichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Chloroform	ug/Kg	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	*8.1 J**	*8.8 J**	*8.9 J**	*8.2 J**	*8.9 J**	*9.2 J**	*8.7 J**

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed

F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected

J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis

J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 16-2
SWMU 17 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		17B03/DP2	17B03/DP3	17B04/DP1	17B04/DP2	17B04/DP3	17B05/DP1	17B05/DP1D
Date Sampled:		3/28/97	3/28/97	3/31/97	3/31/97	3/31/97	3/31/97	3/31/97
Sample Depth From:		4	8	0	4	8	0	0
Sample Depth To:		8	12	4	8	12	4	4
Laboratory Number:		D97-3802-11	D97-3802-12	D97-3877-1	D97-3877-2	D97-3877-3	D97-3877-5	D97-3877-6
Sample Type:								Duplicate
Volatiles	UNITS							
1,1-Dichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Chloroform	ug/Kg	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	NA	NA	NA	NA	NA	NA	NA
Physical Properties of Soil	UNITS							
pH	SU	*9.3 J**	*11.9 J**	*7.8 J**	*8.2 J**	*8.3 J**	*9 J**	*9 J**

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 16-2
SWMU 17 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		17B05/DP2	17B05/DP3	17B06A/DP1	17B06A/DP1D	17B08A/DP1	17B08A/DP2
Date Sampled:		3/31/97	3/31/97	5/7/98	5/7/98	5/7/98	5/7/98
Sample Depth From:		4	8	0	0	0	4
Sample Depth To:		8	12	4	4	4	8
Laboratory Number:		D97-3877-7	D97-3877-8	D98-3519-6	D98-3519-7 Duplicate	D98-3519-4	D98-3519-5
Sample Type:							
Volatiles	UNITS						
1,1-Dichloroethene	ug/Kg	NA	NA	5.91 U	***1.24 J***	27.4 DU	25.4 DU
2-Butanone	ug/Kg	NA	NA	118 U	5.86 U	27.4 DU	***98.6 D***
Acetone	ug/Kg	NA	NA	118 U	117 U	548 DU	***95.1 DJ***
Chloroform	ug/Kg	NA	NA	***1.67 J***	5.86 U	***17.5 DJ***	25.4 DU
cis-1,2-Dichloroethene	ug/Kg	NA	NA	***5.08 J***	***25.8***	***69.2 D***	***85 D***
Methylene chloride	ug/Kg	NA	NA	***4.48 J***	***2.95 J***	***13.8 DJ***	25.4 DU
Tetrachloroethene	ug/Kg	NA	NA	***21.3***	4.51 JU*	27.4 DU	25.4 DU
Toluene	ug/Kg	NA	NA	***1.61 J***	5.86 U	***5.73 DJ***	25.4 DU
Trichloroethene	ug/Kg	NA	NA	***23.3***	***98.4***	***356 D***	***655 D***
Total Detected VOCs	UNITS						
Total Volatiles	ug/Kg	NA	NA	***57.44***	***128.4***	***462.23***	***933.7***
Physical Properties of Soil	UNITS						
pH	SU	***9 J****	***7.9 J****	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 16-3
SWMU 17 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result
Volatiles	**(µg/kg)**			**(µg/kg)**
Trichloroethene	60	17B06A / DP1D	0 - 4	98.4
		17B08A / DP1	0 - 4	356 D
		17B08A / DP2	4 - 8	655 D

Notes:

D = Sample was diluted prior to analysis.

DAF = Dilution Attenuation Factor

ft = feet

SSL = Soil Screening Level

Table 16-4
SWMU 17 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		17B01/DW1	17B02/DW1	17B02/DW1D	17B03/DW1	17B04/DW1	17B04A/DW1	17B05/DW1
Date Sampled:		3/28/97	3/28/97	3/28/97	3/28/97	3/31/97	4/21/97	3/31/97
Sample Depth From:		19	19	19	19	19	16	19
Sample Depth To:		21	21	21	21	21	18	21
Laboratory Number:		D97-3802-4	D97-3802-8	D97-3802-9 Duplicate	D97-3802-13	D97-3877-4	D97-4833-8	D97-3877-9
Sample Type:								
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	0.01 U
Barium, Dissolved	mg/L	***0.0375***	***0.0466***	***0.046***	***0.0594***	***0.12***	NA	***0.0726***
Cadmium, Dissolved	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	0.005 U
Chromium, Dissolved	mg/L	***0.0027 J***	0.01 U	***0.0026 J***	0.01 U	0.01 U	NA	0.01 U
Lead, Dissolved	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NA	0.003 U
Mercury, Dissolved	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	***0.0005***	NA	0.0002 U
Silver, Dissolved	mg/L	0.02 U	***0.0039 J***	***0.0044 J***	0.02 U	0.02 U	NA	0.02 U
Water Quality Parameters	UNITS							
pH	SU	***6.9 J****	***6.6 J****	***6.7 J****	***6.8 J****	***6.8 J****	NA	***6.8 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 16-4
SWMU 17 Phase 1 Direct-Push Groundwater Results
Armco Kansas City Facility

	Sample Point:	17B06/DW1	17B08/DW1	17B09/DW1	17B10/DW1
	Date Sampled:	4/21/97	4/21/97	4/21/97	5/14/98
	Sample Depth From:	11.5	13	16	15
	Sample Depth To:	12.5	15	18	17
	Laboratory Number:	D97-4833-2	D97-4833-3	D97-4833-9	D98-3694-3
	Sample Type:				
Metals, Dissolved	UNITS				
Arsenic, Dissolved	mg/L	***0.01 J***	0.01 U	0.01 U	NA
Barium, Dissolved	mg/L	***0.133***	***0.0603***	***0.0268***	NA
Cadmium, Dissolved	mg/L	***0.0036 J***	0.005 U	0.005 U	NA
Chromium, Dissolved	mg/L	***0.0164***	***0.0022 J***	0.01 U	NA
Lead, Dissolved	mg/L	***0.115***	0.003 U	0.003 U	NA
Mercury, Dissolved	mg/L	0.0002 U	0.0002 U	0.0002 U	NA
Silver, Dissolved	mg/L	***0.0033 J***	0.02 U	0.02 U	NA
Water Quality Parameters	UNITS				
pH	SU	***6.7 J****	***6.6 J****	***6.6 J****	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 16-5
SWMU 17 Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Metals	**(mg/L)**			**(mg/L)**
Lead	0.015	17B06 / DW1	11.5 - 12.5	0.115

Notes:
ft = feet
MCL = Maximum Contaminant Level

k:*armcorfi*ustn.sup*site.dgn

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SWMU17.DGN/11-MAY-99 12:53/DLS

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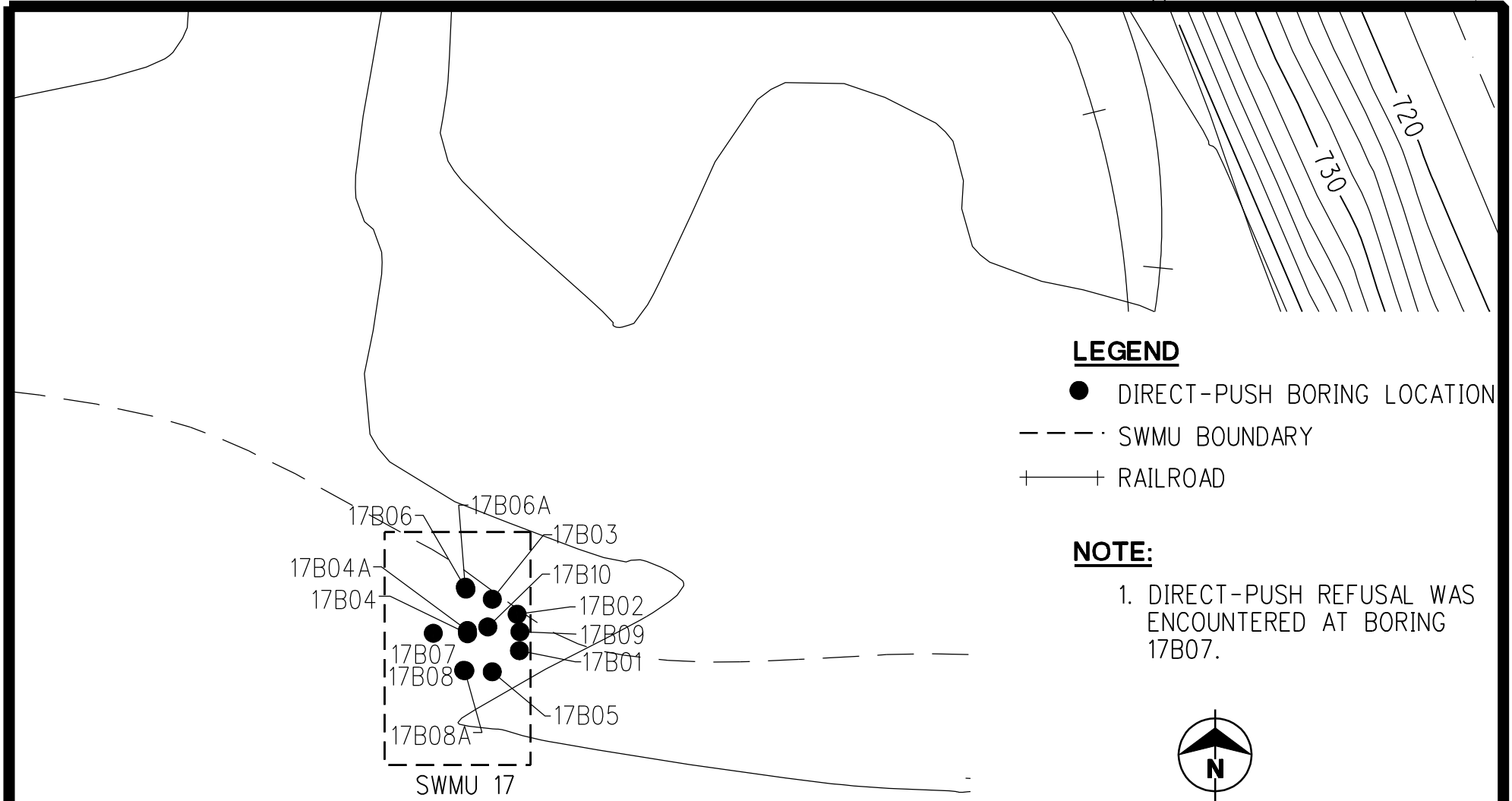

LEGEND

- DIRECT-PUSH BORING LOCATION
- SWMU BOUNDARY
- RAILROAD

NOTE:

1. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORING 17B07.

N

50' 0' 50' 100'

SCALE IN FEET

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Figure 16-1
SWMU 17 SOIL AND GROUNDWATER SAMPLING LOCATIONS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

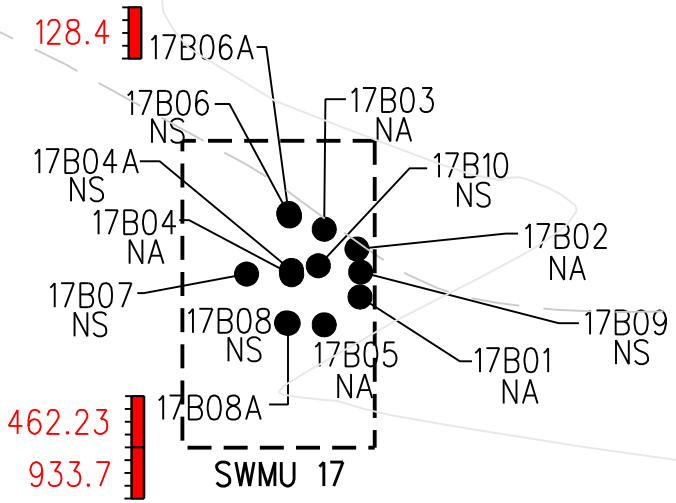
k:*armcorfi*ustn.sup*site.dgn
k:*armcorfi*ustn.sup*swmu0001.dgn
k:*res*global*stdbdr*ustn*civil*2d*wcibdr04.dgn
k:*armcorfi*ustn.sup*armconb.dgn
17VOCSO.DGN/11-MAY-99 15:12/DLS
COPYRIGHT © 1998 BURNS AND McDONNELL WASTE CONSULTANTS, INC.

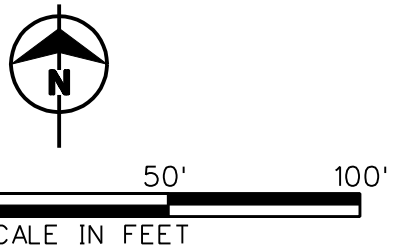
VOC SOIL DETECTIONS ABOVE SSLs				
PARAMETER	SSL (ug/Kg)	SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (ug/Kg)
TRICHLOROETHENE	60	17B06A/DP1D	0-4	98.4
TRICHLOROETHENE	60	17B08A/DP1	0-4	356 D
TRICHLOROETHENE	60	17B08A/DP2	4-8	655 D

QUALIFIER NOTES:
D = SAMPLE WAS DILUTED PRIOR TO ANALYSIS.

LEGEND

- ● DIRECT-PUSH BORING LOCATION
- 10.0 OR ▮ TOTAL VOC RESULTS (mg/Kg) - ALL DETECTIONS BELOW SSLs
- 10.0 OR ▮ TOTAL VOC RESULTS (mg/Kg) - ONE OR MORE DETECTIONS ABOVE SSLs
- NA NOT ANALYZED
- ND NOT DETECTED
- NS NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- - - - SWMU BOUNDARY





NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
2. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORING 17B07.
3. ONLY GROUNDWATER WAS COLLECTED FROM THE FOLLOWING LOCATIONS: 17B04A, 17B06, 17B08, 17B09, AND 17B10 (SEE SWMU 33 FOR DISCUSSION).
4. SEE SWMU 17 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

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Figure 16-2
SWMU 17 TOTAL VOC SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:*armcorfi*ustn.sup*site.dgn
k:*armcorfi*ustn.sup*swmu0001.dgn
k:*res*global*stdbdr*ustn*civil*2d*wcibdr04.dgn
k:*armcorfi*ustn.sup*armconb.dgn
17PBPH.DGN/11-MAY-99 14:53/DLS

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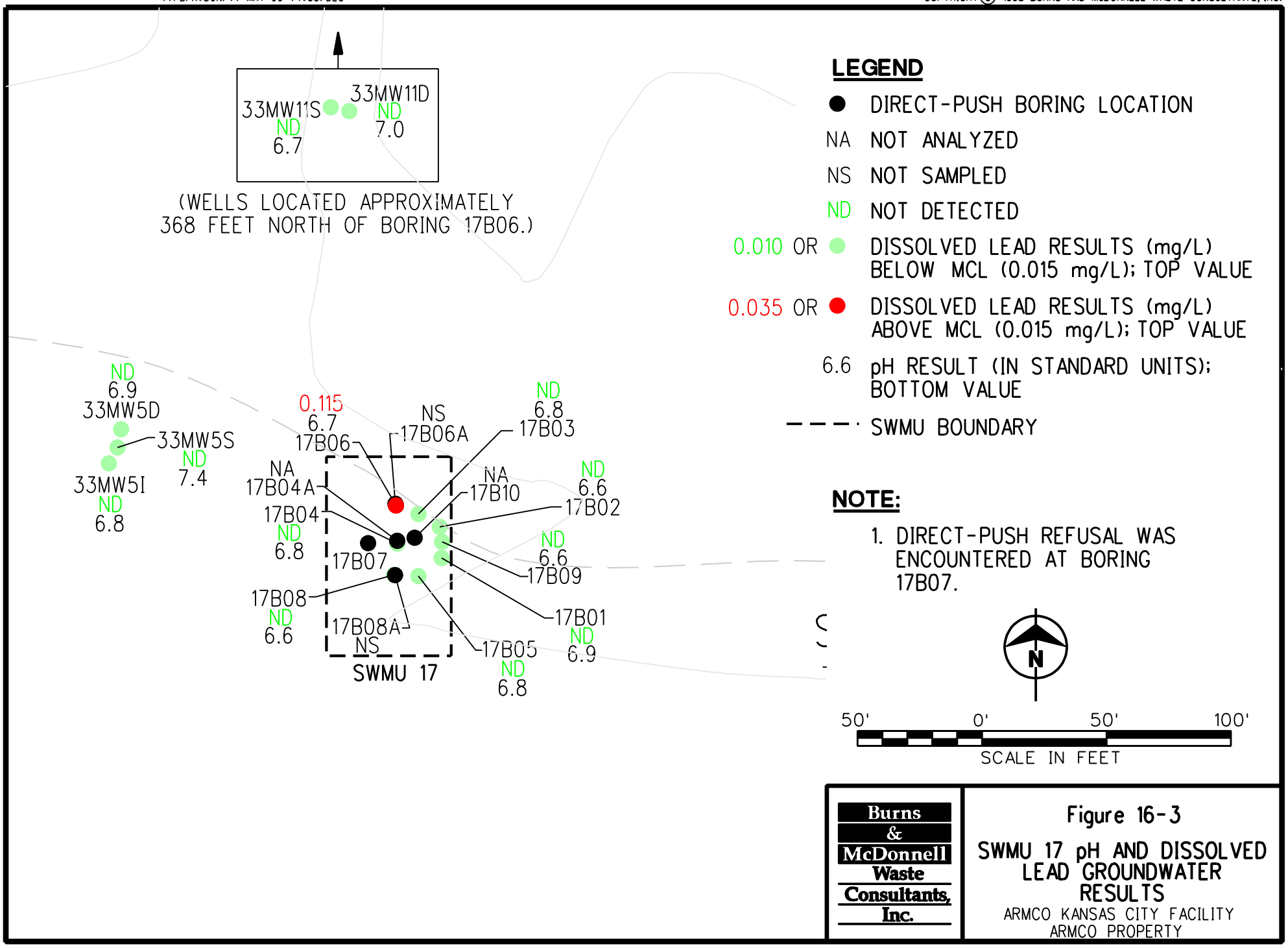

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Figure 16-3

SWMU 17 pH AND DISSOLVED LEAD GROUNDWATER RESULTS

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

18.0 SWMU 24 – WASTE HYDRAULIC LUBRICATING OIL STORAGE TANKS

18.1 SWMU BACKGROUND

18.1.1 Description of SWMU

The former Waste Hydraulic and Lubricating Oil Storage Tanks (SWMU 24), located on Armco and KCT property (Figure 1-2), functioned between 1975 and 1993 as a waste oil collection system for the entire Facility. Waste oil of various types was brought to the area in drummed containers or 600-gallon waste oil "tote boxes". Until 1991, the waste oil from SWMU 24 was incorporated into the heating oil supply; however, after November 1991, waste oil was sent off site for fuel blending. The defined SWMU area is approximately 1 acre in size.

When the SWMU was removed from service in 1993, its components were cleaned and subsequently dismantled and removed. The two ASTs at SWMU 24 were cut up and recycled in 1996.

Various records indicated that for a brief time in the 1980s, 1,1,1-TCA might have been mixed into the waste oil, which was subsequently mixed with the fuel oil and utilized in the boiler furnaces (AOC 4). There was no mechanism at the Boiler Furnace Area to incorporate the addition of any material to the fuel oil supply. If 1,1,1-TCA was added to the fuel oil system, it most likely would have been added in the waste oil area.

Based on the types of materials handled at SWMU 24, the primary constituents of potential concern were petroleum hydrocarbons and heavy metals associated with the waste oil, and VOCs.

As reported to USEPA and MDNR in a letter dated March 9, 1999, Armco sold a portion of its property, totaling less than one (1) acre, to KCT for construction of an overhead Railroad Bridge known as the Flyover Project to relieve transportation congestion and public safety issues in the area. As indicated on Figure 18-1, this parcel of land contained a portion of SWMU 24. As part

of the Flyover Project, the low-lying area at the center of SWMU 24 has been partially filled by KCT.

SWMU 24 was designated in the Permit as an IM SWMU. IM activities were completed as described in Section 18.2.

18.1.2 Release Potential

No documented spills are known to have occurred at this location. Stained soils have been identified at this location. The low area surrounding the two waste oil ASTs provided a form of secondary containment for the waste oil stored there. Although there was no secondary containment around the drums or hoppers, releases in those areas would have flowed to the low area around the ASTs.

The SWMU was removed from service in 1993, and any remaining waste oil in the area was removed at that time. Therefore, there is no ongoing risk of a release of waste oil to the environment. The primary release potential for SWMU 24 was to the surrounding surface and subsurface soils which could have been impacted by releases of waste oil to the ground surface.

18.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was evaluated through the collection of surface soil, subsurface soil, and groundwater samples. Table 18-1 presents a summary of the investigation activities for SWMU 24, and Figure 18-1 presents the sampling locations.

18.2.1 Interim Measures Activities

Eight surface soil samples were collected from four sampling grids (Grids 24G01 through 24G04) located in the low area in the center of SWMU 24 where ASTs were formerly located. As shown on Figure 18-1, this low area is approximately 10 feet below surrounding grade to the west, south, and east and the height of the slag berm to the north. Each surface soil sample was a composite of four aliquots collected across a sampling grid. Samples were collected from each

grid at two depth intervals (0 to 6 and 6 to 12 inches bgs). Surface soil samples were analyzed for VOCs, PAHs, TPH, and RCRA metals.

Subsurface soil samples were collected from six exploratory trenches (Trench 24T01 through 24T06) completed across the SWMU 24 area (see Figure 18-1) and analyzed for VOCs, PAHs, TPH, and RCRA metals. Trenches 24T01, 24T05, and 24T06 were located near the center of SWMU 24 where the majority of the waste oil handling occurred. Trenches 24T02 and 24T04 were located in the western portion and Trench 24T03 was located in the eastern portion of SWMU 24 in order to define the horizontal extent of constituents.

Perched groundwater seeped into Trench 24T06, and a single unfiltered groundwater sample was collected and analyzed for VOCs, PAHs, TPH, and total RCRA metals.

18.2.2 RFI Activities

During RFI Phase 1, six soil borings (Boring 24B01 through 24B06) were advanced and samples were collected from two to four depth intervals (0 to 4, 4 to 8, 8 to 12, and/or 12 to 16 feet bgs). Fourteen subsurface soil samples were analyzed for PAHs, RCRA metals, and pH. In addition, the samples collected from Boring 24B04 were analyzed for TPH. Perched groundwater with elevated PID readings was encountered in Boring 24B04, and a groundwater sample was collected and analyzed for VOCs, PAHs, TPH, and dissolved RCRA metals.

To further define the horizontal and vertical extent of subsurface soil constituents, two exploratory trenches (Trenches 24T07 and 24T08) were installed during RFI Phase 2 to the east and west, respectively, of SWMU 24. Four samples were collected from each of the trenches and analyzed in the field for lead using XRF. The samples were then sent to the analytical laboratory and analyzed for PAHs, RCRA metals, and pH.

To further define the horizontal extent of VOCs in groundwater, direct-push groundwater samples were collected from eight locations (Borings 06B06A, 06B07A, 06B10A, 06B11A, and 24B07 through 24B10) during RFI Phase 2 and analyzed for VOCs. Samples were collected

from the upper 10 feet of the water table at depths from 24 to 42 feet bgs. Borings identified as "06B_A" were installed adjacent to RFI Phase 1 boring locations (e.g., Boring 06B06) at SWMU 6, which is located directly north of SWMU 24.

Berms of gravel to cobble sized slag fill surround the former AST pit at SWMU 24. Exploratory trenches were utilized to sample this material since it was impenetrable by direct-push or hollow-stem auger boring methods. On the floor of the AST pit, there is a 1 to 2 feet layer of pea gravel-size slag fill underlain by silty clay. Direct-push borings were able to penetrate through this material. Perched groundwater was occasionally encountered above the slag fill/silty clay contact as a result of the lower permeability (and resultant lower infiltration rate) of the silty clay.

18.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Tables 18-2 through 18-5 present the analytical results of the soil samples collected from SWMU 24. Figures 18-2, 18-3, and 18-4 show the soil analytical results for RCRA metals, VOCs, and PAHs, respectively. TPH results are presented in Appendix U.

18.3.1 Metals and pH

During RFI Phase 1, 14 subsurface soil samples were collected from direct-push boring locations and analyzed for pH. As shown on Table 18-3, pH values were neutral (pH 7.8) to slightly basic (pH 9.3). There were no notable trends in changes in pH values with sample depth or location.

Figure 18-2 presents the soil analytical results for metals at SWMU 24. Eight surface soil, 14 direct-push subsurface soil, and 29 trench subsurface soil samples were collected and analyzed for RCRA metals. Table 18-8 presents the soil results that exceeded the screening limits at SWMU 24. Each of the RCRA metals was detected in at least one sample. However, none of the barium, mercury, or silver detections exceeded the 20 DAF SSLs (1,600, 2, and 34 mg/Kg, respectively); the highest concentrations for each of these metals were 780, 0.357, and 1.56 mg/Kg, respectively.

Arsenic was not detected in any of the surface soil samples, but was detected in 9 of the 29 trench soil samples, and all 14 of the direct-push soil boring samples. The highest concentration of arsenic (56.4 mg/Kg) was detected in the shallowest sample (0 to 4 feet bgs) collected from Boring 24B05 which was placed in the low area where the ASTs were formerly located. This value was the only detection that exceeded the 20 DAF SSL for arsenic (29 mg/Kg).

Chromium was detected in all of the soil samples collected at SWMU 24. The highest concentration of chromium (3,890 F mg/Kg) was detected in the shallowest sample (0 to 5 feet bgs) collected from Trench 24T02 in the central portion of the sampling area. This value was the only detection that exceeded the soil screening value for chromium of 3,540 mg/Kg (based on slag samples).

Cadmium was detected in all but one of the soil samples collected at SWMU 24. The 20 DAF SSL for cadmium (8 mg/Kg) was exceeded in all of the surface soil samples, two of the soil boring samples, and 15 of the trench soil samples. These exceedences ranged from 9.1 to 55.1 FJ* mg/Kg and were located in the central portion of the sampling area.

Lead was detected in all but two of the samples collected at SWMU 24. The 20 DAF SSL for lead (400 mg/Kg) was exceeded in half of the surface soil samples, two of the soil boring samples, and six of the trench soil samples. These exceedences ranged from 409 J* to 1,730 mg/Kg and were located in the central portion of the sampling area.

Selenium was detected in one trench sample and five of the soil boring samples. Selenium detections ranged from 0.9 J to 13.5 mg/Kg. The 20 DAF SSL for selenium (5 mg/Kg) was exceeded in the samples collected from the uppermost soil interval (0 to 4 feet bgs) at direct-push Borings 24B02 and 24B05 which were placed in the low area where the ASTs were formerly located.

As shown on Figure 18-2, the vertical and horizontal extent of arsenic, chromium, cadmium, lead, and selenium were adequately defined by the soil sampling locations within and/or surrounding the perimeter of SWMU 24.

18.3.2 VOCs

Eight surface soil and 21 trench soil samples were collected and analyzed for VOCs during the IM investigation. VOCs were not detected in any of the soil samples collected at SWMU 24. As shown on Figure 18-3, the nature and extent of VOC detections was adequately characterized by the sampling locations.

18.3.3 PAHs

Figure 18-4 presents the soil analytical results for PAHs in soil at SWMU 24. Eight surface soil, 14 direct-push soil boring, and 29 trench soil samples were collected and analyzed for PAHs. Table 18-8 presents the samples with PAH detections that exceeded their 20 DAF SSLs.

With the exception of the samples collected from surface soil Grid 24G01, PAHs were largely not detected in the surface soil samples. However, the surface soil sample collected from 0.5 to 1 foot bgs at Grid 24G01 had detections of benzo(a)anthracene (7.13 mg/Kg) and benzo(b)fluoranthene (11.4 mg/Kg) that exceeded the 20 DAF SSLs (2 and 5 mg/Kg, respectively). Total PAH concentrations ranged from 0.701 to 21.804 mg/Kg in the samples collected from the uppermost depth interval (0 to 4 feet bgs) from the direct-push borings, and benzo(a)anthracene (2.02 DJ mg/Kg) was detected at a concentration that slightly exceeded the 20 DAF SSL (2 mg/Kg) in the sample collected from the uppermost depth interval (0 to 4 feet bgs) at Boring 24B05. No exceedences of 20 DAF SSLs were noted for PAHs in samples collected below 4 feet bgs. As shown on Figure 18-4, the horizontal and vertical extent of PAHs in soils were well defined by sampling locations in the immediate area.

18.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

Tables 18-6 and 18-7 present the analytical results of the groundwater samples collected from SWMU 24. Figure 18-5 show the groundwater analytical results for VOCs. TPH results are presented in Appendix U.

18.4.1 Metals and pH

During the IM investigation, perched groundwater seeped into Trench 24T06, and a single unfiltered groundwater sample was collected and analyzed for total RCRA metals. Barium, cadmium, chromium, lead, and mercury were detected in this groundwater sample; however only cadmium (0.0333 mg/L) and lead (0.768 mg/L) were detected at concentrations that exceeded their groundwater screening MCLs (0.005 and 0.015 mg/L, respectively). It is likely that these groundwater exceedences were caused by particulate matter which was suspended in the sample rather than dissolved metals present in the groundwater.

During RFI Phase 1 activities in the fall of 1997, perched groundwater was also encountered in Boring 24B04 at 2.5 to 5.5 feet bgs. A groundwater sample was collected and analyzed for dissolved RCRA metals and pH. Dissolved barium (0.0699 mg/L) and dissolved arsenic (0.02 mg/L) were the only metals detected in this groundwater sample, and neither detection exceeded its groundwater screening MCL (2 and 0.05 mg/L, respectively). A slightly basic pH value (9.5) was noted in this groundwater sample.

18.4.2 VOCs

Ten groundwater samples were collected and analyzed for VOCs. Figure 18-5 shows the analytical results for the VOCs in groundwater. VOCs were not detected in five of the groundwater samples, and total VOC detections ranged from 5.39 to 682.24 µg/L. The groundwater sample collected from Boring 24B04 contained detections of cis-1,2-DCE (295 µg/L), TCE (149 µg/L), and vinyl chloride (5.34 µg/L) that exceeded their groundwater screening MCLs (70, 5, and 2 µg/L, respectively). This sample was collected from perched groundwater (2.5 to 5.5 feet bgs) seeping into the borehole during installation. No other exceedences of groundwater screening MCLs were noted in samples collected from the saturated zone (24 to 42 feet bgs). Therefore, the extent of VOC detections in groundwater was adequately defined by sampling locations which surrounded Boring 24B04.

18.4.3 PAHs

Two groundwater samples (Trench groundwater sample 24T06/GW1 and direct-push groundwater sample 24B04/DW1) were collected and analyzed for PAHs. Since PAHs were not detected in either of these samples, the nature and extent of PAHs in groundwater was adequately defined at SWMU 24.

18.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 24, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater and groundwater transport), the surface pathway (storm water runoff), and air pathways (volatilization and airborne dust).

The nature and extent of contamination at SWMU 24 was assessed through the collection of surface soil, subsurface soil, and groundwater samples. Metals were detected in soil throughout the SWMU 24 area and 20 DAF SSL exceedences (based on soil migration to groundwater) occurred from the surface to depths of 15 feet bgs (approximate deepest elevation 735 feet above MSL). Soil PAH exceedences were limited to a small area in the middle of the SWMU and occurred from the surface to a depth of 4 feet bgs (approximate elevation 738 feet above MSL). VOCs were not detected in any of the soil samples. Based on the data, soil transfer to groundwater could occur. The tendency for metals and PAHs to strongly adsorb to soil and the slightly basic soil pH values (7.8 to 9.3) at SWMU 24 should limit the potential for most vertical migration in soil.

VOCs were present in the groundwater at SWMU 24. However, the one sample with detections above MCLs was collected from perched groundwater (Boring 24B04) encountered at a shallow depth (2.5 feet bgs; approximate elevation 739 feet above MSL) above the saturated zone. Dissolved metals were either not-detected or detected at concentrations less the MCLs in this perched groundwater sample. At SWMU 24, the saturated zone was typically encountered between 24 to 40 feet bgs (approximate elevations ranging from 708 [deepest] to 722 [shallowest] feet above MSL). VOCs were either not-detected or detected in concentrations below MCLs in groundwater samples collected from the saturated zone. SWMU 24 is located

approximately 500 ft east of the Blue River and groundwater is expected to flow toward the Blue River in a west-northwest direction. VOCs are expected to degrade as they migrate in the direction of groundwater flow. Metals and PAHs are expected to strongly adsorb to soil rather than migrate with groundwater flow. Although groundwater transport is a potential migration pathway, it is not expected to be significant based on the groundwater data.

Surface cover material at SWMU 24 is primarily slag fill, and the former tank location has been partially backfilled as part of KCT's Flyover Project. Storm water runoff at SWMU 24 ponds and infiltrates in low-lying areas in the immediate SWMU area; therefore, storm water runoff should not provide a significant route for contaminant migration. Surface soil particulate (dust) could become airborne; however, airborne dust transport is not expected to be a significant migration pathway due to the partial backfill at the former tank locations. VOCs in the subsurface may partition to the gas phase and migrate to the air pathway. However, based on the limited areas of VOCs, constituent migration via volatilization to the air pathway is not expected to be significant for this area.

18.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at SWMU 24.

18.6.1 Human Health Evaluation

SVOCs and metals were identified as COPCs in both surface and subsurface soil. Groundwater samples from perched water zones as opposed to the saturated zone were not considered part of the groundwater medium for purposes of the HHRA. Benzene was the only COPC identified in groundwater. A HHRA and lead modeling were conducted for SWMU 24 to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. For the exposure scenarios evaluated, it was determined that there are no significant noncarcinogenic health effects or carcinogenic risks posed by the COPCs detected in soil or groundwater at SWMU 24. Assumptions and variables used in risk

calculations are discussed further in Chapter 4.0 of Appendix X. The results of the risk characterization and lead modeling are presented in Chapter 5.0 of Appendix X.

18.6.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 24. Therefore, an ecological risk evaluation was not conducted for SWMU 24.

18.7 SUMMARY

SWMU 24, located in the western portion of the Facility, is a former waste oil collection system and consisted of two ASTs. The defined SWMU area is approximately 1 acre in size. Surface soil, subsurface soil, and groundwater samples were collected at SWMU 24. Figures 18-2 through 18-4 present the soil analytical results for metals, Total VOCs, and Total PAHs, respectively. Figure 18-5 presents the groundwater analytical results for Total VOCs.

Surface soil and subsurface soil samples were collected for RCRA metals, pH, VOCs, PAHs, and/or TPH. Subsurface soil samples were collected from direct-push borings and exploratory trenches, and surface soil samples were collected from the former tank location. Soil pH values were neutral to slightly basic (pH 7.8 to 9.3) in the 14 samples analyzed. A total of 51 surface soil and subsurface soil samples were analyzed for RCRA metals and PAHs. Cadmium and lead were detected throughout the SWMU area at concentrations exceeding their 20 DAF SSLs (8 and 400 mg/Kg, respectively), and extended to 15 feet bgs. The highest concentrations of cadmium and lead were 55.1 FJ* and 1,730 mg/Kg, respectively. One detection each of arsenic and chromium and two detections of selenium exceeded 20 DAF SSLs. One detection each of the PAH compounds benzo(a)anthracene (7.13 mg/Kg), benzo(b)fluoranthene (11.4 mg/Kg), and benzo(a)anthracene (2.02 DJ mg/Kg) exceeded 20 DAF SSLs (2, 5, and 2 mg/Kg, respectively). These limited exceedences of arsenic, selenium, and PAHs occurred primarily in a small area in the immediate vicinity of the former tank location and extended no deeper than 5 feet bgs. VOCs were analyzed for in 29 surface and subsurface soil samples; however, VOCs were not detected.

Groundwater samples were collected for pH, RCRA metals, VOCs, and/or PAHs. RCRA metals analyses were performed on perched groundwater samples collected from Trench 24T06 (unfiltered therefore analyzed for total metals) and Boring 24B04 (dissolved metals). The unfiltered sample from Trench 24T06 had detections of cadmium and lead that exceeded groundwater screening MCLs; however, it is likely these were caused by particulate matter suspended in the sample rather than dissolved metals present in the groundwater. In the sample from Boring 24B04, dissolved metals detections were below groundwater screening MCLs. The groundwater pH in this sample was slightly basic (pH 9.5). VOCs were detected in five of the ten samples collected. VOC exceedences of MCLs occurred in a sample collected from perched groundwater encountered in the immediate vicinity of the former tank location (Boring 24B04), and had detections of cis-1,2-DCE (295 µg/L), TCE (149 µg/L), and vinyl chloride (5.34 µg/L) that exceeded the groundwater screening MCLs (70, 5, and 2 µg/L, respectively). The horizontal extent of VOCs was defined by the nine surrounding groundwater samples collected from the saturated zone, which all contained non-detect or concentrations below MCLs of VOCs. Two groundwater samples were analyzed for PAHs; however, no PAHs were detected.

Potential migration pathways at SWMU 24 include soil transfer to groundwater, groundwater transport, storm water runoff, volatilization to the air, and airborne dust migration. Soil detections of PAHs and metals exceeded 20 DAF SSLs (based on soil migration to groundwater), thus indicating that soil transfer to groundwater could occur. VOCs were not detected in soil. The tendency for metals and PAHs to strongly adsorb to soil and the typical slightly basic to basic soil pH conditions at the Facility are expected to limit vertical migration of metals in soil.

Groundwater samples contained detections of VOCs. However, VOCs were primarily detected in the groundwater sample collected from the perched groundwater, and VOCs were either non-detect or detected in concentrations below MCLs in groundwater samples collected from the saturated zone. VOCs are expected to degrade as they migrate in the direction of groundwater flow. Although groundwater transport is a potential migration pathway for SWMU 24, it is not expected to be significant based on the groundwater data.

Storm water runoff ponds and infiltrates in low-lying areas in the immediate SWMU 24 area. The area has been partially backfilled as part of KCT's Flyover Project, which should limit airborne dust migration of surface soil particulate. The limited detections of VOCs in the subsurface soil have the potential to partition to the gas phase and migrate to and via the air pathway; however this pathway is not expected to be significant.

A risk evaluation was conducted for SWMU 24. For the human health evaluation, COPCs identified included metals and PAHs in surface and subsurface soil, and benzene in groundwater. Therefore, a HHRA and lead modeling were conducted to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. No significant risk was posed by the COPCs in soil or groundwater at SWMU 24 for these exposure scenarios. Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted for SWMU 24.

* * * * *

Table 18-1
SWMU 24 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis						Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	VOC	PAH	TPH	RCRA Metals	pH	Comments	Number
INTERIM MEASURES COMPOSITE GRID SURFACE SOIL SAMPLES												
24G01	SR1	0 - 0.5	10/30/1996	IM		X	X	X	X			D96-12383-1
	SR2	0.5 - 1	10/30/1996	IM		X	X	X	X			D96-12383-2
	SR2D	0.5 - 1	10/30/1996	IM		X	X	X	X		Field Duplicate	D96-12383-3
24G02	SR1	0 - 0.5	10/30/1996	IM		X	X	X	X			D96-12383-4
	SR1MS	0 - 0.5	10/30/1996	IM		X	X		X		Matrix Spike	D96-12383-5
	SR1MSD	0 - 0.5	10/30/1996	IM		X	X		X		Matrix Spike Duplicate	D96-12383-6
	SR2	0.5 - 1	10/30/1996	IM		X	X	X	X			D96-12383-7
24G03	SR1	0 - 0.5	10/30/1996	IM		X	X	X	X			D96-12383-8
	SR1R		10/30/1996	IM		X			X		Rinsate	D96-12383-9
	SR2	0.5 - 1	10/30/1996	IM		X	X	X	X			D96-12383-10
24G04	SR1	0 - 0.5	10/30/1996	IM		X	X	X	X			D96-12383-11
	SR2	0.5 - 1	10/30/1996	IM		X	X	X	X			D96-12383-12
DIRECT-PUSH SUBSURFACE SOIL SAMPLES												
24B01	DP1	0 - 4	9/10/1997	1			X		X	X		D97-11023-1
	DP2	6 - 10	9/10/1997	1			X		X	X		D97-11023-2
	DP2R		9/10/1997	1			X		X		Rinsate	D97-11023-3
24B02	DP1	0 - 4	9/10/1997	1			X		X	X		D97-11023-4
	DP2	4 - 8	9/10/1997	1			X		X	X		D97-11023-5
	DP2D	4 - 8	9/10/1997	1			X		X	X	Field Duplicate	D97-11023-6
24B03	DP1	0 - 4	9/10/1997	1			X		X	X		D97-11023-7
	DP1MS	0 - 4	9/10/1997	1			X		X		Matrix Spike	D97-11023-8
	DP1MSD	0 - 4	9/10/1997	1			X		X		Matrix Spike Duplicate	D97-11023-9
	DP2	4 - 8	9/10/1997	1			X		X	X		D97-11023-10
24B04	DP1	0 - 4	9/10/1997	1			X	X	X	X		D97-11023-12
	DP2	4 - 8	9/10/1997	1			X	X	X	X		D97-11023-13
24B05	DP1	0 - 4	9/10/1997	1			X		X	X		D97-11023-14
	DP2	4 - 8	9/10/1997	1			X		X	X		D97-11023-15
24B06	DP1	0 - 4	9/10/1997	1			X		X	X		D97-11023-16
	DP2	4 - 8	9/10/1997	1			X		X	X		D97-11023-17
	DP3	8 - 12	9/10/1997	1			X		X	X		D97-11023-18
	DP4	12 - 16	9/10/1997	1			X		X	X		D97-11023-19
INTERIM MEASURES TRENCH SOIL SAMPLES												
24T01	SB1	0 - 5	11/7/1996	IM		X	X	X	X			D96-12760-5
	SB2	5 - 10	11/7/1996	IM		X	X	X	X			D96-12760-6
	SB2D	5 - 10	11/7/1996	IM		X	X	X	X		Field Duplicate	D96-12760-7
	SB3	10 - 15	11/7/1996	IM		X	X	X	X			D96-12760-8
	SB4	0 - 5	11/7/1996	IM		X	X	X	X			D96-12760-9
	SB5	5 - 10	11/7/1996	IM		X	X	X	X			D96-12760-10
	SB6	10 - 15	11/7/1996	IM		X	X	X	X			D96-12760-11
24T02	SB1	0 - 5	11/8/1996	IM		X	X	X	X			D96-12805-1
	SB2	5 - 10	11/8/1996	IM		X	X	X	X			D96-12805-2
	SB3	10 - 15	11/8/1996	IM		X	X	X	X			D96-12805-3
24T03	SB1	0 - 5	11/7/1996	IM		X	X	X	X			D96-12760-2
	SB1R		11/7/1996	IM		X	X	X	X		Rinsate	D96-12760-1
	SB2	5 - 10	11/7/1996	IM		X	X	X	X			D96-12760-3
	SB3	10 - 15	11/7/1996	IM		X	X	X	X			D96-12760-4
24T04	SB1	0 - 5	11/8/1996	IM		X	X	X	X			D96-12805-4
	SB2	5 - 10	11/8/1996	IM		X	X	X	X			D96-12805-5
	SB3	10 - 15	11/8/1996	IM		X	X	X	X			D96-12805-6
	SB3MS	10 - 15	11/8/1996	IM		X	X		X		Matrix Spike	D96-12805-21
	SB3MSD	10 - 15	11/8/1996	IM		X	X		X		Matrix Spike Duplicate	D96-12805-22
	SB3R		11/8/1996	IM		X	X	X	X		Rinsate	D96-12805-9

Table 18-1
SWMU 24 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis						Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	VOC	PAH	TPH	RCRA Metals	pH	Comments	Number
24T05	SB1	0 - 5	11/8/1996	IM		X	X	X	X			D96-12805-10
	SB2	5 - 10	11/8/1996	IM		X	X	X	X			D96-12805-11
	SB3	10 - 15	11/8/1996	IM		X	X	X	X			D96-12805-12
24T06	SB1	0 - 5	11/8/1996	IM		X	X	X	X			D96-12805-13
	SB2	5 - 10	11/8/1996	IM		X	X	X	X			D96-12805-14
	SB2D	5 -10	11/8/1996	IM		X	X	X	X		Field Duplicate	D96-12805-15
	SB3	10 - 15	11/8/1996	IM		X	X	X	X			D96-12805-16
	SB3MS	10 - 15	11/8/1996	IM		X	X		X		Matrix Spike	D96-12805-23
	SB3MSD	10 - 15	11/8/1996	IM		X	X		X		Matrix Spike Duplicate	D96-12805-24
PHASE 2 TRENCH SOIL SAMPLES												
24T07	SB1	10 - 15	5/20/1998	2	X		X		X	X		D98-3835-1
	SB2	15 - 20	5/20/1998	2	X		X		X	X		D98-3835-2
	SB11	10 - 15	5/20/1998	2	X		X		X	X		D98-3835-3
	SB12	15 - 20	5/20/1998	2	X		X		X	X		D98-3835-4
24T08	SB1	0 - 2	5/20/1998	2	X		X		X	X		D98-3835-5
	SB1D	0 - 2	5/20/1998	2	X		X		X	X	Field Duplicate	D98-3835-6
	SB2	2 - 4	5/20/1998	2	X		X		X	X		D98-3835-7
	SB11	0 - 2	5/20/1998	2	X		X		X	X		D98-3835-8
	SB12	2 - 4	5/20/1998	2	X		X		X	X		D98-3835-9
INTERIM MEASURES TRENCH GROUNDWATER SAMPLES												
24T06	GW1	NA	11/8/1996	IM		X	X	X	X			D96-12805-18
DIRECT-PUSH GROUNDWATER SAMPLES												
06B06A	DW1	30 - 32	5/22/1998	2		X						D98-3877-5
06B07A	DW1	30 - 32	5/22/1998	2		X						D98-3877-6
06B10A	DW1	30 - 32	5/22/1998	2		X						D98-3877-2
	DW1MS	30 - 32	5/22/1998	2		X						D98-3877-3
	DW1MSD	30 - 32	5/22/1998	2		X						D98-3877-4
06B11A	DW1	35 - 37	5/22/1998	2		X						D98-3742-2
24B04	DW1	2.5 - 5.5	9/10/1997	1		X	X	X	X	X	Hit groundwater with elevated PID	D97-11023-11
24B07	DW1	24 - 26	5/18/1998	2		X						D98-3742-1
24B08	DW1	40 - 42	5/26/1998	2		X						D98-3898-2
	DW1D	40 - 42	5/26/1998	2		X					Field Duplicate	D98-3898-3
24B09	DW1	37 - 39	5/22/1998	2		X						D98-3877-7
24B10	DW1	30 - 32	5/26/1998	2		X						D98-3898-1

Notes:

ft = feet

IM = Interim Measures

PAH = Polyaromatic Hydrocarbons

PID = photoionization detector

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)

VOC = Volatile Organic Compounds

XRF = X-Ray Fluorescence Spectroscopy

Table 18-2
SWMU 24 Interim Measures Composite Grid Surface Soil Results
Armco Kansas City Facility

Sample Point:		24G01/SR1	24G01/SR2	24G01/SR2D	24G02/SR1	24G02/SR2	24G03/SR1
Date Sampled:		10/30/1996	10/30/1996	10/30/1996	10/30/1996	10/30/1996	10/30/1996
Sample Depth From:		0	0.5	0.5	0	0.5	0
Sample Depth To:		0.5	1	1	0.5	1	0.5
Laboratory Number:		D96-12383-1	D96-12383-2	D96-12383-3 Duplicate	D96-12383-4	D96-12383-7	D96-12383-8
Sample Type:							
Volatiles	UNITS						
		ND	ND	ND	ND	ND	ND
Semivolatiles	UNITS						
Acenaphthene	mg/Kg	4.07 U	4.15 U	*2.16 J*	4.06 U	4 U	14.5 U
Anthracene	mg/Kg	4.07 U	*1.46 J*	*3.94 J*	4.06 U	4 U	14.5 U
Benzo(a)anthracene	mg/Kg	4.07 U	*3.44 J*	*7.13*	4.06 U	4 U	14.5 U
Benzo(a)pyrene	mg/Kg	4.07 U	4.15 U	*6.62*	4.06 U	4 U	14.5 U
Benzo(b)fluoranthene	mg/Kg	4.07 U	4.15 U	*11.4*	4.06 U	4 U	14.5 U
Chrysene	mg/Kg	4.07 U	*2.99 J*	*8.11*	4.06 U	4 U	14.5 U
Fluoranthene	mg/Kg	4.07 U	*5.04*	*14.4*	4.06 U	4 U	14.5 U
Fluorene	mg/Kg	4.07 U	4.15 U	*1.89 J*	4.06 U	4 U	14.5 U
Indeno(1,2,3-cd)pyrene	mg/Kg	4.07 U	4.15 U	*2.93 J*	4.06 U	4 U	14.5 U
Phenanthrene	mg/Kg	4.07 U	*7.74*	*20.6*	4.06 U	4 U	14.5 U
Pyrene	mg/Kg	4.07 U	*7.4*	*20.1*	4.06 U	4 U	14.5 U
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	mg/Kg	ND	*28.07*	*99.28*	ND	ND	ND
Metals, Total	UNITS						
Barium, Total	mg/Kg	*437*	*159*	*188*	*277*	*153*	*260*
Cadmium, Total	mg/Kg	*13.6 J**	*13.7 J**	*15 J**	*16 J**	*11 J**	*16.3 J**
Chromium, Total	mg/Kg	*232 J**	*84 J**	*134 J**	*138 J**	*90.2 J**	*115 J**
Lead, Total	mg/Kg	*1,140 J**	*464 J**	*409 J**	*416 J**	*295 J**	*365 J**
Mercury, Total	mg/Kg	*0.202*	0.151 U	*0.19*	*0.149*	*0.161*	0.176 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-2
SWMU 24 Interim Measures Composite Grid Surface Soil Results
Armco Kansas City Facility

Sample Point:		24G03/SR2	24G04/SR1	24G04/SR2
Date Sampled:		10/30/1996	10/30/1996	10/30/1996
Sample Depth From:		0.5	0	0.5
Sample Depth To:		1	0.5	1
Laboratory Number:		D96-12383-10	D96-12383-11	D96-12383-12
Sample Type:				
Volatiles	UNITS			
		ND	ND	ND
Semivolatiles	UNITS			
Acenaphthene	mg/Kg	1.43 U	1.54 U	1.44 U
Anthracene	mg/Kg	1.43 U	1.54 U	1.44 U
Benzo(a)anthracene	mg/Kg	1.43 U	1.54 U	1.44 U
Benzo(a)pyrene	mg/Kg	1.43 U	1.54 U	1.44 U
Benzo(b)fluoranthene	mg/Kg	*1.13 J*	1.54 U	1.44 U
Chrysene	mg/Kg	1.43 U	1.54 U	1.44 U
Fluoranthene	mg/Kg	1.43 U	1.54 U	1.44 U
Fluorene	mg/Kg	1.43 U	1.54 U	1.44 U
Indeno(1,2,3-cd)pyrene	mg/Kg	1.43 U	1.54 U	1.44 U
Phenanthrene	mg/Kg	1.43 U	1.54 U	1.44 U
Pyrene	mg/Kg	*1.5*	1.54 U	1.44 U
Total Detected SVOCs	UNITS			
Total Semi-Volatiles	mg/Kg	*2.63*	ND	ND
Metals, Total	UNITS			
Barium, Total	mg/Kg	*220*	*138*	*134*
Cadmium, Total	mg/Kg	*13.8 J**	*19.7 J**	*14.1 J**
Chromium, Total	mg/Kg	*92.8 J**	*183 J**	*59.2 J**
Lead, Total	mg/Kg	*376 J**	*473 J**	*311 J**
Mercury, Total	mg/Kg	0.173 U	0.187 U	0.174 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted sample
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-3
SWMU 24 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		24B01/DP1	24B01/DP2	24B02/DP1	24B02/DP2	24B02/DP2D	24B03/DP1	24B03/DP2
Date Sampled:		9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997
Sample Depth From:		0	6	0	4	4	0	4
Sample Depth To:		4	10	4	8	8	4	8
Laboratory Number:		D97-11023-1	D97-11023-2	D97-11023-4	D97-11023-5	D97-11023-6	D97-11023-7	D97-11023-10
Sample Type:						Duplicate		
Semivolatiles	UNITS							
Acenaphthene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	0.35 U	0.429 U
Anthracene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	0.35 U	0.429 U
Benzo(a)anthracene	mg/Kg	*0.196 J*	0.419 U	0.395 U	0.447 U	0.426 U	*0.533*	0.429 U
Benzo(a)pyrene	mg/Kg	*0.195 J*	0.419 U	0.395 U	0.447 U	0.426 U	*0.36*	0.429 U
Benzo(b)fluoranthene	mg/Kg	*0.298 J*	0.419 U	*0.234 J*	0.447 U	0.426 U	*0.643*	0.429 U
Benzo(g,h,i)perylene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	*0.25 J*	0.429 U
Benzo(k)fluoranthene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	*0.272 J*	0.429 U
Chrysene	mg/Kg	*0.208 J*	0.419 U	0.395 U	0.447 U	0.426 U	*0.469*	0.429 U
Dibenzo(a,h)anthracene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	0.35 U	0.429 U
Fluoranthene	mg/Kg	*0.365 J*	0.419 U	*0.21 J*	0.447 U	0.426 U	*0.837*	0.429 U
Fluorene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	0.35 U	0.429 U
Indeno(1,2,3-cd)pyrene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	*0.246 J*	0.429 U
Naphthalene	mg/Kg	0.388 U	0.419 U	0.395 U	0.447 U	0.426 U	0.35 U	0.429 U
Phenanthrene	mg/Kg	*0.404*	*0.214 J*	0.395 U	0.447 U	0.426 U	*0.805*	0.429 U
Pyrene	mg/Kg	*0.36 J*	0.419 U	*0.257 J*	0.447 U	0.426 U	*0.93*	0.429 U
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	*2.026*	*0.214*	*0.701*	ND	ND	*5.345*	ND
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	*18.2*	*4.96*	*8.26*	*8.14*	*11.6*	*10.7*	*5.58*
Barium, Total	mg/Kg	*153*	*176*	*120*	*232*	*200*	*146*	*195*
Cadmium, Total	mg/Kg	*6.5*	*0.88*	*3.16*	*0.55 J*	*0.44 J*	*2.58*	*0.65*
Chromium, Total	mg/Kg	*73.1*	*17.1*	*51.8*	*19.5*	*17.7*	*22.4*	*15.3*
Lead, Total	mg/Kg	*223 F*	*18.3 F*	*69.4 F*	*16 F*	*14.7 F*	*129 F*	*15.6 F*
Mercury, Total	mg/Kg	*0.105 J*	0.155 U	*0.0642 J*	0.166 U	*0.045 J*	*0.297*	*0.0464 J*
Selenium, Total	mg/Kg	*0.9 J*	1.29 U	*5.23*	1.38 U	1.31 U	*0.92 J*	1.3 U
Silver, Total	mg/Kg	*0.53 J*	0.64 U	0.61 U	0.69 U	0.65 U	0.53 U	0.65 U
Physical Properties of Soil	UNITS							
pH	SU	*8.3*	*8*	*8.2*	*8.2*	*8.1*	*7.8*	*8*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-3
SWMU 24 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		24B04/DP1	24B04/DP1	24B04/DP2	24B05/DP1	24B05/DP1	24B05/DP2	24B06/DP1
Date Sampled:		9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997	9/10/1997
Sample Depth From:		0	0	4	0	0	4	0
Sample Depth To:		4	4	8	4	4	8	4
Laboratory Number:		D97-11023-12	D97-11023-12R2	D97-11023-13	D97-11023-14	D97-11023-14R2	D97-11023-15	D97-11023-16
Sample Type:								
Semivolatiles	UNITS							
Acenaphthene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.365 J*	3.76 DU	0.425 U	0.375 U
Anthracene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.675*	3.76 DU	0.425 U	0.375 U
Benzo(a)anthracene	mg/Kg	*0.565 J*	8.05 DU	0.443 U	*2.02*	*2.02 DJ*	0.425 U	0.375 U
Benzo(a)pyrene	mg/Kg	*0.541 J*	8.05 DU	0.443 U	*1.57*	3.76 DU	0.425 U	0.375 U
Benzo(b)fluoranthene	mg/Kg	*0.735 J*	8.05 DU	0.443 U	*2.21*	*1.95 DJ*	0.425 U	*0.201 J*
Benzo(g,h,i)perylene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.683*	3.76 DU	0.425 U	0.375 U
Benzo(k)fluoranthene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.807*	3.76 DU	0.425 U	0.375 U
Chrysene	mg/Kg	*0.58 J*	8.05 DU	0.443 U	*1.78*	*1.91 DJ*	0.425 U	0.375 U
Dibenzo(a,h)anthracene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.276 J*	3.76 DU	0.425 U	0.375 U
Fluoranthene	mg/Kg	*0.761 J*	8.05 DU	0.443 U	*2.5*	*3.41 DJ*	0.425 U	*0.191 J*
Fluorene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.35 J*	3.76 DU	0.425 U	0.375 U
Indeno(1,2,3-cd)pyrene	mg/Kg	0.805 U	8.05 DU	0.443 U	*0.675*	3.76 DU	0.425 U	0.375 U
Naphthalene	mg/Kg	*0.521 J*	8.05 DU	0.443 U	*0.293 J*	3.76 DU	0.425 U	0.375 U
Phenanthrene	mg/Kg	*1.33*	8.05 DU	0.443 U	*2.86*	*3.4 DJ*	0.425 U	0.375 U
Pyrene	mg/Kg	*1.56*	8.05 DU	0.443 U	*4.74*	*3.37 DJ*	0.425 U	*0.19 J*
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	*6.593*	ND	ND	*21.804*	*16.06*	ND	*0.582*
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	*15.9*	NA	*5.56*	*56.4*	NA	*4.63*	*14.6*
Barium, Total	mg/Kg	*135*	NA	*197*	*155*	NA	*135*	*354*
Cadmium, Total	mg/Kg	*3.69*	NA	*0.8*	*3.32*	NA	*0.44 J*	*9.1*
Chromium, Total	mg/Kg	*92.2*	NA	*17.5*	*31.2*	NA	*15.5*	*269*
Lead, Total	mg/Kg	*256 F*	NA	*19.6 F*	*566 F*	NA	*12.2 F*	*330 F*
Mercury, Total	mg/Kg	*0.0999 J*	NA	*0.0613 J*	*0.357*	NA	0.154 U	*0.083 J*
Selenium, Total	mg/Kg	1.22 U	NA	1.34 U	*13.5*	NA	1.29 U	5.8 DU
Silver, Total	mg/Kg	*0.29 J*	NA	0.67 U	*1.56*	NA	0.64 U	*0.86*
Physical Properties of Soil	UNITS							
pH	SU	*8.1*	NA	*7.9*	*7.5*	NA	*7.8*	*9.3*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-3
SWMU 24 Phase 1 Direct-Push Soil Results
Armco Kansas City Facility

	Sample Point:	24B06/DP2	24B06/DP3	24B06/DP4
	Date Sampled:	9/10/1997	9/10/1997	9/10/1997
	Sample Depth From:	4	8	12
	Sample Depth To:	8	12	16
	Laboratory Number:	D97-11023-17	D97-11023-18	D97-11023-19
	Sample Type:			
Semivolatiles	UNITS			
Acenaphthene	mg/Kg	0.383 U	0.384 U	0.407 U
Anthracene	mg/Kg	0.383 U	*0.241 J*	0.407 U
Benzo(a)anthracene	mg/Kg	0.383 U	*0.6*	0.407 U
Benzo(a)pyrene	mg/Kg	0.383 U	*0.543*	0.407 U
Benzo(b)fluoranthene	mg/Kg	0.383 U	*0.78*	0.407 U
Benzo(g,h,i)perylene	mg/Kg	0.383 U	*0.263 J*	0.407 U
Benzo(k)fluoranthene	mg/Kg	0.383 U	*0.305 J*	0.407 U
Chrysene	mg/Kg	0.383 U	*0.592*	0.407 U
Dibenzo(a,h)anthracene	mg/Kg	0.383 U	0.384 U	0.407 U
Fluoranthene	mg/Kg	*0.225 J*	*0.996*	0.407 U
Fluorene	mg/Kg	0.383 U	0.384 U	0.407 U
Indeno(1,2,3-cd)pyrene	mg/Kg	0.383 U	*0.247 J*	0.407 U
Naphthalene	mg/Kg	0.383 U	*0.2 J*	0.407 U
Phenanthrene	mg/Kg	0.383 U	*0.852*	0.407 U
Pyrene	mg/Kg	*0.194 J*	*1.03*	0.407 U
Total Detected SVOCs	UNITS			
Total Semi-Volatiles	mg/Kg	*0.419*	*6.649*	ND
Metals, Total	UNITS			
Arsenic, Total	mg/Kg	*7.89*	*21.1*	*4.6*
Barium, Total	mg/Kg	*245*	*174*	*172*
Cadmium, Total	mg/Kg	*4.32*	*10.9*	*0.56 J*
Chromium, Total	mg/Kg	*64.3*	*34.2*	*13.6*
Lead, Total	mg/Kg	*155 F*	*802 F*	*12.8 F*
Mercury, Total	mg/Kg	*0.0522 J*	*0.12 J*	0.148 U
Selenium, Total	mg/Kg	1.16 U	*1.42*	1.23 U
Silver, Total	mg/Kg	0.58 U	*0.87*	0.62 U
Physical Properties of Soil	UNITS			
pH	SU	*9.2*	*7.8*	*7.8*

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-4
SWMU 24 Interim Measures Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T01/SB1	24T01/SB2	24T01/SB2D	24T01/SB3	24T01/SB4	24T01/SB5
Date Sampled:		11/7/1996	11/7/1996	11/7/1996	11/7/1996	11/7/1996	11/7/1996
Sample Depth From:		0	5	5	10	0	5
Sample Depth To:		5	10	10	15	5	10
Laboratory Number:		D96-12760-5	D96-12760-6	D96-12760-7	D96-12760-8	D96-12760-9	D96-12760-10
Sample Type:				Duplicate			
Volatiles	UNITS						
		ND	ND	ND	ND	ND	ND
Semivolatiles	UNITS						
Anthracene	mg/Kg	4.14 U	0.394 U	0.379 U	0.408 U	0.365 U	0.391 U
Benzo(a)anthracene	mg/Kg	4.14 U	0.394 U	0.379 U	0.408 U	***0.271 J***	0.391 U
Benzo(a)pyrene	mg/Kg	4.14 U	0.394 U	0.379 U	0.408 U	***0.376***	0.391 U
Benzo(b)fluoranthene	mg/Kg	4.14 U	0.394 U	***0.211 J***	0.408 U	***0.912***	0.391 U
Benzo(g,h,i)perylene	mg/Kg	4.14 U	0.394 U	0.379 U	0.408 U	***0.42***	0.391 U
Benzo(k)fluoranthene	mg/Kg	4.14 U	0.394 U	***0.221 J***	0.408 U	***0.482***	0.391 U
Chrysene	mg/Kg	4.14 U	0.394 U	***0.202 J***	0.408 U	***0.798***	0.391 U
Fluoranthene	mg/Kg	4.14 U	***0.191 J***	***0.355 J***	0.408 U	***0.597***	0.391 U
Indeno(1,2,3-cd)pyrene	mg/Kg	4.14 U	0.394 U	0.379 U	0.408 U	***0.359 J***	0.391 U
Naphthalene	mg/Kg	4.14 U	0.394 U	***0.198 J***	0.408 U	0.365 U	0.391 U
Phenanthrene	mg/Kg	4.14 U	***0.237 J***	***0.478***	0.408 U	***0.246 J***	0.391 U
Pyrene	mg/Kg	4.14 U	***0.169 J***	***0.315 J***	0.408 U	***0.698***	0.391 U
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	mg/Kg	ND	***0.597***	***1.98***	ND	***5.159***	ND
Metals, Total	UNITS						
Barium, Total	mg/Kg	***506***	***331***	***245***	***137***	***546***	***167***
Cadmium, Total	mg/Kg	***40.4 F***	***31.1 F***	***22.8 F***	***6.5 F***	***49.5 F***	***5.83 F***
Chromium, Total	mg/Kg	***1,810 F***	***72.4 F***	***325 F***	***15.8 F***	***1,020 F***	***30.3 F***
Lead, Total	mg/Kg	***408 F***	***401 F***	***290 F***	***12.1 JF***	***1,480 F***	***33.9 F***
Mercury, Total	mg/Kg	0.151 U	0.143 U	0.138 U	0.148 U	0.133 U	0.142 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted for Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-4
SWMU 24 Interim Measures Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T01/SB6	24T02/SB1	24T02/SB2	24T02/SB3	24T03/SB1	24T03/SB2
Date Sampled:		11/7/1996	11/8/1996	11/8/1996	11/8/1996	11/7/1996	11/7/1996
Sample Depth From:		10	0	5	10	0	5
Sample Depth To:		15	5	10	15	5	10
Laboratory Number:		D96-12760-11	D96-12805-1	D96-12805-2	D96-12805-3	D96-12760-2	D96-12760-3
Sample Type:							
Volatiles	UNITS						
		ND	ND	ND	ND	ND	ND
Semivolatiles	UNITS						
Anthracene	mg/Kg	0.43 U	0.354 U	***0.31 J***	0.406 U	0.389 U	0.382 U
Benzo(a)anthracene	mg/Kg	0.43 U	***0.122 J***	***0.209 J***	0.406 U	0.389 U	0.382 U
Benzo(a)pyrene	mg/Kg	0.43 U	***0.121 J***	***0.191 J***	0.406 U	0.389 U	0.382 U
Benzo(b)fluoranthene	mg/Kg	0.43 U	***0.192 J***	***0.272 J***	0.406 U	0.389 U	***0.214 J***
Benzo(g,h,i)perylene	mg/Kg	0.43 U	***0.118 J***	0.371 U	0.406 U	0.389 U	***0.204 J***
Benzo(k)fluoranthene	mg/Kg	0.43 U	0.354 U	0.371 U	0.406 U	0.389 U	0.382 U
Chrysene	mg/Kg	0.43 U	***0.129 J***	***0.22 J***	0.406 U	0.389 U	***0.321 J***
Fluoranthene	mg/Kg	0.43 U	0.354 U	***0.412***	0.406 U	0.389 U	***0.283 J***
Indeno(1,2,3-cd)pyrene	mg/Kg	0.43 U	0.354 U	0.371 U	0.406 U	0.389 U	0.382 U
Naphthalene	mg/Kg	0.43 U	0.354 U	0.371 U	0.406 U	0.389 U	0.382 U
Phenanthrene	mg/Kg	0.43 U	0.354 U	***0.313 J***	0.406 U	0.389 U	***0.462***
Pyrene	mg/Kg	0.43 U	0.354 U	***0.299 J***	0.406 U	0.389 U	***0.399***
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	mg/Kg	ND	***0.682***	***2.226***	ND	ND	***1.883***
Metals, Total	UNITS						
Barium, Total	mg/Kg	***179***	***294***	***128***	***177***	***733***	***552***
Cadmium, Total	mg/Kg	***6.33 F***	***32.1 FJ****	***11 FJ****	***5.75 FJ****	***53.5 F***	***49.1 F***
Chromium, Total	mg/Kg	***27.7 F***	***3,890 F***	***97.6 F***	***15.5 F***	***1,340 F***	***1,070 F***
Lead, Total	mg/Kg	***27.6 F***	***15.8***	***158***	***11.6 J***	***1,280 F***	***959 F***
Mercury, Total	mg/Kg	0.156 U	0.129 U	***0.139***	0.148 U	0.142 U	0.139 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted for Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-4
SWMU 24 Interim Measures Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T03/SB3	24T04/SB1	24T04/SB2	24T04/SB3	24T05/SB1	24T05/SB2
Date Sampled:		11/7/1996	11/8/1996	11/8/1996	11/8/1996	11/8/1996	11/8/1996
Sample Depth From:		10	0	5	10	0	5
Sample Depth To:		15	5	10	15	5	10
Laboratory Number:		D96-12760-4	D96-12805-4	D96-12805-5	D96-12805-6	D96-12805-10	D96-12805-11
Sample Type:							
Volatiles	UNITS						
		ND	ND	ND	ND	ND	ND
Semivolatiles	UNITS						
Anthracene	mg/Kg	0.387 U	***0.328 J***	0.419 U	0.418 U	0.362 U	1.38 U
Benzo(a)anthracene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Benzo(a)pyrene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Benzo(b)fluoranthene	mg/Kg	0.387 U	***0.208 J***	0.419 U	0.418 U	0.362 U	1.38 U
Benzo(g,h,i)perylene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Benzo(k)fluoranthene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Chrysene	mg/Kg	0.387 U	***0.207 J***	0.419 U	0.418 U	0.362 U	1.38 U
Fluoranthene	mg/Kg	0.387 U	***0.262 J***	0.419 U	0.418 U	0.362 U	1.38 U
Indeno(1,2,3-cd)pyrene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Naphthalene	mg/Kg	0.387 U	0.386 U	0.419 U	0.418 U	0.362 U	1.38 U
Phenanthrene	mg/Kg	0.387 U	***0.331 J***	0.419 U	0.418 U	0.362 U	1.38 U
Pyrene	mg/Kg	0.387 U	***0.238 J***	0.419 U	0.418 U	0.362 U	1.38 U
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	mg/Kg	ND	***1.574***	ND	ND	ND	ND
Metals, Total	UNITS						
Barium, Total	mg/Kg	***20.4***	***207***	***253***	***214***	***780***	***154***
Cadmium, Total	mg/Kg	2.35 U	***13.5 FJ****	***8.58 FJ****	***9.02 FJ****	***55.1 FJ****	***22.8 FJ****
Chromium, Total	mg/Kg	***1.31 JF***	***80.2 F***	***22.1 F***	***14.1 F***	***959 F***	***41.9 F***
Lead, Total	mg/Kg	11.7 U	11.7 U	***42.4***	***30.8***	***1,730***	***362***
Mercury, Total	mg/Kg	0.141 U	0.14 U	0.152 U	0.152 U	0.132 U	***0.226***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted for Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-4
SWMU 24 Interim Measures Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T05/SB3	24T06/SB1	24T06/SB2	24T06/SB2D	24T06/SB3
Date Sampled:		11/8/1996	11/8/1996	11/8/1996	11/8/1996	11/8/1996
Sample Depth From:		10	0	5	5	10
Sample Depth To:		15	5	10	10	15
Laboratory Number:		D96-12805-12	D96-12805-13	D96-12805-14	D96-12805-15	D96-12805-16
Sample Type:					Duplicate	
Volatiles	UNITS					
		ND	ND	ND	ND	ND
Semivolatiles	UNITS					
Anthracene	mg/Kg	1.23 U	*1.31*	0.406 U	0.415 U	0.417 U
Benzo(a)anthracene	mg/Kg	1.23 U	1.08 U	0.406 U	*0.241 J*	0.417 U
Benzo(a)pyrene	mg/Kg	1.23 U	1.08 U	0.406 U	*0.222 J*	0.417 U
Benzo(b)fluoranthene	mg/Kg	1.23 U	1.08 U	0.406 U	*0.222 J*	0.417 U
Benzo(g,h,i)perylene	mg/Kg	1.23 U	1.08 U	0.406 U	0.415 U	0.417 U
Benzo(k)fluoranthene	mg/Kg	1.23 U	1.08 U	0.406 U	0.415 U	0.417 U
Chrysene	mg/Kg	1.23 U	1.08 U	0.406 U	*0.294 J*	0.417 U
Fluoranthene	mg/Kg	1.23 U	1.08 U	0.406 U	*0.407 J*	0.417 U
Indeno(1,2,3-cd)pyrene	mg/Kg	1.23 U	1.08 U	0.406 U	0.415 U	0.417 U
Naphthalene	mg/Kg	1.23 U	1.08 U	0.406 U	0.415 U	0.417 U
Phenanthrene	mg/Kg	1.23 U	*0.353 J*	*0.253 J*	*0.515*	0.417 U
Pyrene	mg/Kg	*0.665 J*	*0.551 J*	*0.229 J*	*0.622*	0.417 U
Total Detected SVOCs	UNITS					
Total Semi-Volatiles	mg/Kg	*0.665*	*2.214*	*0.482*	*2.523*	ND
Metals, Total	UNITS					
Barium, Total	mg/Kg	*201*	*402*	*245*	*203*	*154*
Cadmium, Total	mg/Kg	*17.3 FJ**	*31.1 FJ**	*20.4 FJ**	*18.2 FJ**	*6.42 F*
Chromium, Total	mg/Kg	*15.6 F*	*1,460 F*	*256 F*	*164 F*	*16.2 F*
Lead, Total	mg/Kg	*138*	*309*	*340*	*245*	*12 J*
Mercury, Total	mg/Kg	*0.264*	*0.152*	0.148 U	0.151 U	0.152 U

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
D - Diluted for Analysis
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
ND - Not Detected
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-5
SWMU 24 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T07/SB1	24T07/SB1	24T07/SB2	24T07/SB2	24T07/SB11	24T07/SB11	24T07/SB12
Date Sampled:		5/20/1998	5/20/1998	5/20/1998	5/20/1998	5/20/1998	5/20/1998	5/20/1998
Sample Depth From:		10	10	15	15	10	10	15
Sample Depth To:		15	15	20	20	15	15	20
Laboratory Number:		D98-3835-1	D98-3836-1	D98-3835-2	D98-3836-2	D98-3835-3	D98-3836-3	D98-3835-4
Sample Type:								
Semivolatiles	UNITS							
Benzo(b)fluoranthene	mg/Kg	NA	0.327 U	NA	0.33 U	NA	0.33 U	NA
Fluoranthene	mg/Kg	NA	0.327 U	NA	0.33 U	NA	0.33 U	NA
Naphthalene	mg/Kg	NA	0.327 U	NA	0.33 U	NA	0.33 U	NA
Phenanthrene	mg/Kg	NA	0.327 U	NA	0.33 U	NA	0.33 U	NA
Pyrene	mg/Kg	NA	0.327 U	NA	0.33 U	NA	0.33 U	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	ND	NA	ND	NA	ND	NA
Metals, Total	UNITS							
Arsenic, Total	mg/Kg	***4.04***	NA	***7.36***	NA	***4.8***	NA	***5.19***
Barium, Total	mg/Kg	***182 J****	NA	***184 J****	NA	***158 J****	NA	***117 J****
Cadmium, Total	mg/Kg	***0.44 J***	NA	***0.64 J***	NA	***0.72***	NA	***0.31 J***
Chromium, Total	mg/Kg	***17.4***	NA	***18.5***	NA	***18.2***	NA	***18.1***
Lead, Total	mg/Kg	***11.2***	NA	***11.7***	NA	***10.9***	NA	***12.6***
Mercury, Total	mg/Kg	0.149 U	NA	0.157 U	NA	0.147 U	NA	0.147 U
Selenium, Total	mg/Kg	1.24 UJ*	NA	1.3 UJ*	NA	1.23 UJ*	NA	1.23 UJ*
Physical Properties of Soil	UNITS							
pH	SU	NA	***8.7***	NA	***8.9***	NA	***8.1***	NA

LEGEND:

B - Detected in the associated laboratory method blank
F - Detected in the associated equipment rinsate blank
J - Qualified as estimated by the laboratory
J* - Qualified as estimated in the QC evaluation
R - Qualified as unusable in the QC evaluation
T - Detected in associated trip blank
U - Qualified as undetected by the laboratory
U* - Qualified as undetected in the QC evaluation
NA - Not Analyzed
ND - Not Detected

Table 18-5
SWMU 24 Phase 2 Trenching Soil Results
Armco Kansas City Facility

Sample Point:		24T07/SB12	24T08/SB1	24T08/SB1D	24T08/SB2	24T08/SB11	24T08/SB12
Date Sampled:		5/20/1998	5/20/1998	5/20/1998	5/20/1998	5/20/1998	5/20/1998
Sample Depth From:		15	0	0	2	0	2
Sample Depth To:		20	2	2	4	2	4
Laboratory Number:		D98-3836-4	D98-3835-5	D98-3835-6 Duplicate	D98-3835-7	D98-3835-8	D98-3835-9
Sample Type:							
Semivolatiles	UNITS						
Benzo(b)fluoranthene	mg/Kg	0.33 U	1.15 UJ*	0.381 UJ*	0.401 UJ*	0.402 UJ*	***0.149 J***
Fluoranthene	mg/Kg	0.33 U	1.15 UJ*	0.381 UJ*	0.401 UJ*	0.402 UJ*	***0.216 J***
Naphthalene	mg/Kg	0.33 U	1.15 UJ*	0.381 UJ*	0.401 UJ*	0.402 UJ*	***0.251 J***
Phenanthrene	mg/Kg	0.33 U	1.15 UJ*	0.381 UJ*	0.401 UJ*	0.402 UJ*	***0.337 J***
Pyrene	mg/Kg	0.33 U	1.15 UJ*	0.381 UJ*	0.401 UJ*	0.402 UJ*	***0.143 J***
Total Detected SVOCs	UNITS						
Total Semi-Volatiles	mg/Kg	ND	ND	ND	ND	ND	***1.096***
Metals, Total	UNITS						
Arsenic, Total	mg/Kg	NA	***27.3***	***23.5***	***15.4***	***8.3***	***12.5***
Barium, Total	mg/Kg	NA	***78.8 J****	***97.5 J****	***118 J****	***211 J****	***166 J****
Cadmium, Total	mg/Kg	NA	***0.85***	***0.82***	***0.67***	***0.56 J***	***1.44***
Chromium, Total	mg/Kg	NA	***34.7***	***35.8***	***33.1***	***25.1***	***25.9***
Lead, Total	mg/Kg	NA	***27.9***	***21.9***	***15.3***	***13.9***	***28.9***
Mercury, Total	mg/Kg	NA	0.14 U	0.138 U	0.146 U	0.146 U	***0.0624 J***
Selenium, Total	mg/Kg	NA	1.17 UJ*	1.15 UJ*	1.22 UJ*	1.22 UJ*	***1.31 J****
Physical Properties of Soil	UNITS						
pH	SU	***8.1***	***8.5 J****	***8.5 J****	***8.3 J****	***8 J****	***8.3 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-6
SWMU 24 Interim Measures Trench Sample Groundwater Results
Armco Kansas City Facility

	Sample Point:	24T06/GW1
	Date Sampled:	11/8/1996
	Laboratory Number:	D96-12805-18
	Sample Type:	
Volatiles	UNITS	
		ND
Semivolatiles	UNITS	
		ND
Metals, Total	UNITS	
Barium, Total	mg/L	***0.395***
Cadmium, Total	mg/L	***0.0333 FJ****
Chromium, Total	mg/L	***0.0864 F***
Lead, Total	mg/L	***0.768***
Mercury, Total	mg/L	***0.0004***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
ND - Not Detected
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
NA - Not Analyzed
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-7
SWMU 24 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		24B04/DW1	24B07/DW1	24B07/DW1	24B08/DW1	24B08/DW1D	24B09/DW1	24B10/DW1
Date Sampled:		9/10/1997	5/18/1998	5/18/1998	5/26/1998	5/26/1998	5/22/1998	5/26/1998
Sample Depth From:		2.5	24	24	40	40	37	30
Sample Depth To:		5.5	26	26	42	42	39	32
Laboratory Number:		D97-11023-11	D98-3742-1	D98-3742-1R2	D98-3898-2	D98-3898-3	D98-3877-7	D98-3898-1
Sample Type:				Reanalysis		Duplicate		
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	5 U	*3.28 J*	5 U	10 DU	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	*2.58 J*	5 U	10 DU	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	*12*	*4.9 J*	5 U	10 DU	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	5 U	*4.35 J*	5 U	10 DU	5 U	5 U	5 U
1,2-Dichloropropane	ug/L	5 U	*2.74 J*	5 U	10 DU	5 U	5 U	5 U
4-Methyl-2-pentanone	ug/L	*18.2 J*	100 UJ*	100 U	*11.1 DJ*	*4.82 J*	100 U	100 U
Acetone	ug/L	*138*	100 UJ*	100 U	*36.5 DJ*	*24.4 J*	100 U	100 U
Benzene	ug/L	5 U	*3.31 J*	5 U	10 DU	5 U	5 U	5 U
Carbon disulfide	ug/L	5 U	*3.46 J*	5 U	10 DU	5 U	5 U	5 U
Carbon tetrachloride	ug/L	5 U	*2.98 J*	5 U	10 DU	5 U	5 U	5 U
Chloroform	ug/L	5 U	*3.48 J*	5 U	10 DU	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	*295*	5 UJ*	5 U	10 DU	5 U	5 U	5 U
Ethylbenzene	ug/L	5 U	*5.62 J**	5 U	*18 D*	*7.29 J**	5 U	5 U
m,p-Xylene	ug/L	5 U	*10.3 J**	5 U	*65 D*	*27.1 J**	5 U	5 U
Methylene chloride	ug/L	5 U	*2.66 J*	5 U	10 DU	5 U	5 U	5 U
o-Xylene	ug/L	5 U	*4.35 J*	5 U	*15.4 D*	5 U	5 U	5 U
Toluene	ug/L	5 U	*4.95 J*	5 U	*41.9 D*	*16.6 J**	5 U	5 U
trans-1,2-Dichloroethene	ug/L	*10.1*	*4.08 J*	5 U	10 DU	5 U	5 U	5 U
Trichloroethene	ug/L	*149*	*4.02 J*	5 U	10 DU	5 U	5 U	5 U
Vinyl acetate	ug/L	*54.6*	50 UJ*	50 U	100 DU	50 U	50 U	50 U
Vinyl chloride	ug/L	*5.34*	2 UJ*	2 U	4 DU	2 U	2 U	2 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	*682.24*	*67.06*	ND	*187.9*	*80.21*	ND	ND
Semivolatiles	UNITS							
		ND	NA	NA	NA	NA	NA	NA
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	*0.02*	NA	NA	NA	NA	NA	NA
Barium, Dissolved	mg/L	*0.0699*	NA	NA	NA	NA	NA	NA
Water Quality Parameters	UNITS							
pH	SU	*9.5*	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
F - Detected in the associated equipment rinsate blank
J - Qualified as estimated by the laboratory
J* - Qualified as estimated in the QC evaluation
R - Qualified as unusable in the QC evaluation
T - Detected in associated trip blank
U - Qualified as undetected by the laboratory
U* - Qualified as undetected in the QC evaluation
NA - Not Analyzed
ND - Not Detected

Table 18-7
SWMU 24 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		06B06A/DW1		06B07A/DW1		06B10A/DW1		06B11A/DW1		06B11A/DW1	
Date Sampled:		5/22/1998		5/22/1998		5/22/1998		5/18/1998		5/18/1998	
Sample Depth From:		30		30		30		35		35	
Sample Depth To:		32		32		32		37		37	
Laboratory Number:		D98-3877-5		D98-3877-6		D98-3877-2		D98-3742-2		D98-3742-2R2	
Sample Type:										Reanalysis	
Volatiles	UNITS										
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	***26***		5	U	5	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	100	U	100	U	100	U
Acetone	ug/L	100	U	100	U	100	U	100	U	100	U
Benzene	ug/L	5	U	5	U	5	U	5	U	5	U
Carbon disulfide	ug/L	5	U	5	U	5	U	***2.77***	J	5	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U	5	U	5	U
Chloroform	ug/L	5	U	5	U	5	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	5	U	5	U	5	U
m,p-Xylene	ug/L	5	U	5	U	5	U	5	U	5	U
Methylene chloride	ug/L	5	U	5	U	5	U	5	U	5	U
o-Xylene	ug/L	5	U	5	U	5	U	5	U	5	U
Toluene	ug/L	5	U	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U
Trichloroethene	ug/L	5	U	5	U	5	U	***2.62***	J	5	U
Vinyl acetate	ug/L	50	U	50	U	50	U	50	U	50	U
Vinyl chloride	ug/L	2	U	2	U	2	U	2	U	2	U
Total Detected VOCs	UNITS										
Total Volatiles	ug/L	***26***		ND		ND		***5.39***		ND	
Semivolatiles	UNITS										
		NA		NA		NA		NA		NA	
Metals, Dissolved	UNITS										
Arsenic, Dissolved	mg/L	NA		NA		NA		NA		NA	
Barium, Dissolved	mg/L	NA		NA		NA		NA		NA	
Water Quality Parameters	UNITS										
pH	SU	NA		NA		NA		NA		NA	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 18-8
SWMU 24 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Results
Semivolatiles	**(mg/kg)**			**(mg/kg)**
Benzo(a)anthracene	2	24G01 / SR2	0.5 - 1	3.44 J
		24G01 / SR2D	0.5 - 1	7.13
		24B05 / DP1	0 - 4	2.02
		24B05 / DP1**	0 - 4	2.02 DJ
Benzo(b)fluoranthene	5	24G01 / SR2D	0.5 - 1	11.4
Metals	**(mg/kg)**			**(mg/kg)**
Arsenic, Total	29	24B05 / DP1	0 - 4	56.4
Cadmium, Total	8	24G01 / SR1	0 - 0.5	13.6 J*
		24G01 / SR2	0.5 - 1	13.7 J*
		24G01 / SR2D	0.5 - 1	15 J*
		24G02 / SR1	0 - 0.5	16 J*
		24G02 / SR2	0.5 - 1	11 J*
		24G03 / SR1	0 - 0.5	16.3 J*
		24G03 / SR2	0.5 - 1	13.8 J*
		24G04 / SR1	0 - 0.5	19.7 J*
		24G04 / SR2	0.5 - 1	14.1 J*
		24B06 / DP1	0 - 4	9.1
		24B06 / DP3	8 - 12	10.9
		24T01 / SB1	0 - 5	40.4 F
		24T01 / SB2	5 - 10	31.1 F
		24T01 / SB2D	5 - 10	22.8 F
		24T01 / SB4	0 - 5	49.5 F
		24T02 / SB1	0 - 5	32.1 FJ*
		24T02 / SB2	5 - 10	11 FJ*
		24T03 / SB1	0 - 5	53.5 F
		24T03 / SB2	5 - 10	49.1 F
		24T04 / SB1	0 - 5	13.5 FJ*
		24T04 / SB2	5 - 10	8.58 FJ*
		24T04 / SB3	10 - 15	9.02 FJ*
		24T05 / SB1	0 - 5	55.1 FJ*
		24T05 / SB2	5 - 10	22.8 FJ*
		24T05 / SB3	10 - 15	17.03 FJ*
		24T06 / SB1	0 - 5	31.1 FJ*
		24T06 / SB2	5 - 10	20.4 FJ*
		24T06 / SB2D	5 - 10	18.2 FJ*
Chromium, Total	3540***	24T02 / SB1	0 - 5	3890 F
Lead, Total	400	24G01 / SR1	0 - 0.5	1140 J*
		24G01 / SR2	0.5 - 1	464 J*
		24G01 / SR2D	0.5 - 1	409 J*
		24G02 / SR1	0 - 0.5	416 J*
		24G04 / SR1	0 - 0.5	473 J*
		24B05 / DP1	0 - 4	566 F
		24B06 / DP3	8 - 12	802 F
		24T01 / SB1	0 - 5	408 F
		24T01 / SB2	5 - 10	401 F
		24T01 / SB4	0 - 5	1480 F
		24T03 / SB1	0 - 5	1280 F
		24T03 / SB2	5 - 10	959 F
		24T05 / SB1	0 - 5	1730

Table 18-8
SWMU 24 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL	Sample with SSL Exceedence	Sample Depth (ft)	Sample Results
Selenium, Total	5	24B02 / DP1	0 - 4	5.23
		24B05 / DP1	0 - 4	13.5

Notes:

D = Sample was diluted prior to analysis
DAF = Dilution Attenuation Factor
F = Compound was detected in corresponding equipment rinsate blank.
ft = feet
J = Estimated value; concentration below practical quantitation limit.
J* = Qualified as estimated by BMWCI during the QC evaluation.
SSL = Soil Screening Level
** = Represents a reanalyzed sample.
*** = Screening value represents 95% UTL for chromium as calculated from slag samples.

Table 18-9
SWMU 24 Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Volatiles	**(µg/L)**			**(µg/L)**
cis-1,2-Dichloroethene	70	24B04 / DW1	2.5 - 5.5	295
Trichloroethene	5	24B04 / DW1	2.5 - 5.5	149
Vinyl Chloride	2	24B04 / DW1	2.5 - 5.5	5.34
Metals	**(mg/L)**			**(mg/L)**
Cadmium, Total	0.005	24T06 / GW1	NA	0.0333
Lead, Total	0.015	24T06 / GW1	NA	0.768

Notes:
ft = feet
MCL = Maximum Contaminant Level

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SWMU24.DGN/27-APR-99 13:32/OLS

1 STORY METAL BUILDING (REMOVED)

TANK NO. 3 (REMOVED)

TANK NO. 2 (REMOVED)

TANK NO. 1 (REMOVED)

METAL BUILDING (REMOVED)

SWMU 6

SWMU 24

750

740

06B10A

06B11A

24B10

24B05

24B06

24B01

06B07A

24G01

24B02

24T06

24G02

24B03

24B09

06B06A

24T01

24B04

24G03

24T05

24G04

24T02

24B08

24B07

24T08

24T04

24T07

24T03

PARCEL 3A

PARCEL 10A

PARCEL 10

PARCEL 11

LEGEND

- DIRECT-PUSH BORING LOCATION
- TRENCH LOCATION
- LOCATION OF SURFACE SOIL SAMPLE GRID
- SWMU BOUNDARY
- RAILROAD
- BOUNDARY OF PROPERTY SOLD TO KC TERMINAL RAILROAD
- BOUNDARY OF TEMPORARY EASEMENT FOR KC TERMINAL RAILROAD

N

60' 0' 60' 120'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 18-1
SWMU 24 SOIL AND GROUNDWATER SAMPLING LOCATIONS
ARMCO KANSAS CITY FACILITY
ARMCO AND KANSAS CITY TERMINAL PROPERTY

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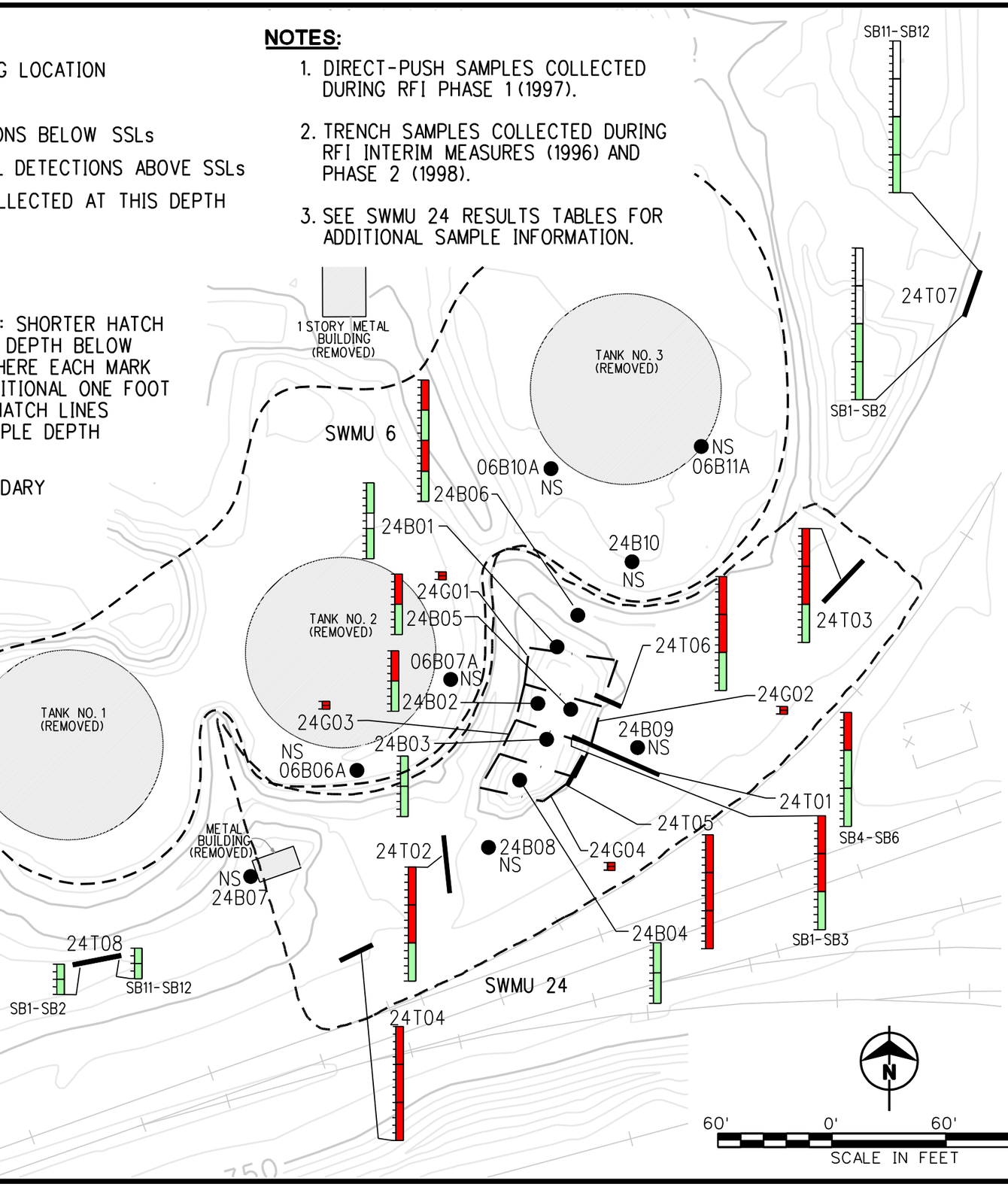
LEGEND

- DIRECT-PUSH BORING LOCATION
- TRENCH LOCATION
- ALL METAL DETECTIONS BELOW SSLs
- ONE OR MORE METAL DETECTIONS ABOVE SSLs
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- NA NOT ANALYZED
- NS NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU OR AOC BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. TRENCH SAMPLES COLLECTED DURING RFI INTERIM MEASURES (1996) AND PHASE 2 (1998).
3. SEE SWMU 24 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.



METAL SOIL DETECTIONS ABOVE SSLs					
PARAMETER	SSL (mg/kg)	SAMPLE	SAMPLE DEPTH (FT BGS)	SAMPLE RESULT (mg/Kg)	
ARSENIC	29	24B05/DP1	0-4	56.4	
CADMIUM	8	24G01/SR1	0-0.5	13.6	J*
		24G01/SR2	0.5-1	13.7	J*
		24G01/SR2D	0.5-1	15	J*
		24G02/SR1	0-0.5	16	J*
		24G02/SR2	0.5-1	11	J*
		24G03/SR1	0-0.5	16.3	J*
		24G03/SR2	0.5-1	13.8	J*
		24G04/SR1	0-0.5	19.7	J*
		24G04/SR2	0.5-1	14.1	J*
		24B06/DP1	0-4	9.1	
		24B06/DP3	8-12	10.9	
		24T01/SB1	0-5	40.4	F
		24T01/SB2	5-10	31.1	F
		24T01/SB2D	5-10	22.8	F
		24T01/SB4	0-5	49.5	F
		24T02/SB1	0-5	32.1	FJ*
		24T02/SB2	5-10	11	FJ*
		24T03/SB1	0-5	53.5	F
		24T03/SB2	5-10	49.1	F
		24T04/SB1	0-5	13.5	FJ*
		24T04/SB2	5-10	8.58	FJ*
		24T04/SB3	10-15	9.02	FJ*
		24T05/SB1	0-5	55.1	FJ*
		24T05/SB2	5-10	22.8	FJ*
		24T05/SB3	10-15	17.03	FJ*
		24T06/SB1	0-5	31.1	FJ*
		24T06/SB2	5-10	20.4	FJ*
		24T06/SB2D	5-10	18.2	FJ*
CHROMIUM	3,540	24T02/SB1	0-5	3890	F
LEAD	400	24G01/SR1	0-0.5	1140	J*
		24G01/SR2	0.5-1	464	J*
		24G01/SR2D	0.5-1	409	J*
		24G02/SR1	0-0.5	416	J*
		24G04/SR1	0-0.5	473	J*
		24B05/DP1	0-4	566	F
		24B06/DP3	8-12	802	F
		24T01/SB1	0-5	408	F
		24T01/SB2	5-10	401	F
		24T01/SB4	0-5	1480	F
		24T03/SB1	0-5	1280	F
		24T03/SB2	5-10	959	F
		24T05/SB1	0-5	1730	
SELENIUM	5	24B02/DP1	0-4	5.23	
		24B05/DP1	0-4	13.5	

QUALIFIER NOTES:
D = SAMPLE DILUTED PRIOR TO ANALYSIS
F = COMPOUND DETECTED IN CORRESPONDING RINSATE BLANK
J = ESTIMATED VALUE
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION

Burns & McDonnell Waste Consultants, Inc.

Figure 18-2
SWMU 24 METALS SOIL RESULTS

ARMCO KANSAS CITY FACILITY
ARMCO AND KANSAS CITY TERMINAL PROPERTY

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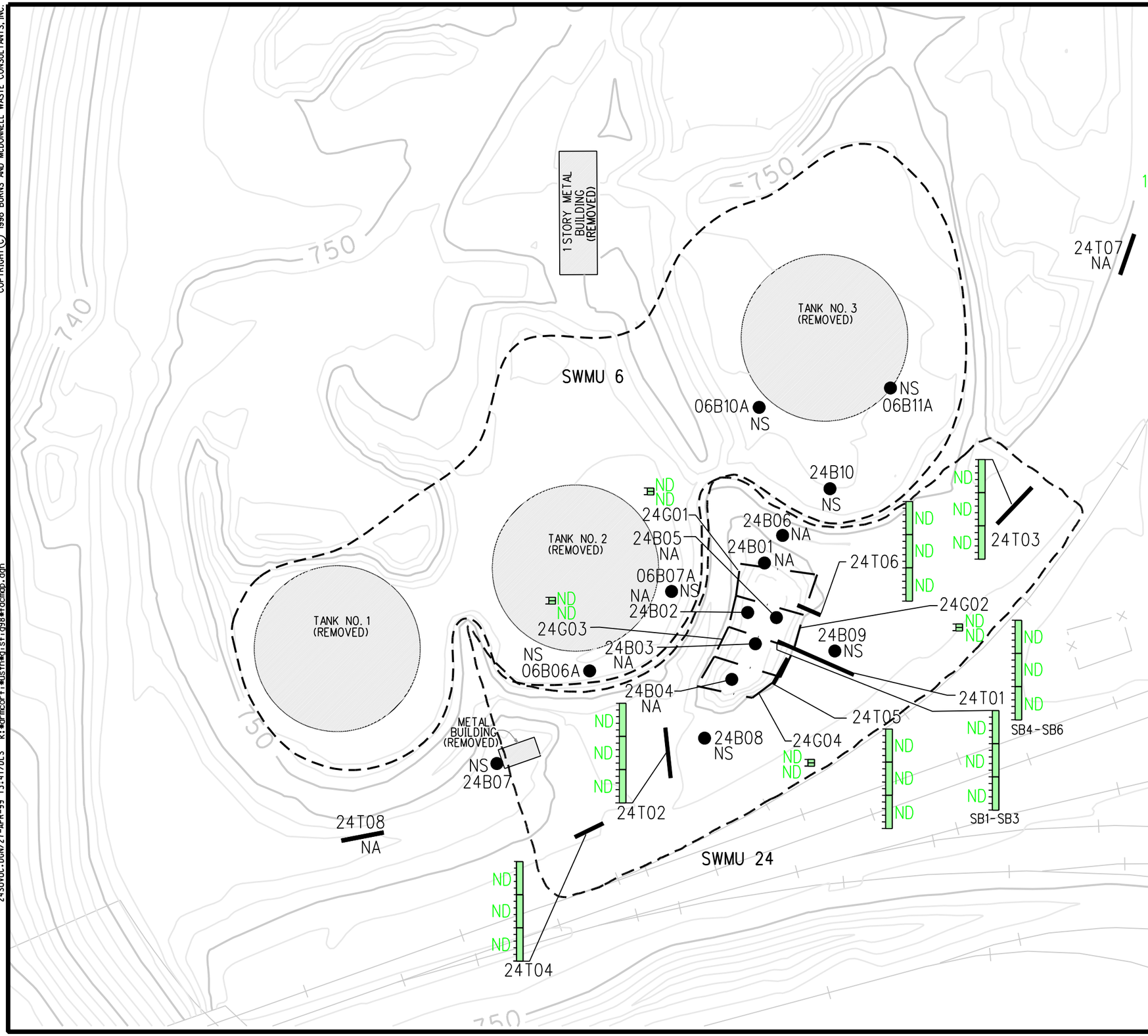


LEGEND

- DIRECT-PUSH BORING LOCATION
- TRENCH LOCATION
- LOCATION OF SURFACE SOIL SAMPLE GRID
- 10.0 OR — TOTAL VOC RESULTS (ug/Kg) - ALL DETECTIONS BELOW 20 DAF SSLs
- NA — NOT ANALYZED
- ND — NOT DETECTED
- NS — NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. TRENCH SAMPLES COLLECTED DURING RFI INTERIM MEASURES (1996) AND PHASE 2 (1998).
3. SEE SWMU 24 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

60' 0' 60' 120'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

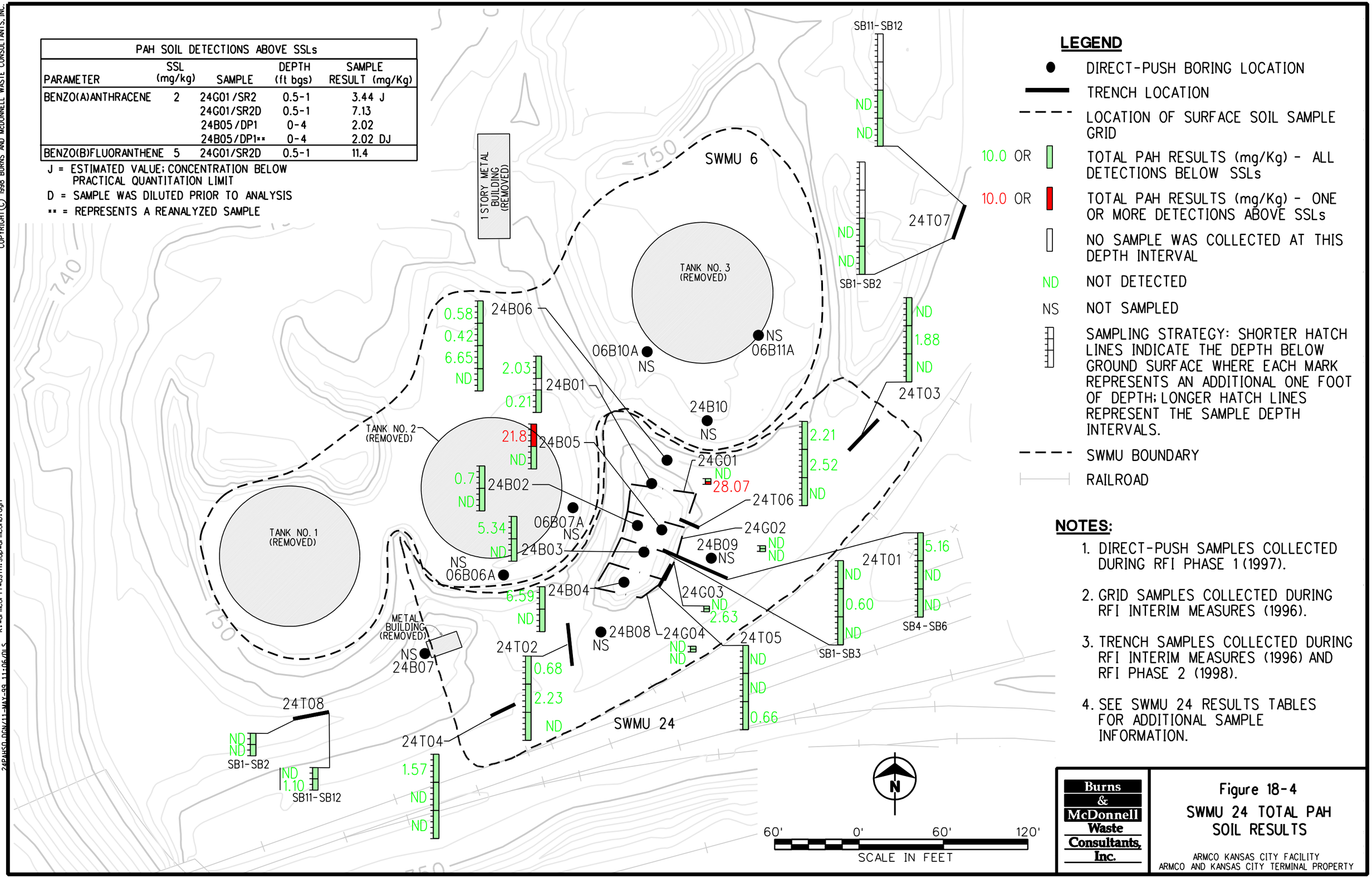
Figure 18-3
SWMU 24 TOTAL VOC SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO AND KANSAS CITY TERMINAL PROPERTY

PAH SOIL DETECTIONS ABOVE SSLs				
PARAMETER	SSL (mg/kg)	SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (mg/Kg)
BENZO(A)ANTHRACENE	2	24G01/SR2	0.5-1	3.44 J
		24G01/SR2D	0.5-1	7.13
		24B05/DP1	0-4	2.02
		24B05/DP1**	0-4	2.02 DJ
BENZO(B)FLUORANTHENE	5	24G01/SR2D	0.5-1	11.4

J = ESTIMATED VALUE; CONCENTRATION BELOW PRACTICAL QUANTITATION LIMIT

D = SAMPLE WAS DILUTED PRIOR TO ANALYSIS

** = REPRESENTS A REANALYZED SAMPLE



LEGEND

- DIRECT-PUSH BORING LOCATION
- TRENCH LOCATION
- LOCATION OF SURFACE SOIL SAMPLE GRID
- 10.0 OR — TOTAL PAH RESULTS (mg/Kg) - ALL DETECTIONS BELOW SSLs
- 10.0 OR — TOTAL PAH RESULTS (mg/Kg) - ONE OR MORE DETECTIONS ABOVE SSLs
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- ND — NOT DETECTED
- NS — NOT SAMPLED
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
2. GRID SAMPLES COLLECTED DURING RFI INTERIM MEASURES (1996).
3. TRENCH SAMPLES COLLECTED DURING RFI INTERIM MEASURES (1996) AND RFI PHASE 2 (1998).
4. SEE SWMU 24 RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

Burns & McDonnell Waste Consultants, Inc.

Figure 18-4
SWMU 24 TOTAL PAH SOIL RESULTS

ARMCO KANSAS CITY FACILITY
ARMCO AND KANSAS CITY TERMINAL PROPERTY

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VOC GROUNDWATER DETECTIONS ABOVE MCLs				
PARAMETER	MCL (ug/L)	SAMPLE	SAMPLE DEPTH (FT)	SAMPLE RESULT (ug/L)
cis-1,2-DICHLOROETHENE	70	24B04/DW1	2.5-5.5	295
TRICHLOROETHENE	5	24B04/DW1	2.5-5.5	149
VINYL CHLORIDE	2	24B04/DW1	2.5-5.5	5.34

LEGEND

- DIRECT-PUSH BORING LOCATION
- 10.0 OR — TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR — TOTAL VOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE)
- TRENCH LOCATION
- LOCATION OF SURFACE SOIL SAMPLE GRID
- ND NOT DETECTED
- NS NOT SAMPLED
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASES 1 AND 2 (1997-1998).
2. TRENCH SAMPLES TAKEN DURING RFI INTERIM MEASURES (1996).
3. SEE SWMU 24 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

N

60' 0' 60' 120'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 18-5
SWMU 24 TOTAL VOC GROUNDWATER RESULTS

ARMCO KANSAS CITY FACILITY
ARMCO AND KANSAS CITY TERMINAL PROPERTY

22.0 SWMU 33 – NAIL MILL DEGREASING AREA

22.1 SWMU BACKGROUND

22.1.1 Description of SWMU

The Nail Mill Degreasing Area (SWMU 33), located on Armco property (see Figure 1-2), was used for the removal of residue during the production of nails. The degreasing operation was located in the northwest portion of the Nail Mill. The presence of chlorinated VOCs in the surrounding area was discovered and reported in 1991 while Armco was preparing for the closure and conversion of the mill into a warehouse. The nail mill was subsequently demolished and a wood block floor contaminated with TCE was removed and properly disposed. The area currently consists of rubble over the concrete floor of the former building. The defined SWMU 33 area is approximately 2.5 acres in size.

During preparation for the closure of the nail mill, Remcor collected samples of the wood block floor, concrete floor, and soil from beneath the floor in June 1990. All samples were analyzed for VOCs. TCE, 1,1,1-TCA, PCE, 1,1-DCE, and benzene were detected in the samples (Remcor, 1990a).

In July 1991, Terracon Environmental conducted a Phase I and Phase II soil vapor survey of the area for TCE, 1,1,1-TCA, and total volatile organics. Terracon Environmental concluded that degreasing materials remain sorbed onto the shallower soils underlying the degreaser area and that a groundwater plume of VOCs was present in the area (Terracon Environmental, 1991). Terracon Environmental conducted a Phase II Investigation in September 1991 and collected soil and groundwater samples for VOC analysis (Terracon Environmental, 1991a). TCE, 1,2-DCE, 1,1,1-TCA, and chloroform were detected in soil samples. In addition, TCE and 1,2-DCE were detected in groundwater samples. Terracon Environmental concluded that TCE was present in soil near the degreaser location and decreased with depth and distance from the degreaser. Terracon Environmental also concluded that existing data were too limited to provide precise delineation of groundwater contamination. Four monitoring wells were installed during the

Phase II Investigation. Monitoring Well MW1 was located northeast of the previous degreaser location but was destroyed during demolition activities completed in that vicinity. Wells MW2 through MW4 (now labeled 33MW2 through 33MW4) still exist at the SWMU.

Based on the types of materials handled at SWMU 33 and previous sampling and analysis activities completed by Remcor and Terracon Environmental, the primary constituents of potential concern were VOCs associated with solvents.

Due to the close proximity of SWMU 17 to the east of SWMU 33 and the related nature of groundwater contamination in the area, SWMU 17 groundwater information is presented in this chapter.

22.1.2 Release Potential

Available information indicates solvents used at this SWMU may have been released to the underlying soils and groundwater. Because SWMU 33 is no longer active, and all associated structures have been demolished, the potential does not exist for future releases from this SWMU. The original concrete floor slabs remain in place but are now covered, at least partially, by rock and gravel associated with the demolition of the Nail Mill. The primary release potential for SWMU 33 was to the surrounding subsurface soil and groundwater.

22.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at this SWMU was evaluated through the collection of subsurface soil and groundwater samples. Table 22-1 presents the investigation activities performed at SWMU 33. Figure 22-1 presents the soil and groundwater sampling locations.

22.2.1 RFI Phase 1

Subsurface soil samples were collected from 17 direct-push borings (Borings 33B01 through 33B10, and 33B13 through 33B19) and from one monitoring well borehole (33MW2S). Two to

four subsurface soil samples were collected from each boring at depth intervals up to 20 feet bgs. All subsurface samples were analyzed for VOCs.

Groundwater samples were collected from 47 direct-push borings (Borings 33B03 through 33B17, 33B19 through 33B47, 33B22A, 33B51, and 33MW6D). A large number of borings were advanced in order to assist in characterization and delineation of VOCs for the purposes of monitoring well placement. Samples were collected from the upper 10 feet of the water table and analyzed using a field GC for chlorinated VOCs and/or BTEX. Seven of the groundwater samples were sent to the analytical laboratory for confirmation of results. Six of the groundwater samples sent to the analytical laboratory were analyzed for VOCs, and three were analyzed for TPH and SVOCs.

At SWMU 17, groundwater samples were collected from four direct-push borings (Borings 17B04A, 17B06, 17B08, and 17B09 due to signs of contamination (sheen observed on the water table and organic odors) encountered in the groundwater at Boring 17B04. These groundwater samples were analyzed for VOCs, SVOCs, and TPH. Due to their proximity to the SWMU 33 area, these samples are presented with the SWMU 33 groundwater data.

Nine monitoring wells were installed at SWMU 33 (Wells 33MW2S, 33MW4S, 33MW5S/5D, 33MW6D, 33MW7S/7D, 33MW8S, 33MW9S) during RFI Phase 1. Wells were typically completed in two well clusters, with one well screened in the shallow unconfined saturated zone (approximately 10 to 20 feet bgs) and one screened just above bedrock in the semi-confined deep saturated zone (approximately 60 to 70 feet bgs). These shallow and deep wells are identified with an "S" or "D," respectively, to identify their general screen location. In addition to groundwater samples collected from the newly installed wells, groundwater was collected from three previously existing wells (Wells 33MW2, 33MW3, and 33MW4). All of the groundwater samples were analyzed for VOCs. In addition, the groundwater sample collected from Well 33MW5S was analyzed for SVOCs and TPH.

22.2.2 RFI Phase 2

Three direct-push soil borings (Borings 33B29A, 33B30A, and 33B32A) were advanced, and four samples were collected from each boring in four foot intervals up to sixteen (16) feet bgs. Samples were sent to the analytical laboratory and analyzed for VOCs. Subsurface soil samples were also collected from direct-push Boring 33B56 and Monitoring Well Borehole 33MW5I. Two samples were collected from each boring at depths up to 17 feet bgs. The samples were analyzed for VOCs. In addition, the samples from Boring 33B56 were analyzed for SVOCs.

Groundwater was collected from direct-push Borings 33B52 through 33B55 and Boring 17B10. Groundwater samples were analyzed in the field for VOCs, and three samples (33B54/DW1, 33B55/DW1, and 17B10/DW1) were sent to the laboratory for confirmatory analysis of VOCs.

Eleven additional monitoring wells (33MW10S/10D, 33MW11S/11D, 33MW12S/12D, 33MW13S/13D, 33MW14S/14D, and 33MW5I) were installed in the SWMU 33 area during RFI Phase 2. Wells were typically completed in two well clusters, with one well screened in the shallow unconfined saturated zone and the second screened just above bedrock in the deep semi-confined saturated zone. These shallow and deep wells are identified with an "S" or "D," respectively, to identify their general screen location. Monitoring wells labeled with an "I," represent intermediate depth monitoring wells that are screened directly over the semi-confining layer of the shallow saturated zone. Groundwater was collected from all of the monitoring wells in the SWMU 33 area during RFI Phase 2 and analyzed for VOCs and natural attenuation parameters (see Appendix T). Groundwater samples from Wells 33MW5S/5I/5D, 33MW11S/11D, 33MW12S/12D, and 33MW13S/13D were also analyzed for pH and RCRA metals to aid in characterization of dissolved metals in groundwater at SWMU 13, and these results are presented with SWMU 13 (Chapter 15.0).

This area is underlain by approximately 10 feet of gravel to boulder size slag and refractory brick fragments in a silty to sandy clay matrix. There are extensive areas of intact concrete floor remaining from demolished former mill buildings in this area. The fill layer generally thins closer to the Blue River and is thicker in buried creek channels and in buried basements below the former mill building footprints. Below the fill material is silty clay typical of Blue River

alluvial valley sediments. The silty clay alluvium with local, discontinuous interbeds of fine sandy clay is approximately 50 feet thick. Below the silty clay is approximately 5 feet of clayey to sandy gravel directly overlying the Pennsylvanian shale bedrock. There are two saturated zones within the unconsolidated materials. There is a shallow, unconfined saturated zone with a static groundwater surface approximately 5 to 15 feet bgs and a deeper, semi-confined saturated zone with a groundwater surface approximately 20 to 30 feet bgs.

22.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Tables 22-2 and 22-3 present the analytical results for the subsurface soil samples.

22.3.1 VOCs

Figure 22-2 shows the subsurface soil Total VOC results. Fifty-eight subsurface soil samples were collected from 23 borings at SWMU 33 and analyzed for VOCs. Total VOC detections ranged from 2.01 to 24,423 µg/Kg. Total VOC concentrations greater than 1,000 µg/Kg (15 samples) were located nearest the former degreaser location in the samples collected from Borings 33B01, 33B02, 33B05, 33B14, 33B15, and 33MW2S. Chlorinated VOCs (1,1,1-TCA, 1,1,2-TCA, 1,1-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, TCE, methylene chloride, and vinyl chloride) were typically detected in this area. This information supports an earlier conclusion that degreasing materials remain sorbed onto soils underlying the degreaser area. Nonchlorinated VOCs (BTEX, 2-hexanone, acetone, and carbon disulfide) were also detected, but these detections were more sporadic across the sampling area.

The 20 DAF SSLs for 1,1-DCE (60 µg/Kg), cis-1,2-DCE (400 µg/Kg), TCE (60 µg/Kg), and vinyl chloride (10 µg/Kg) were exceeded for one sample, 10 samples, 26 samples, and three samples, respectively. The highest detections of 1,1-DCE (61.9 µg/Kg), cis-1,2-DCE (6,180 D µg/Kg), TCE (19,800 D µg/Kg), and vinyl chloride (195 µg/Kg) were noted in samples from Borings 33B01 (5 to 9 feet bgs) and 33MW2S (1 to 7.5 feet bgs) close to the former degreaser location. The highest detections of chlorinated VOCs were typically encountered from 5 to 10 feet bgs; however, exceedences were noted as shallow as 1 to 5 feet bgs and as deep as 19 to 20 feet bgs. Table 22-7 presents the soil samples with 20 DAF SSL exceedences.

Total VOC concentrations decreased radially outward from the former degreaser location. The horizontal extent of VOCs in soil was well defined by borings south (Borings 33B08, 33B09, 33B13, 33B17, and 33B18), west (Boring 33B07), and east (Boring 33MW5I) of the former degreaser location. The northern extent of VOCs in soils was less clearly defined by Boring 33B32A since a sample collected from Boring 33B56 (north of Boring 33B32A) had a vinyl chloride detection that exceeded the 20 DAF SSL. Based upon the drilling logs (Appendix B), it appears that the sample from Boring 33B56 was collected below the water table and may represent VOCs present in the surrounding groundwater rather than subsurface soils. VOCs were encountered at all depth intervals (up to 20 feet bgs) at sampling locations in the immediate vicinity of the former degreaser, and the vertical extent of VOCs was pursued until the groundwater table was reached. Moving radially outward from the former degreaser, VOCs were generally limited to the soil depths below 8 feet bgs.

In some borings, increases in soil VOC concentrations tended to occur in the deeper samples collected immediately above (approximately 16 to 20 feet bgs) the shallow groundwater table. These increased concentrations may be attributed to the pressure of the saturated capillary fringe of the groundwater table that inhibits further migration of constituents to the groundwater.

22.3.2 SVOCs

Due to odors encountered during direct-push boring installation, two subsurface soil samples were collected from Boring 33B56 and analyzed for SVOCs. 2-Methylnaphthalene (15.4 D mg/Kg) was detected in the sample collected from 13-15 feet bgs. A 20 DAF SSL has not been established for this compound.

22.4 NATURE AND EXTENT OF CONTAMINATION IN GROUNDWATER

Tables 22-4 through 22-5 present the analytical results for groundwater samples collected in the SWMU 33 area. Figures 22-3 through 22-6 show the analytical results for groundwater samples. During the RFI, groundwater samples were collected throughout the SWMU 33 area and analyzed for VOCs. Selected samples were also analyzed for SVOCs and TPH. TPH results are presented in Appendix U. On-site analysis of VOCs using a field GC was performed as a

screening tool for plume definition to aid in the monitoring well placement. On-site GC results are presented in Appendix R. Natural attenuation parameter results are provided in Appendix T.

22.4.1 VOCs

22.4.1.1 RFI Phase 1

During RFI Phase 1, groundwater samples were collected from 13 direct-push borings and 12 monitoring wells and analyzed for VOCs. Six of the monitoring wells (Wells 33MW2S, 33MW4S, 33MW5S, 33MW7S, 33MW8S, and 33MW9S) were screened in the shallow unconfined saturated zone, and five of the monitoring wells (Wells 33MW3, 33MW4, 33MW5D, 33MW6D, and 33MW7D) were screened in the deep semi-confined saturated zone. Well 33MW2 is an intermediate depth monitoring well that was screened directly over the semi-confining layer of the shallow saturated zone.

Results for the RFI Phase 1 groundwater samples collected from the shallow unconfined saturated zone are presented on Figure 22-3. Total VOC detections ranged from 36.5 to 141,276 µg/L, and chlorinated VOCs were the predominant fraction detected. The groundwater screening MCLs were exceeded for 1,1,2-TCA (two samples), 1,1-DCE (four samples), 1,2-DCA (one sample), cis-1,2-DCE (seven samples), trans-1,2-DCE (one sample), PCE (one sample), TCE (eight samples), and vinyl chloride (nine samples). Table 22-8 presents the groundwater results that exceeded MCLs. Total VOC results for samples collected from Boring 17B08 (22,364 µg/L) and Monitoring Well 33MW2S (141,276 µg/L) were at least an order of magnitude greater than other VOC samples. In both samples, cis-1,2-DCE and TCE comprised the majority of the total concentrations. Intermediate depth 33MW2 (located adjacent to 33MW2S) contained a total VOC concentration of 2,878.1 µg/L, which consisted primarily of cis-1,2-DCE and vinyl chloride. Monitoring Wells 33MW2S and 33MW2 are located in the immediate vicinity of the former degreaser, and Boring 17B08 is located adjacent to the former wire mill rinsewater neutralization tank (SWMU 17). In general, VOC concentrations in the groundwater decreased in the outermost wells at SWMU 33, and no MCL exceedences were noted in the shallow saturated zone samples collected from the westernmost (33MW4S) and southernmost (33MW7S) wells.

Results for the RFI Phase 1 groundwater samples collected from the deep semi-confined saturated zone are presented on Figure 22-4. VOCs were not detected in groundwater samples collected from four of the five monitoring wells. The sample collected from Monitoring Well 33MW3 had detections of cis-1,2-DCE (21.9 µg/L), TCE (32.1 µg/L), and vinyl chloride (19.1 µg/L); however, only the TCE and vinyl chloride detections exceeded MCLs (5 and 2 µg/L, respectively). Monitoring Well 33MW3 is located in the immediate vicinity of the former degreaser, and the extent of VOCs in the deep semi-confined saturated zone were defined by wells in the surrounding area (33MW4, 33MWSD, 33MW6D, and 33MW7D).

22.4.1.2 RFI Phase 2

During RFI Phase 2, groundwater samples were collected from three direct-push borings and 23 monitoring wells and analyzed for VOCs. Five monitoring well clusters (33MW10S/10D, 33MW11S/11D, 33MW12S/12D, 33MW13S/13D, and 33MW14S/14D) were installed during RFI Phase 2. The two well clusters contained one well screened in the shallow unconfined saturated zone and a second well screened in the deep semi-confined saturated zone. Well 33MW5I was installed during RFI Phase 2 as an intermediate depth monitoring well that was screened directly over the semi-confining layer of the shallow saturated zone.

Figure 22-5 presents the results for the RFI Phase 2 groundwater samples collected from the shallow unconfined saturated zone and also depicts isoconcentration contours. To aid in characterization of the VOC plume, Phase 1 direct-push groundwater samples are also shown on this figure with the Phase 2 direct-push and monitoring well data.

Total VOC detections ranged from 7.15 to 127,847 µg/L, and chlorinated VOCs were the predominant fraction detected. The groundwater screening MCLs were exceeded for benzene (one sample), 1,1,2-TCA (one sample), 1,1-DCE (two samples), 1,2-DCA (one sample), cis-1,2-DCE (four samples), methylene chloride (one sample), PCE (one sample), TCE (five samples), and vinyl chloride (four samples). VOC results for samples collected from Monitoring Well 33MW2S (127,847 µg/L) which is located in the immediate vicinity of the former degreaser were at least two orders of magnitude greater than other VOC samples. Total VOC

concentrations in surrounding monitoring wells to the west (33MW8S) and east (33MW5S) of this location were significantly lower (71.67 and 431.8 µg/L respectively). VOC concentrations in intermediate depth monitoring wells were 9042.4 µg/L (33MW2) and 1990.58 µg/L (33MW5I). As shown on the isoconcentration contours, a chlorinated VOC plume is present in the shallow unconfined saturated zone throughout the SWMU 33 vicinity. The extent of VOCs in the shallow unconfined saturated zone was well defined by samples collected from wells around the perimeter of the area that had no detected VOCs (Wells 33MW7S, 33MW10S, 33MW11S, 33MW12S, 33MW13S, and 33MW14S), or low concentrations of detected VOCs (33MW9S).

Figure 22-6 presents the results for the RFI Phase 2 groundwater samples collected from the deep semi-confined saturated zone and also depicts isoconcentration contours. VOCs were not detected in samples collected from seven of the 10 monitoring wells. Chlorinated VOCS were the only detected VOCs. 1,1-DCE (2.42 J µg/L), cis-1,2-DCE (326 D µg/L), TCE (35.1 µg/L), and vinyl chloride (148 µg/L) were detected in the sample collected from Monitoring Well 33MW3, located nearest the former degreaser location. Cis-1,2-DCE, TCE, and vinyl chloride exceeded the groundwater screening MCLs. Cis-1,2-DCE (2.92 J µg/L) was detected below the groundwater screening MCL in the sample collected from Monitoring Well 33MW11D, which is located along the Blue River in the northeast portion of the SWMU 33 area. 1,1-DCA (4.32 J µg/L) 1,1-DCE (2.2 J µg/L), cis-1,2-DCE (74.4 µg/L), and vinyl chloride (9.05 µg/L) were detected in Monitoring Well 33MW10D which is located along the Blue River in the northwest portion of the SWMU 33 area. Since the sample from Well 33MW10D contained detections of cis-1,2-DCE and vinyl chloride that exceeded MCLs, a second sample was collected from this well in the fall of 1998 and the results confirmed the initial analysis. The extent of VOCs in the deep semi-confined saturated zone was well defined by wells in the perimeter of the SWMU 33 area to the east, south, and west. The extent of VOCs in the deep semi-confined saturated zone was less clearly defined to the north due to chlorinated VOC detections in Well 33MW10D.

22.4.1.3 VOC Summary

As previously described and shown on Figures 22-5 and 22-6, chlorinated VOCs in groundwater are centrally located around the SWMU 33 former degreasing pit (Monitoring Wells 33MW2S, 33MW2, 33MW3), and decrease radially outward from this location. VOCs detected were primarily TCE, which was most likely a source product, and related degradation products cis-1,2-DCE and vinyl chloride. The degradation of chlorinated VOCs is described in greater detail in Chapter 25.0 (Contaminant Fate and Transport Potential).

VOCs have migrated at Monitoring Wells 33MW2S, 33MW2, and 33MW3 from the shallow unconfined saturated zone to the deep semi-confined saturated zone. This hydraulic connection between the two aquifers is supported by the results of the pump test conducted at this location (see Section 2.6.2.2). The horizontal extent of VOCs in the groundwater is defined by perimeter monitoring wells. The source detections of VOCs in deep Well 33MW10D is unknown and it is uncertain if these detections are part of the larger plume of VOC detections centered around Wells 33MW2S, 33MW2, and 33MW3.

22.4.2 SVOCs

During RFI Phase 1, groundwater samples were collected from seven direct-push borings (Borings 33B45 through 33B47, 17B04A, 17B06, 17B08, and 17B09) and Monitoring Well 33MW5S in the shallow unconfined saturated zone (See Subsection 2.6.2) and analyzed for SVOCs. SVOCs were not detected in the samples collected from SWMU 17. SVOCs were also not detected in the groundwater samples collected from Borings 33B45 and 33B46; however, the results for these samples were rejected due to quality control samples that indicated a potential low bias in the analytical results. 4-Chloroaniline (4.1 J µg/L), 4-methylphenol (2.8 J µg/L), and naphthalene (2.9 J µg/L) were each detected in the sample collected from Boring 33B47. No MCLs have been established for these compounds. However, SVOCs were not detected in the groundwater sample collected from Well 33MW5S which was installed at the approximate location and depth of Boring 33B47. Therefore, the nature and extent of SVOCs in groundwater was adequately characterized at SWMU 33.

22.5 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for SWMU 33, as summarized in Table 3-1, include subsurface pathways (soil transfer to groundwater, groundwater transport, and storm sewers), surface pathways (storm water runoff and surface water transport), and air pathways (volatilization and airborne dust).

The nature and extent of contamination at SWMU 33 was assessed through the collection of subsurface soil and groundwater samples. VOC concentrations in soil exceeded 20 DAF SSLs (based on soil migration to groundwater) at depths to 20 feet bgs (approximate deepest elevation 727 feet above MSL). VOCs were detected in groundwater throughout SWMU 33 and its surrounding area. Therefore, soil transfer to groundwater and groundwater transport have and/or are occurring at SWMU 33.

VOCs in groundwater were detected in both the shallow unconfined saturated zone and the deep semi-confined saturated zone. SWMU 33 is located adjacent to the channelized Blue River on its north side. Groundwater flow direction in the shallow unconfined saturated zone is to the northeast. However, it does not appear to be hydraulically connected to the Blue River due to the lack of groundwater infiltrating through seep holes into the channel. Groundwater flow direction in the deep semi-confined saturated zone typically forms a trough in the center of the SWMU area. The typical elevation of the deep semi-confined saturated zone is approximately the same as the low-flow channel elevation in the channelized Blue River. Groundwater flow direction for the SWMU 33 area was described in greater detail in Chapter 2.0 (see Figures 2-18 through 2-25). Chapter 2.0 also provided a summary of hydraulic conductivities for the soil matrices at SWMU 33. VOCs, given their chemical and physical characteristics, are expected to degrade and/or volatilize as they migrate in the direction of groundwater flow. Degradation of VOCs is occurring in the groundwater based on the detection of TCE daughter products (e.g., cis-1,2-DCE and vinyl chloride). Subsurface transport modeling of VOCs in groundwater was attempted for the SWMU 33 area. This is described in more detail in Section 25.3 of the Report.

Surface cover material at SWMU 33 is primarily slag fill. Storm water runs toward either storm drains east of the SWMU or storm drain catch basins west of the SWMU. Storm sewers

throughout the area discharge to the Blue River. Surface soil particulate (dust) could become airborne. VOCs in the subsurface may partition to the gas phase and may migrate to the air pathway. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Thus, storm water runoff, storm sewer transport, surface water transport, volatilization to air, and airborne dust transport are potential routes for constituent migration at SWMU 33.

22.6 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at SWMU 33.

22.6.1 Human Health Evaluation

VOCs were identified as COPCs in subsurface soil. VOCs, SVOCs, and metals were identified as COPCs in groundwater. A human health risk assessment was conducted for SWMU 33 to evaluate potential health risks to existing and/or possible future on-site worker populations including full-time workers and temporary excavation workers. For the exposure scenarios evaluated, it was determined that there are no significant noncarcinogenic health effects or carcinogenic risks posed by the chemicals of concern detected in soil or groundwater at SWMU 33. Assumptions and variables used in risk calculations are discussed further in Chapter 4.0 of Appendix X. The results of the risk characterization are presented in Chapter 5.0 of Appendix X.

22.6.2 Ecological Evaluation

Due to lack of sustainable habitat, ecological receptors are not expected to be affected at SWMU 33. Therefore, an ecological risk evaluation was not conducted for SWMU 33.

22.7 SUMMARY

SWMU 33, located in the western portion of the Facility, was a degreasing operation for the removal of residue during the production of nails. The defined SWMU 33 area is approximately 2.5 acres in size. The area investigated for SWMU 33 groundwater included the entire area north of the Wire Mill Building to the Blue River, and encompassed the SWMUs 13 and 17 areas. Subsurface soil and groundwater samples were collected at SWMU 33.

Figure 22-2 presents the subsurface soil Total VOC results. Fifty-eight subsurface soil samples were collected from 23 borings at SWMU 33 and analyzed for VOCs. Total VOC detections ranged from 2.01 to 24,423 µg/Kg. Total VOC concentrations greater than 1,000 µg/Kg (15 samples) were located nearest the former degreaser location, and chlorinated VOCs were the predominant fraction detected. Total VOC concentrations decreased around the perimeter of the SWMU area. The horizontal extent of VOCs in soil was well defined by borings south, west, and east of the former degreaser location, but was less clearly defined to the north. VOCs were encountered at all depth intervals (up to 20 feet bgs) at sampling locations in the immediate vicinity of the former degreaser, and the vertical extent of VOCs was pursued until the groundwater table was reached. In areas surrounding the former degreaser location, VOCs were generally limited to the soil depths below 8 feet bgs.

Two subsurface soil samples were collected from Boring 33B56 and analyzed for SVOCs. 2-Methylnaphthalene (15.4 D mg/Kg) was detected in the sample collected from 13-15 feet bgs. A 20 DAF SSL has not been established for this compound. No other SVOCs were detected in soil.

Groundwater VOC samples were collected throughout the SWMU 33 area from direct-push borings (approximately 55 samples) and 23 monitoring wells. As shown on Figures 22-5 and 22-6, chlorinated VOCs in groundwater are centrally located around the SWMU 33 former degreasing pit (Monitoring Wells 33MW2S, 33MW2, 33MW3), and decrease radially outward from this location. VOCs detected were primarily TCE, which was most likely a source product, and related degradation products cis-1,2-DCE and vinyl chloride. Total VOC results for samples collected from shallow Well 33MW2S (127,847 µg/L), intermediate Well 33MW2 (9,042.4

µg/L), and deep Well 33MW3 (511.52 µg/L) were significantly greater than other VOC samples. Total VOC concentrations in monitoring wells (33MW8S, 33MW7S/7D, and 33MW5S/5I/5D) peripheral to the former degreaser location were significantly lower or non-detect.

VOCs have migrated at Monitoring Wells 33MW2S, 33MW2, and 33MW3 from the shallow unconfined saturated zone to the deep semi-confined saturated zone. This hydraulic connection between the two saturated zones is supported by the results of the pump test conducted at this location (see Section 2.6.2.2). The horizontal extent of VOCs in the upper unconfined and lower semi-confined saturated zones were defined by samples collected from the perimeter of the SWMU 33 area. The extent of VOCs in the lower semi-confined saturated zone was less clearly defined to the north due to chlorinated VOC detections in excess of MCLs in the sample from Well 33MW10D. The source of VOC detections in deep Well 33MW10D is unknown, and it is unclear if these detections are part of the larger plume of VOC detections centered around the former degreaser.

Eight groundwater samples were collected from the upper unconfined saturated zone and analyzed for SVOCs. The SVOCs 4-chloroaniline, 4-methylphenol, and naphthalene were detected at low concentrations in the sample collected from Boring 33B47 (no MCLs exist for these compounds). However, SVOCs were not detected in the sample collected from Well 33MW5S which was installed at the approximate location and depth of Boring 33B47. Therefore, the nature and extent of SVOCs in groundwater was adequately characterized at SWMU 33.

Potential migration pathways at SWMU 33 include soil transfer to groundwater, groundwater transport, storm sewer transport, storm water runoff, surface water transport, volatilization to air, and airborne dust migration. Subsurface soil detections of VOCs exceeded 20 DAF SSLs (based on soil migration to groundwater) and VOCs are located in groundwater throughout the SWMU 33 area in both the shallow unconfined saturated zone and the deep semi-confined saturated zone. Therefore, soil transfer to groundwater and groundwater transport have and/or are occurring at SWMU 33. VOCs, given their chemical and physical characteristics, are expected to degrade and/or volatilize as they migrate in the direction of groundwater flow. Degradation of

VOCs is occurring in the groundwater based on the detection of TCE daughter products (e.g., cis-1,2-DCE and vinyl chloride). Contaminant transport modeling was attempted for VOCs in groundwater at SWMU 33, and is summarized in detail in Section 25.3 of the Report.

Storm water runs toward either storm drains east of the SWMU or storm drain catch basins west of the SWMU. Storm sewers throughout the area discharge to the Blue River. Surface soil particulate (dust) could become airborne. VOCs in the subsurface may partition to the gas phase and may migrate to the air pathway. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. Thus, storm water runoff, storm sewer transport, surface water transport, volatilization to air, and airborne dust transport are potential routes for constituent migration at SWMU 33.

A risk evaluation was conducted for SWMU 33. For the human health evaluation, VOCs, SVOCs, and metals were identified as COPCs in groundwater (includes groundwater data from SWMU 17) and VOCs were identified as COPCs in subsurface soil. Therefore, a HHRA was conducted to evaluate potential health risks to existing and/or possible future on-site worker populations including full-time workers and temporary excavation workers. No significant risk was posed by the COPCs in soil and groundwater at SWMU 33 for these exposure scenarios. Due to lack of sustainable habitat for ecological receptors, an ecological risk evaluation was not conducted for SWMU 33.

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Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
DIRECT-PUSH SUBSURFACE SOIL SAMPLES															
33B01	DP1	1 - 5	3/31/1997	1			X								D97-3879-1
	DP2	5 - 9	3/31/1997	1			X								D97-3879-2
	DP3	9 - 13	3/31/1997	1			X								D97-3879-3
	DP3R		3/31/1997	1			X							Rinsate	D97-3879-4
33B02	DP1	1 - 5	3/31/1997	1			X								D97-3879-5
	DP2	5 - 9	3/31/1997	1			X								D97-3879-6
	DP3	9 - 13	3/31/1997	1			X								D97-3879-7
33B03	DP1	3.2 - 4.2	4/8/1997	1			X								D97-4264-4
	DP2	7 - 8	4/8/1997	1			X								D97-4264-5
33B04	DP1	1.7 - 2.4	4/7/1997	1			X								D97-4256-1
	DP1D	1.7 - 2.4	4/7/1997	1			X							Field Duplicate	D97-4256-2
	DP2	8 - 9	4/7/1997	1			X								D97-4256-3
33B05	DP1	2.5 - 3.5	4/7/1997	1			X								D97-4256-5
	DP2	7 - 8	4/7/1997	1			X								D97-4256-6
33B06	DP1	1.6 - 2.6	4/7/1997	1			X								D97-4256-7
	DP2	6 - 7	4/7/1997	1			X								D97-4256-8
	DP3	9 - 10	4/7/1997	1			X								D97-4256-9
33B07	DP1	2.5 - 3.5	4/7/1997	1			X								D97-4256-10
	DP2	6.8 - 7.8	4/7/1997	1			X								D97-4256-11
33B08	DP1	1.5 - 2.5	4/7/1997	1			X								D97-4256-12
	DP2	6.5 - 7.5	4/7/1997	1			X								D97-4256-13
	DP2D	6.5 - 7.5	4/7/1997	1			X							Field Duplicate	D97-4256-14
33B09	DP1	0.8 - 1.8	4/7/1997	1			X								D97-4256-15
	DP1R		4/7/1997	1			X							Rinsate	D97-4256-17
	DP2	6 - 7	4/7/1997	1			X								D97-4256-16
33B10	DP1	1 - 2	4/8/1997	1			X								D97-4264-1
	DP2	7.5 - 8.5	4/8/1997	1			X								D97-4264-2
33B13	DP1	4 - 5	4/8/1997	1			X								D97-4264-10
	DP2	8 - 9	4/8/1997	1			X								D97-4264-11
33B14	DP1	2.1 - 3.1	4/8/1997	1			X								D97-4264-12
	DP2	5 - 6	4/8/1997	1			X								D97-4264-13
33B15	DP1	1.5 - 2.5	4/9/1997	1			X								D97-4344-1
	DP2	6.5 - 7.5	4/9/1997	1			X								D97-4344-2
	DP3	9.5 - 10.5	4/9/1997	1			X								D97-4344-3
33B16	DP1	1 - 2	4/9/1997	1			X								D97-4344-4
	DP2	6 - 7	4/9/1997	1			X								D97-4344-5

Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
33B17	DP1	3 - 4	4/9/1997	1			X								D97-4344-6
	DP2	5.5 - 6.5	4/9/1997	1			X								D97-4344-7
33B18	DP1	2.5 - 5	4/9/1997	1			X								D97-4344-8
	DP1MS	2.5 - 5	4/9/1997	1			X							Matrix Spike	D97-4344-9
	DP1MSD	2.5 - 5	4/9/1997	1			X							Matrix Spike Duplicate	D97-4344-10
	DP2	5 - 6	4/9/1997	1			X								D97-4344-11
33B19	DP1	4 - 5	4/9/1997	1			X								D97-4344-13
	DP2	5.5 - 8	4/9/1997	1			X								D97-4344-14
	DP2MS	5.5 - 8	4/9/1997	1			X							Matrix Spike	D97-4344-15
	DP2MSD	5.5 - 8	4/9/1997	1			X							Matrix Spike Duplicate	D97-4344-16
33B29A	DP1	0 - 4	6/4/1998	2			X								D98-4166-7
	DP2	4 - 8	6/4/1998	2			X								D98-4166-8
	DP2MS	4 - 8	6/4/1998	2			X							Matrix Spike	D98-4166-9
	DP2MSD	4 - 8	6/4/1998	2			X							Matrix Spike Duplicate	D98-4166-10
	DP3	8 -12	6/4/1998	2			X								D98-4166-11
	DP4	12 - 16	6/4/1998	2			X								D98-4166-12
33B30A	DP1	0 - 4	6/4/1998	2			X								D98-4166-2
	DP2	4 - 8	6/4/1998	2			X								D98-4166-3
	DP2D	4 - 8	6/4/1998	2			X							Field Duplicate	D98-4166-4
	DP3	8 - 12	6/4/1998	2			X								D98-4166-5
	DP4	12 - 16	6/4/1998	2			X								D98-4166-6
33B32A	DP1	0 - 4	6/2/1998	2			X								D98-4081-1
	DP2	4 - 8	6/2/1998	2			X								D98-4081-2
	DP3	8 - 12	6/2/1998	2			X								D98-4081-3
	DP3D	8 -12	6/2/1998	2			X							Field Duplicate	D98-4081-4
	DP4	12 - 16	6/2/1998	2			X								D98-4081-5
	DP4R		6/2/1998	2			X							Rinsate	
OTHER COLLECTED SUBSURFACE SOILS															
33MW5I	SB1	8 - 10	6/16/1998	2			X								D98-4394-1
	SB2	11 - 12	6/16/1998	2			X								D98-4394-2
33B56	SB1	13 - 15	6/17/1998	2			X	X							D98-4412-1
	SB2	15 - 17	6/17/1998	2			X	X							D98-4412-2
DIRECT-PUSH GROUNDWATER SAMPLES[3]															
33B03	DW1	16 - 18	4/8/1997	1	X										
33B04	DW1	13 - 15	4/7/1997	1	X										
33B05	DW1	17 - 19	4/7/1997	1	X										
33B06	DW1	24 - 26	4/7/1997	1	X										
33B07	DW1	24 - 26	4/7/1997	1	X										
33B08	DW1	26 - 28	4/7/1997	1	X										
33B09	DW1	26 - 28	4/7/1997	1	X										

Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
33B10	DW1	22 - 24	4/8/1997	1	X										
33B11	DW1	20 - 22	4/8/1997	1	X										
33B12	DW1	18 - 20	4/8/1997	1	X	X									
33B13	DW1	20 - 22	4/8/1997	1	X	X									
33B14	DW1	18 - 20	4/8/1997	1	X	X									
33B15	DW1	18 - 20	4/9/1997	1	X	X									
33B16	DW1	18 - 20	4/9/1997	1	X	X									
33B17	DW1	18 - 20	4/9/1997	1	X	X									
33B19	DW1	20 - 22	4/9/1997	1	X	X									
33B20	DW1	16 - 18	4/11/1997	1	X	X									
33B21	DW1	18 - 20	4/11/1997	1	X	X									
	DW1D	18 - 20	4/11/1997	1	X	X								Field Duplicate	
33B22	DW1	18 - 20	4/11/1997	1	X	X									
33B22A	DW1	25 - 25.5	4/18/1997	1	X		X								D97-4807-1
	DW1D	25 - 25.5	4/18/1997	1			X							Field Duplicate	D97-4807-2
33B23	DW1	18 - 20	4/11/1997	1	X	X									
	DW1MS	18 - 20	4/11/1997	1	X									Matrix Spike	
	DW1MSD	18 - 20	4/11/1997	1	X									Matrix Spike Duplicate	
33B24	DW1	22 - 24	4/11/1997	1	X	X									
33B25	DW1	22 - 24	4/11/1997	1	X	X									
	DW1D	22 - 24	4/11/1997	1	X	X								Field Duplicate	
33B26	DW1	20 - 22	4/11/1997	1	X	X									
33B27	DW1	20 - 22	4/11/1997	1	X	X									
33B28	DW1	20 - 22	4/11/1997	1	X	X									
	DW1MS	20 - 22	4/11/1997	1	X									Matrix Spike	
	DW1MSD	20 - 22	4/11/1997	1	X									Matrix Spike Duplicate	
33B29	DW1	18 - 20	4/11/1997	1	X	X									
33B30	DW1	18 - 20	4/14/1997	1	X										
33B31	DW1	18 - 20	4/14/1997	1	X										
33B32	DW1	18 - 20	4/14/1997	1	X	X									
33B33	DW1	18 - 20	4/14/1997	1	X	X									
33B34	DW1	16 - 18	4/14/1997	1	X										
33B35	DW1	18 - 20	4/14/1997	1	X										
33B36	DW1	18 - 20	4/14/1997	1	X										
33B37	DW1	21 - 23	4/15/1997	1	X										

Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
33B38	DW1	18 - 20	4/15/1997	1	X	X									
	DW1D	18 - 20	4/15/1997	1	X									Field Duplicate	
33B39	DW1	24 - 26	4/15/1997	1	X	X									
33B40	DW1	27 - 29	4/15/1997	1	X	X									
	DW1D	27 - 29	4/15/1997	1	X	X								Field Duplicate	
33B41	DW1	18 - 20	4/16/1997	1	X		X								D97-4731-3
	DW1MS	18 - 20	4/16/1997	1	X									Matrix Spike	
	DW1MSD	18 - 20	4/16/1997	1	X									Matrix Spike Duplicate	
33B42	DW1	13 - 15	4/16/1997	1	X										
33B43	DW1	13 - 15	4/16/1997	1	X										
33B44	DW1	18 - 20	4/16/1997	1	X										
33B45	DW1	18 - 20	4/17/1997	1	X			X	X						D97-4731-6
33B46	DW1	18 - 20	4/17/1997	1	X		X	X	X						D97-4731-5
33B47	DW1	8 - 10	4/17/1997	1	X		X	X	X						D97-4731-4
33B48	DW1		4/18/1997	1										Refusal	
33B49	DW1		4/18/1997	1										Refusal	
33B50	DW1		4/18/1997	1										Refusal	
33B51	DW1	18 - 20	4/18/1997	1	X		X								D97-4807-3
	DW1MS	18 - 20	4/18/1997	1			X							Matrix Spike	D97-4807-4
	DW1MSD	18 - 20	4/18/1997	1			X							Matrix Spike Duplicate	D97-4807-5
33MH1[4]	DW1		4/16/1997	1	X										
33B52	DW1	13 - 17	5/14/1998	2	X	X									
33B53	DW1	13 - 17	5/14/1998	2	X	X									
33B54	DW1	13 - 17	5/14/1998	2	X	X	X								D98-3694-1
33B55	DW1	13 - 17	5/14/1998	2	X	X	X								D98-3694-2
	DW2	64 - 68	5/14/1998	2	X	X									
	DW3	33 - 37	5/14/1998	2	X	X									
33MW6D	DW1	12 - 20	4/17/1997	1	X		X								D97-4731-2
CONTINUOUSLY SAMPLED SOIL MONITORING WELL SAMPLES															
33MW2S	CS1	1 - 5	5/7/1997	1			X								D97-5623-2
	CS2	7 - 7.5	5/7/1997	1			X								D97-5623-3
	CS3	14 - 15	5/7/1997	1			X								D97-5623-4
	CS4	19 - 20	5/7/1997	1			X								D97-5623-5
33MW5D	CS1	12 - 13	4/15/1997	1									X		D97-5281-1
	CS2	32 - 33	4/15/1997	1									X		D97-5281-3
	CS3	42 - 43	4/15/1997	1									X		D97-5281-4

Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
33MW6D	CS1	38 - 39	4/17/1997	1									X		D97-5281-5
	CS2	54 - 56	4/17/1997	1									X		D97-5281-6
	CS3	63 - 65	4/17/1997	1									X		D97-5281-8
33MW7D	CS1	20 - 20.5	5/6/1997	1									X		D97-6623-4
	CS2	52 - 52.5	5/6/1997	1									X		D97-6623-5
MONITORING WELL GROUNDWATER SAMPLES															
MW2	GW1	NA	5/12/1997	1			X								D97-5825-11
	GW2	NA	7/17/1998	2			X					X			D98-4944-8
33MW2S	GW1	NA	5/12/1997	1			X								D97-5825-12
	GW2	NA	7/17/1998	2			X					X			D98-4944-9
MW3	GW1	NA	5/12/1997	1			X								D97-5825-9
	GW1D	NA	5/12/1997	1			X							Field Duplicate	D97-5825-10
	GW2	NA	7/17/1998	2			X					X			D98-4944-7
MW4	GW1	NA	5/12/1997	1			X								D97-5825-1
	GW2	NA	7/16/1998	2			X					X			D98-4917-2
33MW4S	GW1	NA	5/12/1997	1			X								D97-5825-2
	GW2	NA	7/15/1998	2			X					X			D98-4890-3
33MW5D	GW1	NA	5/13/1997	1			X								D97-5891-10
	GW1	NA	5/31/1997	1			X								D97-6645-1
	GW2	NA	7/16/1998	2			X			X	X	X			D98-4917-5
33MW5S	GW1	NA	5/12/1997	1			X	X	X						D97-5825-13
	GW2	NA	7/17/1998	2			X			X	X	X			D98-4944-4
	GW2D	NA	7/17/1998	2			X			X	X	X		Field Duplicate	D98-4944-5
33MW5I	GW2	NA	7/17/1998	2			X			X	X	X			D98-4944-6
33MW6D	GW1	NA	5/13/1997	1			X								D97-5891-11
	GW1	NA	5/31/1997	1			X								D97-6645-2
	GW2	NA	7/15/1998	2			X					X			D98-4890-2
33MW7D	GW1	NA	5/12/1997	1			X								D97-5825-7
	GW2	NA	7/16/1998	2			X					X			D98-4917-4
33MW7S	GW1	NA	5/12/1997	1			X								D97-5825-8
	GW2	NA	7/16/1998	2			X					X			D98-4917-3
33MW8S	GW1	NA	5/12/1997	1			X								D97-5825-3
	GW2	NA	7/16/1998	2			X					X			D98-4917-8
33MW9S	GW1	NA	5/12/1997	1			X								D97-5825-4
	GW1MS	NA	5/12/1997	1			X							Matrix Spike	D97-5825-5
	GW1MSD	NA	5/12/1997	1			X							Matrix Spike Duplicate	D97-5825-6
	GW2	NA	7/14/1998	2			X					X			D98-4875-10
33MW10S	GW2	NA	7/14/1998	2			X					X			D98-4875-4
33MW10D	GW2	NA	7/14/1998	2			X					X			D98-4875-5
33MW11S	GW2	NA	7/14/1998	2			X			X	X	X			D98-4875-6
33MW11D	GW2	NA	7/14/1998	2			X			X	X	X			D98-4875-7

Table 22-1
SWMU 33 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of			Field		Chemical Analysis								
Point	Designator	Sample (ft)	Date Collected	RFI Phase	VOC 1	VOC 2	VOC	SVOC	TPH	pH	RCRA Metals	Nat. Attn.[1]	Physical Analysis[2]	Comments	Lab ID Number
	GW2MS	NA	7/14/1998	2			X			X	X	X		Matrix Spike	D98-4875-8
	GW2MSD	NA	7/14/1998	2			X			X	X	X		Matrix Spike Duplicate	D98-4875-9
33MW12S	GW2	NA	7/16/1998	2			X			X	X	X			D98-4917-7
33MW12D	GW2	NA	7/16/1998	2			X			X	X	X			D98-4917-6
33MW13S	GW2	NA	7/17/1998	2			X			X	X	X			D98-4944-2
33MW13D	GW2	NA	7/17/1998	2			X			X	X	X			D98-4944-3
33MW14S	GW2	NA	7/14/1998	2			X					X			D98-4875-2
33MW14D	GW2	NA	7/14/1998	2			X					X			D98-4875-1

Notes:

ft = feet

RCRA Metals = Resource Conservation and Recovery Act Metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver

SVOC = Semivolatile Organic Compounds

TPH = Total Petroleum Hydrocarbons (gasoline and diesel range)

VOC = Volatile Organic Compounds

VOC 1 = trichloroethene, 1,2-dichloroethene, 1,1,1-trichloroethane, vinyl chloride

VOC 2 = benzene, toluene, ethylbenzene, xylenes

[1] = Natural Attenuation Parameters include the following: pH, dissolved oxygen, redox potential (Eh), ferrous iron, nitrate, nitrite, sulfate, sulfide, methane/ethane/ethene, chloride, alkalinity, and total organic carbon (see Appendix T).

[2] = Physical Analysis included the following: Sieve/Hydrometer, Atterberg Limits, Moisture Content, Cation Exchange Capacity, Total Organic Carbon.

[3] = 33MH1 was a water sample taken from a manhole.

[4] = Direct-push refusal was encountered at Borings 33B48 through 33B50.

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B01/DP1	33B01/DP2	33B01/DP3	33B02/DP1	33B02/DP2	33B02/DP3	33B03/DP1
Date Sampled:		3/31/97	3/31/97	3/31/97	3/31/97	3/31/97	3/31/97	4/8/97
Sample Depth From:		1	5	9	1	5	9	3.2
Sample Depth To:		5	9	13	5	9	13	4.2
Laboratory Number:		D97-3879-1	D97-3879-2	D97-3879-3	D97-3879-5	D97-3879-6	D97-3879-7	D97-4264-4
Sample Type:								
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/Kg	6.63 U	***13.8***	6.49 U	6.28 U	***65.5***	***61.9***	6.14 U
1,1,2-Trichloroethane	ug/Kg	6.63 U	6.27 U	***10.7***	6.28 U	***6.37***	***9.37***	6.14 U
1,1-Dichloroethane	ug/Kg	6.63 U	***9.25***	6.49 U	6.28 U	***14.8***	***17.4***	6.14 U
1,1-Dichloroethene	ug/Kg	***26.3***	***61.9***	***12.4***	6.28 U	***24.6***	***21.5***	6.14 U
1,2-Dichloroethane	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	***7.81***	6.14 U
2-Butanone	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
2-Hexanone	ug/Kg	***18 J***	62.7 U	64.9 U	62.8 U	62.1 U	70.1 U	61.4 U
Acetone	ug/Kg	133 U	125 U	130 U	126 U	124 U	140 U	123 U
Carbon disulfide	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
Chloroform	ug/Kg	6.63 U	***8.51***	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
cis-1,2-Dichloroethene	ug/Kg	***2,570 D***	***4,510 D***	***1,440 D***	***1,700 D***	***5,070 D***	***1,750 D***	6.14 U
Ethylbenzene	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
m,p-Xylene	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
Methylene chloride	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
o-Xylene	ug/Kg	6.63 U	6.27 U	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
trans-1,2-Dichloroethene	ug/Kg	***9.99***	***19.3***	6.49 U	6.28 U	6.21 U	7.01 U	6.14 U
Trichloroethene	ug/Kg	***8,100 D***	***19,800 D***	***8,260 D***	***3,290 D***	***12,400 D***	***6,730 D***	***13.6***
Vinyl chloride	ug/Kg	***9.24***	2.51 U	2.59 U	***9.07***	2.48 U	2.81 U	2.46 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***10,733.53***	***24,422.76***	***9,723.1***	***4,999.07***	***17,581.27***	***8,597.98***	***13.6***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B03/DP2	33B04/DP1	33B04/DP1D	33B04/DP2	33B05/DP1	33B05/DP2	33B06/DP1
Date Sampled:		4/8/97	4/7/97	4/7/97	4/7/97	4/7/97	4/7/97	4/7/97
Sample Depth From:		7	1.7	1.7	8	2.5	7	1.6
Sample Depth To:		8	2.4	2.4	9	3.5	8	2.6
Laboratory Number:		D97-4264-5	D97-4256-1	D97-4256-2	D97-4256-3	D97-4256-5	D97-4256-6	D97-4256-7
Sample Type:				Duplicate				
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
1,1,2-Trichloroethane	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	***10.2***	6.24 U
1,1-Dichloroethane	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
1,1-Dichloroethene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	***7.14***	***16.5***	6.24 U
1,2-Dichloroethane	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
2-Butanone	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
2-Hexanone	ug/Kg	63 U	62.7 U	60.4 U	63.6 U	62.2 U	59 U	62.4 U
Acetone	ug/Kg	126 U	125 U	121 U	***69.5 J***	124 U	118 U	125 U
Carbon disulfide	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
Chloroform	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	***7.7***	***9.88***	6.24 U
cis-1,2-Dichloroethene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	***377 D***	***540 D***	***24***
Ethylbenzene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
m,p-Xylene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
Methylene chloride	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
o-Xylene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
trans-1,2-Dichloroethene	ug/Kg	6.3 U	6.27 U	6.04 U	6.36 U	6.22 U	5.9 U	6.24 U
Trichloroethene	ug/Kg	***176***	6.27 U	6.04 U	6.36 U	***2,560 D***	***5,860 D***	***297***
Vinyl chloride	ug/Kg	2.52 U	2.51 U	2.42 U	2.54 U	2.49 U	2.36 U	2.5 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***176***	ND	ND	***69.5***	***2,951.84***	***6,436.58***	***321***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B06/DP2		33B06/DP3		33B07/DP1		33B07/DP2		33B08/DP1		33B08/DP2		33B08/DP2D	
Date Sampled:		4/7/97		4/7/97		4/7/97		4/7/97		4/7/97		4/7/97		4/7/97	
Sample Depth From:		6		9		2.5		6.8		1.5		6.5		6.5	
Sample Depth To:		7		10		3.5		7.8		2.5		7.5		7.5	
Laboratory Number:		D97-4256-8		D97-4256-9		D97-4256-10		D97-4256-11		D97-4256-12		D97-4256-13		D97-4256-14	
Sample Type:														Duplicate	
Volatiles	UNITS														
1,1,1-Trichloroethane	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
1,1,2-Trichloroethane	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
1,1-Dichloroethane	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
1,1-Dichloroethene	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
1,2-Dichloroethane	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
2-Butanone	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
2-Hexanone	ug/Kg	65	U	64.5	U	63.5	U	63.1	U	67.1	U	66	U	67.5	U
Acetone	ug/Kg	130	U	129	U	127	U	***43.9***	***J***	134	U	132	U	***56***	***J***
Carbon disulfide	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
Chloroform	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
cis-1,2-Dichloroethene	ug/Kg	***112***		***111***		***21.3***		***7.05***		6.71	U	6.6	U	6.75	U
Ethylbenzene	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
m,p-Xylene	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
Methylene chloride	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
o-Xylene	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
trans-1,2-Dichloroethene	ug/Kg	6.5	U	6.45	U	6.35	U	6.31	U	6.71	U	6.6	U	6.75	U
Trichloroethene	ug/Kg	***296***	***D***	***261***	***D***	***37.6***		6.31	U	6.71	U	6.6	U	6.75	U
Vinyl chloride	ug/Kg	2.6	U	2.58	U	2.54	U	2.53	U	2.68	U	2.64	U	2.7	U
Total Detected VOCs	UNITS														
Total Volatiles	ug/Kg	***408***		***372***		***58.9***		***50.95***		ND		ND		***56***	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B09/DP1	33B09/DP2	33B10/DP1	33B10/DP2	33B13/DP1	33B13/DP2	33B14/DP1
Date Sampled:		4/7/97	4/7/97	4/8/97	4/8/97	4/8/97	4/8/97	4/8/97
Sample Depth From:		0.8	6	1	7.5	4	8	2.1
Sample Depth To:		1.8	7	2	8.5	5	9	3.1
Laboratory Number:		D97-4256-15	D97-4256-16	D97-4264-1	D97-4264-2	D97-4264-10	D97-4264-11	D97-4264-12
Sample Type:								
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
1,1,2-Trichloroethane	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
1,1-Dichloroethane	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
1,1-Dichloroethene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
1,2-Dichloroethane	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
2-Butanone	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
2-Hexanone	ug/Kg	64.7 U	63.9 U	52.5 U	64.7 U	70.2 U	68.3 U	67.3 U
Acetone	ug/Kg	***422***	128 U	***124***	***157***	***54.1 J***	137 U	***64.3 J***
Carbon disulfide	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
Chloroform	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
cis-1,2-Dichloroethene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	***83.2***
Ethylbenzene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
m,p-Xylene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
Methylene chloride	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
o-Xylene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
trans-1,2-Dichloroethene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	7.02 U	6.83 U	6.73 U
Trichloroethene	ug/Kg	6.47 U	6.39 U	5.25 U	6.47 U	***27.7***	***33.2***	***5,070 D***
Vinyl chloride	ug/Kg	2.59 U	2.55 U	2.1 U	2.59 U	2.81 U	2.73 U	2.69 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***422***	ND	***124***	***157***	***81.8***	***33.2***	***5,217.5***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B14/DP2	33B15/DP1	33B15/DP2	33B15/DP3	33B16/DP1	33B16/DP2	33B17/DP1
Date Sampled:		4/8/97	4/9/97	4/9/97	4/9/97	4/9/97	4/9/97	4/9/97
Sample Depth From:		5	1.5	6.5	9.5	1	6	3
Sample Depth To:		6	2.5	7.5	10.5	2	7	4
Laboratory Number:		D97-4264-13	D97-4344-1	D97-4344-2	D97-4344-3	D97-4344-4	D97-4344-5	D97-4344-6
Sample Type:								
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
1,1,2-Trichloroethane	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
1,1-Dichloroethane	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	***17.2***
1,1-Dichloroethene	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
1,2-Dichloroethane	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
2-Butanone	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
2-Hexanone	ug/Kg	63.9 U	65.5 U	61.7 U	63.5 U	66.1 U	63.5 U	65.2 U
Acetone	ug/Kg	128 U	***59.9 J***	***63 J***	127 U	***52.8 J***	127 U	***89.2 J***
Carbon disulfide	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
Chloroform	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
cis-1,2-Dichloroethene	ug/Kg	***123***	***55.3***	***168***	***195***	***31.6***	***8.65***	6.52 U
Ethylbenzene	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
m,p-Xylene	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
Methylene chloride	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
o-Xylene	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
trans-1,2-Dichloroethene	ug/Kg	6.39 U	6.55 U	6.17 U	6.35 U	6.61 U	6.35 U	6.52 U
Trichloroethene	ug/Kg	***2,310 D***	***577 D***	***1,010 D***	***404 D***	***202***	***398 D***	6.52 U
Vinyl chloride	ug/Kg	2.55 U	2.62 U	2.47 U	2.54 U	2.64 U	2.54 U	2.61 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***2,433***	***692.2***	***1,241***	***599***	***286.4***	***406.65***	***106.4***

LEGEND:

B - Detected in the associated laboratory method blank
F - Detected in the associated equipment rinsate blank
J - Qualified as estimated by the laboratory
J* - Qualified as estimated in the QC evaluation
R - Qualified as unusable in the QC evaluation
T - Detected in associated trip blank
U - Qualified as undetected by the laboratory
U* - Qualified as undetected in the QC evaluation
NA - Not Analyzed
ND - Not Detected
D - Diluted for Analysis

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B17/DP2		33B18/DP1		33B18/DP2		33B19/DP1		33B19/DP2		33B29A/DP1		33B29A/DP2	
Date Sampled:		4/9/97		4/9/97		4/9/97		4/9/97		4/9/97		6/4/98		6/4/98	
Sample Depth From:		5.5		2.5		5		4		5.5		0		4	
Sample Depth To:		6.5		5		6		5		8		4		8	
Laboratory Number:		D97-4344-7		D97-4344-8		D97-4344-11		D97-4344-13		D97-4344-14		D98-4166-7		D98-4166-8	
Sample Type:															
Volatiles	UNITS														
1,1,1-Trichloroethane	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
1,1,2-Trichloroethane	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
1,1-Dichloroethane	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
1,1-Dichloroethene	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
1,2-Dichloroethane	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
2-Butanone	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	***5.09***	***J***	6.38	U
2-Hexanone	ug/Kg	305	DU	64.1	U	67.7	U	72.7	U	63	U	***28.1***	***J***	63.8	U
Acetone	ug/Kg	***127***	***DJ***	128	U	***700***	***D***	***201***		***57.7***	***J***	127	U	128	U
Carbon disulfide	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
Chloroform	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
cis-1,2-Dichloroethene	ug/Kg	30.5	DU	6.41	U	6.77	U	***57.6***		***85.6***		6.35	U	6.38	U
Ethylbenzene	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
m,p-Xylene	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
Methylene chloride	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
o-Xylene	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
trans-1,2-Dichloroethene	ug/Kg	30.5	DU	6.41	U	6.77	U	7.27	U	6.3	U	6.35	U	6.38	U
Trichloroethene	ug/Kg	30.5	DU	6.41	U	6.77	U	***19.8***		6.3	U	***36.6***		***8.44***	
Vinyl chloride	ug/Kg	12.2	DU	2.56	U	2.71	U	2.91	U	2.52	U	2.54	U	2.55	U
Total Detected VOCs	UNITS														
Total Volatiles	ug/Kg	***127***		ND		***700***		***278.4***		***143.3***		***69.79***		***8.44***	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B29A/DP3		33B29A/DP4		33B30A/DP1		33B30A/DP2		33B30A/DP2D		33B30A/DP3		33B30A/DP4	
Date Sampled:		6/4/98		6/4/98		6/4/98		6/4/98		6/4/98		6/4/98		6/4/98	
Sample Depth From:		8		12		0		4		4		8		12	
Sample Depth To:		12		16		4		8		8		12		16	
Laboratory Number:		D98-4166-11		D98-4166-12		D98-4166-2		D98-4166-3		D98-4166-4 Duplicate		D98-4166-5		D98-4166-6	
Sample Type:															
Volatiles	UNITS														
1,1,1-Trichloroethane	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
1,1,2-Trichloroethane	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
1,1-Dichloroethane	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
1,1-Dichloroethene	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
1,2-Dichloroethane	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
2-Butanone	ug/Kg	6.84	U	6.74	U	6.33	U	***5***	***J***	***3.39***	***J***	***13.4***	***J****	32	DU
2-Hexanone	ug/Kg	68.4	U	67.4	U	63.3	U	58.8	U	58.7	U	62	U	320	DU
Acetone	ug/Kg	137	U	135	U	127	U	118	U	117	U	124	U	640	DU
Carbon disulfide	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
Chloroform	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
cis-1,2-Dichloroethene	ug/Kg	6.84	U	6.74	U	6.33	U	***114***		***67.3***	***J****	***18.5***	***J****	***65.7***	***D***
Ethylbenzene	ug/Kg	6.84	U	***1.41***	***J***	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
m,p-Xylene	ug/Kg	6.84	U	***10.4***		6.33	U	5.88	U	5.87	U	6.2	U	32	DU
Methylene chloride	ug/Kg	***5.57***	***J***	***5.36***	***J***	6.33	U	5.88	U	5.87	U	6.2	U	***8.43***	***DJ***
o-Xylene	ug/Kg	6.84	U	***3.96***	***J***	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
trans-1,2-Dichloroethene	ug/Kg	6.84	U	6.74	U	6.33	U	5.88	U	5.87	U	6.2	U	32	DU
Trichloroethene	ug/Kg	***31.9***	***J****	***335***	***DJ****	***6.75***		***38.3***		***29.5***	***J****	***101***	***J****	***325***	***D***
Vinyl chloride	ug/Kg	2.74	U	2.69	U	2.53	U	2.35	U	2.35	U	2.48	U	12.8	DU
Total Detected VOCs	UNITS														
Total Volatiles	ug/Kg	***37.47***		***356.13***		***6.75***		***157.3***		***100.19***		***132.9***		***399.13***	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-2
SWMU 33 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		33B32A/DP1		33B32A/DP2		33B32A/DP3		33B32A/DP3D		33B32A/DP4	
Date Sampled:		6/2/98		6/2/98		6/2/98		6/2/98		6/2/98	
Sample Depth From:		0		4		8		8		12	
Sample Depth To:		4		8		12		12		16	
Laboratory Number:		D98-4081-1		D98-4081-2		D98-4081-3		D98-4081-4 Duplicate		D98-4081-5	
Sample Type:											
Volatiles	UNITS										
1,1,1-Trichloroethane	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	***3.61***	***J***
1,1,2-Trichloroethane	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
1,1-Dichloroethane	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
1,1-Dichloroethene	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
1,2-Dichloroethane	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
2-Butanone	ug/Kg	6.46	U	5.61	U	***5.41***	***J***	6.38	U	6.27	U
2-Hexanone	ug/Kg	64.6	U	56.1	U	60.9	U	63.8	U	62.7	U
Acetone	ug/Kg	129	U	112	U	122	U	128	U	125	U
Carbon disulfide	ug/Kg	6.46	U	5.61	U	***6.47***	***J****	6.38	U	6.27	U
Chloroform	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
cis-1,2-Dichloroethene	ug/Kg	6.46	U	5.61	U	***11.9***	***J****	***6.05***	***J***	***6.84***	***J****
Ethylbenzene	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
m,p-Xylene	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
Methylene chloride	ug/Kg	***3.03***	***J***	***2.01***	***J***	***2.06***	***J***	***3.06***	***J***	6.27	U
o-Xylene	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
trans-1,2-Dichloroethene	ug/Kg	6.46	U	5.61	U	6.09	U	6.38	U	6.27	U
Trichloroethene	ug/Kg	6.46	U	2.97	JU*	6.09	U	6.38	U	***9.41***	***J****
Vinyl chloride	ug/Kg	2.59	U	2.24	U	2.44	U	2.55	U	2.51	U
Total Detected VOCs	UNITS										
Total Volatiles	ug/Kg	***3.03***		***2.01***		***25.84***		***9.11***		***19.86***	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-3
SWMU 33 Phases 1 and 2 Soil Boring Results
Armco Kansas City Facility

Sample Point:		33MW2S/CS1	33MW2S/CS2	33MW2S/CS3	33MW2S/CS4	33MW5I/SB1	33MW5I/SB2	33B56/SB1
Date Sampled:		5/7/97	5/7/97	5/7/97	5/7/97	6/16/98	6/16/98	6/17/98
Sample Depth From:		1	7	14	19	8	11	13
Sample Depth To:		5	7.5	15	20	10	12	15
Laboratory Number:		D97-5623-2	D97-5623-3	D97-5623-4	D97-5623-5	D98-4394-1	D98-4394-2	D98-4412-1
Sample Type:								
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/Kg	***12.8***	***22.7***	7.45 U	7.13 U	7.35 UJ*	6.66 U	32.9 DU
1,1,2-Trichloroethane	ug/Kg	***10.7***	***14.2***	***12.1***	7.13 U	7.35 UJ*	6.66 U	32.9 DU
1,1-Dichloroethane	ug/Kg	***21.7***	***22.8***	***14.4***	7.13 U	7.35 UJ*	6.66 U	32.9 DU
1,1-Dichloroethene	ug/Kg	***27.9***	***37.8***	***17.1***	***8***	7.35 UJ*	6.66 U	32.9 DU
2-Hexanone	ug/Kg	62 U	***6.9 J***	74.5 U	71.3 U	73.5 UJ*	66.6 U	329 DU
Acetone	ug/Kg	124 U	128 U	149 U	***45.9 J***	147 UJ*	133 U	***189 DJ***
Benzene	ug/Kg	6.2 U	6.41 U	7.45 U	7.13 U	***2.6 J***	6.66 U	32.9 DU
cis-1,2-Dichloroethene	ug/Kg	***4,440 D***	***6,180 D***	***778 D***	***215***	7.35 UJ*	6.66 U	32.9 DU
o-Xylene	ug/Kg	6.2 U	6.41 U	7.45 U	7.13 U	7.35 UJ*	6.66 U	32.9 DU
trans-1,2-Dichloroethene	ug/Kg	***45.6***	***36.4***	***9.78***	7.13 U	7.35 UJ*	6.66 U	32.9 DU
Trichloroethene	ug/Kg	***2,600 D***	***10,800 D***	***4,950 D***	***1,210 D***	7.35 UJ*	6.66 U	32.9 DU
Vinyl chloride	ug/Kg	***195***	***132***	2.98 U	2.85 U	2.94 UJ*	2.66 U	13.1 DU
Total Detected VOCs	UNITS							
Total Volatiles	ug/Kg	***7,353.7***	***17,252.8***	***5,781.38***	***1,478.9***	***2.6***	ND	***189***
Semivolatiles	UNITS							
2-Methylnaphthalene	mg/Kg	NA	NA	NA	NA	NA	NA	***15.4 D***
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	mg/Kg	NA	NA	NA	NA	NA	NA	***15.4***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-3
SWMU 33 Phases 1 and 2 Soil Boring Results
Armco Kansas City Facility

	Sample Point:	33B56/SB2	
	Date Sampled:	6/17/98	
	Sample Depth From:	15	
	Sample Depth To:	17	
	Laboratory Number:	D98-4412-2	
	Sample Type:		
Volatiles	UNITS		
1,1,1-Trichloroethane	ug/Kg	6.35	U
1,1,2-Trichloroethane	ug/Kg	6.35	U
1,1-Dichloroethane	ug/Kg	***6.3***	***J***
1,1-Dichloroethene	ug/Kg	6.35	U
2-Hexanone	ug/Kg	63.5	U
Acetone	ug/Kg	***53.6***	***J***
Benzene	ug/Kg	6.35	U
cis-1,2-Dichloroethene	ug/Kg	***11.8***	
o-Xylene	ug/Kg	***1.56***	***J***
trans-1,2-Dichloroethene	ug/Kg	6.35	U
Trichloroethene	ug/Kg	6.35	U
Vinyl chloride	ug/Kg	***16.6***	
Total Detected VOCs	UNITS		
Total Volatiles	ug/Kg	***89.86***	
Semivolatiles	UNITS		
2-Methylnaphthalene	mg/Kg	0.419	U
Total Detected SVOCs	UNITS		
Total Semi-Volatiles	mg/Kg	ND	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-4
SWMUs 17 and 33 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		17B04A/DW1	17B06/DW1	17B08/DW1	17B09/DW1	17B10/DW1	33B22A/DW1	33B22A/DW1D
Date Sampled:		4/21/97	4/21/97	4/21/97	4/21/97	5/14/98	4/18/97	4/18/97
Sample Depth From:		16	11.5	13	16	15	25	25
Sample Depth To:		18	12.5	15	18	17	25.5	25.5
Laboratory Number:		D97-4833-8	D97-4833-2	D97-4833-3	D97-4833-9	D98-3694-3	D97-4807-1	D97-4807-2
Sample Type:								Duplicate
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	5 U	5 U	*36.3*	*3.77 J*	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	*7.72*	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	*23.9*	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	*13.8*	5 U	*108*	*7.91*	5 U	5 U	5 U
Benzene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	5 U	5 U	*7.7*	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	*1,360 D*	*535 D*	*5,460 D*	*931 D*	*23.1*	5 U	5 U
Ethylbenzene	ug/L	5 U	5 U	5 U	5 U	*2.97 J*	5 U	5 U
Tetrachloroethene	ug/L	5 U	5 U	*4.99 J*	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	*9.6*	5 U	*76.2*	*6.75*	*8.72*	5 U	5 U
Trichloroethene	ug/L	*1,870 D*	*1,420 D*	*16,500 D*	*1,940 D*	5 U	5 U	5 U
Vinyl chloride	ug/L	*173*	*17*	*139*	*7.87*	*7.58*	2 U	2 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	*3,426.4*	*1,972*	*22,363.81*	*2,897.3*	*42.37*	ND	ND
Semivolatiles	UNITS							
4-Chloroaniline	ug/L	20.4 U	20 U	21 U	20 U	NA	NA	NA
4-Methylphenol	ug/L	10.2 U	10 U	10.5 U	10 U	NA	NA	NA
Naphthalene	ug/L	10.2 U	10 U	10.5 U	10 U	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	ND	ND	ND	ND	NA	NA	NA
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	NA	*0.01 J*	0.01 U	0.01 U	NA	NA	NA
Barium, Dissolved	mg/L	NA	*0.133*	*0.0603*	*0.0268*	NA	NA	NA
Cadmium, Dissolved	mg/L	NA	*0.0036 J*	0.005 U	0.005 U	NA	NA	NA
Chromium, Dissolved	mg/L	NA	*0.0164*	*0.0022 J*	0.01 U	NA	NA	NA
Lead, Dissolved	mg/L	NA	*0.115*	0.003 U	0.003 U	NA	NA	NA
Silver, Dissolved	mg/L	NA	*0.0033 J*	0.02 U	0.02 U	NA	NA	NA
Water Quality Parameters	UNITS							
pH	SU	NA	*6.7 J**	*6.6 J**	*6.6 J**	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-4
SWMUs 17 and 33 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

Sample Point:		33B41/DW1	33B45/DW1	33B46/DW1	33B47/DW1	33B51/DW1	33B54/DW1	33B55/DW1
Date Sampled:		4/16/97	4/17/97	4/17/97	4/17/97	4/18/97	5/14/98	5/14/98
Sample Depth From:		18	18	18	8	18	13	13
Sample Depth To:		20	20	20	10	20	17	17
Laboratory Number:		D97-4731-3	D97-4731-6	D97-4731-5	D97-4731-4	D97-4807-3	D98-3694-1	D98-3694-2
Sample Type:								
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	NA	5 U	5 U	***19.9***	5 U	5 U
1,1-Dichloroethene	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
Benzene	ug/L	5 U	NA	5 U	5 U	***17.8***	5 U	5 U
Chloroform	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	5 U	NA	5 U	5 U	***5.74***	5 U	5 U
Ethylbenzene	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
Trichloroethene	ug/L	5 U	NA	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	ug/L	2 U	NA	2 U	2 U	***248***	2 U	2 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	ND	NA	ND	ND	***291.44***	ND	ND
Semivolatiles	UNITS							
4-Chloroaniline	ug/L	NA	20 UR	308 DUR	***4.1 J***	NA	NA	NA
4-Methylphenol	ug/L	NA	10 UR	154 DUR	***2.8 J***	NA	NA	NA
Naphthalene	ug/L	NA	10 UR	154 DUR	***2.9 J***	NA	NA	NA
Total Detected SVOCs	UNITS							
Total Semi-Volatiles	ug/L	NA	ND	ND	***9.8***	NA	NA	NA
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Barium, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Cadmium, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Chromium, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Lead, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Silver, Dissolved	mg/L	NA	NA	NA	NA	NA	NA	NA
Water Quality Parameters	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-4
SWMUs 17 and 33 Phases 1 and 2 Direct-Push Groundwater Results
Armco Kansas City Facility

	Sample Point:	33MW6D/DW1	
	Date Sampled:	4/17/97	
	Sample Depth From:	12	
	Sample Depth To:	20	
	Laboratory Number:	D97-4731-2	
	Sample Type:		
Volatiles	UNITS		
1,1,1-Trichloroethane	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
1,1-Dichloroethene	ug/L	5	U
Benzene	ug/L	5	U
Chloroform	ug/L	5	U
cis-1,2-Dichloroethene	ug/L	5	U
Ethylbenzene	ug/L	5	U
Tetrachloroethene	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U
Trichloroethene	ug/L	5	U
Vinyl chloride	ug/L	***60.9***	
Total Detected VOCs	UNITS		
Total Volatiles	ug/L	***60.9***	
Semivolatiles	UNITS		
4-Chloroaniline	ug/L	NA	
4-Methylphenol	ug/L	NA	
Naphthalene	ug/L	NA	
Total Detected SVOCs	UNITS		
Total Semi-Volatiles	ug/L	NA	
Metals, Dissolved	UNITS		
Arsenic, Dissolved	mg/L	NA	
Barium, Dissolved	mg/L	NA	
Cadmium, Dissolved	mg/L	NA	
Chromium, Dissolved	mg/L	NA	
Lead, Dissolved	mg/L	NA	
Silver, Dissolved	mg/L	NA	
Water Quality Parameters	UNITS		
pH	SU	NA	

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-5
SWMU 33 Area Phase 1 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:	UNITS	33MW2S/GW1 5/12/97 D97-5825-12	33MW2/GW1 5/12/97 D97-5825-11	33MW3/GW1 5/12/97 D97-5825-9	33MW3/GW1D 5/12/97 D97-5825-10 Duplicate	33MW4S/GW1 5/12/97 D97-5825-2	33MW4/GW1 5/12/97 D97-5825-1	33MW5S/GW1 5/12/97 D97-5825-13
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	***50.8***	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	***80.7***	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	***103***	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	***369 DJ***	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	***18.6***	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	***57.5***	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	***8,400 D***	***963 D***	***21.9***	***19.1***	5 U	5 U	***403 D***
Tetrachloroethene	ug/L	***10.1***	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	ug/L	***15.4***	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	***106***	***14.1***	5 U	5 U	5 U	5 U	5 U
Trichloroethene	ug/L	***132,000 D***	***21***	***32.1***	***26.3***	5 U	5 U	***279***
Vinyl chloride	ug/L	***64.4***	***1,880 D***	***19.1***	***17.6***	2 U	2 U	***30.6***
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	***141,275.5***	***2,878.1***	***73.1***	***63***	ND	ND	***712.6***
Semivolatiles	UNITS							
		NA	NA	NA	NA	NA	NA	ND

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-5
SWMU 33 Area Phase 1 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:		33MW5D/GW1 5/30/97 D97-6645-1	33MW6D/GW1 5/30/97 D97-6645-2	33MW7S/GW1 5/12/97 D97-5825-8	33MW7D/GW1 5/12/97 D97-5825-7	33MW8S/GW1 5/12/97 D97-5825-3	33MW9S/GW1 5/12/97 D97-5825-4
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	***10.5***	5 U
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U	***5*** U	5 U
Toluene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	ug/L	5 U	5 U	5 U	5 U	***26***	***5*** U
Vinyl chloride	ug/L	2 U	2 U	2 U	2 U	2 U	2 U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND	ND	ND	ND	***36.5***	ND
Semivolatiles	UNITS						
		NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-6
SWMU 33 Area Phase 2 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:		33MW2S/GW2 07/17/1998 D98-4944-9	33MW2/GW2 07/17/1998 D98-4944-8	33MW3/GW2 07/17/1998 D98-4944-7	33MW4S/GW2 07/15/1998 D98-4890-3	33MW4/GW2 07/16/1998 D98-4917-2	33MW5S/GW2 07/17/1998 D98-4944-4	33MW5S/GW2D 07/17/1998 D98-4944-5 Duplicate
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	***75 J****	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	***42.4 J****	***2.7 J***	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	***126 J****	***20.2***	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	2,500 DUJ*	***90.8***	***2.42 J***	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	***15.1 J****	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene	ug/L	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/L	***2.02 J***	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	***42.7 J****	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	***58,700 DJ****	***3,100 D***	***326 D***	5 U	5 U	***386 D***	***350 D***
Methylene chloride	ug/L	***5.93 J****	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	ug/L	***23.1 J****	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	ug/L	***14.8 J****	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	2,500 DUJ*	***15.7***	5 U	5 U	5 U	5 U	***2.96 J***
Trichloroethene	ug/L	***67,700 DJ****	***5,230 D***	***35.1***	5 U	5 U	***19.2***	***19.6***
Vinyl chloride	ug/L	***1,100 DJ****	***583 D***	***148***	2 U	2 U	***26.6***	***24.3***
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	***127,847.05***	***9,042.4***	***511.52***	ND	ND	***431.8***	***396.86***
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	NA	NA	NA	NA	NA	0.01 U	0.01 U
Barium, Dissolved	mg/L	NA	NA	NA	NA	NA	***0.235***	***0.225***
Cadmium, Dissolved	mg/L	NA	NA	NA	NA	NA	0.005 U	0.005 U
Chromium, Dissolved	mg/L	NA	NA	NA	NA	NA	***0.0023 J***	***0.0025 J***
Lead, Dissolved	mg/L	NA	NA	NA	NA	NA	0.003 U	0.003 U
Silver, Dissolved	mg/L	NA	NA	NA	NA	NA	0.005 U	0.005 U
Water Quality Parameters	UNITS							
pH	SU	NA	NA	NA	NA	NA	***6.8 J****	***7.4 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-6
SWMU 33 Area Phase 2 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:		33MW5I/GW2 07/17/1998 D98-4944-6	33MW5D/GW2 07/16/1998 D98-4917-5	33MW6D/GW2 07/15/1998 D98-4890-2	33MW7S/GW2 07/16/1998 D98-4917-3	33MW7D/GW2 07/16/1998 D98-4917-4	33MW8S/GW2 07/16/1998 D98-4917-8	33MW9S/GW2 07/14/1998 D98-4875-10
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
1,1-Dichloroethane	ug/L	*5.49*	5 U	5 U	5 U	5 U	*4.63 J*	5 UJ*
1,1-Dichloroethene	ug/L	*10.5*	5 U	5 U	5 U	5 U	*3.14 J*	5 UJ*
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
1,2-Dichloroethene	ug/L	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
Chloroform	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
cis-1,2-Dichloroethene	ug/L	*1,150 D*	5 U	5 U	5 U	5 U	*12.2*	*7.15 J**
Methylene chloride	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
Toluene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ*
trans-1,2-Dichloroethene	ug/L	*6.19*	5 U	5 U	5 U	5 U	5 U	5 UJ*
Trichloroethene	ug/L	*806 D*	5 U	5 U	5 U	5 U	*51.7*	5 UJ*
Vinyl chloride	ug/L	*12.4*	2 U	2 U	2 U	2 U	2 U	2 UJ*
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	*1,990.58*	ND	ND	ND	ND	*71.67*	*7.15*
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	*0.0148*	*0.021*	NA	NA	NA	NA	NA
Barium, Dissolved	mg/L	*0.315*	*1.31*	NA	NA	NA	NA	NA
Cadmium, Dissolved	mg/L	0.005 U	0.005 U	NA	NA	NA	NA	NA
Chromium, Dissolved	mg/L	*0.0026 J*	*0.0023 J*	NA	NA	NA	NA	NA
Lead, Dissolved	mg/L	0.003 U	0.003 U	NA	NA	NA	NA	NA
Silver, Dissolved	mg/L	0.005 U	0.005 U	NA	NA	NA	NA	NA
Water Quality Parameters	UNITS							
pH	SU	*6.9 J**	*6.8 J**	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-6
SWMU 33 Area Phase 2 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:	UNITS	33MW10S/GW2 07/14/1998 D98-4875-4	33MW10D/GW2 07/14/1998 D98-4875-5	33MW10D/GW2 09/21/1998 366821	33MW11S/GW2 07/14/1998 D98-4875-6	33MW11D/GW2 07/14/1998 D98-4875-7	33MW12S/GW2 07/16/1998 D98-4917-7	33MW12D/GW2 07/16/1998 D98-4917-6
Volatiles	UNITS							
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	*4.32 J*	*2.9 J*	5 U	*2.92 J*	5 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	*2.2 J*	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene	ug/L	NA	NA	*65*	NA	NA	NA	NA
Benzene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	5 U	*74.4*	*63*	5 U	5 U	5 U	5 U
Methylene chloride	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	ug/L	2 U	*9.05*	*4.1*	2 U	2 U	2 U	2 U
Total Detected VOCs	UNITS							
Total Volatiles	ug/L	ND	*87.77*	*137.2*	ND	*2.92*	ND	ND
Metals, Dissolved	UNITS							
Arsenic, Dissolved	mg/L	NA	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U
Barium, Dissolved	mg/L	NA	NA	NA	*0.47*	*0.858*	*0.0837*	*0.677*
Cadmium, Dissolved	mg/L	NA	NA	NA	0.005 U	0.005 U	*0.0035 J*	*0.0013 J*
Chromium, Dissolved	mg/L	NA	NA	NA	*0.0029 J*	*0.0023 J*	*0.0035 J*	0.005 U
Lead, Dissolved	mg/L	NA	NA	NA	0.003 U	0.003 U	*0.0026 J*	*0.0146*
Silver, Dissolved	mg/L	NA	NA	NA	*0.0024 J*	0.005 U	*0.0046 J*	*0.0108*
Water Quality Parameters	UNITS							
pH	SU	NA	NA	NA	*6.7 J**	*7 J**	*6 J**	*6.9 J**

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-6
SWMU 33 Area Phase 2 Monitoring Well Groundwater Results
Armco Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number: / Sample Type:	UNITS	33MW13S/GW2 07/17/1998 D98-4944-2	33MW13D/GW2 07/17/1998 D98-4944-3	33MW14S/GW2 07/14/1998 D98-4875-2	33MW14D/GW2 07/14/1998 D98-4875-1
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U
1,2-Dichloroethene	ug/L	NA	NA	NA	NA
Benzene	ug/L	5 U	5 U	5 U	5 U
Chloroform	ug/L	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U
Methylene chloride	ug/L	5 U	5 U	5 U	5 U
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U
Toluene	ug/L	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U
Trichloroethene	ug/L	3.79 JU*	5 U	5 U	5 U
Vinyl chloride	ug/L	2 U	2 U	2 U	2 U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	ND	ND	ND	ND
Metals, Dissolved	UNITS				
Arsenic, Dissolved	mg/L	0.01 U	0.01 U	NA	NA
Barium, Dissolved	mg/L	*0.047*	*0.61*	NA	NA
Cadmium, Dissolved	mg/L	0.005 U	0.005 U	NA	NA
Chromium, Dissolved	mg/L	*0.004 J*	0.005 U	NA	NA
Lead, Dissolved	mg/L	0.003 U	0.003 U	NA	NA
Silver, Dissolved	mg/L	0.005 U	0.005 U	NA	NA
Water Quality Parameters	UNITS				
pH	SU	*5.1 J**	*6.8 J**	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
D - Diluted for Analysis
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 22-7
SWMU 33 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL (µg/kg)	Sample with SSL Exceedence	Sample Depth (ft)	Sample Results (µg/kg)
1,1-Dichloroethene	60	33B01 / DP2	5 - 9	61.9
cis-1,2-Dichloroethene	400	33B01 / DP1	1 - 5	2,570 D
		33B01 / DP2	5 - 9	4,510 D
		33B01 / DP3	9 - 13	1,440 D
		33B02 / DP1	1 - 5	1,700 D
		33B02 / DP2	5 - 9	5,070 D
		33B02 / DP3	9 - 13	1,750 D
		33B05 / DP2	7 - 8	540 D
		33MW2S / CS1	1 - 5	4,440 D
		33MW2S / CS2	7 - 7.5	6,180 D
		33MW2S / CS3	14 - 15	778 D
Trichloroethene	60	33B01 / DP1	1 - 5	8,100 D
		33B01 / DP2	5 - 9	19,800 D
		33B01 / DP3	9 - 13	8,260 D
		33B02 / DP1	1 - 5	3,290 D
		33B02 / DP2	5 - 9	12,400 D
		33B02 / DP3	9 - 13	6,730 D
		33B03 / DP2	7 - 8	176
		33B05 / DP1	2.5 - 3.5	2,560 D
		33B05 / DP2	7 - 8	5,860 D
		33B06 / DP1	1.6 - 2.6	297
		33B06 / DP2	6 - 7	296 D
		33B06 / DP3	9 - 10	261 D
		33B14 / DP1	2.1 - 3.1	5,070 D
		33B14 / DP2	5 - 6	2,310 D
		33B15 / DP1	1.5 - 2.5	577 D
		33B15 / DP2	6.5 - 7.5	1,010 D
		33B15 / DP3	9.5 - 10.5	404 D
		33B16 / DP1	1 - 2	202
		33B16 / DP2	6 - 7	398 D
		33B29A / DP4	12 - 16	335 DJ*
		33B30A / DP3	8 - 12	101 J*
		33B30A / DP4	12 - 16	325 D
		33MW2S / CS1	1 - 5	2,600 D
		33MW2S / CS2	7 - 7.5	10,800 D
		33MW2S / CS3	14 - 15	4,950 D
		33MW2S / CS4	19 - 20	1,210 D
Vinyl Chloride	10	33MW2S / CS1	1 - 5	195
		33MW2S / CS2	7 - 7.5	132
		33B56 / SB2	15 - 17	16.6

Notes:

D = Sample was diluted for analysis.

DAF = Dilution Attenuation Factor

ft = feet

J* = Qualified as estimated by BMWCI during the QC evaluation.

SSL = Soil Screening Level

Table 22-8
SWMU 33 Area Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Volatiles	**(µg/L)**			**(µg/L)**
Benzene	5	33B51 / DW1	18 - 20	17.8
1,1,2-Trichloroethane	5	17B08 / DW1	13 - 15	7.72
		33MW2S / GW1	NA	80.7
		33MW2S / GW2	NA	42.4 J*
1,1-Dichloroethene	7	17B04A / DW1	16 - 18	13.8
		17B08 / DW1	13 - 15	108
		17B09 / DW1	16 - 18	7.91
		33MW2 / GW2	NA	90.8
		33MW2S / GW1	NA	369 DJ
		33MW5I / GW2	NA	10.5
1,2-Dichloroethane	5	33MW2S / GW1	NA	18.6
		33MW2S / GW2	NA	15.1 J*
cis-1,2-Dichloroethene	70	17B04A / DW1	16 - 18	1,360 D
		17B06 / DW1	11.5 - 12.5	535 D
		17B08 / DW1	13 - 15	5,460 D
		17B09 / DW1	16 - 18	931 D
		33MW2S / GW1	NA	8,400 D
		33MW2S / GW2	NA	58700 DJ*
		33MW2 / GW1	NA	963 D
		33MW2 / GW2	NA	3100 D
		33MW3 / GW2	NA	326 D
		33MW5S / GW1	NA	403 D
		33MW5S / GW2	NA	386 D
		33MW5S / GW2D	NA	350 D
		33MW5I / GW2	NA	1150 D
		33MW10D / GW2	NA	74.4
trans-1,2-Dichloroethene	100	33MW2S / GW1	NA	106
Methylene Chloride	5	33MW2S / GW2	NA	5.93 J*
Tetrachloroethene	5	33MW2S / GW1	NA	10.1
		33MW2S / GW2	NA	23.1 J*
Trichloroethene	5	17B04A / DW1	16 - 18	1,870 D
		17B06 / DW1	11.5 - 12.5	1,420 D
		17B08 / DW1	13 - 15	16,500 D
		17B09 / DW1	16 - 18	1,940 D
		33MW2S / GW1	NA	132,000 D
		33MW2S / GW2	NA	67700 D
		33MW2 / GW1	NA	21
		33MW2 / GW2	NA	5230 D
		33MW3 / GW1	NA	32.1
		33MW3 / GW1D	NA	26.3
		33MW3 / GW2	NA	35.1
		33MW5S / GW1	NA	279
		33MW5S / GW2	NA	19.2
		33MW5S / GW2D	NA	19.6
		33MW5I / GW2	NA	806 D
		33MW8S / GW1	NA	26
		33MW8S / GW2	NA	51.7
Vinyl Chloride	2	17B04A / DW1	16 - 18	173
		17B06 / DW1	11.5 - 12.5	17
		17B08 / DW1	13 - 15	139
		17B09 / DW1	16 - 18	7.87
		17B10 / DW1	15 - 17	7.58
		33B51 / DW1	18 - 20	248

Table 22-8
SWMU 33 Area Groundwater Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	MCL	Sample with MCL Exceedence	Sample Depth (ft)	Sample Result
Vinyl Chloride	2	33MW6D / DW1	12 - 20	60.9
(continued)		33MW2S / GW1	NA	64.4
		33MW2S / GW2	NA	1100 DJ*
		33MW2 / GW1	NA	1,880 D
		33MW2 / GW2	NA	583 D
		33MW3 / GW1	NA	19.1
		33MW3 / GW1D	NA	17.6
		33MW3 / GW2	NA	148
		33MW5S / GW1	NA	30.6
		33MW5S / GW2	NA	26.6
		33MW5S / GW2D	NA	24.3
		33MW5I / GW2	NA	12.4
		33MW10D / GW2	NA	9.05
		33MW10D / GW2**	NA	4.1
Metals	**(mg/L)**			**(mg/L)**
Lead, Dissolved	0.015	17B06 / DW1	11.5 - 12.5	0.115

Notes:

D = Sample was diluted for analysis.
ft = feet
J = Estimated value; concentration below practical quantitation limit.
J* = Qualified as estimated by BMWCI during the QC evaluation.
MCL = Maximum Contaminant Level
** = Second sample was collected 2 months after initial sample to confirm detections.

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k:\armcorf\austin\gisfig98\33gwcod.dgn
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k:\armcorf\austin\intmedia\33mw11.dgn
k:\res\gl0001\dtp\austin\vii\24wc124x18.dgn

SWMU33.DGN/24-AUG-99 10:23/DLS

METAL BUILDING

WIRE MILL BUILDING

BIG BLUE RIVER

SWMU 33

SWMU 17

SWMU 13

33MW10S
33MW10D
33MW9S
33MW11S
33MW11D
33MW6D
33MW4
33MW4S
33MW8S
33MW14S
33MW14D
33MW2S
33MW2
33MW3
33MW5D
33MW5S
33MW5I
33MW13S
33MW13D
33MW12S
33MW12D
33MW7D
33MW7S
33MH01

33B51
33B50
33B40
33B39
33B49
33B38
33B56
33B35
33B34
33B60
33B33
33B12
33B32
33B32A
33B31
33B36
33B48
33B30
33B30A
33B37
33B21
33B20
33B04
33B19
33B15
33B03
33B58
33B01
33B02
33B22
33B22A
33B07
33B05
33B06
33B14
33B16
33B29A
33B29
33B45
33B46
33B13
33B18
33B08
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33B10
33B28
33B23
33B17
33B59
33B57
33B44
33B52
33B53
33B55
33B54
33B24
33B25
33B26
33B27
33B43
33B42
33B41

17B06A
17B04A
17B06
17B03
17B07
17B02
17B09
17B01
17B04
17B08
17B08A
17B10
17B05

750
740
730
720

LEGEND

- DIRECT-PUSH BORING LOCATION
- MONITORING WELL LOCATION
- MANHOLE LOCATION
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.
2. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.

NORTH

80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-1
SWMU 33 SOIL AND GROUNDWATER SAMPLING LOCATIONS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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VOC SOIL DETECTIONS ABOVE DAF SSLs					
PARAMETER	DAF SSL (ug/Kg)	SAMPLE	SAMPLE DEPTH (FT BGS)	SAMPLE RESULT (ug/Kg)	
1,1-DICHLOROETHENE	60				
		33B01/DP2	5-9	61.9	
CIS-1,2-DICHLOROETHENE	400				
		33B01/DP1	1-5	2,570	D
		33B01/DP2	5-9	4,510	D
		33B01/DP3	9-13	1,440	D
		33B02/DP1	1-5	1,700	D
		33B02/DP2	5-9	5,070	D
		33B02/DP3	9-13	1,750	D
		33B05/DP2	7-8	540	D
		33MW2S/CS1	1-5	4,440	D
		33MW2S/CS2	7-7.5	6,180	D
		33MW2S/CS3	14-15	778	D
TRICHLOROETHENE	60				
		33B01/DP1	1-5	8,100	D
		33B01/DP2	5-9	19,800	D
		33B01/DP3	9-13	8,260	D
		33B02/DP1	1-5	3,290	D
		33B02/DP2	5-9	12,400	D
		33B02/DP3	9-13	6,730	D
		33B03/DP2	7-8	176	
		33B05/DP1	2.5-3.5	2,560	D
		33B05/DP2	7-8	5,860	D
		33B06/DP1	1.6-2.6	297	
		33B06/DP2	6-7	296	D
		33B06/DP3	9-10	261	D
		33B14/DP1	2.1-3.1	5,070	D
		33B14/DP2	5-6	2,310	D
		33B15/DP1	1.5-2.5	577	D
		33B15/DP2	6.5-7.5	1,010	D
		33B15/DP3	9.5-10.5	404	D
		33B16/DP1	1-2	202	
		33B16/DP2	6-7	398	D
		33B29A/DP4	12-16	335	DJ*
		33B30A/DP3	8-12	101	J*
		33B30A/DP4	12-16	325	D
		33MW2S/CS1	1-5	2,600	D
		33MW2S/CS2	7-7.5	10,800	D
		33MW2S/CS3	14-15	4,950	D
		33MW2S/CS4	19-20	1,210	D
VINYL CHLORIDE	10				
		33MW2S/CS1	1-5	195	
		33MW2S/CS2	7-7.5	132	
		33B56/SB2	15-17	16.6	

QUALIFIER NOTES:
D = SAMPLE WAS DILUTED FOR ANALYSIS.
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION.

LEGEND

- ✷ MONITORING WELL LOCATION
- ● DIRECT-PUSH BORING LOCATION
- ▼ MANHOLE LOCATION
- 10.0 OR ▯ TOTAL VOC RESULT (ug/Kg) - ALL DETECTIONS BELOW SSLs
- 10.0 OR ▮ TOTAL VOC RESULT (ug/Kg) - ONE OR MORE DETECTIONS ABOVE SSLs (SEE INSET TABLE)
- ▯ NO SAMPLE COLLECTED AT THIS DEPTH INTERVAL
- ND NOT DETECTED
- NS NOT SAMPLED
- ▮ SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- - - SWMU BOUNDARY
- RAILROAD

NOTES:

1. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.
2. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.
3. SOIL FROM INSTALLATION OF WELLS 33MW5D, 33MW6D, 33MW7D WAS ONLY ANALYZED FOR SOIL PHYSICAL CHARACTERISTICS.
4. SOIL VOC RESULTS FOR SAMPLES FROM BORINGS 17B06A AND 17B08A ARE PRESENTED WITH SWMU 17.

NORTH

80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-2
SWMU 33 TOTAL VOC SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\kcmocr\fi\austn_sup\sum0001.dgn
k:\kcmocr\fi\austn\intro\sit1a.dgn
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33VOCSD.DGN/24-AUG-99 10:29/BLS

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TABLE 2. PHASE 1 VOC GROUNDWATER DETECTIONS ABOVE MCLs				
PARAMETER	MCL (ug/L)	SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (ug/L)
1,1,2-TRICHLOROETHANE	5			
		17B08/DW1	13-15	7.72
		33MW2S/GW1	NA	80.7
1,1-DICHLOROETHENE	7			
		17B04A/DW1	16-18	13.8
		17B08/DW1	13-15	108
		17B09/DW1	16-18	7.91
		33MW2S/GW1	NA	369 DJ
1,2-DICHLOROETHANE	5			
		33MW2S/GW1	NA	18.6
CIS-1,2-DICHLOROETHENE	70			
		17B04A/DW1	16-18	1,360 D
		17B06/DW1	11.5-12.5	535 D
		17B08/DW1	13-15	5,460 D
		17B09/DW1	16-18	931 D
		33MW2S/GW1	NA	8,400 D
		33MW2/GW1	NA	963 D
		33MW5S/GW1	NA	403 D
TRANS-1,2-DICHLOROETHENE	100			
		33MW2S/GW1	NA	106
TETRACHLOROETHENE	5			
		33MW2S/GW1	NA	10.1
TRICHLOROETHENE	5			
		17B04A/DW1	16-18	1,870 D
		17B06/DW1	11.5-12.5	1,420 D
		17B08/DW1	13-15	16,500 D
		17B09/DW1	16-18	1,940 D
		33MW2S/GW1	NA	132,000 D
		33MW2/GW1	NA	21
		33MW5S/GW1	NA	279
		33MW8S/GW1	NA	26
VINYL CHLORIDE	2			
		17B04A/DW1	16-18	173
		17B06/DW1	11.5-12.5	17
		17B08/DW1	13-15	139
		17B09/DW1	16-18	7.87
		17B10/DW1	15-17	7.58
		33MW6D/DW1	12-20	60.9
		33MW2S/GW1	NA	64.4
		33MW2/GW1	NA	1,880 D
		33MW5S/GW1	NA	30.6

NOTES:
D = SAMPLE WAS DILUTED FOR ANALYSIS.
J = ESTIMATED VALUE.
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION.
NA = NOT APPLICABLE.

TABLE 1. DIRECT-PUSH BORINGS		
BORING	DEPTH (ft bgs)	RFI PHASE SAMPLED
33B22A	22-22.5	1
33B41	18-20	1
33B46	18-20	1
33B47	8-10	1
33B51	18-20	1
33B54	13-17	2
33B55	13-17	2
33MW6D	12-20	1
17B04A	16-18	1
17B06	11.5-12.5	1
17B08	13-15	1
17B09	16-18	1

LEGEND

- ✷ MONITORING WELL LOCATION
- ● DIRECT-PUSH BORING LOCATION
- ⍒ MANHOLE LOCATION
- ND NOT DETECTED
- NA NOT ANALYZED
- NS SHALLOW GROUNDWATER NOT SAMPLED
- OS ON-SITE VOC SCREENING DATA IS ONLY AVAILABLE FOR THE GROUNDWATER SAMPLE COLLECTED AT THIS LOCATION (SEE APPENDIX)
- 10.0 OR ● TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR ● TOTAL VOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE 2)
- – – – SWMU BOUNDARY
- RAILROAD

NOTES:

1. MONITORING WELL SAMPLES COLLECTED DURING RFI PHASE 1 IN MAY 1997.
2. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASE 1 (1997). (SEE INSET TABLE 1).
3. MONITORING WELLS 33MW5I, 33MW10S, 33MW10D, 33MW11S, 33MW11D, 33MW12S, 33MW12D, 33MW13S, 33MW13D, 33MW14S, AND 33MW14D WERE INSTALLED DURING RFI PHASE 2 (1998).
4. BORINGS 33B51 THROUGH 33B60 WERE ADVANCED DURING RFI PHASE 2 (1998).
5. MONITORING WELLS 33MW2 AND 33MW5I ARE INTERMEDIATE DEPTH MONITORING WELLS SCREENED DIRECTLY ABOVE THE SEMI-CONFINING LAYER IN THE SHALLOW GROUNDWATER. THESE WELLS NOT USED ON CONTOURING SHALLOW GROUNDWATER DATA.
6. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.
7. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.

BIG BLUE RIVER
METAL BUILDING
WIRE MILL BUILDING
SWMU 33
SWMU 17
SWMU 13
NORTH
80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-3
SWMU 33 PHASE 1
TOTAL VOC RESULTS
SHALLOW GROUNDWATER
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

33VOCSP1.DGN/2-SEP-99 10:31/SDS
k:\armcor\austn_sup\swmu0001.dgn
k:\projects\plot\std\dr\austn\civil\24x18vc.dgn
k:\armcor\austn\intrmeas\site.dgn

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PHASE 1 VOC GROUNDWATER DETECTIONS ABOVE MCLs			
PARAMETER	MCL (ug/L)	SAMPLE	SAMPLE RESULT (ug/L)
TRICHLOROETHENE	5	33MW3/GW1	32.1
		33MW3/GW1D	26.3
VINYL CHLORIDE	2	33MW3/GW1	19.1
		33MW3/GW1D	17.6

QUALIFIER NOTES:
D = SAMPLE WAS DILUTED FOR ANALYSIS.
** = SECOND SAMPLE WAS COLLECTED TWO MONTHS AFTER INTITIAL SAMPLE TO CONFIRM DETECTIONS.

BIG BLUE RIVER

METAL BUILDING

WIRE MILL BUILDING

SWMU 33

SWMU 17

SWMU 13

33MW10S
33MW10D NS
33MW9S
33MW11S 33MW11D NS
33MW6D ND
33MW4S
33MW4 ND
33MW8S
33MW2S
33MW2
33MW3 73.1
33MW5S
33MW5I NS
33MW5D ND
33MW7S
33MW7D ND
33MW12S
33MW12D NS
33MW13S
33MW13D NS
33MW14S
33MW14D NS
33MH01

33B51 NS
33B50 NS
33B40 NS
33B39 NS
33B56 NS
33B38 NS
33B49 NS
33B35 NS
33B34 NS
33B60 NS
33B33 NS
33B12 NS
33B32 NS
33B32A NS
33B31 NS
33B36 NS
33B48 NS
33B30 NS
33B30A NS
33B37 NS
33B21 NS
33B20 NS
33B04 NS
33B19 NS
33B15 NS
33B01 NS
33B03 NS
33B58 NS
33B22 NS
33B22A NS
33B11 NS
33B07 NS
33B06 NS
33B05 NS
33B02 NS
33B14 NS
33B16 NS
33B29 NS
33B29A NS
33B45 NS
33B46 NS
33B13 NS
33B18 NS
33B08 NS
33B09 NS
33B10 NS
33B28 NS
33B17 NS
33B23 NS
33B59 NS
33B57 NS
33B44 NS
33B52 NS
33B53 NS
33B54 NS
33B55 NS
33B24 NS
33B25 NS
33B26 NS
33B27 NS
33B43 NS
33B42 NS
33B41 NS

17B06A NS
17B04A NS
17B06 NS
17B03 NS
17B02 NS
17B04 NS
17B09 NS
17B07 NS
17B01 NS
17B10 NS
17B08 NS
17B05 NS
17B08A NS

LEGEND

- MONITORING WELL LOCATION
- DIRECT-PUSH BORING LOCATION
- MANHOLE LOCATION
- ND NOT DETECTED
- NS DEEP GROUNDWATER NOT SAMPLED
- 10.0 OR TOTAL VOC RESULT (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR TOTAL VOC RESULT (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE)
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. MONITORING WELL SAMPLES COLLECTED DURING RFI PHASE 1 IN MAY 1997.
2. MONITORING WELLS 33MW5I, 33MW10S, 33MW10D, 33MW11S, 33MW11D, 33MW12S, 33MW12D, 33MW13S, 33MW13D, 33MW14S, AND 33MW14D WERE INSTALLED DURING RFI PHASE 2 (1998).
3. BORINGS 33B51 THROUGH 33B60 WERE ADVANCED DURING RFI PHASE 2 (1998).
4. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.
5. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.

NORTH

80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-4
SWMU 33 PHASE 1
TOTAL VOC RESULTS
DEEP GROUNDWATER
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

33VODP1.DGN/27-MAY-99 15:09/OLS
u:\armco\esed\f4-wel2.dgn
k:\armco\austin\intrmed\site.dgn
k:\armco\austin\sup#\swmu001.dgn
k:\res\mjl\dcol#\esti\dbo#\austin#c\vi\#2\dmwc124x18.dgn

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TABLE 2. VOC GROUNDWATER DETECTIONS ABOVE MCLs					
PARAMETER	MCL (ug/L)	SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT	(ug/L)
BENZENE	5				
		33B51/DW1	18-20	17.8	
1,1,2-TRICHLOROETHANE	5				
		17B08/DW1	13-15	7.72	
		33MW2S/GW2	NA	42.4	J*
1,1-DICHLOROETHENE	7				
		17B04A/DW1	16-18	13.8	
		17B08/DW1	13-15	108	
		17B09/DW1	16-18	7.91	
		33MW2/GW2	NA	90.8	
		33MW5I/GW2	NA	10.5	
1,2-DICHLOROETHANE	5				
		33MW2S/GW2	NA	15.1	J*
CIS-1,2-DICHLOROETHENE	70				
		17B04A/DW1	16-18	1,360	D
		17B06/DW1	11.5-12.5	535	D
		17B08/DW1	13-15	5,460	D
		17B09/DW1	16-18	931	D
		33MW2S/GW2	NA	58700	DJ*
		33MW2/GW2	NA	3100	D
		33MW5S/GW2	NA	386	D
		33MW5S/GW2D	NA	350	D
		33MW5I/GW2	NA	1150	D
METHYLENE CHLORIDE	5				
		33MW2S/GW2	NA	5.93	J*
TETRACHLOROETHENE	5				
		33MW2S/GW2	NA	23.1	J*
TRICHLOROETHENE	5				
		17B04A/DW1	16-18	1,870	D
		17B06/DW1	11.5-12.5	1,420	D
		17B08/DW1	13-15	16,500	D
		17B09/DW1	16-18	1,940	D
		33MW2S/GW2	NA	67700	D
		33MW2/GW2	NA	5230	D
		33MW5S/GW2	NA	19.2	
		33MW5S/GW2D	NA	19.6	
		33MW5I/GW2	NA	806	D
		33MW8S/GW2	NA	51.7	
VINYL CHLORIDE	2				
		17B04A/DW1	16-18	173	
		17B06/DW1	11.5-12.5	17	
		17B08/DW1	13-15	139	
		17B09/DW1	16-18	7.87	
		17B10/DW1	15-17	7.58	
		33B51/DW1	18-20	248	
		33MW6D/DW1	12-20	60.9	
		33MW2S/GW2	NA	1100	DJ*
		33MW2/GW2	NA	583	D
		33MW5S/GW2	NA	26.6	
		33MW5S/GW2D	NA	24.3	
		33MW5I/GW2	NA	12.4	

NOTES:
D = SAMPLE WAS DILUTED FOR ANALYSIS.
J = ESTIMATED VALUE.
J* = QUALIFIED AS ESTIMATED DURING QC EVALUATION.
NA = NOT APPLICABLE.

TABLE 1. DIRECT-PUSH BORINGS		
BORING	DEPTH (ft bgs)	RFI PHASE SAMPLED
33B22A	22-22.5	1
33B41	18-20	1
33B46	18-20	1
33B47	8-10	1
33B51	18-20	1
33B54	13-17	2
33B55	13-17	2
33MW6D	12-20	1
17B04A	16-18	1
17B06	11.5-12.5	1
17B08	13-15	1
17B09	16-18	1

LEGEND

- ✳ MONITORING WELL LOCATION
- ● DIRECT-PUSH BORING LOCATION
- ▼ MANHOLE LOCATION
- ND NOT DETECTED
- NA NOT ANALYZED
- NS SHALLOW GROUNDWATER NOT SAMPLED
- OS ON-SITE VOC SCREENING DATA IS ONLY AVAILABLE FOR THE GROUNDWATER SAMPLE COLLECTED AT THIS LOCATION (SEE APPENDIX)
- 10.0 OR ● TOTAL VOC RESULTS (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR ● TOTAL VOC RESULTS (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE 2)
- ——— ISOCONCENTRATION CONTOUR SHALLOW GROUNDWATER (ug/L)
- – – – SWMU BOUNDARY
- ——|—— RAILROAD

NOTES:

1. MONITORING WELL SAMPLES COLLECTED DURING RFI PHASE 2 IN JULY 1998.
2. DIRECT-PUSH GROUNDWATER SAMPLES COLLECTED DURING RFI PHASES 1 AND 2 (1997 AND 1998). (SEE INSET TABLE 1).
3. CONTOURS GENERATED BASED ON MONITORING WELL AND DIRECT-PUSH GROUNDWATER DATA AND TAKE INTO ACCOUNT GROUNDWATER FLOW DIRECTION BASED ON WATER-LEVEL ELEVATIONS FOR THAT TIME PERIOD. CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS AND MAY NOT REPRESENT ACTUAL CONCENTRATIONS AT THE LOCATIONS SHOWN.
4. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.
5. MONITORING WELLS 33MW2 AND 33MW5I ARE INTERMEDIATE DEPTH MONITORING WELLS SCREENED DIRECTLY ABOVE THE SEMI-CONFINING LAYER IN THE SHALLOW GROUNDWATER. THESE WELLS NOT USED ON CONTOURING SHALLOW GROUNDWATER DATA.
6. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.

BIG BLUE RIVER
METAL BUILDING
WIRE MILL BUILDING
SWMU 33
SWMU 17
SWMU 13
10
100
1000
10,000
50,000
100,000
33MW10S ND
33MW10D
33MW9S 7.15
33MW11S ND
33MW11D
33B51 291.44
33MW6D 60.9
33B50 NS
33B39 OS
33B40 OS
33B38 OS
33B56
33B49 NS
33MW4S ND
33MW4
33B35 OS
33B34 OS
33B60
33B33 OS
33B12 OS
33B32 OS
33B32A
33B31 OS
33B36 OS
33B48 NS
33B37 OS
33B30 OS
33B30A NS
33MW5S 431.8
33MW5D
33MW5I 1990.58
33MH01 OS
33B47 ND
17B06A NA
17B06 1972
17B03 NA
17B04A 3426.4
17B02 NA
17B07 NA
17B09 2897.3
17B04 NA
17B01 NA
22364
17B08
17B08A NA
17B10 42.37
17B05 NA
33B46 ND
33B45 NA
33B29A NS
33B29 OS
33MW13S ND
33MW13D NS
33B21 OS
33B20 OS
33MW2S 127847.05
33B04 OS
33B19 OS
33B15 OS
33B03 OS
33B58
33B01 NS
33B02 NS
33B16 OS
33B07 OS
33B06 OS
33MW3
33B05 OS
33B18 NS
33B14 OS
33B08 OS
33B13 OS
33MW2 9042.4
33B09 OS
33B10 OS
33B28 OS
33B57 OS
33B44 OS
33B52 OS
33B53 OS
33MW12S ND
33MW12D NS
33B55 ND
33B54 ND
33B22 OS
33B22A ND
33MW8S 71.67
33B11 OS
33MW14S ND
33MW14D
33B23 OS
33B17 OS
33B59
33B24 OS
33B25 OS
33MW7D
33MW7S ND
33B26 OS
33B27 OS
33B43 OS
33B42 OS
33B41 ND

NORTH
80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-5
SWMU 33 PHASE 2
TOTAL VOC RESULTS
SHALLOW GROUNDWATER
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

33GWVOCS.DGN/27-MAY-99 13:48/MLS
k:\armcorfi\ustn.sup\swmu0001.dgn
k:\ess\global\std\dgn\ustn\civil\2dmwc124x18.dgn
k:\armcorfi\ustn\intrmeas\site.dgn

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VOC GROUNDWATER DETECTIONS ABOVE MCLs				
PARAMETER	MCL (ug/L)	SAMPLE	SAMPLE RESULT (ug/L)	
CIS-1,2-DICHLOROETHENE	70	33MW3/GW2	326	D
		33MW10D/GW2	74.4	
TRICHLOROETHENE	5	33MW3/GW2	35.1	
VINYL CHLORIDE	2	33MW3/GW2	148	
		33MW10D/GW2	9.05	
		33MW10D/GW2**	4.1	

QUALIFIER NOTES:
D = SAMPLE WAS DILUTED FOR ANALYSIS.
** = SECOND SAMPLE WAS COLLECTED TWO MONTHS AFTER INTITIAL SAMPLE TO CONFIRM DETECTIONS.

33MW10S
33MW10D
87.77
50
50
10
10
BIG BLUE RIVER
METAL BUILDING
33MW9S
33MW11S
33MW11D
2.92
33B51
NS
33MW6D
ND
33B50
NS
33B40
NS
33B39
NS
33B56
NS
33B38
NS
33B49
NS
10
33MW4S
33B35
NS
33MW4
ND
33B34
NS
33B60
NS
33B33
NS
NS
33B12
100
NS
33B32A
33B32
NS
33B31
NS
33B36
NS
33B48
NS
NS
33B30
33B30A
33B37
NS
33MW5D
ND
33MW5S
NS
33MW5I
NS
33B47
NS
33MH01
17B06A
NS
17B04A
NS
17B06
NS
17B03
NS
17B02
NS
17B04
NS
17B09
NS
17B07
NS
17B01
NS
17B10
NS
17B08
NS
17B08A
NS
17B05
NS
SWMU 17
SWMU 13
33B21
NS
33B20
NS
33B04
NS
33B19
NS
33B15
NS
33B01
NS
33B03
NS
33B58
NS
NS
33B22
NS
33B22A
NS
33MW8S
33B11
NS
33MW2S
33B02
33B07
NS
NS
33B05
NS
33B14
NS
33B16
NS
33B29A
33B29
NS
33B45
NS
33B46
NS
33MW13S
33MW13D
ND
33B06
33MW2
33MW3
511.52
500
33B13
NS
33B18
NS
33MW14S
33MW14D
ND
33B17
NS
33B08
NS
33B09
NS
33B10
NS
33B28
NS
33B23
NS
33B59
NS
SWMU 33
33B57
NS
33B44
NS
33B52
NS
33MW12S
NS
33MW12D
ND
33B55
NS
33B53
33B54
NS
100
10
33MW7D
ND
33MW7S
33B24
NS
33B25
NS
33B26
NS
33B27
NS
33B43
NS
WIRE MILL BUILDING
33B42
NS
33B41
NS

LEGEND

- ✷ MONITORING WELL LOCATION
- ● DIRECT-PUSH BORING LOCATION
- ⛉ MANHOLE LOCATION
- ND NOT DETECTED
- NS DEEP GROUNDWATER NOT SAMPLED
- ISOCONCENTRATION CONTOUR DEEP GROUNDWATER (ug/L)
- INFERRED ISOCONCENTRATION CONTOUR DEEP GROUNDWATER (ug/L)
- 10.0 OR ● TOTAL VOC RESULT (ug/L) - ALL DETECTIONS BELOW MCLs
- 10.0 OR ● TOTAL VOC RESULT (ug/L) - ONE OR MORE DETECTIONS ABOVE MCLs (SEE INSET TABLE)
- SWMU BOUNDARY
- RAILROAD

NOTES:

1. MONITORING WELL SAMPLES COLLECTED DURING RFI PHASE 2 IN JULY 1998.
2. CONTOURS GENERATED BASED ON MONITORING WELL GROUNDWATER DATA AND TAKE INTO ACCOUNT GROUNDWATER FLOW DIRECTION BASED ON WATER-LEVEL ELEVATIONS FOR THAT TIME PERIOD. CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS AND MAY NOT REPRESENT ACTUAL CONCENTRATIONS AT THE LOCATIONS SHOWN.
3. BORINGS 33B57, 33B58, 33B59, AND 33B60 WERE ADVANCED FOR COLLECTION OF GEOPHYSICAL INFORMATION ONLY.
4. DIRECT-PUSH REFUSAL WAS ENCOUNTERED AT BORINGS 33B48, 33B49, AND 33B50.

NORTH

80' 0' 80' 160'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 22-6
SWMU 33 PHASE 2
TOTAL VOC RESULTS
DEEP GROUNDWATER
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\kcmo\fi\austin\intrmeas\site.dgn
k:\kcmo\fi\austin_sup\swmu000).dgn
k:\#esmjlobo\#stdobr\austfmc\civil\2dfwci2#x18.dgn

33GWVOCD.DGN/2-SEP-99 11:02/SOS

24.0 AOC 8 – "OWL GUN CLUB" SHOOTING PARK

24.1 AOC BACKGROUND

24.1.1 Description of AOC

AOC 8, located on Armco property (see Figure 1-2), was a clay pigeon shooting park known as the "Owl Gun Club" which was located south of the Old Blue River "W" Landfill (SWMU 2) and immediately north of Rock Creek. Armco purchased the majority of the property in this area in 1957. The specific dates of operation of the Owl Gun Club are unknown. From a review of aerial photos, the AOC first becomes visible in 1955 and is no longer visible in 1974. Prior to utilization of the shooting range, the area was used for agriculture. Stationing posts and two trap buildings are visible on a 1955 aerial photograph. The western trap building is no longer present by 1964. By 1974, all evidence of the shooting range has been removed, and the area was again used for agriculture. A 1984 aerial photograph also indicates the former shooting range area was cultivated. Because little information is available about the dates the gun club was active or the amount of activity at the club, it is not possible to estimate how much lead shot might be present. The original defined AOC area was approximately 2.5 acres in size.

The primary constituent of potential concern associated with AOC 8 is lead from the lead shot utilized at the gun club.

24.1.2 Release Potential

Although no documented spills or releases are known to have occurred at this AOC, the nature of the activities resulted in a direct placement of lead shot onto the nearby surface soils. The primary release potential for this AOC was to the surrounding surface soil.

24.2 SCOPE OF ACTIVITIES COMPLETED

Potential impact to the environment at AOC 8 was assessed through the collection of surface and shallow subsurface soil samples. Table 24-1 presents a summary of the investigation activities

completed for AOC 8 and Figure 24-1 shows the grid and boring locations at AOC 8. Based on new information obtained during RFI Phase 1 concerning the actual AOC location, grid and boring locations were moved approximately 200 feet north of the AOC boundary as defined in the RFI Workplan. The AOC boundary shown on Figures 24-1 and 24-2 reflects this adjustment.

Composite surface soil samples were collected from four grids (Grid A08G01 through A08G04) during RFI Phase 1. Grid samples were composites of five aliquot locations from within each grid, and were collected from 0 to 1 feet bgs. Due to the presence of an elevated lead detection at Grid A08G02, discrete (grab) samples were collected from each of the five original aliquot locations within that grid. During RFI Phase 1, four direct-push soil borings were advanced in the center of each surface soil grid, and samples were collected from 1 to 3 feet bgs. All samples were analyzed for lead.

During RFI Phase 2, XRF screening was used to aid in the characterization of soil samples in the field to more thoroughly define the extent of lead. Once the XRF screening indicated that the extent of lead had been defined, samples were sent to the analytical laboratory for confirmatory analysis. Selected samples from the impacted areas were also sent to the analytical laboratory for confirmatory analysis and to assist in the definition of the vertical extent of lead.

Soil samples were collected from an additional 44 direct-push borings (Borings A08B05 through A08B48) during RFI Phase 2. Two to three soil samples were collected from each boring, for a total of 125 samples. Samples were typically collected from the 0 to 1, 1 to 2, and/or 2 to 3 feet bgs depth intervals. Exceptions were made at Boring A08B11 where samples were collected from the 4 to 5, 5 to 6, and 6 to 7 feet bgs depth intervals, and A08B18 where samples were collected from the 4.5 to 5.5, 5.5 to 6.5, and 6.5 to 7.5 feet bgs depth intervals. These variations were due to wood chips and fill materials that were placed in the area subsequent to the shooting park, and sampling began at the depth of native soil. All samples from Borings A08B05 through A08B40 were initially screened for lead using XRF spectroscopy. A total of 109 of the samples from the 44 Phase 2 borings were subsequently sent to the analytical laboratory for lead analysis. In addition, ten of the samples from Borings A08B17, A08B23, A08B33, and A08B37 were analyzed for pH to obtain soil chemistry information.

AOC 8 is underlain by clays and silty to sandy clays typical of Missouri River floodplain sediments. A fill platform of slag material abuts AOC 8 to the northwest. Slag gravel roads also bound the western and southern margins of the site. The slag fill platform mentioned above has recently been utilized for the placement of mulched tree trimmings generated off-site and on-site.

24.3 NATURE AND EXTENT OF CONTAMINATION IN SOIL

Tables 24-2 and 24-3 present the analytical results for AOC 8. Figure 24-2 presents the lead soil results for AOC 8. XRF analysis results are presented in Appendix S.

Ten samples, from depths between 0 to 3 feet bgs, were analyzed for pH. Results ranged from pH 7.8 J* to 8.9. No notable differences were found with varying depth or location, and results show a neutral to basic pH.

Lead was detected in all of the samples collected at AOC 8. Lead concentrations were below the 20 DAF SSL (400 mg/Kg) in approximately 75 percent of the samples sent to the analytical laboratory. Lead concentrations exceeded the 20 DAF SSL (400 mg/Kg) in 30 of the 122 samples analyzed and are presented in Table 24-4. The number of detections, number of 20 DAF SSL exceedences, and highest lead concentrations are summarized below by depth interval.

Analytical Laboratory Lead Results for AOC 8 by Depth

Depth (ft)	Number of Samples	Number of Detections	Number of 20 DAF SSL Exceedences	Highest Detection (mg/Kg)	Location	Second Highest Detection (mg/Kg)	Location
0-1	51	51	22	45,600 DF	A08B10	40,400 DF	A08B06
1-2	42	42	6	55,200 J*	A08B48	39,100 DF	A08B06
1-3	4	4	0	191	A08B03	135	A08B02
2-3	20	20	1	778 DF	A08B07	61.1 DJ*	A08B16
4-5	2	2	1	11,200 DF	A08B11	59.1 DJ*	A08B18
5-6	2	2	0	19.6 DF	A08B11	8 DJ*	A08B18
6-7	1	1	0	10.6 DF	A08B11	--	--

As is apparent on Figure 24-2, the size of AOC 8 (based upon the area investigated) increased to encompass approximately 6 acres. The horizontal extent of contamination was well defined by

the borings around the perimeter of the area sampled, but shifted north of the initial AOC definition. In particular, borings around the perimeter of the impacted area generally had lead concentrations less than 100 mg/Kg.

The soil samples collected from the central portion of the AOC 8 area contained lead at varying (almost sporadic) concentrations. It is probable that the highest concentrations were due to discrete pellets of lead shot in the portion of the sample extracted and analyzed by the laboratory. Twelve samples showed lead concentrations in excess of 10,000 mg/Kg. These detections occurred throughout the central portion of the area sampled, with significantly lower concentrations typically encountered in nearby sample locations, or even within the same boring location or duplicate sample. For example, the sample collected in the 0 to 1 feet depth interval at Boring A08B10 contained 3,810 mg/Kg lead while its duplicate contained 45,600 mg/Kg lead. Similar discrepancies between original and duplicate results were noted at Boring A08B37.

As an example of the typical sporadic nature of the data, the lead concentration in the 0 to 1 feet interval at Boring A08B19 (in the central portion of the impacted area) was 1,770 mg/Kg while at Boring A08B42 (approximately 50 feet to the west) the concentration was 11,500 mg/Kg. Similarly, the lead concentration in the 0 to 1 feet interval at Boring A08B20 (also centrally located) was 3,000 mg/Kg, increased to 28,300 mg/Kg just 50 feet to the east (in Boring A08B21), and then decreased to 216 mg/Kg another 50 feet east (in Boring A08B26).

The majority of the 20 DAF SSL exceedences were noted in the 0 to 1 feet bgs depth interval, a few exceedences occurred in the 1 to 2 feet bgs depth interval, and one exceedence occurred in the 2 to 3 feet bgs depth interval. Therefore, for most borings, the vertical extent of lead was limited to the upper one or two feet of soil. An exception was noted at Boring A08B11 that contained a lead detection of 11,200 mg/Kg from 4 to 5 feet bgs. As previously indicated in Section 24.2, samples were collected beginning at 4 to 5 feet bgs when native soil was encountered below the fill material. The location is potentially a low point in the surrounding topography that has been filled during the intervening years with miscellaneous materials (primarily wood chips). The vertical extent of lead was defined in this boring by the deeper samples (19.6 DF mg/Kg and 10.6 DF mg/Kg at 5 to 6 and 6 to 7 feet bgs, respectively).

24.4 FATE AND TRANSPORT POTENTIAL

Potential migration pathways for AOC 8, as summarized in Table 3-1 include subsurface pathways (soil transfer to groundwater and groundwater transport), the surface pathway (storm water runoff), and the air pathway (airborne dust).

The nature and extent of contamination at AOC 8 was assessed through the collection of surface soil and subsurface soil samples. Lead was detected throughout AOC 8 at concentrations exceeding 20 DAF SSLs (based on soil migration to groundwater), from the surface to typically depths of 2 or 3 feet bgs. At one sampling location, lead exceedences occurred to a depth of 5 feet bgs (approximate elevation 724 feet above MSL). Therefore, soil transfer to groundwater could occur. The tendency for metals to strongly adsorb to soil and the neutral to slightly basic soil pH (7.8 to 8.9) at AOC 8 are expected to limit vertical migration of lead.

Groundwater was not encountered at AOC 8 during subsurface soil sampling activities and groundwater samples were not collected. At SWMU 2 located just north of AOC 8, the saturated zone was typically encountered at approximate elevations 719 (shallowest) to 711 (deepest) feet above MSL. Based on the vertical definition of lead in subsurface soil at depths shallower than the saturated zone, a groundwater transport pathway is not expected to be significant for AOC 8.

AOC 8 is a vegetated area. Storm water ponds and infiltrates in the immediate AOC area. Thus, storm water runoff should not provide a significant route for constituent migration. Surface soil particulate (dust) could become airborne. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. However, based on the size of the lead shot in the soil and the vegetative surface cover, dust migration via the air pathway is not expected to be significant at AOC 8.

24.5 RISK EVALUATION

A risk evaluation for the Facility was conducted (see Appendices X and Y). The following subsections provide a summary of specific risk evaluation conducted at AOC 8.

24.5.1 Human Health Evaluation

Lead was identified as a COPC in both surface and subsurface soil. Lead modeling was conducted for AOC 8 to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. For the exposure scenarios evaluated, it was determined that lead in soil at AOC 8 may pose an unacceptable level of risk for the full-time pregnant female worker scenario. However, lead in soil did not pose significant risk for the generic full-time worker or the temporary excavation worker scenarios. The results of the lead modeling and risk evaluation are presented in Chapter 5.0 of Appendix X.

24.5.2 Ecological Evaluation

Lead was identified as a COPEC at AOC 8. Lead exceeded the preliminary screening for plant, soil organism, and wildlife receptors. Five wildlife species exceeded the benchmarks used in site-specific screening in surface soil. The preliminary and site-specific screening indicate possible negative impact to various ecological receptors. However, based on the RFI field activities and a field site visit in October 1998, the ecological receptors present at AOC 8 did not exhibit signs of lead toxicity. The effects of lead on potential receptors are dependent on the bioavailability of lead. Since the soil pH in this area is neutral to slightly basic, lead is probably not in soluble (bioavailable) form. Therefore, the lead contamination at AOC 8 is not anticipated to pose risk to potential ecological receptors. Details of the ecological risk evaluation for AOC 8 are provided in Chapter 4.0 of Appendix Y.

24.6 SUMMARY

AOC 8, located in the eastern portion of the Facility, was an area utilized as a clay pigeon shooting park. The original defined AOC area was approximately 2.5 acres in size. The AOC 8 area was expanded in size, primarily to the north, during the investigation to approximately 6 acres in size in order to define the nature and extent of contamination. Surface soil and subsurface soil samples were collected at AOC 8.

As shown on Figure 24-2, the horizontal and vertical extent of contamination at AOC 8 were adequately defined by the 122 surface and subsurface soil samples. The horizontal extent of

contamination was well defined by borings on the perimeter of the AOC 8 area, but shifted north of the initial AOC definition. In particular, borings around the perimeter of the impacted area generally had lead concentrations less than 100 mg/Kg. Concentrations of lead in soil samples throughout the central portion of the sampling area varied significantly, ranging from concentrations just above the 20 DAF SSL of 400 mg/kg to concentrations as high as 55,200 mg/Kg. The sporadic nature of the data is attributed to some samples containing actual lead shot, while others may not have contained this material. All but two of the 20 DAF SSL exceedences (and thus the vertical extent of contamination) were limited to the upper two feet of the soil. In the west-central portion of the sampling area, an exception was noted at Boring A08B11 that was located in an area of fill material and contained a lead detection of 11,200 mg/Kg from 4 to 5 feet bgs. Ten samples were also analyzed for pH, which was neutral to basic (pH 7.8 J* to pH 8.9).

Potential migration pathways at AOC 8 include soil transfer to groundwater, groundwater transport, storm water runoff, and airborne dust migration.). Lead was detected throughout AOC 8 at concentrations exceeding 20 DAF SSLs (based on soil migration to groundwater), from the surface to as deep as 5 feet bgs (approximate elevation 724 feet above MSL). Therefore, soil transfer to groundwater could occur. The tendency for metals to strongly adsorb to soil and the neutral to basic pH of the soil at AOC 8 are expected to limit vertical migration of metals. Groundwater was not encountered during subsurface soil sampling and groundwater samples were not collected. The saturated zone, as encountered to the north at SWMU 2, is expected to be approximately 5 feet or deeper below the deepest soil detections above 20 DAF SSLs. Based on the definition of the vertical extent of lead in soil at shallower depths above the saturated zone, and the tendencies for metals to strongly adsorb to soil rather than migrate with groundwater movement, the groundwater transport pathway is not expected to be significant for AOC 8.

Storm water ponds and infiltrates in the immediate AOC area; therefore, storm water runoff should not provide a significant route for constituent migration. Surface soil particulate (dust) could become airborne. The prevailing wind direction at the Facility is from the south-southwest to the north-northeast. However, based on the size of the lead shot in the soil and the vegetative surface cover, dust migration via the air pathway is not expected to be significant at AOC 8.

A risk evaluation was conducted for AOC 8. For the human health evaluation, lead was identified as a COPC in surface and subsurface soil. Therefore, lead modeling was conducted to evaluate potential health risks to possible future on-site worker populations including full-time workers and temporary excavation workers. It was determined that lead in soil may pose an unacceptable level of risk for the full-time pregnant female worker scenario. However, lead in soil did not pose significant risk for the full-time generic worker or the temporary excavation worker scenarios. An ecological evaluation was also conducted for AOC 8. Lead exceeded both preliminary (benchmark) and site-specific screening for various plant and wildlife receptors. Qualitative factors and field site visits both indicate that lead contamination is not eliciting adverse effects on these receptors, and as such, risk to potential ecological receptors is not expected to be significant.

* * * * *

Table 24-1
AOC 8 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis			Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	pH	Comments	Number
DIRECT-PUSH SOIL SAMPLES									
A08B01	DP1	1 - 3	3/17/97	1		X			D97-3187-1
	DP1D	1 - 3	3/17/97	1		X		Field Duplicate	D97-3187-2
A08B02	DP1	1 - 3	3/17/97	1		X			D97-3187-3
	DP1MS	1 - 3	3/17/97	1		X		Matrix Spike	D97-3187-4
	DP1MSD	1 - 3	3/17/97	1		X		Matrix Spike Duplicate	D97-3187-5
A08B03	DP1	1 - 3	3/17/97	1		X			D97-3187-6
A08B04	DP1	1 - 3	3/17/97	1		X			D97-3187-7
	DP1R		3/17/97	1		X			D97-3187-8
A08B05	DP1	0 - 1	6/1/98	2	X	X			D98-4319-1
	DP1MS	0 - 1	6/1/98	2	X	X		Matrix Spike	D98-4319-2
	DP1MSD	0 - 1	6/1/98	2	X	X		Matrix Spike Duplicate	D98-4319-3
	DP1R		6/1/98	2		X		Rinsate	D98-4166-15
	DP2	1 - 2	6/1/98	2	X	X			D98-4319-4
	DP3	2 - 3	6/1/98	2	X	X			D98-4319-5
A08B06	DP1	0 - 1	6/1/98	2	X	X			D98-4319-6
	DP2	1 - 2	6/1/98	2	X	X			D98-4319-7
	DP3	2 - 3	6/1/98	2	X	X			D98-4319-8
	DP3D	2 - 3	6/1/98	2	X	X		Field Duplicate	D98-4319-9
A08B07	DP1	0 - 1	6/1/98	2	X	X			D98-4319-10
	DP2	1 - 2	6/1/98	2	X	X			D98-4319-11
	DP3	2 - 3	6/1/98	2	X	X			D98-4319-12
A08B08	DP1	0 - 1	6/3/98	2	X	X			D98-4319-13
	DP2	1 - 2	6/3/98	2	X	X			D98-4319-14
	DP3	2 - 3	6/3/98	2	X				
A08B09	DP1	0 - 1	6/3/98	2	X	X			D98-4319-15
	DP2	1 - 2	6/3/98	2	X	X			D98-4319-16
	DP2MS	1 - 2	6/3/98	2	X	X		Matrix Spike	D98-4319-17
	DP2MSD	1 - 2	6/3/98	2	X	X		Matrix Spike Duplicate	D98-4319-18
	DP3	2 - 3	6/3/98	2	X	X			D98-4319-19
A08B10	DP1	0 - 1	6/3/98	2	X	X			D98-4319-20
	DP1D	0 - 1	6/3/98	2	X	X		Field Duplicate	D98-4319-21
	DP2	1 - 2	6/3/98	2	X	X			D98-4319-22
	DP3	2 - 3	6/3/98	2	X	X			D98-4319-23
A08B11	DP1	4 - 5	6/3/98	2	X	X			D98-4319-24
	DP1R		6/3/98	2		X		Rinsate	D98-4166-16
	DP2	5 - 6	6/3/98	2	X	X			D98-4319-25
	DP3	6 -7	6/3/98	2	X	X			D98-4319-26
A08B12	DP1	0 - 1	6/3/98	2	X	X			D98-4319-27
	DP2	1 - 2	6/3/98	2	X	X			D98-4319-28
	DP3	2 - 3	6/3/98	2	X				
A08B13	DP1	0 - 1	6/4/98	2	X	X			D98-4319-29
	DP2	1 - 2	6/4/98	2	X	X			D98-4319-30
	DP3	2 - 3	6/4/98	2	X				
A08B14	DP1	0 - 1	6/4/98	2	X	X			D98-4319-31
	DP2	1 - 2	6/4/98	2	X	X			D98-4319-32
	DP2D	1 - 2	6/4/98	2	X	X		Field Duplicate	D98-4319-33
	DP3	2 - 3	6/4/98	2	X	X			D98-4319-34
A08B15	DP1	0 - 1	6/4/98	2	X	X			D98-4290-1
	DP2	1 - 2	6/4/98	2	X	X			D98-4290-2
	DP3	2 - 3	6/4/98	2	X	X			D98-4290-3
A08B16	DP1	0 - 1	6/4/98	2	X				
	DP2	1 - 2	6/4/98	2	X	X			D98-4290-4
	DP3	2 - 3	6/4/98	2	X	X			D98-4290-5

Table 24-1
AOC 8 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis			Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	pH	Comments	Number
A08B17	DP1	0 - 1	6/4/98	2	X	X	X		D98-4290-6
	DP2	1 - 2	6/4/98	2	X	X	X		D98-4290-7
	DP3	2 - 3	6/4/98	2	X				
A08B18	DP1	4.5 - 5.5	6/4/98	2	X	X			D98-4290-8
	DP2	5.5 - 6.5	6/4/98	2	X	X			D98-4290-9
	DP3	6.5 - 7.5	6/4/98	2	X				
A08B19	DP1	0 - 1	6/5/98	2	X	X			D98-4290-10
	DP2	1 - 2	6/5/98	2	X	X			D98-4290-11
	DP3	2 - 3	6/5/98	2	X				
A08B20	DP1	0 - 1	6/5/98	2	X	X			D98-4290-12
	DP2	1 - 2	6/5/98	2	X	X			D98-4290-13
	DP2D	1 - 2	6/5/98	2	X	X		Field Duplicate	D98-4290-14
	DP3	2 - 3	6/5/98	2	X	X			D98-4290-15
A08B21	DP1	0 - 1	6/5/98	2	X	X			D98-4290-16
	DP2	1 - 2	6/5/98	2	X	X			D98-4290-17
	DP3	2 - 3	6/5/98	2	X	X			D98-4290-18
	DP3MS	2 - 3	6/5/98	2	X	X		Matrix Spike	D98-4290-19
	DP3MSD	2 - 3	6/5/98	2	X	X		Matrix Spike Duplicate	D98-4290-20
A08B22	DP1	0 - 1	6/5/98	2	X	X			D98-4344-1
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-2
	DP3	2 - 3	6/5/98	2	X	X			D98-4344-3
A08B23	DP1	0 - 1	6/5/98	2	X	X	X		D98-4344-4
	DP2	1 - 2	6/5/98	2	X	X	X		D98-4344-5
	DP3	2 - 3	6/5/98	2	X	X	X		D98-4344-6
A08B24	DP1	0 - 1	6/5/98	2	X	X			D98-4344-7
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-8
	DP3	2 - 3	6/5/98	2	X				
A08B25	DP1	0 - 1	6/5/98	2	X	X			D98-4344-9
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-10
	DP3	2 - 3	6/5/98	2	X				
A08B26	DP1	0 - 1	6/5/98	2	X	X			D98-4344-11
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-12
	DP3	2 - 3	6/5/98	2	X	X			D98-4344-13
A08B27	DP1	0 - 1	6/5/98	2	X	X			D98-4344-14
	DP1D	0 - 1	6/5/98	2	X	X		Field Duplicate	D98-4344-15
	DP1R		6/5/98	2	X	X		Rinsate	D98-4202-1
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-16
	DP3	2 - 3	6/5/98	2	X				
A08B28	DP1	0 - 1	6/5/98	2	X	X			D98-4344-17
	DP2	1 - 2	6/5/98	2	X	X			D98-4344-18
	DP3	2 - 3	6/5/98	2	X	X			D98-4344-19
A08B29	DP1	0 - 1	6/5/98	2	X	X			D98-4344-20
	DP1MS	0 - 1	6/5/98	2	X	X		Matrix Spike	D98-4344-21
	DP1MSD	0 - 1	6/5/98	2	X	X		Matrix Spike Duplicate	D98-4344-22
	DP2	1 - 2	6/5/98	2	X	X			D98-4290-21
	DP3	2 - 3	6/5/98	2	X	X			D98-4290-22
A08B30	DP1	0 - 1	6/9/98	2	X	X			D98-4290-23
	DP1D	0 - 1	6/9/98	2	X	X		Field Duplicate	D98-4290-24
	DP2	1 - 2	6/9/98	2	X	X			D98-4290-25
	DP3	2 - 3	6/9/98	2	X	X			D98-4290-26
A08B31	DP1	0 - 1	6/9/98	2	X	X			D98-4290-27
	DP2	1 - 2	6/9/98	2	X	X			D98-4290-28
	DP3	2 - 3	6/9/98	2	X	X			D98-4290-29

Table 24-1
AOC 8 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis			Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	pH	Comments	Number
A08B32	DP1	0 - 1	6/9/98	2	X	X			D98-4290-30
	DP1MS	0 - 1	6/9/98	2	X	X		Matrix Spike	D98-4290-31
	DP1MSD	0 - 1	6/9/98	2	X	X		Matrix Spike Duplicate	D98-4290-32
	DP2	1 - 2	6/9/98	2	X	X			D98-4290-33
	DP3	2 - 3	6/9/98	2	X				
A08B33	DP1	0 - 1	6/9/98	2	X	X	X		D98-4290-34
	DP2	1 - 2	6/9/98	2	X	X	X		D98-4290-35
	DP3	2 - 3	6/9/98	2	X				
A08B34	DP1	0 - 1	6/9/98	2	X	X			D98-4343-1
	DP2	1 - 2	6/9/98	2	X	X			D98-4343-2
	DP3	2 - 3	6/9/98	2	X				
A08B35	DP1	0 - 1	6/9/98	2	X	X			D98-4343-3
	DP2	1 - 2	6/9/98	2	X	X			D98-4343-4
	DP3	2 - 3	6/9/98	2	X	X			D98-4343-5
A08B36	DP1	0 - 1	6/9/98	2	X	X			D98-4343-6
	DP2	1 - 2	6/9/98	2	X	X			D98-4343-7
	DP3	2 - 3	6/9/98	2	X				
A08B37	DP1	0 - 1	6/10/98	2	X	X	X		D98-4343-8
	DP1D	0 - 1	6/10/98	2	X	X	X	Field Duplicate	D98-4343-9
	DP2	1 - 2	6/10/98	2	X	X	X		D98-4343-10
	DP3	2 - 3	6/10/98	2	X	X	X		D98-4343-11
A08B38	DP1	0 - 1	6/10/98	2	X	X			D98-4343-12
	DP1MS	0 - 1	6/10/98	2	X	X		Matrix Spike	D98-4343-13
	DP1MSD	0 - 1	6/10/98	2	X	X		Matrix Spike Duplicate	D98-4343-14
	DP2	1 - 2	6/10/98	2	X	X			D98-4343-15
	DP3	2 - 3	6/10/98	2	X				
A08B39	DP1	0 - 1	6/10/98	2	X	X			D98-4343-16
	DP2	1 - 2	6/10/98	2	X	X			D98-4343-17
	DP3	2 - 3	6/10/98	2	X	X			
A08B40	DP1	0 - 1	6/10/98	2	X	X			D98-4343-18
	DP2	1 - 2	6/10/98	2	X	X			D98-4343-19
	DP3	2 - 3	6/10/98	2	X				
A08B41	DP1	0 - 1	8/24/98	2		X			363831
	DP2	1 - 2	8/24/98	2		X			363832
A08B42	DP1	0 - 1	8/24/98	2		X			363829
	DP2	1 - 2	8/24/98	2		X			363830
A08B43	DP1	0 - 1	8/24/98	2		X			363827
	DP2	1 - 2	8/24/98	2		X			363828
A08B44	DP1	0 - 1	8/24/98	2		X			363825
	DP2	1 - 2	8/24/98	2		X			363826
A08B45	DP1	0 - 1	8/24/98	2		X			363822
	DP1MS	0 - 1	8/24/98	2		X		Matrix Spike	363822MS
	DP1MSD	0 - 1	8/24/98	2		X		Matrix Spike Duplicate	363822DP
	DP1R		8/24/98	2		X		Rinsate	363833
	DP2	1 - 2	8/24/98	2		X			363823
	DP2D	1 - 2	8/24/98	2		X		Field Duplicate	363824
A08B46	DP1	0 - 1	8/24/98	2		X			363820
	DP2	1 - 2	8/24/98	2		X			363821
A08B47	DP1	0 - 1	8/24/98	2		X			363818
	DP2	1 - 2	8/24/98	2		X			363819
A08B48	DP1	0 - 1	8/24/98	2		X			363815
	DP2	1 - 2	8/24/98	2		X			363816
	DP3	2 - 3	8/24/98	2		X			363817

Table 24-1
AOC 8 Investigation Activities
Armco Kansas City Facility

Sample Location		Depth of Sample	Date	RFI	Field XRF	Chemical Analysis			Lab ID
Point	Designator	(ft)	Collected	Phase	Lead	Lead	pH	Comments	Number
COMPOSITE SURFACE SOIL GRIDS									
A08G01	SR1	0 - 1	3/12/97	1		X			D97-3022-1
	SR1R		3/12/97	1		X		Rinsate	D97-3022-2
A08G02	SR1	0 - 1	3/12/97	1		X			D97-3022-3
	SR1D	0 - 1	3/12/97	1		X		Field Duplicate	D97-3022-4
A08G02A	SR1	0 - 1	5/8/97	1		X			D97-5659-3
A08G02B	SR1	0 - 1	5/8/97	1		X			D97-5659-4
A08G02C	SR1	0 - 1	5/8/97	1		X			D97-5659-2
A08G02D	SR1	0 - 1	5/8/97	1		X			D97-5659-1
A08G02E	SR1	0 - 1	5/8/97	1		X			D97-5659-5
A08G03	SR1	0 - 1	3/12/97	1		X			D97-3022-5
	SR1MS	0 - 1	3/12/97	1		X		Matrix Spike	D97-3022-6
	SR1MSD	0 - 1	3/12/97	1		X		Matrix Spike Duplicate	D97-3022-7
A08G04	SR1	0 - 1	3/12/97	1		X			D97-3022-8

Notes:

ft = feet

XRF = X-Ray Fluorescence Spectroscopy

Table 24-2
AOC 8 Phase 1 Composite Surface Soil Results
Armco Kansas City Facility

Sample Point:		A08G01/SR1	A08G02/SR1	A08G02/SR1D	A08G02A/SR1	A08G02B/SR1	A08G02C/SR1	A08G02D/SR1
Date Sampled:		03/12/1997	03/12/1997	03/12/1997	05/08/1997	05/08/1997	05/08/1997	05/08/1997
Sample Depth From:		0	0	0	0	0	0	0
Sample Depth To:		1	1	1	1	1	1	1
Laboratory Number:		D97-3022-1	D97-3022-3	D97-3022-4	D97-5659-3	D97-5659-4	D97-5659-2	D97-5659-1
Sample Type:				Duplicate				
Metals, Total	UNITS							
Lead, Total	mg/Kg	***66.1 F***	***699 F***	***9,510 F***	***757***	***711***	***11.2 J***	***16.6***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-2
AOC 8 Phase 1 Composite Surface Soil Results
Armco Kansas City Facility

Sample Point:		A08G02E/SR1	A08G03/SR1	A08G04/SR1
Date Sampled:		05/08/1997	03/12/1997	03/12/1997
Sample Depth From:		0	0	0
Sample Depth To:		1	1	1
Laboratory Number:		D97-5659-5	D97-3022-5	D97-3022-8
Sample Type:				
Metals, Total	UNITS			
Lead, Total	mg/Kg	***460***	***65.7 F***	***45.4 F***

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B01/DP1	A08B01/DP1D	A08B02/DP1	A08B03/DP1	A08B04/DP1	A08B05/DP1	A08B05/DP2
Date Sampled:		03/17/1997	03/17/1997	03/17/1997	03/17/1997	03/17/1997	06/01/1998	06/01/1998
Sample Depth From:		1	1	1	1	1	0	1
Sample Depth To:		3	3	3	3	3	1	2
Laboratory Number:		D97-3187-1	D97-3187-2	D97-3187-3	D97-3187-6	D97-3187-7	D98-4319-1	D98-4319-4
Sample Type:			Duplicate					
Metals, Total	UNITS							
Lead, Total	mg/Kg	***24.5***	***23.2***	***135***	***191***	***25***	***3,420 DF***	***40.2 DF***
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B05/DP3	A08B06/DP1	A08B06/DP2	A08B06/DP3	A08B06/DP3D	A08B07/DP1	A08B07/DP2
Date Sampled:		06/01/1998	06/01/1998	06/01/1998	06/01/1998	06/01/1998	06/01/1998	06/01/1998
Sample Depth From:		2	0	1	2	2	0	1
Sample Depth To:		3	1	2	3	3	1	2
Laboratory Number:		D98-4319-5	D98-4319-6	D98-4319-7	D98-4319-8	D98-4319-9	D98-4319-10	D98-4319-11
Sample Type:						Duplicate		
Metals, Total	UNITS							
Lead, Total	mg/Kg	***31.8 DF***	***40,400 DF***	***39,100 DF***	***56 DF***	***30.4 DF***	***29.1 DF***	***27,200 DF***
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B07/DP3	A08B08/DP1	A08B08/DP2	A08B09/DP1	A08B09/DP2	A08B09/DP3	A08B10/DP1
Date Sampled:		06/01/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998
Sample Depth From:		2	0	1	0	1	2	0
Sample Depth To:		3	1	2	1	2	3	1
Laboratory Number:		D98-4319-12	D98-4319-13	D98-4319-14	D98-4319-15	D98-4319-16	D98-4319-19	D98-4319-20
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***778*** ***DF***	***27.5*** ***DF***	***8.7*** ***DF***	***1,950*** ***DF***	***24.4*** ***DF***	***24.8*** ***DF***	***3,810*** ***DF***
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B10/DP1D	A08B10/DP2	A08B10/DP3	A08B11/DP1	A08B11/DP2	A08B11/DP3	A08B12/DP1
Date Sampled:		06/03/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998	06/03/1998
Sample Depth From:		0	1	2	4	5	6	0
Sample Depth To:		1	2	3	5	6	7	1
Laboratory Number:		D98-4319-21	D98-4319-22	D98-4319-23	D98-4319-24	D98-4319-25	D98-4319-26	D98-4319-27
Sample Type:		Duplicate						
Metals, Total	UNITS							
Lead, Total	mg/Kg	***45,600 DF***	***55.7 DF***	***16.7 DF***	***11,200 DF***	***19.6 DF***	***10.6 DF***	***12.4 DF***
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B12/DP2	A08B13/DP1	A08B13/DP2	A08B14/DP1	A08B14/DP2	A08B14/DP2D	A08B14/DP3
Date Sampled:		06/03/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998
Sample Depth From:		1	0	1	0	1	1	2
Sample Depth To:		2	1	2	1	2	2	3
Laboratory Number:		D98-4319-28	D98-4319-29	D98-4319-30	D98-4319-31	D98-4319-32	D98-4319-33	D98-4319-34
Sample Type:							Duplicate	
Metals, Total	UNITS							
Lead, Total	mg/Kg	***9.5*** ***DF***	***494*** ***DF***	***24*** ***DF***	***32,500*** ***DF***	***86.7*** ***DF***	***40.3*** ***DF***	***14.4*** ***DF***
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B15/DP1	A08B15/DP2	A08B15/DP3	A08B16/DP2	A08B16/DP3	A08B17/DP1	A08B17/DP2
Date Sampled:		06/04/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998	06/04/1998
Sample Depth From:		0	1	2	1	2	0	1
Sample Depth To:		1	2	3	2	3	1	2
Laboratory Number:		D98-4290-1	D98-4290-2	D98-4290-3	D98-4290-4	D98-4290-5	D98-4290-6	D98-4290-7
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***10,200 DJ****	***39.9 DJ****	***9.1 DJ****	***1,020 DJ****	***61.1 DJ****	***15.6 DJ****	***8.3 DJ****
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	***8.5 J****	***8.5 J****

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B18/DP1	A08B18/DP2	A08B19/DP1	A08B19/DP2	A08B20/DP1	A08B20/DP2	A08B20/DP2D
Date Sampled:		06/04/1998	06/04/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998
Sample Depth From:		4.5	5.5	0	1	0	1	1
Sample Depth To:		5.5	6.5	1	2	1	2	2
Laboratory Number:		D98-4290-8	D98-4290-9	D98-4290-10	D98-4290-11	D98-4290-12	D98-4290-13	D98-4290-14
Sample Type:								Duplicate
Metals, Total	UNITS							
Lead, Total	mg/Kg	***59.1 DJ****	***8 DJ****	***1,770 DJ****	***62.3 DJ****	***3,000 DJ****	***23.3 DJ****	***47.9 DJ****
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B20/DP3	A08B21/DP1	A08B21/DP2	A08B21/DP3	A08B22/DP1	A08B22/DP2	A08B22/DP3
Date Sampled:		06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998
Sample Depth From:		2	0	1	2	0	1	2
Sample Depth To:		3	1	2	3	1	2	3
Laboratory Number:		D98-4290-15	D98-4290-16	D98-4290-17	D98-4290-18	D98-4344-1	D98-4344-2	D98-4344-3
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***11.8 DJ****	***28,300 DJ****	***59.8 DJ****	***22.3 DJ****	***1,910 DJ****	***15.8 DJ****	***16.7 DJ****
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B23/DP1	A08B23/DP2	A08B23/DP3	A08B24/DP1	A08B24/DP2	A08B25/DP1	A08B25/DP2
Date Sampled:		06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998
Sample Depth From:		0	1	2	0	1	0	1
Sample Depth To:		1	2	3	1	2	1	2
Laboratory Number:		D98-4344-4	D98-4344-5	D98-4344-6	D98-4344-7	D98-4344-8	D98-4344-9	D98-4344-10
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***25,500 DJ****	***42.7 DJ****	***17.2 DJ****	***64.5 DJ****	***13.1 DJ****	***39 DJ****	***20.6 DJ****
Physical Properties of Soil	UNITS							
pH	SU	***7.8 J****	***8 J****	***8.2 J****	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B26/DP1	A08B26/DP2	A08B26/DP3	A08B27/DP1	A08B27/DP1D	A08B27/DP2	A08B28/DP1
Date Sampled:		06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998
Sample Depth From:		0	1	2	0	0	1	0
Sample Depth To:		1	2	3	1	1	2	1
Laboratory Number:		D98-4344-11	D98-4344-12	D98-4344-13	D98-4344-14	D98-4344-15	D98-4344-16	D98-4344-17
Sample Type:						Duplicate		
Metals, Total	UNITS							
Lead, Total	mg/Kg	***216 DJ****	***18.3 DJ****	***18.1 DJ****	***67.9 DJ****	***82.9 DJ****	***16.3 DJ****	***314 DJ****
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B28/DP2	A08B28/DP3	A08B29/DP1	A08B29/DP2	A08B29/DP3	A08B30/DP1	A08B30/DP1D
Date Sampled:		06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/05/1998	06/09/1998	06/09/1998
Sample Depth From:		1	2	0	1	2	0	0
Sample Depth To:		2	3	1	2	3	1	1
Laboratory Number:		D98-4344-18	D98-4344-19	D98-4344-20	D98-4290-21	D98-4290-22	D98-4344-23	D98-4344-24
Sample Type:								Duplicate
Metals, Total	UNITS							
Lead, Total	mg/Kg	***21.6 DJ****	***14.2 DJ****	***939 DJ****	***35,200 DJ****	***50 DJ****	***6,190 DJ****	***3,800 DJ****
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B30/DP2		A08B30/DP3		A08B31/DP1	A08B31/DP2	A08B31/DP3	A08B32/DP1	A08B32/DP2					
Date Sampled:		06/09/1998		06/09/1998		06/09/1998	06/09/1998	06/09/1998	06/09/1998	06/09/1998					
Sample Depth From:		1		2		0	1	2	0	1					
Sample Depth To:		2		3		1	2	3	1	2					
Laboratory Number:		D98-4344-25		D98-4344-26		D98-4344-27	D98-4344-28	D98-4344-29	D98-4344-30	D98-4344-33					
Sample Type:															
Metals, Total	UNITS														
Lead, Total	mg/Kg	***20.8***	***DJ****	***16***	***DJ****	***169***	***DJ****	***50***	***DJ****	***13.2***	***DJ****	***1,850***	***DJ****	***21***	***DJ****
Physical Properties of Soil	UNITS														
pH	SU	NA		NA		NA	NA	NA	NA	NA					

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B33/DP1	A08B33/DP2	A08B34/DP1	A08B34/DP2	A08B35/DP1	A08B35/DP2	A08B35/DP3
Date Sampled:		06/05/1998	06/09/1998	06/09/1998	06/09/1998	06/09/1998	06/09/1998	06/09/1998
Sample Depth From:		0	1	0	1	0	1	2
Sample Depth To:		1	2	1	2	1	2	3
Laboratory Number:		D98-4344-34	D98-4344-35	D98-4343-1	D98-4343-2	D98-4343-3	D98-4343-4	D98-4343-5
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***59.6 DJ****	***9.97 DJ****	***194 J****	***57.3 J****	***274 J****	***21.3 J****	***15.7 J****
Physical Properties of Soil	UNITS							
pH	SU	***8.2 J****	***8.5 J****	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B36/DP1	A08B36/DP2	A08B37/DP1	A08B37/DP1D	A08B37/DP2	A08B37/DP3	A08B38/DP1
Date Sampled:		06/09/1998	06/09/1998	06/10/1998	06/10/1998	06/10/1998	06/10/1998	06/10/1998
Sample Depth From:		0	1	0	0	1	2	0
Sample Depth To:		1	2	1	1	2	3	1
Laboratory Number:		D98-4343-6	D98-4343-7	D98-4343-8	D98-4343-9	D98-4343-10	D98-4343-11	D98-4343-12
Sample Type:					Duplicate			
Metals, Total	UNITS							
Lead, Total	mg/Kg	*54.2 J**	*18.4 J**	*37.9 J**	*1,270 J**	*14.2 J**	*12.8 J**	*96.2 J**
Physical Properties of Soil	UNITS							
pH	SU	NA	NA	*8.9*	*8.5*	*8.1 J**	*8.2 J**	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B38/DP2	A08B39/DP1	A08B39/DP2	A08B40/DP1	A08B40/DP2	A08B41/DP1	A08B41/DP2
Date Sampled:		06/10/1998	06/10/1998	06/10/1998	06/10/1998	06/10/1998	08/24/1998	08/24/1998
Sample Depth From:		1	0	1	0	1	0	1
Sample Depth To:		2	1	2	1	2	1	2
Laboratory Number:		D98-4343-15	D98-4343-16	D98-4343-17	D98-4343-18	D98-4343-19	363831	363832
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***18.7 J****	***18.1 J****	***11 J****	***110 J****	***51.6 J****	***5,690 F***	***79.2 F***
Physical Properties of Soil	UNITS							
		NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B42/DP1	A08B42/DP2	A08B43/DP1	A08B43/DP2	A08B44/DP1	A08B44/DP2	A08B45/DP1
Date Sampled:		08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998
Sample Depth From:		0	1	0	1	0	1	0
Sample Depth To:		1	2	1	2	1	2	1
Laboratory Number:		363829	363830	363827	363828	363825	363826	363822
Sample Type:								
Metals, Total	UNITS							
Lead, Total	mg/Kg	***11,500 F***	***434 F***	***62.8 F***	***22.3 F***	***44.5 F***	***42.9 F***	***32.8 F***
Physical Properties of Soil	UNITS							
		NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
F - Detected in the associated equipment rinsate blank
J - Qualified as estimated by the laboratory
J* - Qualified as estimated in the QC evaluation
R - Qualified as unusable in the QC evaluation
T - Detected in associated trip blank
U - Qualified as undetected by the laboratory
U* - Qualified as undetected in the QC evaluation
NA - Not Analyzed
ND - Not Detected

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

Sample Point:		A08B45/DP2	A08B45/DP2D	A08B46/DP1	A08B46/DP2	A08B47/DP1	A08B47/DP2	A08B48/DP1
Date Sampled:		08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998	08/24/1998
Sample Depth From:		1	1	0	1	0	1	0
Sample Depth To:		2	2	1	2	1	2	1
Laboratory Number:		363823	363824	363820	363821	363818	363819	363815
Sample Type:			Duplicate					
Metals, Total	UNITS							
Lead, Total	mg/Kg	***19.7 F***	***22.1 F***	***58 J****	***27.6 J****	***13.6 J****	***13.4 J****	***60.4 J****
Physical Properties of Soil	UNITS							
		NA	NA	NA	NA	NA	NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-3
AOC 8 Phases 1 and 2 Direct-Push Soil Results
Armco Kansas City Facility

	Sample Point:	A08B48/DP2	A08B48/DP3
	Date Sampled:	08/24/1998	08/24/1998
	Sample Depth From:	1	2
	Sample Depth To:	2	3
	Laboratory Number:	363816	363817
	Sample Type:		
Metals, Total	UNITS		
Lead, Total	mg/Kg	***55,200 J****	***13.6 J****
Physical Properties of Soil	UNITS		
		NA	NA

LEGEND:

B - Detected in the associated laboratory method blank
R - Qualified as unusable in the QC evaluation
NA - Not Analyzed
F - Detected in the associated equipment rinsate blank
T - Detected in associated trip blank
ND - Not Detected
J - Qualified as estimated by the laboratory
U - Qualified as undetected by the laboratory
J* - Qualified as estimated in the QC evaluation
U* - Qualified as undetected in the QC evaluation

Table 24-4
AOC 8 Soil Results Exceeding Screening Limits
Armco Kansas City Facility

Parameter	20 DAF SSL (mg/kg)	Sample with SSL Exceedence	Sample Depth (ft)	Sample Result (mg/kg)
Lead, Total	400	A08G02 / SR1	0 - 1	699 F
		A08G02 / SR1D	0 - 1	9,510 F
		A08G02A / SR1	0 - 1	757
		A08G02B / SR1	0 - 1	711
		A08G02E / SR1	0 - 1	460
		A08B05 / DP1	0 - 1	3,420 DF
		A08B06 / DP1	0 - 1	40,400 DF
		A08B06 / DP2	1 - 2	39,100 DF
		A08B07 / DP2	1 - 2	27,200 DF
		A08B07 / DP3	2 - 3	778 DF
		A08B09 / DP1	0 - 1	1,950 DF
		A08B10 / DP1	0 - 1	3,810 DF
		A08B10 / DP1D	0 - 1	45,600 DF
		A08B11 / DP1	4 - 5	11,200 DF
		A08B13 / DP1	0 - 1	494 DF
		A08B14 / DP1	0 - 1	32,500 DF
		A08B15 / DP1	0 - 1	10,200 DJ*
		A08B16 / DP2	1 - 2	1,020 DJ*
		A08B19 / DP1	0 - 1	1,770 DJ*
		A08B20 / DP1	0 - 1	3,000 DJ*
		A08B21 / DP1	0 - 1	28,300 DJ*
		A08B22 / DP1	0 - 1	1,910 DJ*
		A08B23 / DP1	0 - 1	25 500 DJ*
		A08B29 / DP1	0 - 1	939 DJ*
		A08B29 / DP2	1 - 2	35,200 DJ*
		A08B30 / DP1	0 - 1	6,190 DJ*
		A08B30 / DP1D	0 - 1	3,800 DJ*
		A08B32 / DP1	0 - 1	1,850 DJ*
		A08B37 / DP1D	0 - 1	1,270 J*
		A08B41 / DP1	0 - 1	5,690 F
		A08B42 / DP1	0 - 1	11,500 F
		A08B42 / DP2	1 - 2	434 F
		A08B48 / DP2	1 - 2	55,200 J*

Notes:

D = Sample was diluted for analysis.

DAF = Dilution Attenuation Factor

F = Compound was detected in corresponding equipment rinsate blank.

ft = feet

J* = Qualified as estimated by BMWCI during the QC evaluation.

SSL = Soil Screening Level

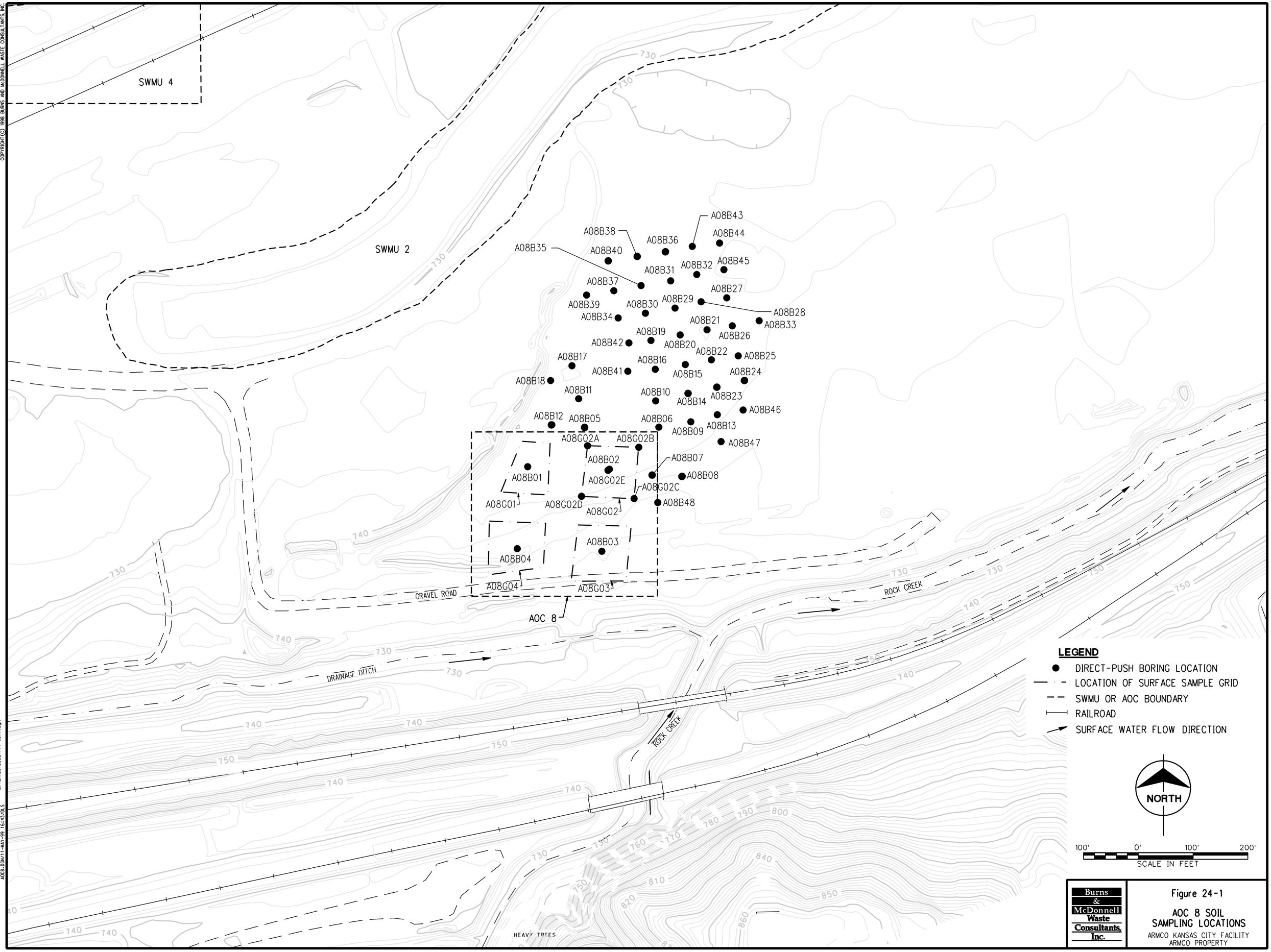

Figure 24-1

AOC 8 SOIL SAMPLING LOCATIONS

ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

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AOC8.DGN/11-MAY-99 16:43/DLS

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LEAD SOIL DETECTIONS ABOVE SSL			
SAMPLE	DEPTH (ft bgs)	SAMPLE RESULT (mg/Kg)	
A08B05/DP1	0-1	3,420	DF
A08B06/DP1	0-1	40,400	DF
A08B06/DP2	1-2	39,100	DF
A08B07/DP2	1-2	27,200	DF
A08B07/DP3	2-3	778	DF
A08B09/DP1	0-1	1,950	DF
A08B10/DP1	0-1	3,810	DF
A08B10/DP1D	0-1	45,600	DF
A08B11/DP1	4-5	11,200	DF
A08B13/DP1	0-1	494	DF
A08B14/DP1	0-1	32,500	DF
A08B15/DP1	0-1	10,200	DJ*
A08B16/DP2	1-2	1,020	DJ*
A08B19/DP1	0-1	1,770	DJ*
A08B20/DP1	0-1	3,000	DJ*
A08B21/DP1	0-1	28,300	DJ*
A08B22/DP1	0-1	1,910	DJ*
A08B23/DP1	0-1	25,500	DJ*
A08B29/DP1	0-1	939	DJ*
A08B29/DP2	1-2	35,200	DJ*
A08B30/DP1	0-1	6,190	DJ*
A08B30/DP1D	0-1	3,800	DJ*
A08B32/DP1	0-1	1,850	DJ*
A08B37/DP1D	0-1	1,270	J*
A08B41/DP1	0-1	5,690	F
A08B42/DP1	0-1	11,500	F
A08B42/DP2	1-2	434	F
A08B48/DP2	1-2	55,200	J*
A08G02/SR1	0-1	699	F
A08G02/SR1D	0-1	9,510	F
A08G02A/SR1	0-1	757	
A08G02B/SR1	0-1	711	
A08G02E/SR1	0-1	460	

QUALIFIER NOTES:
- D = Sample was diluted for analysis.
- F = Compound was detected in corresponding equipment rinsate blank.
- J* = Qualified as estimated by BMWCI during the QC evaluation.

SWMU 2

A08B38 A08B43 A08B36 A08B44 A08B35 A08B40 A08B45 A08B37 A08B31 A08B32 A08B27 A08B39 A08B34 A08B30 A08B29 A08B28 A08B21 A08B33 A08B19 A08B26 A08B20 A08B42 A08B25 A08B17 A08B41 A08B22 A08B15 A08B18 A08B16 A08B24 A08B10 A08B23 A08B11 A08B14 A08B46 A08B12 A08B05 A08B06 A08B13 A08G02A A08G02B A08B47 A08B02 A08B09 A08B01 A08B07 A08G02E A08B08 A08G02C A08G01 A08G02D A08G02 A08B48 A08B03 A08B04 A08G04 A08G03 AOC 8

GRAVEL ROAD ROCK CREEK DRAINAGE DITCH ROCK CREEK HEAVY TREES

730 740 750 760 770 780 790 800 810 820 840 850 860

LEGEND

- DIRECT-PUSH BORING LOCATION
- LOCATION OF SURFACE SAMPLE GRID
- LEAD RESULT ABOVE SSL (400 mg/Kg) (SEE INSET TABLE)
- LEAD RESULT BELOW SSL (400 mg/Kg)
- XRF DATA ONLY, SEE APPENDIX
- SAMPLING STRATEGY: SHORTER HATCH LINES INDICATE THE DEPTH BELOW GROUND SURFACE WHERE EACH MARK REPRESENTS AN ADDITIONAL ONE FOOT OF DEPTH; LONGER HATCH LINES REPRESENT THE SAMPLE DEPTH INTERVALS.
- NO SAMPLE WAS COLLECTED AT THIS DEPTH INTERVAL
- SWMU OR AOC BOUNDARY
- RAILROAD

NOTES:

1. DIRECT-PUSH SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997) AND PHASE 2 (1998).
2. COMPOSITE SURFACE SOIL SAMPLES COLLECTED DURING RFI PHASE 1 (1997).
3. SEE AOC 8 DATA RESULTS TABLES FOR ADDITIONAL SAMPLE INFORMATION.

NORTH

100' 0' 100' 200'
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 24-2
AOC 8 LEAD SOIL RESULTS
ARMCO KANSAS CITY FACILITY
ARMCO PROPERTY

k:\armcor\fi\ustn\sup43dswu.dgn
k:\armcor\fi\ustn\sup43site.dgn
k:\wes\gis\arcinfo\ustn\cty_ln2dwg.dgn
k:\armcor\fi\ustn\gis\gis8bdcc.dgn
k:\armcor\fi\ustn\sup43wwcrk.dgn

A08B.DGN/12-MAY-99 07:41/DLS

APPENDIX Q
ON-SITE TPH IMMUNOASSAY RESULTS

SWMU 24 - Waste Hydraulic and Lubricating Oil Storage Tanks (Armco)
Immuno Assay Readings
Armco Kansas City Facility

Sample Point	Sample Depth below Ground Surface (feet)	Immuno Assay Reading (%)
24T1I1	0 - 5	HIGH
24T1I2	5 - 10	41.0
24T1I3	10 - 15	LOW
24T1I4	10	32.0
24T1I5	10	34.0
24T1I6	8 - 10	LOW
24T1I7	0 - 5	LOW
24T1I8	10 - 15	LOW
24T2I1	15	5 (8-30)
24T2I2	0 - 5	LOW (<8)
24T2I3	5 - 10	41 (70-130)
24T2I4	10 - 15	13 (30-70)
24T2I5	5 - 10	25 (30-70)
24T2I6	10 - 15	LOW (<8)
24T3I1	10.5	LOW
24T3I2	5 - 10	16.0
24T3I3	0 - 5	11.0
24T4I1	0 - 5	LOW (<8)
24T4I2	5 - 10	8 (8-30)
24T4I3	10 - 15	LOW (<8)
24T5I1	0 - 5	16 (30-70)
24T5I2	5 - 10	18 (30-70)
24T5I3	10 - 15	LOW (<8)
24T6I1	0 - 5	18.0
24T6I2	5 - 10	56.0
24T6I3	10 - 15	59.0

SWMU 24 - Waste Hydraulic and Lubricating Oil Storage Tanks (Armco)
Photoionization Detector Readings
Armco Kansas City Facility

Sample Point	Sample Depth below Ground Surface (feet)	Photoionization Detector Reading (ppm)
24T1H1	0 - 5	41.0
24T1H2	5 - 10	2.0
24T1H3	10 - 15	0.0
24T1H4	10	65.0
24T1H5	10	58.0
24T1H6	8 - 10	0.0
24T1H7	0 - 5	6.0
24T1H8	10 - 15	0.0
24T2H1	0 - 0.5	0.0
24T2H2	5 - 10	0.0
24T2H3	10 - 15	0.0
24T2H4	0 - 5	0.0
24T2H5	5 - 10	0.0
24T2H6	10 - 15	0.0
24T3H1	2	2.8
24T3H2	2	1.0
24T3H3	2	5.2
24T3H4	5	0.0
24T3H5	7	10.0
24T3H6	10.5	6.0
24T4H1	0 - 5	0.0
24T4H2	5 - 10	0.0
24T4H3	10 - 15	0.0
24T5H1	0 - 5	0.0
24T5H2	5 - 10	19.0
24T5H3	10 - 15	0.0
24T5H4	0 - 5	2.0
24T5H5	5 - 10	1.3
24T5H6	10 - 15	0.0
24T6H1	10 - 15	0.0
24T6H2	0 - 5	0.0

APPENDIX R
ON-SITE ANALYTICAL GC VOC RESULTS

Appendix R
On-Site Analytical GC VOC Results
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory									
Point	Designator	Sampled	From - To	Number	Units	1,1,1-TCA	DCE	TCE	VC	Benzene	Ethylbenzene	Toluene	Xylenes (total)
02B04A	DW1	5/15/1998	0 - 3	19OF20	ug/L	2 U	2 U	2 U	2.2	5 U	48	76.6	96.9
02B10	DW1	5/15/1998	20 - 24	18OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B11	DW1	5/15/1998	18 - 22	11OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B12	DW1	5/15/1998	20 - 24	12OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B13	DW1	5/15/1998	20 - 24	13OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B13	DW1D	5/15/1998	20 - 24	15OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B14	DW1	5/15/1998	20 - 24	14OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
02B15	DW1	5/15/1998	20 - 24	16OF20	ug/L	2 U	2 U	2 U	2 U	5 U	35.1	10.3	95
02B17	DW1	5/15/1998	4 - 8	20OF20	ug/L	2 U	2 U	2 U	2 U	5 U	5 U	5 U	15 U
17B10	DW1	5/14/1998	15 - 17	5OF20	ug/L	2 U	19.6	2 U	10	NA	NA	NA	NA
33B03	DW1	4/8/1997	16 - 18	9OF60	ug/L	5 U	5 U	1707	2 U	NA	NA	NA	NA
33B04	DW1	4/7/1997	13 - 15	1OF60	ug/L	5 U	5 U	28.2	2 U	NA	NA	NA	NA
33B05	DW1	4/7/1997	17 - 19	2OF60	ug/L	10 U	10 U	3839	4 U	NA	NA	NA	NA
33B06	DW1	4/7/1997	24 - 26	3OF60	ug/L	10 U	10 U	1609	4 U	NA	NA	NA	NA
33B07	DW1	4/7/1997	24 - 26	4OF60	ug/L	25 U	25 U	2917	10 U	NA	NA	NA	NA
33B08	DW1	4/7/1997	26 - 28	5OF60	ug/L	25 U	25 U	2239	10 U	NA	NA	NA	NA
33B09	DW1	4/7/1997	26 - 28	6OF60	ug/L	25 U	25 U	2513	10 U	NA	NA	NA	NA
33B10	DW1	4/8/1997	22 - 24	7OF60	ug/L	10 U	10 U	10 U	4 U	NA	NA	NA	NA
33B10-R	DW1	4/8/1997	22 - 24	8OF60	ug/L	5 U	5 U	26.3	2 U	NA	NA	NA	NA
33B11	DW1	4/8/1997	20 - 22	10OF60	ug/L	5 U	5 U	127	2 U	NA	NA	NA	NA
33B12	DW1	4/8/1997	18 - 20	11OF60	ug/L	5 U	5 U	48	23	NA	NA	NA	NA
33B12	DW1	4/8/1997	18 - 20	1OF27	ug/L	NA	NA	NA	NA	5 U	60.3	28	174
33B13	DW1	4/8/1997	20 - 22	13OF60	ug/L	10 U	10 U	1010	4 U	NA	NA	NA	NA
33B13	DW1	4/8/1997	20 - 22	3OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15
33B14	DW1	4/8/1997	18 - 20	12OF60	ug/L	10 U	10 U	2723	4 U	NA	NA	NA	NA
33B14	DW1	4/8/1997	18 - 20	2OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B15	DW1	4/8/1997	18 - 20	14OF60	ug/L	10 U	10 U	1388	90	NA	NA	NA	NA
33B15	DW1	4/9/1997	18 - 20	4OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B16	DW1	4/9/1997	18 - 20	15OF60	ug/L	47.4	10 U	1699	4 U	NA	NA	NA	NA
33B16	DW1	4/9/1997	18 - 20	5OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B17	DW1	4/9/1997	18 - 20	16OF60	ug/L	5 U	5 U	31.9	2 U	NA	NA	NA	NA
33B17	DW1	4/9/1997	18 - 20	6OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B19	DW1	4/9/1997	20 - 22	17OF60	ug/L	206	10 U	1946	4 U	NA	NA	NA	NA
33B19	DW1	4/9/1997	20 - 22	7OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B20	DW1	4/9/1997	16 - 18	18OF60	ug/L	5 U	5 U	788	2 U	NA	NA	NA	NA
33B20	DW1	4/9/1997	16 - 18	8OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B20-R	DW1	4/9/1997	16 - 18	19OF60	ug/L	5 U	5 U	903	2 U	NA	NA	NA	NA
33B20-R	DW1	4/9/1997	16 - 18	9OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U

Appendix R
On-Site Analytical GC VOC Results
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory									
Point	Designator	Sampled	From - To	Number	Units	1,1,1-TCA	DCE	TCE	VC	Benzene	Ethylbenzene	Toluene	Xylenes (total)
33B21	DW1	4/11/1997	18 - 20	10OF27	ug/L	NA	NA	NA	NA	4 U	4 U	4 U	12 U
33B21	DW1	4/11/1997	18 - 20	20OF60	ug/L	4 U	4 U	4 U	4 U	NA	NA	NA	NA
33B21	DW1D	4/11/1997	18 - 20	11OF27	ug/L	NA	NA	NA	NA	4 U	4 U	4 U	12 U
33B21	DW1D	4/11/1997	18 - 20	21OF60	ug/L	4 U	4 U	4 U	4 U	NA	NA	NA	NA
33B22	DW1	4/11/1997	18 - 20	12OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B22	DW1	4/11/1997	18 - 20	22OF60	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B22A	DW1	4/18/1997	25 - 25.5	59OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B22A-R	DW1	4/18/1997	25 - 25.5	60OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B23	DW1	4/11/1997	18 - 20	13OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B23	DW1	4/11/1997	18 - 20	23OF60	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B24	DW1	4/11/1997	22 - 24	14OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B24	DW1	4/11/1997	22 - 24	24OF60	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B25	DW1	4/11/1997	22 - 24	15OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B25	DW1	4/11/1997	22 - 24	25OF60	ug/L	2 U	2 U	3.5	2 U	NA	NA	NA	NA
33B25	DW1D	4/11/1997	22 - 24	16OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B25	DW1D	4/11/1997	22 - 24	26OF60	ug/L	2 U	2 U	7.9	2 U	NA	NA	NA	NA
33B26	DW1	4/11/1997	20 - 22	17OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B26	DW1	4/11/1997	20 - 22	27OF60	ug/L	2 U	2 U	7.6	2 U	NA	NA	NA	NA
33B27	DW1	4/11/1997	20 - 22	18OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B27	DW1	4/11/1997	20 - 22	28OF60	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B28	DW1	4/11/1997	20 - 22	19OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B28	DW1	4/11/1997	20 - 22	29OF60	ug/L	2 U	2 U	5.6	2 U	NA	NA	NA	NA
33B29	DW1	4/11/1997	18 - 20	20OF27	ug/L	NA	NA	NA	NA	2 U	2 U	2 U	6 U
33B29	DW1	4/11/1997	18 - 20	30OF60	ug/L	14.9	2 U	598	2 U	NA	NA	NA	NA
33B29-R	DW1	4/11/1997	18 - 20	21OF27	ug/L	NA	NA	NA	NA	4 U	4 U	4 U	12 U
33B29-R	DW1	4/11/1997	18 - 20	31OF60	ug/L	16	4 U	918	4 U	NA	NA	NA	NA
33B30	DW1	4/14/1997	18 - 20	32OF60	ug/L	10 U	10 U	1894	4 U	NA	NA	NA	NA
33B31	DW1	4/14/1997	18 - 20	33OF60	ug/L	10 U	10 U	69.5	4 U	NA	NA	NA	NA
33B32	DW1	4/14/1997	18 - 20	22OF27	ug/L	NA	NA	NA	NA	10 U	10 U	10 U	30 U
33B32	DW1	4/14/1997	18 - 20	34OF60	ug/L	190	43.7	689	160	NA	NA	NA	NA
33B33	DW1	4/14/1997	18 - 20	23OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B33	DW1	4/14/1997	18 - 20	38OF60	ug/L	5 U	5 U	10	2 U	NA	NA	NA	NA
33B34	DW1	4/14/1997	16 - 18	35OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B34-R	DW1	4/14/1997	16 - 18	36OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B35	DW1	4/14/1997	18 - 20	37OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B36	DW1	4/14/1997	18 - 20	39OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B37	DW1	4/15/1997	21 - 23	40OF60	ug/L	25 U	25 U	1282	10 U	NA	NA	NA	NA
33B38	DW1	4/15/1997	18 - 20	24OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U

Appendix R
On-Site Analytical GC VOC Results
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory									
Point	Designator	Sampled	From - To	Number	Units	1,1,1-TCA	DCE	TCE	VC	Benzene	Ethylbenzene	Toluene	Xylenes (total)
33B38	DW1	4/15/1997	18 - 20	41OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B38	DW1D	4/15/1997	18 - 20	43OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B38-R	DW1	4/15/1997	18 - 20	42OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B39	DW1	4/15/1997	24 - 26	25OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B39	DW1	4/15/1997	24 - 26	44OF60	ug/L	223	45.9	646	2 U	NA	NA	NA	NA
33B40	DW1	4/15/1997	27 - 29	26OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B40	DW1	4/15/1997	27 - 29	45OF60	ug/L	111	30.5	357	2 U	NA	NA	NA	NA
33B40	DW1D	4/15/1997	27 - 29	27OF27	ug/L	NA	NA	NA	NA	5 U	5 U	5 U	15 U
33B40-R	DW1	4/15/1997	27 - 29	46OF60	ug/L	97.6	13.9	359	2 U	NA	NA	NA	NA
33B41	DW1	4/16/1997	18 - 20	47OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B42	DW1	4/16/1997	13 - 15	48OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B43	DW1	4/17/1997	13 - 15	53OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B44	DW1	4/17/1997	18 - 20	51OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B44-R	DW1	4/17/1997	18 - 20	52OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B45	DW1	4/17/1997	18 - 20	54OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B46	DW1	4/17/1997	18 - 20	56OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B47	DW1	4/17/1997	8 - 10	57OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B51	DW1	4/18/1997	18 - 20	58OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA
33B52	DW1	5/14/1998	13 - 17	1OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B53	DW1	5/14/1998	13 - 17	2OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B54	DW1	5/14/1998	13 - 17	3OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B55	DW1	5/14/1998	13 - 17	4OF20	ug/L	2 U	3.1	2 U	2.4	NA	NA	NA	NA
33B55	DW1	5/14/1998	33 - 37	9OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B55	DW1	5/14/1998	64 - 68	8OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33B55	DW1D	5/14/1998	64 - 68	10OF20	ug/L	2 U	2 U	2 U	2 U	NA	NA	NA	NA
33MH01	DW1	4/16/1997	0 - 0	49OF60	ug/L	5 U	5 U	105	2 U	NA	NA	NA	NA
33MH01-R	DW1	4/16/1997	0 - 0	50OF60	ug/L	5 U	5 U	107	2 U	NA	NA	NA	NA
33MW6D	DW1	4/17/1997	12 - 20	55OF60	ug/L	5 U	5 U	5 U	2 U	NA	NA	NA	NA

Notes:
1,1,1-TCA = 1,1,1-Trichloroethane
DCE = 1,2-Dichloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
NA = Not Analyzed

APPENDIX S
ON-SITE ANALYTICAL XRF RESULTS

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
04B07	DP1	0-1	5/26/1998	801 ± 41.6
04B07	DP2	1-2	5/26/1998	61 ± 13.9
04B08	DP1	0-1	5/26/1998	362 ± 24
04B08	DP2	1-2	5/26/1998	821 ± 37.1
04B11	DP1	0-1	5/27/1998	483 ± 33.5
04B11	DP2	1-2	5/27/1998	441 ± 28.7
04B13	DP1	0-1	5/27/1998	652 ± 36.3
04B13	DP2	1-2	5/27/1998	1947 ± 61.9
04B13	DP3	2-3	5/27/1998	4152 ± 85.4
04B14	DP1	0-1	5/27/1998	779 ± 36.5
04B14	DP2	1-2	5/27/1998	1063 ± 43.9
04B14	DP3	2-3	5/27/1998	365 ± 26.6
04B15	DP1	0-1	5/27/1998	197 ± 20 2
04B15	DP2	1-2	5/27/1998	576 ± 31.7
04B16	DP1	0-1	5/27/1998	236 ± 22 2
04B16	DP2	1-2	5/27/1998	194 ± 20.1
04B16	DP3	2-3	5/27/1998	3927 ± 95
04B16	DP4	3-4	5/27/1998	5170 ± 119
04B18	DP2	1-2	5/27/1998	78 ± 15 1
04B18	DP3	2-3	5/27/1998	259 ± 21.4
04B19	DP2	1-2	5/27/1998	183 ± 19.6
04B19	DP3	2-3	5/27/1998	109 ± 17.6
04B19	DP4	3-4	5/27/1998	923 ± 39.6
04B20	DP1	0-1	5/27/1998	243 ± 21.7
04B20	DP2	1-2	5/27/1998	39 ± 14.9
04B20	DP3	2-3	5/27/1998	71 ± 14 8
04B20	DP4	3-4	5/27/1998	36 ± 13 5
04B20	DP5	4-5	5/27/1998	178 ± 19 8
04B20	DP6	5-6	5/27/1998	51 ± 12 9
04B20	DP7	6-7	5/27/1998	16 ± 11.9
04B20	DP8	7-8	5/27/1998	Not Detected
04B21	DP1	0-1	5/27/1998	45 ± 15.1
04B21	DP2	1-2	5/27/1998	93 ± 17
04B21	DP3	2-3	5/27/1998	205 ± 22.6
04B22	DP1	0-1	5/27/1998	127 ± 18.2
04B22	DP2	1-2	5/27/1998	52 ± 14.4
04B23	DP1	0-1	5/27/1998	604 ± 31.1
04B30	DP2	1-2	5/28/1998	3412 ± 87 3
04B30	DP3	2-3	5/28/1998	3129 ± 86
04B30	DP4	3-4	5/28/1998	2303 ± 70.6
04B31	DP1	0-1	5/28/1998	542 ± 33
04B31	DP2	1-2	5/28/1998	85 ± 15.6
04B31	DP3	2-3	5/28/1998	137 ± 17.5
04B31	DP4	3-4	5/28/1998	58 ± 15.8
04B32	DP1	0-1	5/28/1998	401 ± 28.2
04B32	DP2	1-2	5/28/1998	86 ± 15
04B33	DP1	0-1	5/29/1998	420 ± 22.8
04B33	DP2	1-2	5/29/1998	1894 ± 64 4
04B33	DP3	2-3	5/29/1998	37 ± 17.8
04B33	DP4	3-4	5/29/1998	Not Detected
04B34	DP1	0-1	5/29/1998	3525 ± 89 9
04B34	DP2	1-2	5/29/1998	1803 ± 58.8
04B35	DP1	0-1	5/29/1998	2691 ± 76.4
04B35	DP2	1-2	5/29/1998	140 ± 19.6
04B36	DP1	0-1	5/29/1998	3601 ± 22.8
04B36	DP2	1-2	5/29/1998	4810 ± 64 4
04B36	DP3	2-3	5/29/1998	5660 ± 17.8
04B36	DP4	3-4	5/29/1998	8040 ± 161

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
04B37	DP1	0-1	5/29/1998	172 ± 18 8
04B37	DP2	1-2	5/29/1998	54 ± 14 3
04B37	DP3	2-3	5/29/1998	18 ± 12 2
04B37	DP4	3-4	5/29/1998	35 ± 13.3
04B38	DP2	1-2	5/29/1998	25 ± 15
04B38	DP3	2-3	5/29/1998	63 ± 14.1
04B39	DP1	0-1	5/29/1998	5440 ± 133
04B39	DP2	1-2	5/29/1998	387 ± 25 5
04B39	DP3	2-3	5/29/1998	1887 ± 63.2
04B40	DP1	0-1	6/3/1998	6310 ± 139
04B40	DP2	1-2	6/3/1998	5990 ± 140
04B40	DP3	2-3	6/3/1998	27 ± 14.6
04B40A	DP4	3-4	6/3/1998	119 ± 18 6
04B40A	DP4D	3-4	6/3/1998	94 ± 17 6
04B40A	DP5	4-5	6/3/1998	2095 ± 67 7
04B40A	DP6	5-6	6/3/1998	50 ± 15 5
04B40A	DP7	6-7	6/3/1998	24 ± 15 5
04B40A	DP8	7-8	6/3/1998	48 ± 15.2
04B41	DP1	0-1	6/3/1998	485 ± 36.7
04B41	DP2	1-2	6/3/1998	2021 ± 77 6
04B41	DP3	2-3	6/3/1998	716 ± 37 3
04B41	DP4	3-4	6/3/1998	41 ± 14 5
04B41	DP5	4-5	6/3/1998	344 ± 28 1
04B41	DP6	5-6	6/3/1998	531 ± 39 9
04B41	DP7	6-7	6/3/1998	65 ± 16.3
04B41	DP8	7-8	6/3/1998	70 ± 16.5
04B42	DP1	0-1	6/3/1998	475 ± 35 4
04B42	DP2	1-2	6/3/1998	951 ± 49
04B42	DP3	2-3	6/3/1998	1533 ± 60.5
04B42	DP3D	2-3	6/3/1998	5710 ± 139
04B42	DP4	3-4	6/3/1998	7570 ± 168
04B42	DP5	4-5	6/3/1998	604 ± 36.4
04B42A	DP10	9-10	6/3/1998	63 ± 14 7
04B42A	DP2	1-2	6/3/1998	947 ± 45 8
04B42A	DP3	2-3	6/3/1998	2250 ± 72 1
04B42A	DP4	3-4	6/3/1998	241 ± 23 4
04B42A	DP5	4-5	6/3/1998	5890 ± 140
04B42A	DP6	5-6	6/3/1998	203 ± 21 8
04B42A	DP9	8-9	6/3/1998	153 ± 19.9
04B43	DP1	0-1	6/4/1998	1462 ± 61 2
04B43	DP2	1-2	6/4/1998	3320 ± 97 7
04B43	DP3	2-3	6/4/1998	2408 ± 75 9
04B43	DP4	3-4	6/4/1998	7800 ± 179
04B43	DP5	4-5	6/4/1998	2212 ± 77 2
04B43	DP6	5-6	6/4/1998	25 ± 14 9
04B43	DP7	6-7	6/4/1998	71 ± 16 7
04B43	DP8	7-8	6/4/1998	15 ± 14
04B44	DP2	1-2	6/4/1998	1362 ± 52 9
04B44	DP3	2-3	6/4/1998	3620 ± 101
04B44	DP4	3-4	6/4/1998	580 ± 35
04B44	DP5	4-5	6/4/1998	617 ± 35 2
04B44	DP6	5-6	6/4/1998	211 ± 23 3
04B44	DP7	6-7	6/4/1998	36 ± 14 2
04B44	DP8	7-8	6/4/1998	Not Detected
04B45	DP2	1-2	6/4/1998	4600 ± 115
04B45	DP3	2-3	6/4/1998	8460 ± 178
04B45	DP4	3-4	6/4/1998	272 ± 23 6
04B45	DP6	5-6	6/4/1998	238 ± 24 8
04B45	DP6D	5-6	6/4/1998	55 ± 14.9

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
04B46	DP1	0-1	6/5/1998	26 ± 14.6
04B46	DP2	1-2	6/5/1998	65 ± 15.6
04B46	DP3	2-3	6/5/1998	Not Detected
04B46	DP4	3-4	6/5/1998	19 ± 13
04B47	DP1	0-1	6/5/1998	Not Detected
04B47	DP2	1-2	6/5/1998	50 ± 10.1
04B47	DP2D	1-2	6/5/1998	101 ± 18.5
04B47	DP3	2-3	6/5/1998	70 ± 19
04B47	DP4	3-4	6/5/1998	25 ± 14
04B48	DP1	0-1	6/9/1998	67 ± 16
04B48	DP2	1-2	6/9/1998	Not Detected
04B48	DP3	2-3	6/9/1998	54 ± 16
04B48	DP4	3-4	6/9/1998	Not Detected
04B48	DP5	4-5	6/9/1998	17 ± 13.2
04B48	DP6	5-6	6/9/1998	35 ± 14.9
04B48	DP7	6-7	6/9/1998	36 ± 14.6
04B48	DP8	7-8	6/9/1998	Not Detected
04B49	DP1	0-1	6/9/1998	523 ± 33.5
04B49	DP2	1-2	6/9/1998	82 ± 16.9
04B49	DP3	2-3	6/9/1998	56 ± 15.5
04B49	DP4	3-4	6/9/1998	91 ± 17.6
04B49	DP5	4-5	6/9/1998	Not Detected
04B49	DP5D	4-5	6/9/1998	67 ± 16.1
04B49	DP6	5-6	6/9/1998	Not Detected
04B49	DP7	6-7	6/9/1998	Not Detected
04B49	DP8	7-8	6/9/1998	Not Detected
04B50	DP2	1-2	6/12/1998	380 ± 30.2
04B50	DP2D	1-2	6/12/1998	386 ± 30.9
04B50	DP3	2-3	6/12/1998	177 ± 22.6
04B50	DP4	3-4	6/12/1998	32 ± 14.7
04B50	DP5	4-5	6/9/1998	45 ± 15.7
04B50	DP6	5-6	6/9/1998	44 ± 14.8
04B50	DP7	6-7	6/9/1998	Not Detected
04D01	SR1	0-0.5	5/29/1998	2549 ± 72.5
04D02	SR1	0-0.5	5/29/1998	3124 ± 86.7
04D03	SR1	0-0.5	5/29/1998	26 ± 12.7
04D04	SR1	0-0.5	5/29/1998	2328 ± 66
04D05	SR1	0-0.5	5/29/1998	2581 ± 73.2
04D06	SR1	0-0.5	5/29/1998	492 ± 27.3
04D07	SR1	0-0.5	5/29/1998	1892 ± 63.9
04D08	SR1	0-0.5	5/29/1998	1633 ± 56
04D09	SR1	0-0.5	5/29/1998	5950 ± 136
04D10	SR1	0-0.5	5/29/1998	3143 ± 83
04D11	SR1	0-0.5	5/29/1998	1700 ± 55.7
04D12	SR1	0-0.5	5/29/1998	4260 ± 107
04D13	SR1	0-0.5	5/29/1998	4080 ± 98.3
04D14	SR1	0-0.5	6/5/1998	103 ± 16.8
04D15	SR1	0-0.5	6/5/1998	2304 ± 89.4
04D16	SR1	0-0.5	6/5/1998	361 ± 24.9
04D17	SR1	0-0.5	6/5/1998	461 ± 28
04D18	SR1	0-0.5	6/5/1998	108 ± 16.5
04D19	SR1	0-0.5	6/5/1998	21 ± 13.2
04D20	SR1	0-0.5	6/5/1998	247 ± 22.2
04D21	SR1	0-0.5	6/5/1998	206 ± 20.9
04D22	SR1	0-0.5	6/5/1998	373 ± 25.8
04D23	SR1	0-0.5	6/5/1998	976 ± 41.3
04D24	SR1	0-0.5	6/5/1998	630 ± 31.9
04D25	SR1	0-0.5	6/5/1998	318 ± 24.8
04D26	SR1	0-0.5	6/5/1998	29 ± 14.6
04D27	SR1	0-0.5	6/5/1998	8360 ± 163

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
04D28	SR1	0-0.5	6/5/1998	53 ± 16.6
04D29	SR1	0-0.5	6/5/1998	2407 ± 72.7
04D30	SR1	0-0.5	6/8/1998	599 ± 31.6
04D31	SR1	0-0.5	6/8/1998	2711 ± 80.1
04D32	SR1	0-0.5	6/8/1998	755 ± 35.1
04D33	SR1	0-0.5	6/9/1998	93 ± 16.5
04D34	SR1	0-0.5	6/9/1998	23 ± 12.3
04D35	SR1	0-0.5	6/9/1998	44 ± 14.6
04D36	SR1	0-0.5	6/9/1998	23 ± 14.3
04D37	SR1	0-0.5	6/9/1998	295 ± 23.3
04D38	SR1	0-0.5	6/9/1998	61 ± 14.4
04D39	SR1	0-0.5	6/9/1998	Not Detected
04D40	SR1	0-0.5	6/9/1998	18 ± 13.2
04D41	SR1	0-0.5	6/9/1998	24 ± 14.2
04D42	SR1	0-0.5	6/11/1998	Not Detected
04D43	SR1	0-0.5	6/11/1998	Not Detected
04D44	SR1	0-0.5	6/11/1998	70 ± 16.9
06B14A	DP2	2-4	5/26/1998	1394 ± 51 3
06B14A	DP3	4-6	5/26/1998	900 ± 38.9
06B14A	DP4	6-8	5/26/1998	Not Detected
06T01	SB1	5 0	5/26/1998	1653 ± 49 9
06T01	SB2	6 75	5/26/1998	114 ± 15 3
06T01	SB3	8 0	5/26/1998	162 ± 26 3
06T01	SB4	6.25	5/26/1998	753 ± 32.5
06T02	SB1	0-2	5/18/1998	17 ± 11.5
06T02	SB1D	0-2	5/18/1998	17 ± 12.3
06T02	SB11	0-2	5/18/1998	Not Detected
06T03	SB1	0-2	5/18/1998	259 ± 21
06T03	SB2	2-4	5/18/1998	373 ± 23.4
06T03	SB2D	2-4	5/18/1998	509 ± 28.1
06T03	SB11	0-2	5/18/1998	454 ± 28 1
06T03	SB12	2-4	5/18/1998	394 ± 26.4
06T03A	SB1	0-2	5/18/1998	338 ± 23.5
06T03A	SB1D	0-2	5/18/1998	291 ± 22
06T03A	SB2	2-4	5/18/1998	748 ± 36.1
06T03A	SB3	4-6	5/18/1998	423 ± 26.3
06T03A	SB4	6-8	5/18/1998	710 ± 34.2
06T03A	SB5	8-10	5/19/1998	328 ± 23 9
06T03A	SB6	10-12	5/19/1998	62 ± 13.6
06T03A	SB7	12-14	5/19/1998	250 ± 21.6
06T03A	SB11	0-2	5/19/1998	371 ± 24 2
06T03A	SB12	2-4	5/19/1998	335 ± 24.7
06T03A	SB13	4-6	5/19/1998	482 ± 29.2
06T03A	SB14	6-8	5/19/1998	615 ± 31.5
06T03A	SB15	8-10	5/19/1998	64 ± 13.3
06T03A	SB16	10-12	5/19/1998	Not Detected
06T03A	SB17	12-14	5/19/1998	Not Detected
06T03A	SB14A	6-8	5/19/1998	554 ± 32.1
06T03A	SB15A	8-10	5/19/1998	102 ± 15 8
06T03A	SB1B	0-2	5/29/1998	356 ± 24 8
06T03A	SB2B	2-4	5/29/1998	302 ± 21 1
06T03A	SB3B	4-6	5/29/1998	851 ± 32 3
06T03A	SB11B	0-2	5/29/1998	109 ± 15.5
06T03A	SB12B	2-4	5/29/1998	879 ± 41.3
06T03A	SB13B	4-6	5/29/1998	828 ± 39 8
06T03A	SB11C	0-2	6/1/1998	150 ± 20 8
06T03A	SB12C	2-4	6/1/1998	194 ± 22
06T03A	SB13C	4-6	6/1/1998	1309 ± 51.7
07B04A	DP2	3-4	5/28/1998	82 ± 14.1

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
07B09	DP1	0-1	5/28/1998	317 ± 25 3
07B09	DP2	1-2	5/28/1998	281 ± 22 9
07B09	DP3	2-3	5/28/1998	371 ± 23
07B09	DP4	3-4	5/28/1998	90 ± 15.4
07B10	DP1	0-1	5/28/1998	984 ± 43.8
07B10	DP2	1-2	5/28/1998	374 ± 26.2
07B10	DP3	2-3	5/28/1998	384 ± 26.4
07B11	DP2	1-2	5/28/1998	19 ± 13.5
07B11	DP3	2-3	5/28/1998	Not Detected
07B11	DP4	3-4	5/28/1998	Not Detected
07B12	DP1	0-1	6/1/1998	595 ± 38
07B12	DP2	1-2	6/1/1998	111 ± 19.8
07B12	DP3	2-3	6/1/1998	708 ± 44
07B12	DP4	3-4	6/1/1998	1534 ± 75.5
07B13	DP1	0-1	6/1/1998	2089 ± 72 6
07B13	DP2	1-2	6/1/1998	257 ± 20.8
07B13	DP2D	1-2	6/1/1998	128 ± 17 5
07B13	DP3	2-3	6/1/1998	263 ± 22 4
07B13	DP4	3-4	6/1/1998	15 ± 12.5
07B14	DP1	0-1	6/1/1998	655 ± 35.7
07B14	DP2	1-2	6/1/1998	571 ± 30 3
07B14	DP3	2-3	6/1/1998	289 ± 23.8
07B15	DP1	0-1	6/1/1998	1267 ± 47 6
07B15	DP2	1-2	6/1/1998	372 ± 25.7
07B15	DP3	2-3	6/1/1998	53 ± 13
07B16	DP1	0-1	6/1/1998	1236 ± 48 3
07B16	DP1D	0-1	6/1/1998	893 ± 39.6
07B16	DP2	1-2	6/1/1998	701 ± 31.3
07B17	DP1	0-1	6/2/1998	1466 ± 57 6
07B17	DP2	1-2	6/2/1998	253 ± 22
07B17	DP2D	1-2	6/2/1998	347 ± 25 2
07B17	DP3	2-3	6/2/1998	159 ± 23.1
07B18	DP1	0-1	6/2/1998	847 ± 71 5
07B18	DP2	1-2	6/2/1998	242 ± 26 3
07B18	DP3	2-3	6/2/1998	32 ± 14.4
07B18	DP4	3-4	6/2/1998	Not Detected
07B19	DP1	0-1	6/2/1998	371 ± 30.5
07B19	DP2	1-2	6/2/1998	248 ± 27.3
07B19	DP3	2-3	6/2/1998	37 ± 22
07B19	DP4	3-4	6/2/1998	468 ± 26
07B20	DP1	0-1	6/2/1998	217 ± 25 1
07B20	DP2	1-2	6/2/1998	117 ± 19 6
07B20	DP3	2-3	6/2/1998	30 ± 14.3
07B21	DP1	0-1	6/2/1998	201 ± 23 7
07B21	DP2	1-2	6/2/1998	333 ± 27 2
07B21	DP3	2-3	6/2/1998	14 ± 13
07B22	DP1	0-1	6/2/1998	266 ± 24
07B22	DP2	1-2	6/2/1998	596 ± 43.3
07B23	DP1	0-1	6/2/1998	91 ± 18
07B23	DP2	1-2	6/2/1998	150 ± 24.9
07B23	DP3	2-3	6/2/1998	101 ± 18.6
07B24	DP1	0-1	6/2/1998	67 ± 17.6
07B24	DP2	1-2	6/2/1998	42 ± 19.2
07B25	DP1	0-1	6/2/1998	678 ± 40.8
07B25	DP2	1-2	6/2/1998	1119 ± 50 1
07B25	DP3	2-3	6/2/1998	692 ± 41.3
07B26	DP1	0-1	6/2/1998	23 ± 13
07B26	DP2	1-2	6/2/1998	34 ± 15.4
07B26	DP3	2-3	6/2/1998	Not Detected
07B26	DP3D	2-3	6/2/1998	30 ± 14.6

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
07B27	DP1	0-1	6/2/1998	689 ± 39.9
07B27	DP2	1-2	6/2/1998	427 ± 34.6
07B28	DP2	1-2	6/5/1998	523 ± 35.7
07B28	DP3	2-3	6/5/1998	575 ± 32.7
07B28	DP4	3-4	6/5/1998	839 ± 41.5
07B28	DP5	4-5	6/5/1998	647 ± 36.1
07B28	DP6	5-6	6/5/1998	1002 ± 42.7
07B29	DP1	0-1	6/5/1998	58 ± 18.1
07B29	DP2	1-2	6/5/1998	81 ± 17.1
07B29	DP3	2-3	6/5/1998	28 ± 14.5
07B29	DP5	4-5	6/5/1998	129 ± 20
07B29	DP6	5-6	6/5/1998	Not Detected
07B29	DP7	6-7	6/5/1998	Not Detected
07B29	DP8	7-8	6/5/1998	Not Detected
07B30	DP2	1-2	6/5/1998	115 ± 19
07B30	DP3	2-3	6/5/1998	97 ± 17.5
07B30	DP4	3-4	6/5/1998	Not Detected
07B30	DP4D	3-4	6/5/1998	22 ± 13.5
07B30	DP5	4-5	6/5/1998	Not Detected
07B30	DP6	5-6	6/5/1998	Not Detected
07B30	DP7	6-7	6/5/1998	Not Detected
07B30	DP8	7-8	6/5/1998	Not Detected
07B31	DP2	1-2	6/10/1998	331 ± 31.1
07B31	DP3	2-3	6/10/1998	Not Detected
07B31	DP5	4-5	6/10/1998	38 ± 21
07B31	DP6	5-6	6/10/1998	Not Detected
07B32	DP1	0-1	6/10/1998	272 ± 27.2
07B32	DP2	1-2	6/10/1998	3072 ± 79.6
07B32	DP3	2-3	6/10/1998	6070 ± 117
07B32A	DP4	3-4	6/10/1998	175 ± 20.6
07B32A	DP5	4-5	6/10/1998	1052 ± 42.1
07B32A	DP6	5-6	6/10/1998	162 ± 19.4
07B33	DP1	0-1	6/10/1998	198 ± 22.8
07B33	DP2	1-2	6/10/1998	285 ± 27.6
07B33	DP3	2-3	6/10/1998	36 ± 16.2
07B34	DP1	0-1	6/10/1998	107 ± 20.3
07B34	DP2	1-2	6/10/1998	1881 ± 60.9
07B35	DP1	0-1	6/10/1998	1648 ± 59.8
07B35	DP2	1-2	6/10/1998	1166 ± 48.8
07B35	DP2D	1-2	6/10/1998	707 ± 43.8
07B35	DP3	2-3	6/10/1998	566 ± 42.7
24T07	SB1	0-5	5/20/1998	87 ± 30.9
24T07	SB2	5-10	5/20/1998	351 ± 23.8
24T07	SB11	0-5	5/20/1998	304 ± 24.2
24T07	SB12	5-10	5/20/1998	122 ± 16
24T08	SB1	0-2	5/20/1998	19 ± 12.3
24T08	SB1D	0-2	5/20/1998	14 ± 11.2
24T08	SB2	2-4	5/20/1998	Not Detected
24T08	SB11	0-2	5/20/1998	Not Detected
24T08	SB12	2-4	5/20/1998	34 ± 13.2
27B04	DP1	0-1	6/1/1998	114 ± 15.5
27B04	DP2	1-2	6/1/1998	243 ± 21.2
27B04	DP3	2-3	6/1/1998	307 ± 22.8
27B04	DP3D	2-3	6/1/1998	215 ± 20.3
27B04	DP4	3-4	6/1/1998	100 ± 15.3
27B04	DP5	4-5	6/1/1998	68 ± 15
27B04	DP6	5-6	6/1/1998	35 ± 12.8
27B05	DP1	0-1	6/1/1998	259 ± 21.9
27B05	DP2	1-2	6/1/1998	916 ± 37.9
27B05	DP3	2-3	6/1/1998	198 ± 27

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
A04B03A	DP2	6-8	5/26/1998	18 ± 12.2
A04B03A	DP3	8-10	5/26/1998	90 ± 15.9
A04T01	SB1	0-2	5/19/1998	Not Detected
A04T01	SB2	2-4	5/19/1998	Not Detected
A04T01	SB3	4-6	5/19/1998	Not Detected
A04T01	SB4	6-8	5/19/1998	Not Detected
A04T01	SB11	0-2	5/19/1998	372 ± 25.5
A04T01	SB12	2-4	5/19/1998	20 ± 11.7
A04T01	SB13	4-6	5/19/1998	Not Detected
A04T01	SB14	6-8	5/19/1998	Not Detected
A04T01	SB11A	0-2	5/19/1998	21 ± 12
A04T01	SB12A	2-4	5/19/1998	Not Detected
A08B05	DP1	0-1	6/1/1998	2056 ± 53 1
A08B05	DP2	1-2	6/1/1998	38 ± 15 5
A08B05	DP3	2-3	6/1/1998	35 ± 14.8
A08B06	DP1	0-1	6/1/1998	1134 ± 37 8
A08B06	DP2	1-2	6/1/1998	163 ± 19 4
A08B06	DP3	2-3	6/1/1998	20 ± 14.7
A08B06	DP3D	2-3	6/1/1998	Not Detected
A08B07	DP1	0-1	6/1/1998	18 ± 12 5
A08B07	DP2	1-2	6/1/1998	228 ± 19 9
A08B07	DP3	2-3	6/1/1998	24 ± 13.2
A08B08	DP1	0-1	6/3/1998	58 ± 14 2
A08B08	DP2	1-2	6/3/1998	Not Detected
A08B08	DP3	2-3	6/3/1998	Not Detected
A08B09	DP1	0-1	6/3/1998	692 ± 30 2
A08B09	DP2	1-2	6/3/1998	19 ± 13 9
A08B09	DP3	2-3	6/3/1998	Not Detected
A08B10	DP1	0-1	6/3/1998	1048 ± 30 2
A08B10	DP1D	0-1	6/3/1998	217 ± 30 2
A08B10	DP2	1-2	6/3/1998	Not Detected
A08B10	DP3	2-3	6/3/1998	Not Detected
A08B11	DP1	0-1	6/3/1998	1978 ± 49 9
A08B11	DP2	1-2	6/3/1998	17 ± 13 5
A08B11	DP3	2-3	6/3/1998	Not Detected
A08B12	DP1	0-1	6/3/1998	Not Detected
A08B12	DP2	1-2	6/3/1998	Not Detected
A08B12	DP3	2-3	6/3/1998	Not Detected
A08B13	DP1	0-1	6/4/1998	70 ± 14.4
A08B13	DP2	1-2	6/4/1998	Not Detected
A08B13	DP3	2-3	6/4/1998	36 ± 17.5
A08B14	DP1	0-1	6/4/1998	2473 ± 56
A08B14	DP2	1-2	6/4/1998	Not Detected
A08B14	DP2D	1-2	6/4/1998	48 ± 16.2
A08B14	DP3	2-3	6/4/1998	Not Detected
A08B15	DP1	0-1	6/4/1998	2249 ± 53 9
A08B15	DP2	1-2	6/4/1998	Not Detected
A08B15	DP3	2-3	6/4/1998	Not Detected
A08B16	DP2	1-2	6/4/1998	117 ± 17.8
A08B16	DP3	2-3	6/4/1998	Not Detected
A08B17	DP1	0-1	6/4/1998	Not Detected
A08B17	DP2	1-2	6/4/1998	Not Detected
A08B17	DP3	2-3	6/4/1998	Not Detected
A08B18	DP1	0-1	6/4/1998	54 ± 14.9
A08B18	DP2	1-2	6/4/1998	Not Detected
A08B18	DP3	2-3	6/4/1998	17 ± 13.3
A08B19	DP1	0-1	6/5/1998	18 ± 14.4
A08B19	DP2	1-2	6/5/1998	20 ± 14.8
A08B19	DP3	2-3	6/5/1998	14 ± 13.4

Appendix S
On-Site Analytical XRF Lead Results
Armco Kansas City Facility

Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
A08B20	DP1	0-1	6/5/1998	3137 ± 63.4
A08B20	DP2	1-2	6/5/1998	Not Detected
A08B20	DP2D	1-2	6/5/1998	26 ± 15.7
A08B20	DP3	2-3	6/5/1998	Not Detected
A08B21	DP1	0-1	6/5/1998	653 ± 29.8
A08B21	DP2	1-2	6/5/1998	50 ± 16.2
A08B21	DP3	2-3	6/5/1998	Not Detected
A08B22	DP1	0-1	6/5/1998	509 ± 26.3
A08B22	DP2	1-2	6/5/1998	Not Detected
A08B22	DP3	2-3	6/5/1998	Not Detected
A08B23	DP1	0-1	6/5/1998	390 ± 24.8
A08B23	DP2	1-2	6/5/1998	Not Detected
A08B23	DP3	2-3	6/5/1998	Not Detected
A08B24	DP1	0-1	6/5/1998	17 ± 11.8
A08B24	DP2	1-2	6/5/1998	Not Detected
A08B24	DP3	2-3	6/5/1998	Not Detected
A08B25	DP1	0-1	6/5/1998	Not Detected
A08B25	DP2	1-2	6/5/1998	Not Detected
A08B25	DP3	2-3	6/5/1998	Not Detected
A08B26	DP1	0-1	6/5/1998	2613 ± 56.2
A08B26	DP2	1-2	6/5/1998	Not Detected
A08B26	DP3	2-3	6/5/1998	Not Detected
A08B27	DP1	0-1	6/5/1998	30 ± 13
A08B27	DP1D	0-1	6/5/1998	84 ± 14.9
A08B27	DP2	1-2	6/5/1998	Not Detected
A08B27	DP3	2-3	6/5/1998	Not Detected
A08B28	DP1	0-1	6/5/1998	124 ± 15.8
A08B28	DP2	1-2	6/5/1998	Not Detected
A08B28	DP3	2-3	6/5/1998	Not Detected
A08B29	DP1	0-1	6/5/1998	366 ± 23.1
A08B29	DP2	1-2	6/5/1998	361 ± 23.4
A08B29	DP3	2-3	6/5/1998	20 ± 14.5
A08B30	DP1	0-1	6/9/1998	1061 ± 38.1
A08B30	DP1D	0-1	6/9/1998	1010 ± 37.2
A08B30	DP2	1-2	6/9/1998	Not Detected
A08B30	DP3	2-3	6/9/1998	Not Detected
A08B31	DP1	0-1	6/9/1998	476 ± 27.3
A08B31	DP2	1-2	6/9/1998	16 ± 13.8
A08B31	DP3	2-3	6/9/1998	13 ± 13.1
A08B32	DP1	0-1	6/9/1998	78 ± 16.4
A08B32	DP2	1-2	6/9/1998	Not Detected
A08B32	DP3	2-3	6/9/1998	Not Detected
A08B33	DP1	0-1	6/9/1998	31 ± 14.5
A08B33	DP2	1-2	6/9/1998	23 ± 13.4
A08B33	DP3	2-3	6/9/1998	Not Detected
A08B34	DP1	0-1	6/9/1998	129 ± 19.4
A08B34	DP2	1-2	6/9/1998	Not Detected
A08B34	DP3	2-3	6/9/1998	Not Detected
A08B35	DP1	0-1	6/9/1998	782 ± 33.4
A08B35	DP2	1-2	6/9/1998	18 ± 14
A08B35	DP3	2-3	6/9/1998	Not Detected
A08B36	DP1	0-1	6/9/1998	47 ± 14.3
A08B36	DP2	1-2	6/9/1998	Not Detected
A08B36	DP3	2-3	6/9/1998	Not Detected
A08B37	DP1	0-1	6/10/1998	356 ± 25
A08B37	DP1D	0-1	6/10/1998	575 ± 29.2
A08B37	DP2	1-2	6/10/1998	Not Detected
A08B37	DP3	2-3	6/10/1998	26 ± 14.4

Appendix S
On-Site Analytical XRF Lead Results
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Sample Location		Sample	Date	Lead
Point	Designator	Depth (ft)	Sampled	Result (ppm) ± Deviation
A08B38	DP1	0-1	6/10/1998	43 ± 15.1
A08B38	DP2	1-2	6/10/1998	Not Detected
A08B38	DP3	2-3	6/10/1998	Not Detected
A08B39	DP1	0-1	6/10/1998	18 ± 15 1
A08B39	DP2	1-2	6/10/1998	25 ± 14.9
A08B39	DP3	2-3	6/10/1998	Not Detected
A08B40	DP1	0-1	6/10/1998	49 ± 14.9
A08B40	DP2	1-2	6/10/1998	Not Detected
A08B40	DP3	2-3	6/10/1998	Not Detected
AST5	SR1	0-0 5	5/21/1998	727 ± 38.7
AST5	SR1A	0 5-1 0	5/21/1998	562 ± 32 6
AST5	SR2	0-0 5	5/21/1998	127 ± 18 8
AST5	SR2A	0.5-1.0	5/21/1998	112 ± 17 7
AST5	SR3	0-0 5	5/21/1998	519 ± 33 7
AST5	SR4	0-0.5	5/21/1998	2562 ± 91.4

APPENDIX U
ANALYTICAL LABORATORY TPH DATA

Appendix U
Analytical Laboratory TPH Data
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
SWMU 4								
04B02	DW1	4/21/1997	5 5 - 7 5	D97-4833-7	TPH (extractable)	mg/L	3 32	
04B02	DW1	4/21/1997	5.5 - 7.5	D97-4833-7	TPH (volatile)	ug/L	50	U
04B05	DW1	4/25/1997	2 - 7	D97-5144-13	TPH (extractable)	mg/L	0.56	U
04B05	DW1	4/25/1997	2 - 7	D97-5144-13	TPH (volatile)	ug/L	50	U
04B05	DW1D	4/25/1997	2 - 7	D97-5144-14	TPH (extractable)	mg/L	0.56	U
04B05	DW1D	4/25/1997	2 - 7	D97-5144-14	TPH (volatile)	ug/L	50	U
04B06	DW1	4/25/1997	5 - 7	D97-5144-17	TPH (extractable)	mg/L	0.55	U
SWMU 6								
06B01	DP1	3/24/1997	0 8 - 2 8	D97-3627-1	TPH (extractable)	mg/Kg	1140	
06B01	DP1	3/24/1997	0 8 - 2 8	D97-3627-1	TPH (volatile)	ug/Kg	49400	D
06B01	DP2	3/24/1997	4 - 5 5	D97-3627-19	TPH (extractable)	mg/Kg	46	
06B01	DP2	3/24/1997	4 - 5.5	D97-3627-19	TPH (volatile)	ug/Kg	1450	
06B02	DP1	3/24/1997	2 2 - 4 2	D97-3627-2	TPH (extractable)	mg/Kg	12 5	U
06B02	DP1	3/24/1997	2.2 - 4.2	D97-3627-2	TPH (volatile)	ug/Kg	62	U
06B03	DP1	3/24/1997	1 4 - 3 4	D97-3627-4	TPH (extractable)	mg/Kg	21 5	
06B03	DP1	3/24/1997	1.4 - 3.4	D97-3627-4	TPH (volatile)	ug/Kg	121	
06B04	DP1	3/24/1997	1 - 3	D97-3627-5	TPH (extractable)	mg/Kg	221	
06B04	DP1	3/24/1997	1 - 3	D97-3627-5	TPH (volatile)	ug/Kg	1510	
06B05	DP1	3/24/1997	1 5 - 3 5	D97-3627-6	TPH (extractable)	mg/Kg	52 9	
06B05	DP1	3/24/1997	1.5 - 3.5	D97-3627-6	TPH (volatile)	ug/Kg	60	U
06B06	DP1	3/24/1997	1 - 3	D97-3627-7	TPH (extractable)	mg/Kg	48 5	
06B06	DP1	3/24/1997	1 - 3	D97-3627-7	TPH (volatile)	ug/Kg	61	U
06B07	DP1	3/24/1997	1 - 3	D97-3627-8	TPH (extractable)	mg/Kg	116	
06B07	DP1	3/24/1997	1 - 3	D97-3627-8	TPH (volatile)	ug/Kg	61	U
06B07	DP1D	3/24/1997	1 - 3	D97-3627-9	TPH (extractable)	mg/Kg	75 7	
06B07	DP1D	3/24/1997	1 - 3	D97-3627-9	TPH (volatile)	ug/Kg	62	U
06B08	DP1	3/24/1997	1 - 3	D97-3627-10	TPH (extractable)	mg/Kg	725	
06B08	DP1	3/24/1997	1 - 3	D97-3627-10	TPH (volatile)	ug/Kg	290	J*
06B09	DP1	3/24/1997	2 - 4	D97-3627-11	TPH (extractable)	mg/Kg	81	
06B09	DP1	3/24/1997	2 - 4	D97-3627-11	TPH (volatile)	ug/Kg	73	
06B10	DP1	3/24/1997	1 - 3	D97-3627-12	TPH (extractable)	mg/Kg	63 7	
06B10	DP1	3/24/1997	1 - 3	D97-3627-12	TPH (volatile)	ug/Kg	182	
06B11	DP1	3/24/1997	1 2 - 3 2	D97-3627-13	TPH (extractable)	mg/Kg	48 1	
06B11	DP1	3/24/1997	1.2 - 3.2	D97-3627-13	TPH (volatile)	ug/Kg	60	U
06B12	DP1	3/24/1997	5 - 7	D97-3627-14	TPH (extractable)	mg/Kg	12 1	U
06B12	DP1	3/24/1997	5 - 7	D97-3627-14	TPH (volatile)	ug/Kg	60	U
06B13	DP1	3/24/1997	0 - 2	D97-3627-15	TPH (extractable)	mg/Kg	160	
06B13	DP1	3/24/1997	0 - 2	D97-3627-15	TPH (volatile)	ug/Kg	59	U
06B14	DP1	3/24/1997	0 - 2	D97-3627-16	TPH (extractable)	mg/Kg	188	
06B14	DP1	3/24/1997	0 - 2	D97-3627-16	TPH (volatile)	ug/Kg	833	
06T05	SB11	9/15/1998	6 - 8	366025	Diesel Fuel	mg/Kg	1500	Y
06T05	SB11	9/15/1998	6 - 8	366025	Motor Oil	mg/Kg	3200	
06T05	SB11	9/15/1998	6 - 8	366025	TPH as Gasoline	mg/Kg	110	Z J*
06T05	SB12	9/15/1998	8 - 10	366026	Diesel Fuel	mg/Kg	26	U
06T05	SB12	9/15/1998	8 - 10	366026	Motor Oil	mg/Kg	510	
06T05	SB12	9/15/1998	8 - 10	366026	TPH as Gasoline	mg/Kg	0.58	U
06T05	SB13	9/15/1998	10 - 12	366027	Diesel Fuel	mg/Kg	120	U
06T05	SB13	9/15/1998	10 - 12	366027	Motor Oil	mg/Kg	1500	
06T05	SB13	9/15/1998	10 - 12	366027	TPH as Gasoline	mg/Kg	2.2	Z J*
06T05	SB13	9/15/1998	10 - 12	366027R1	TPH as Gasoline	mg/Kg	0.61	U
06T05	SB14	9/15/1998	12 - 14	366028	Diesel Fuel	mg/Kg	250	U
06T05	SB14	9/15/1998	12 - 14	366028	Motor Oil	mg/Kg	3600	
06T05	SB14	9/15/1998	12 - 14	366028	TPH as Gasoline	mg/Kg	1	Z J*
06T05	SB15	9/15/1998	14 - 16	366029	Diesel Fuel	mg/Kg	13	U
06T05	SB15	9/15/1998	14 - 16	366029	Motor Oil	mg/Kg	67	U
06T05	SB15	9/15/1998	14 - 16	366029	TPH as Gasoline	mg/Kg	0.67	U

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Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
06T05	SB16	9/15/1998	16 - 18	366030	Diesel Fuel	mg/Kg	13	U
06T05	SB16	9/15/1998	16 - 18	366030	Motor Oil	mg/Kg	66	U
06T05	SB16	9/15/1998	16 - 18	366030	TPH as Gasoline	mg/Kg	0.66	U
06T05	SB17	9/15/1998	18 - 20	366031	Diesel Fuel	mg/Kg	220	Y
06T05	SB17	9/15/1998	18 - 20	366031	Motor Oil	mg/Kg	100	J
06T05	SB17	9/15/1998	18 - 20	366031	TPH as Gasoline	mg/Kg	40	Z
06T05	SB21	9/15/1998	6 - 8	366032	Diesel Fuel	mg/Kg	13	U
06T05	SB21	9/15/1998	6 - 8	366032	Motor Oil	mg/Kg	280	
06T05	SB21	9/15/1998	6 - 8	366032	TPH as Gasoline	mg/Kg	0.63	U
06T05	SB22	9/15/1998	8 - 10	366033	Diesel Fuel	mg/Kg	44	Y
06T05	SB22	9/15/1998	8 - 10	366033	Motor Oil	mg/Kg	500	
06T05	SB22	9/15/1998	8 - 10	366033	TPH as Gasoline	mg/Kg	0.58	U
06T05	SB23	9/15/1998	10 - 12	366034	Diesel Fuel	mg/Kg	32	Y
06T05	SB23	9/15/1998	10 - 12	366034	Motor Oil	mg/Kg	120	
06T05	SB23	9/15/1998	10 - 12	366034	TPH as Gasoline	mg/Kg	0.61	U J*
06T05	SB23	9/15/1998	10 - 12	366034R1	TPH as Gasoline	mg/Kg	0.67	U J*
06T05	SB23D	9/15/1998	10 - 12	366035	Diesel Fuel	mg/Kg	93	Y
06T05	SB23D	9/15/1998	10 - 12	366035	Motor Oil	mg/Kg	220	
06T05	SB23D	9/15/1998	10 - 12	366035R1	TPH as Gasoline	mg/Kg	0.68	U J*
06T05	SB23D	9/15/1998	10 - 12	366035	TPH as Gasoline	mg/Kg	0.61	U J*
06T05	SB24	9/15/1998	12 - 14	366036	Diesel Fuel	mg/Kg	12	U
06T05	SB24	9/15/1998	12 - 14	366036	Motor Oil	mg/Kg	62	U
06T05	SB24	9/15/1998	12 - 14	366036	TPH as Gasoline	mg/Kg	0.62	U
06T05	SB25	9/15/1998	14 - 16	366037	Diesel Fuel	mg/Kg	13	U
06T05	SB25	9/15/1998	14 - 16	366037	Motor Oil	mg/Kg	64	U
06T05	SB25	9/15/1998	14 - 16	366037	TPH as Gasoline	mg/Kg	0.64	U
06T05	SB26	9/15/1998	16 - 18	366038	Diesel Fuel	mg/Kg	12	U
06T05	SB26	9/15/1998	16 - 18	366038	Motor Oil	mg/Kg	62	U
06T05	SB26	9/15/1998	16 - 18	366038	TPH as Gasoline	mg/Kg	0.62	U J*
06T05	SB26	9/15/1998	16 - 18	366038R1	TPH as Gasoline	mg/Kg	0.57	U J*
06T05	SB27	9/15/1998	18 - 20	366039	Diesel Fuel	mg/Kg	14	U
06T05	SB27	9/15/1998	18 - 20	366039	Motor Oil	mg/Kg	68	U
06T05	SB31	9/16/1998	6 - 8	366181	Diesel Fuel	mg/Kg	580	
06T05	SB31	9/16/1998	6 - 8	366181	Motor Oil	mg/Kg	280	U
06T05	SB31	9/16/1998	6 - 8	366181	TPH as Gasoline	mg/Kg	110	Z
06T05	SB32	9/16/1998	8 - 10	366182	Diesel Fuel	mg/Kg	130	U
06T05	SB32	9/16/1998	8 - 10	366182	Motor Oil	mg/Kg	1100	
06T05	SB32	9/16/1998	8 - 10	366182	TPH as Gasoline	mg/Kg	0.63	U
06T05	SB33	9/16/1998	10 - 12	366183	Diesel Fuel	mg/Kg	12	U
06T05	SB33	9/16/1998	10 - 12	366183	Motor Oil	mg/Kg	270	
06T05	SB33	9/16/1998	10 - 12	366183	TPH as Gasoline	mg/Kg	0.62	U
06T05	SB34	9/16/1998	12 - 14	366184	Diesel Fuel	mg/Kg	49	U
06T05	SB34	9/16/1998	12 - 14	366184	Motor Oil	mg/Kg	810	
06T05	SB34	9/16/1998	12 - 14	366184	TPH as Gasoline	mg/Kg	0.61	U
06T05	SB35	9/16/1998	14 - 16	366185	Diesel Fuel	mg/Kg	12	U
06T05	SB35	9/16/1998	14 - 16	366185	Motor Oil	mg/Kg	260	
06T05	SB35	9/16/1998	14 - 16	366185	TPH as Gasoline	mg/Kg	0.62	U
06T05	SB36	9/16/1998	16 - 18	366186	Diesel Fuel	mg/Kg	49	U
06T05	SB36	9/16/1998	16 - 18	366186	Motor Oil	mg/Kg	750	
06T05	SB36	9/16/1998	16 - 18	366186	TPH as Gasoline	mg/Kg	0.61	U
06T05	SB37	9/16/1998	18 - 20	366187	Diesel Fuel	mg/Kg	14	U
06T05	SB37	9/16/1998	18 - 20	366187	Motor Oil	mg/Kg	68	U
06T05	SB37	9/16/1998	18 - 20	366187	TPH as Gasoline	mg/Kg	0.68	U
SWMU 12								
12B01	DP1	3/17/1997	0 - 4	D97-3170-1	TPH (extractable)	mg/Kg	968	D
12B01	DP1	3/17/1997	0 - 4	D97-3170-1	TPH (volatile)	ug/Kg	1190	
12B01	DP1D	3/17/1997	0 - 4	D97-3170-2	TPH (extractable)	mg/Kg	138	D

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Sample Location		Date	Sample Depth	Laboratory				
Point	Designator	Sampled	From - To	Number	Parameter	Units	Result	
12B01	DP1D	3/17/1997	0 - 4	D97-3170-2	TPH (volatile)	ug/Kg	809	
12B01	DP2	3/17/1997	4 - 7	D97-3170-3	TPH (extractable)	mg/Kg	106	
12B01	DP2	3/17/1997	4 - 7	D97-3170-3	TPH (volatile)	ug/Kg	66	U
12B02	DP1	3/17/1997	0 - 4	D97-3170-4	TPH (extractable)	mg/Kg	152	D
12B02	DP1	3/17/1997	0 - 4	D97-3170-4	TPH (volatile)	ug/Kg	65	U
12B02	DP2	3/17/1997	4 - 7	D97-3170-5	TPH (extractable)	mg/Kg	13 5	U
12B02	DP2	3/17/1997	4 - 7	D97-3170-5	TPH (volatile)	ug/Kg	67	U
12B03	DP1	3/17/1997	0 - 4	D97-3170-8	TPH (extractable)	mg/Kg	638	D
12B03	DP1	3/17/1997	0 - 4	D97-3170-8	TPH (volatile)	ug/Kg	3010	D
12B03	DP2	3/17/1997	4 - 7	D97-3170-9	TPH (extractable)	mg/Kg	574	D
12B03	DP2	3/17/1997	4 - 7	D97-3170-9	TPH (volatile)	ug/Kg	126	
12G01	SR1	3/10/1997	0 5 - 1	D97-2852-1	TPH (extractable)	mg/Kg	23800	D J*
12G01	SR1	3/10/1997	0.5 - 1	D97-2852-1	TPH (volatile)	ug/Kg	14000	D
12G01	SR1D	3/10/1997	0.5 - 1	D97-2852-2	TPH (extractable)	mg/Kg	6400	
12G01	SR1D	3/10/1997	0.5 - 1	D97-2852-2	TPH (volatile)	ug/Kg	4450	D
12G02	SR1	3/10/1997	0 5 - 1	D97-2852-3	TPH (extractable)	mg/Kg	4440	
12G02	SR1	3/10/1997	0.5 - 1	D97-2852-3	TPH (volatile)	ug/Kg	84	
12G03	SR1	3/10/1997	0.5 - 1	D97-2852-4	TPH (extractable)	mg/Kg	4710	
12G03	SR1	3/10/1997	0.5 - 1	D97-2852-4	TPH (volatile)	ug/Kg	71	U
12G04	SR1	3/10/1997	0 5 - 1	D97-2852-6	TPH (extractable)	mg/Kg	270	
12G04	SR1	3/10/1997	0.5 - 1	D97-2852-6	TPH (volatile)	ug/Kg	66	U
12MW1	GW1	12/11/1996	0 - 0	D96-14212-2	TPH (extractable)	mg/L	1 04	
12MW1	GW1	12/11/1996	0 - 0	D96-14212-2	TPH (volatile)	ug/L	50	U
12MW2	GW1	12/11/1996	0 - 0	D96-14212-3	TPH (extractable)	mg/L	0 94	
12MW2	GW1	12/11/1996	0 - 0	D96-14212-3	TPH (volatile)	ug/L	50	U
12MW3	CS1	12/6/1996	14 - 19	D96-14052-3	TPH (extractable)	mg/Kg	13 7	U
12MW3	CS1	12/6/1996	14 - 19	D96-14052-3	TPH (volatile)	ug/Kg	112	
12MW3	GW1	12/11/1996	0 - 0	D96-14212-4	TPH (extractable)	mg/L	1 72	
12MW3	GW1	12/11/1996	0 - 0	D96-14212-4	TPH (volatile)	ug/L	50	U
12MW3	SS1	12/6/1996	19 - 21	D96-14052-4	TPH (extractable)	mg/Kg	14 9	
12MW3	SS1	12/6/1996	19 - 21	D96-14052-4	TPH (volatile)	ug/Kg	92	
12MW4	CS1	12/6/1996	7 - 7 5	D96-14052-1	TPH (extractable)	mg/Kg	13 2	U
12MW4	CS1	12/6/1996	7 - 7 5	D96-14052-1	TPH (volatile)	ug/Kg	66	U
12MW4	CS2	12/6/1996	15 - 16	D96-14052-2	TPH (extractable)	mg/Kg	13	U
12MW4	CS2	12/6/1996	15 - 16	D96-14052-2	TPH (volatile)	ug/Kg	204	
12MW4	GW1	12/11/1996	0 - 0	D96-14212-7	TPH (extractable)	mg/L	0 56	
12MW4	GW1	12/11/1996	0 - 0	D96-14212-7	TPH (volatile)	ug/L	50	U
12MW4	GW1D	12/11/1996	0 - 0	D96-14212-8	TPH (extractable)	mg/L	0 8	
12MW4	GW1D	12/11/1996	0 - 0	D96-14212-8	TPH (volatile)	ug/L	50	U
OWA05	GW1	12/11/1996	0 - 0	D96-14212-9	TPH (extractable)	mg/L	0 5	U
OWA05	GW1	12/11/1996	0 - 0	D96-14212-9	TPH (volatile)	ug/L	50	U
OWA06	GW1	12/11/1996	0 - 0	D96-14212-10	TPH (extractable)	mg/L	0 5	U
OWA06	GW1	12/11/1996	0 - 0	D96-14212-10	TPH (volatile)	ug/L	50	U
SWMU 13								
13B01	DP1	3/26/1997	0 - 4	D97-3689-1	TPH (extractable)	mg/Kg	49.5	
13B01	DP1	3/26/1997	0 - 4	D97-3689-1	TPH (volatile)	ug/Kg	54	U
13B01	DP2	3/26/1997	4 - 8	D97-3689-2	TPH (extractable)	mg/Kg	91 4	
13B01	DP2	3/26/1997	4 - 8	D97-3689-2	TPH (volatile)	ug/Kg	62	U
13B01	DP3	3/26/1997	8 - 12	D97-3689-3	TPH (extractable)	mg/Kg	18 6	
13B01	DP3	3/26/1997	8 - 12	D97-3689-3	TPH (volatile)	ug/Kg	68	U
13B01	DP4	3/26/1997	12 - 16	D97-3689-26	TPH (extractable)	mg/Kg	116	
13B01	DP4	3/26/1997	12 - 16	D97-3689-26	TPH (volatile)	ug/Kg	65	U
13B01	DW1	3/27/1997	24 - 26	D97-3771-1	TPH (extractable)	mg/L	1.16	
13B01	DW1	3/27/1997	24 - 26	D97-3771-1	TPH (volatile)	ug/L	69.5	
13B01	DW1D	3/27/1997	24 - 26	D97-3771-2	TPH (extractable)	mg/L	1.41	
13B01	DW1D	3/27/1997	24 - 26	D97-3771-2	TPH (volatile)	ug/L	50	U

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Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
13B02	DP1	3/26/1997	0 - 4	D97-3689-4	TPH (extractable)	mg/Kg	270	
13B02	DP1	3/26/1997	0 - 4	D97-3689-4	TPH (volatile)	ug/Kg	57	U
13B02	DP2	3/26/1997	4 - 8	D97-3689-5	TPH (extractable)	mg/Kg	2410	D
13B02	DP2	3/26/1997	4 - 8	D97-3689-5	TPH (volatile)	ug/Kg	16700	D
13B02	DP3	3/26/1997	8 - 12	D97-3689-6	TPH (extractable)	mg/Kg	2180	D
13B02	DP3	3/26/1997	8 - 12	D97-3689-6	TPH (volatile)	ug/Kg	84700	D
13B02	DP4	3/26/1997	12 - 16	D97-3689-12	TPH (extractable)	mg/Kg	1920	D
13B02	DP4	3/26/1997	12 - 16	D97-3689-12	TPH (volatile)	ug/Kg	44600	D
13B02	DW1	3/26/1997	24 - 26	D97-3689-7	TPH (extractable)	mg/L	6.89	
13B02	DW1	3/26/1997	24 - 26	D97-3689-7	TPH (volatile)	ug/L	87.1	
13B03	DW1	3/27/1997	43 - 45	D97-3771-28	TPH (extractable)	mg/L	3.57	
13B03	DW1	3/27/1997	43 - 45	D97-3771-28	TPH (volatile)	ug/L	258	
13B03A	DP1	3/27/1997	0 - 4	D97-3771-21	TPH (extractable)	mg/Kg	49.2	
13B03A	DP1	3/27/1997	0 - 4	D97-3771-21	TPH (volatile)	ug/Kg	55	U
13B03A	DP2	3/27/1997	4 - 8	D97-3771-22	TPH (extractable)	mg/Kg	29.1	
13B03A	DP2	3/27/1997	4 - 8	D97-3771-22	TPH (volatile)	ug/Kg	64	U
13B03A	DP3	3/27/1997	8 - 12	D97-3771-23	TPH (extractable)	mg/Kg	12.8	U
13B03A	DP3	3/27/1997	8 - 12	D97-3771-23	TPH (volatile)	ug/Kg	64	U
13B03A	DP4	3/27/1997	12 - 16	D97-3771-25	TPH (extractable)	mg/Kg	13.3	U
13B03A	DP4	3/27/1997	12 - 16	D97-3771-25	TPH (volatile)	ug/Kg	82	
13B04	DW1	3/27/1997	31 - 33	D97-3771-20	TPH (extractable)	mg/L	1.38	J*
13B04	DW1	3/27/1997	31 - 33	D97-3771-20	TPH (volatile)	ug/L	50	U
13B05	DW1	3/26/1997	24 - 26	D97-3689-23	TPH (extractable)	mg/L	0.93	
13B05	DW1	3/26/1997	24 - 26	D97-3689-23	TPH (volatile)	ug/L	50	U
13B06	DP1	3/27/1997	0 - 4	D97-3771-3	TPH (extractable)	mg/Kg	158	
13B06	DP1	3/27/1997	0 - 4	D97-3771-3	TPH (volatile)	ug/Kg	55	U
13B06	DP2	3/27/1997	4 - 8	D97-3771-5	TPH (extractable)	mg/Kg	86	
13B06	DP2	3/27/1997	4 - 8	D97-3771-5	TPH (volatile)	ug/Kg	62	U
13B06	DP3	3/27/1997	8 - 12	D97-3771-6	TPH (extractable)	mg/Kg	18	
13B06	DP3	3/27/1997	8 - 12	D97-3771-6	TPH (volatile)	ug/Kg	66	U
13B06	DP4	3/27/1997	12 - 16	D97-3771-7	TPH (extractable)	mg/Kg	13.5	U
13B06	DP4	3/27/1997	12 - 16	D97-3771-7	TPH (volatile)	ug/Kg	131	
13B06	DW1	3/27/1997	24 - 26	D97-3771-11	TPH (extractable)	mg/L	4.1	J*
13B06	DW1	3/27/1997	24 - 26	D97-3771-11	TPH (volatile)	ug/L	343	
13B07	DP1	3/27/1997	0 - 4	D97-3771-8	TPH (extractable)	mg/Kg	55.1	
13B07	DP1	3/27/1997	0 - 4	D97-3771-8	TPH (volatile)	ug/Kg	61	U
13B07	DP2	3/27/1997	4 - 8	D97-3771-9	TPH (extractable)	mg/Kg	17.9	
13B07	DP2	3/27/1997	4 - 8	D97-3771-9	TPH (volatile)	ug/Kg	524	
13B07	DP3	3/27/1997	8 - 12	D97-3771-10	TPH (extractable)	mg/Kg	237	
13B07	DP3	3/27/1997	8 - 12	D97-3771-10	TPH (volatile)	ug/Kg	22000	D
13B07	DP4	3/27/1997	12 - 16	D97-3771-12	TPH (extractable)	mg/Kg	564	
13B07	DP4	3/27/1997	12 - 16	D97-3771-12	TPH (volatile)	ug/Kg	1150	D
13B07	DW1	3/27/1997	24 - 26	D97-3771-24	TPH (extractable)	mg/L	242	D
13B07	DW1	3/27/1997	24 - 26	D97-3771-24	TPH (volatile)	ug/L	1570	
13B08	DP1	3/27/1997	0 - 4	D97-3771-13	TPH (extractable)	mg/Kg	274	
13B08	DP1	3/27/1997	0 - 4	D97-3771-13	TPH (volatile)	ug/Kg	94	
13B08	DP2	3/27/1997	4 - 8	D97-3771-14	TPH (extractable)	mg/Kg	14.1	
13B08	DP2	3/27/1997	4 - 8	D97-3771-14	TPH (volatile)	ug/Kg	63	U
13B08	DP2D	3/27/1997	4 - 8	D97-3771-15	TPH (extractable)	mg/Kg	12.6	U
13B08	DP2D	3/27/1997	4 - 8	D97-3771-15	TPH (volatile)	ug/Kg	63	U
13B08	DP3	3/27/1997	8 - 12	D97-3771-16	TPH (extractable)	mg/Kg	13.2	U
13B08	DP3	3/27/1997	8 - 12	D97-3771-16	TPH (volatile)	ug/Kg	66	U
13B08	DP4	3/27/1997	12 - 16	D97-3771-17	TPH (extractable)	mg/Kg	21.1	
13B08	DP4	3/27/1997	12 - 16	D97-3771-17	TPH (volatile)	ug/Kg	61	U
13B08	DW1	3/27/1997	24 - 26	D97-3771-27	TPH (extractable)	mg/L	13.9	
13B08	DW1	3/27/1997	24 - 26	D97-3771-27	TPH (volatile)	ug/L	50	U

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Point	Designator	Sampled	From - To	Number	Parameter	Units	Result	
13B09	DP1	3/27/1997	0 - 4	D97-3771-29	TPH (extractable)	mg/Kg	38 1	
13B09	DP1	3/27/1997	0 - 4	D97-3771-29	TPH (volatile)	ug/Kg	81	
13B09	DP2	3/27/1997	4 - 8	D97-3771-30	TPH (extractable)	mg/Kg	682	
13B09	DP2	3/27/1997	4 - 8	D97-3771-30	TPH (volatile)	ug/Kg	8270	D
13B09	DP3	3/27/1997	8 - 12	D97-3771-31	TPH (extractable)	mg/Kg	27 2	
13B09	DP3	3/27/1997	8 - 12	D97-3771-31	TPH (volatile)	ug/Kg	310	
13B09	DP4	3/27/1997	12 - 16	D97-3771-32	TPH (extractable)	mg/Kg	3000	D
13B09	DP4	3/27/1997	12 - 16	D97-3771-32	TPH (volatile)	ug/Kg	6740	D
13B09	DW1	3/27/1997	24 - 26	D97-3771-33	TPH (extractable)	mg/L	336	D
13B09	DW1	3/27/1997	24 - 26	D97-3771-33	TPH (volatile)	ug/L	2640	D
13B10	DP1	3/28/1997	0 - 4	D97-3802-14	TPH (extractable)	mg/Kg	32 6	
13B10	DP1	3/28/1997	0 - 4	D97-3802-14	TPH (volatile)	ug/Kg	53	U
13B10	DP2	3/28/1997	4 - 8	D97-3802-15	TPH (extractable)	mg/Kg	195	
13B10	DP2	3/28/1997	4 - 8	D97-3802-15	TPH (volatile)	ug/Kg	3050	
13B11	DP1	3/28/1997	0 - 4	D97-3802-16	TPH (extractable)	mg/Kg	296	
13B11	DP1	3/28/1997	0 - 4	D97-3802-16	TPH (volatile)	ug/Kg	74	
13B11	DP2	3/28/1997	4 - 8	D97-3802-17	TPH (extractable)	mg/Kg	96	
13B11	DP2	3/28/1997	4 - 8	D97-3802-17	TPH (volatile)	ug/Kg	76	
13B11	DP3	3/28/1997	8 - 12	D97-3802-18	TPH (extractable)	mg/Kg	117	
13B11	DP3	3/28/1997	8 - 12	D97-3802-18	TPH (volatile)	ug/Kg	188	
13B11	DP4	3/28/1997	12 - 16	D97-3802-19	TPH (extractable)	mg/Kg	454	
13B11	DP4	3/28/1997	12 - 16	D97-3802-19	TPH (volatile)	ug/Kg	5310	D
13B11	DW1	3/28/1997	24 - 26	D97-3802-20	TPH (extractable)	mg/L	19 7	
13B11	DW1	3/28/1997	24 - 26	D97-3802-20	TPH (volatile)	ug/L	4960	D
13B12	DW1	4/22/1997	28 - 30	D97-4913-16	TPH (extractable)	mg/L	0 5	U
13B12	DW1	4/22/1997	28 - 30	D97-4913-16	TPH (volatile)	ug/L	50	U
13B13	DW1	5/8/1997	8 - 18 5	D97-5706-2	TPH (extractable)	mg/L	0 52	U
13B13	DW1	5/8/1997	8 - 18.5	D97-5706-2	TPH (volatile)	ug/L	50	U
13B14	DW1	5/8/1997	9 - 17 5	D97-5706-3	TPH (extractable)	mg/L	0 6	
13B14	DW1	5/8/1997	9 - 17.5	D97-5706-3	TPH (volatile)	ug/L	51	
13B15	DW1	5/8/1997	13 - 21	D97-5706-4	TPH (extractable)	mg/L	0 5	U
13B15	DW1	5/8/1997	13 - 21	D97-5706-4	TPH (volatile)	ug/L	50	U
SWMU 17								
17B04A	DW1	4/21/1997	16 - 18	D97-4833-8	TPH (extractable)	mg/L	1 72	
17B04A	DW1	4/21/1997	16 - 18	D97-4833-8	TPH (volatile)	ug/L	913	D
17B06	DW1	4/21/1997	11 5 - 12 5	D97-4833-2	TPH (extractable)	mg/L	1 39	
17B06	DW1	4/21/1997	11.5 - 12.5	D97-4833-2	TPH (volatile)	ug/L	721	
17B08	DW1	4/21/1997	13 - 15	D97-4833-3	TPH (extractable)	mg/L	1 84	
17B08	DW1	4/21/1997	13 - 15	D97-4833-3	TPH (volatile)	ug/L	9990	D
17B09	DW1	4/21/1997	16 - 18	D97-4833-9	TPH (extractable)	mg/L	1 06	
17B09	DW1	4/21/1997	16 - 18	D97-4833-9	TPH (volatile)	ug/L	925	D
SWMU 24								
24B04	DP1	9/10/1997	0 - 4	D97-11023-12	TPH (extractable)	mg/Kg	1810	
24B04	DP1	9/10/1997	0 - 4	D97-11023-12	TPH (volatile)	ug/Kg	28100	D
24B04	DP2	9/10/1997	4 - 8	D97-11023-13	TPH (extractable)	mg/Kg	17 2	
24B04	DP2	9/10/1997	4 - 8	D97-11023-13	TPH (volatile)	ug/Kg	209	
24B04	DW1	9/10/1997	2 5 - 5 5	D97-11023-11	TPH (extractable)	mg/L	22	
24B04	DW1	9/10/1997	2.5 - 5.5	D97-11023-11	TPH (volatile)	ug/L	253	
24G01	SR1	10/30/1996	0 - 0 5	D96-12383-1	TPH (extractable)	mg/Kg	9490	J*
24G01	SR1	10/30/1996	0 - 0 5	D96-12383-1	TPH (volatile)	ug/Kg	223	
24G01	SR2	10/30/1996	0.5 - 1	D96-12383-2	TPH (extractable)	mg/Kg	893	J*
24G01	SR2	10/30/1996	0 5 - 1	D96-12383-2	TPH (volatile)	ug/Kg	142	
24G01	SR2D	10/30/1996	0 5 - 1	D96-12383-3	TPH (extractable)	mg/Kg	2050	J*
24G01	SR2D	10/30/1996	0.5 - 1	D96-12383-3	TPH (volatile)	ug/Kg	345	

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Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
24G02	SR1	10/30/1996	0 - 0.5	D96-12383-4	TPH (extractable)	mg/Kg	2900	
24G02	SR1	10/30/1996	0 - 0 5	D96-12383-4	TPH (volatile)	ug/Kg	100	
24G02	SR2	10/30/1996	0.5 - 1	D96-12383-7	TPH (extractable)	mg/Kg	1180	
24G02	SR2	10/30/1996	0.5 - 1	D96-12383-7	TPH (volatile)	ug/Kg	61	U
24G03	SR1	10/30/1996	0 - 0.5	D96-12383-8	TPH (extractable)	mg/Kg	4830	
24G03	SR1	10/30/1996	0 - 0.5	D96-12383-8	TPH (volatile)	ug/Kg	229	
24G03	SR2	10/30/1996	0.5 - 1	D96-12383-10	TPH (extractable)	mg/Kg	3970	J*
24G03	SR2	10/30/1996	0.5 - 1	D96-12383-10	TPH (volatile)	ug/Kg	23100	D
24G04	SR1	10/30/1996	0 - 0 5	D96-12383-11	TPH (extractable)	mg/Kg	2850	J*
24G04	SR1	10/30/1996	0 - 0 5	D96-12383-11	TPH (volatile)	ug/Kg	156	
24G04	SR2	10/30/1996	0 5 - 1	D96-12383-12	TPH (extractable)	mg/Kg	1360	J*
24G04	SR2	10/30/1996	0.5 - 1	D96-12383-12	TPH (volatile)	ug/Kg	161	
24T01	SB1	11/7/1996	0 - 5	D96-12760-5	TPH (extractable)	mg/Kg	7250	
24T01	SB1	11/7/1996	0 - 5	D96-12760-5	TPH (volatile)	ug/Kg	13000	D
24T01	SB2	11/7/1996	5 - 10	D96-12760-6	TPH (extractable)	mg/Kg	178	J*
24T01	SB2	11/7/1996	5 - 10	D96-12760-6	TPH (volatile)	ug/Kg	159	
24T01	SB2D	11/7/1996	5 - 10	D96-12760-7	TPH (extractable)	mg/Kg	113	J*
24T01	SB2D	11/7/1996	5 - 10	D96-12760-7	TPH (volatile)	ug/Kg	175	
24T01	SB3	11/7/1996	10 - 15	D96-12760-8	TPH (extractable)	mg/Kg	12 4	U
24T01	SB3	11/7/1996	10 - 15	D96-12760-8	TPH (volatile)	ug/Kg	32	J
24T01	SB4	11/7/1996	0 - 5	D96-12760-9	TPH (extractable)	mg/Kg	145	J*
24T01	SB4	11/7/1996	0 - 5	D96-12760-9	TPH (volatile)	ug/Kg	74	
24T01	SB5	11/7/1996	5 - 10	D96-12760-10	TPH (extractable)	mg/Kg	11.8	U
24T01	SB5	11/7/1996	5 - 10	D96-12760-10	TPH (volatile)	ug/Kg	59	U
24T01	SB6	11/7/1996	10 - 15	D96-12760-11	TPH (extractable)	mg/Kg	13	U
24T01	SB6	11/7/1996	10 - 15	D96-12760-11	TPH (volatile)	ug/Kg	65	U
24T02	SB1	11/8/1996	0 - 5	D96-12805-1	TPH (extractable)	mg/Kg	10 7	U
24T02	SB1	11/8/1996	0 - 5	D96-12805-1	TPH (volatile)	ug/Kg	54	U
24T02	SB2	11/8/1996	5 - 10	D96-12805-2	TPH (extractable)	mg/Kg	21 2	
24T02	SB2	11/8/1996	5 - 10	D96-12805-2	TPH (volatile)	ug/Kg	56	U
24T02	SB3	11/8/1996	10 - 15	D96-12805-3	TPH (extractable)	mg/Kg	12 3	U
24T02	SB3	11/8/1996	10 - 15	D96-12805-3	TPH (volatile)	ug/Kg	62	U
24T03	SB1	11/7/1996	0 - 5	D96-12760-2	TPH (extractable)	mg/Kg	54 2	J*
24T03	SB1	11/7/1996	0 - 5	D96-12760-2	TPH (volatile)	ug/Kg	59	U
24T03	SB2	11/7/1996	5 - 10	D96-12760-3	TPH (extractable)	mg/Kg	149	
24T03	SB2	11/7/1996	5 - 10	D96-12760-3	TPH (volatile)	ug/Kg	58	U
24T03	SB3	11/7/1996	10 - 15	D96-12760-4	TPH (extractable)	mg/Kg	11 7	U
24T03	SB3	11/7/1996	10 - 15	D96-12760-4	TPH (volatile)	ug/Kg	59	U
24T04	SB1	11/8/1996	0 - 5	D96-12805-4	TPH (extractable)	mg/Kg	74 4	J*
24T04	SB1	11/8/1996	0 - 5	D96-12805-4	TPH (volatile)	ug/Kg	58	U
24T04	SB2	11/8/1996	5 - 10	D96-12805-5	TPH (extractable)	mg/Kg	12.7	U
24T04	SB2	11/8/1996	5 - 10	D96-12805-5	TPH (volatile)	ug/Kg	63	U
24T04	SB3	11/8/1996	10 - 15	D96-12805-6	TPH (extractable)	mg/Kg	16 7	
24T04	SB3	11/8/1996	10 - 15	D96-12805-6	TPH (volatile)	ug/Kg	63	U
24T05	SB1	11/8/1996	0 - 5	D96-12805-10	TPH (extractable)	mg/Kg	618	
24T05	SB1	11/8/1996	0 - 5	D96-12805-10	TPH (volatile)	ug/Kg	29	J J*
24T05	SB2	11/8/1996	5 - 10	D96-12805-11	TPH (extractable)	mg/Kg	298	
24T05	SB2	11/8/1996	5 - 10	D96-12805-11	TPH (volatile)	ug/Kg	641	
24T05	SB3	11/8/1996	10 - 15	D96-12805-12	TPH (extractable)	mg/Kg	291	
24T05	SB3	11/8/1996	10 - 15	D96-12805-12	TPH (volatile)	ug/Kg	62	U
24T06	GW1	11/8/1996	0 - 0	D96-12805-18	TPH (extractable)	mg/L	1 48	
24T06	GW1	11/8/1996	0 - 0	D96-12805-18	TPH (volatile)	ug/L	50	U
24T06	SB1	11/8/1996	0 - 5	D96-12805-13	TPH (extractable)	mg/Kg	1240	J*
24T06	SB1	11/8/1996	0 - 5	D96-12805-13	TPH (volatile)	ug/Kg	55	U
24T06	SB2	11/8/1996	5 - 10	D96-12805-14	TPH (extractable)	mg/Kg	60.8	
24T06	SB2	11/8/1996	5 - 10	D96-12805-14	TPH (volatile)	ug/Kg	223	J*
24T06	SB2D	11/8/1996	5 - 10	D96-12805-15	TPH (extractable)	mg/Kg	67.8	

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Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
24T06	SB2D	11/8/1996	5 - 10	D96-12805-15	TPH (volatile)	ug/Kg	334	J*
24T06	SB3	11/8/1996	10 - 15	D96-12805-16	TPH (extractable)	mg/Kg	12 6	U
24T06	SB3	11/8/1996	10 - 15	D96-12805-16	TPH (volatile)	ug/Kg	45	J
SWMU 25								
25B01	CS1	11/4/1996	0 - 2	D96-12547-1	TPH (extractable)	mg/Kg	244	D J*
25B01	CS1	11/4/1996	0 - 2	D96-12547-1	TPH (volatile)	ug/Kg	291	J*
25B01	CS2	11/4/1996	2 - 4	D96-12547-2	TPH (extractable)	mg/Kg	211	D J*
25B01	CS2	11/4/1996	2 - 4	D96-12547-2	TPH (volatile)	ug/Kg	276	J*
25B01	CS3	11/4/1996	4 - 7	D96-12547-3	TPH (extractable)	mg/Kg	49 3	
25B01	CS3	11/4/1996	4 - 7	D96-12547-3	TPH (volatile)	ug/Kg	57	U
25B02	CS1	11/4/1996	0 - 2	D96-12547-4	TPH (extractable)	mg/Kg	399	D J*
25B02	CS1	11/4/1996	0 - 2	D96-12547-4	TPH (volatile)	ug/Kg	803	J*
25B02	CS2	11/4/1996	2 - 4	D96-12547-5	TPH (extractable)	mg/Kg	442	D J*
25B02	CS2	11/4/1996	2 - 4	D96-12547-5	TPH (volatile)	ug/Kg	436	J*
25B02	CS2D	11/4/1996	2 - 4	D96-12547-6	TPH (extractable)	mg/Kg	244	D J*
25B02	CS2D	11/4/1996	2 - 4	D96-12547-6	TPH (volatile)	ug/Kg	236	J*
25B02	CS3	11/4/1996	4 - 7	D96-12547-9	TPH (extractable)	mg/Kg	128	J*
25B02	CS3	11/4/1996	4 - 7	D96-12547-9	TPH (volatile)	ug/Kg	63	U J*
25B03	CS1	11/4/1996	0 - 2	D96-12547-10	TPH (extractable)	mg/Kg	22	J*
25B03	CS1	11/4/1996	0 - 2	D96-12547-10	TPH (volatile)	ug/Kg	659	J*
25B03	CS2	11/4/1996	2 - 4	D96-12547-11	TPH (extractable)	mg/Kg	94 6	
25B03	CS2	11/4/1996	2 - 4	D96-12547-11	TPH (volatile)	ug/Kg	199	J*
25B03	CS3	11/4/1996	4 - 7	D96-12547-12	TPH (extractable)	mg/Kg	140	D
25B03	CS3	11/4/1996	4 - 7	D96-12547-12	TPH (volatile)	ug/Kg	64	U
25B04	CS1	11/4/1996	0 - 2	D96-12547-13	TPH (extractable)	mg/Kg	730	
25B04	CS1	11/4/1996	0 - 2	D96-12547-13	TPH (volatile)	ug/Kg	196	J*
25B04	CS2	11/4/1996	2 - 4	D96-12547-14	TPH (extractable)	mg/Kg	95 7	J*
25B04	CS2	11/4/1996	2 - 4	D96-12547-14	TPH (volatile)	ug/Kg	65	
25B04	CS3	11/4/1996	4 - 5	D96-12547-15	TPH (extractable)	mg/Kg	1030	D J*
25B04	CS3	11/4/1996	4 - 5	D96-12547-15	TPH (volatile)	ug/Kg	697	
25B05	CS1	11/4/1996	0 - 2	D96-12547-16	TPH (extractable)	mg/Kg	441	D
25B05	CS1	11/4/1996	0 - 2	D96-12547-16	TPH (volatile)	ug/Kg	636	J*
25B05	CS2	11/4/1996	2 - 4	D96-12547-17	TPH (extractable)	mg/Kg	257	J*
25B05	CS2	11/4/1996	2 - 4	D96-12547-17	TPH (volatile)	ug/Kg	332	J*
25B06	CS1	11/4/1996	0 - 2	D96-12547-18	TPH (extractable)	mg/Kg	202	D J*
25B06	CS1	11/4/1996	0 - 2	D96-12547-18	TPH (volatile)	ug/Kg	264	J*
25B06	CS2	11/4/1996	2 - 4	D96-12547-19	TPH (extractable)	mg/Kg	237	D J*
25B06	CS2	11/4/1996	2 - 4	D96-12547-19	TPH (volatile)	ug/Kg	393	J*
25B07	CS1	11/4/1996	0 - 2	D96-12547-20	TPH (extractable)	mg/Kg	208	D J*
25B07	CS1	11/4/1996	0 - 2	D96-12547-20	TPH (volatile)	ug/Kg	367	J*
25B07	CS2	11/4/1996	2 - 4	D96-12547-21	TPH (extractable)	mg/Kg	72 9	J*
25B07	CS2	11/4/1996	2 - 4	D96-12547-21	TPH (volatile)	ug/Kg	1080	J*
25B07	CS3	11/4/1996	4 - 5 5	D96-12547-22	TPH (extractable)	mg/Kg	803	D J*
25B07	CS3	11/4/1996	4 - 5.5	D96-12547-22	TPH (volatile)	ug/Kg	408	J*
25B08	CS1	11/4/1996	0 - 2	D96-12547-24	TPH (extractable)	mg/Kg	187	D J*
25B08	CS1	11/4/1996	0 - 2	D96-12547-24	TPH (volatile)	ug/Kg	420	J*
25B08	CS2	11/4/1996	2 - 4	D96-12547-25	TPH (extractable)	mg/Kg	141	J*
25B08	CS2	11/4/1996	2 - 4	D96-12547-25	TPH (volatile)	ug/Kg	451	J*
25B08	CS3	11/4/1996	4 - 8	D96-12547-26	TPH (extractable)	mg/Kg	321	D J*
25B08	CS3	11/4/1996	4 - 8	D96-12547-26	TPH (volatile)	ug/Kg	901	J*
25B10	DP1	9/10/1997	4 - 7.5	D97-11023-20	TPH (extractable)	mg/Kg	782	
25B10	DP1	9/10/1997	4 - 7.5	D97-11023-20	TPH (volatile)	ug/Kg	1290	D
25G01	SR1	11/6/1996	0 - 1	D96-12650-1	TPH (extractable)	mg/Kg	552	D J*
25G01	SR1	11/6/1996	0 - 1	D96-12650-1	TPH (volatile)	ug/Kg	311	
25G02	SR1	11/6/1996	0 - 1	D96-12650-4	TPH (extractable)	mg/Kg	138	D J*
25G02	SR1	11/6/1996	0 - 1	D96-12650-4	TPH (volatile)	ug/Kg	111	

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Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
25G02	SR1D	11/6/1996	0 - 1	D96-12650-5	TPH (extractable)	mg/Kg	97.2	D
25G02	SR1D	11/6/1996	0 - 1	D96-12650-5	TPH (volatile)	ug/Kg	102	
25G03	SR1	11/6/1996	0 - 1	D96-12650-6	TPH (extractable)	mg/Kg	156	D J*
25G03	SR1	11/6/1996	0 - 1	D96-12650-6	TPH (volatile)	ug/Kg	801	
25G04	SR1	11/6/1996	0 - 1	D96-12650-7	TPH (extractable)	mg/Kg	266	D J*
25G04	SR1	11/6/1996	0 - 1	D96-12650-7	TPH (volatile)	ug/Kg	37	J
SWMU 26								
26B01	CS1	11/4/1996	2 - 4	D96-12547-27	TPH (extractable)	mg/Kg	12 3	U
26B01	CS1	11/4/1996	2 - 4	D96-12547-27	TPH (volatile)	ug/Kg	62	U
26B01	CS2	11/4/1996	4 - 7	D96-12547-28	TPH (extractable)	mg/Kg	13.2	U
26B01	CS2	11/4/1996	4 - 7	D96-12547-28	TPH (volatile)	ug/Kg	66	U
26B02	CS1	11/4/1996	2 - 4	D96-12547-31	TPH (extractable)	mg/Kg	12	U
26B02	CS1	11/4/1996	2 - 4	D96-12547-31	TPH (volatile)	ug/Kg	60	U
26B02	CS1D	11/4/1996	2 - 4	D96-12547-32	TPH (extractable)	mg/Kg	13	U
26B02	CS1D	11/4/1996	2 - 4	D96-12547-32	TPH (volatile)	ug/Kg	65	U
26B02	CS2	11/4/1996	4 - 7	D96-12547-33	TPH (extractable)	mg/Kg	12 9	U
26B02	CS2	11/4/1996	4 - 7	D96-12547-33	TPH (volatile)	ug/Kg	65	U
SWMU 27								
27B01	DP1	3/31/1997	1 - 3	D97-3890-1	TPH (extractable)	mg/Kg	15 8	
27B01	DP1	3/31/1997	1 - 3	D97-3890-1	TPH (volatile)	ug/Kg	53	U
27B01	DP2	3/31/1997	3 - 5	D97-3890-2	TPH (extractable)	mg/Kg	494	
27B01	DP2	3/31/1997	3 - 5	D97-3890-2	TPH (volatile)	ug/Kg	53	U
27B01	DP2D	3/31/1997	3 - 5	D97-3890-3	TPH (extractable)	mg/Kg	33.2	
27B01	DP2D	3/31/1997	3 - 5	D97-3890-3	TPH (volatile)	ug/Kg	53	U
27B01	DP3	3/31/1997	5 - 7	D97-3890-4	TPH (extractable)	mg/Kg	2400	D J*
27B01	DP3	3/31/1997	5 - 7	D97-3890-4	TPH (volatile)	ug/Kg	667	
27B02	DP1	3/31/1997	1 - 3	D97-3890-5	TPH (extractable)	mg/Kg	14 5	
27B02	DP1	3/31/1997	1 - 3	D97-3890-5	TPH (volatile)	ug/Kg	53	U
27B02	DP2	3/31/1997	3 - 5	D97-3890-6	TPH (extractable)	mg/Kg	262	
27B02	DP2	3/31/1997	3 - 5	D97-3890-6	TPH (volatile)	ug/Kg	59	U
27B02	DP3	3/31/1997	5 - 7	D97-3890-7	TPH (extractable)	mg/Kg	345	
27B02	DP3	3/31/1997	5 - 7	D97-3890-7	TPH (volatile)	ug/Kg	69	U
27B03	DP1	3/31/1997	1 - 3	D97-3890-9	TPH (extractable)	mg/Kg	165	
27B03	DP1	3/31/1997	1 - 3	D97-3890-9	TPH (volatile)	ug/Kg	56	U
27B03	DP2	3/31/1997	3 - 5	D97-3890-10	TPH (extractable)	mg/Kg	130	
27B03	DP2	3/31/1997	3 - 5	D97-3890-10	TPH (volatile)	ug/Kg	57	U
27B03	DP3	3/31/1997	5 - 7	D97-3890-11	TPH (extractable)	mg/Kg	48 4	
27B03	DP3	3/31/1997	5 - 7	D97-3890-11	TPH (volatile)	ug/Kg	70	U
SWMU 33								
33B45	DW1	4/17/1997	18 - 20	D97-4731-6	TPH (extractable)	mg/L	2 18	J*
33B45	DW1	4/17/1997	18 - 20	D97-4731-6	TPH (volatile)	ug/L	50	U
33B46	DW1	4/17/1997	18 - 20	D97-4731-5	TPH (extractable)	mg/L	3 59	
33B46	DW1	4/17/1997	18 - 20	D97-4731-5	TPH (volatile)	ug/L	660	
33B47	DW1	4/17/1997	8 - 10	D97-4731-4	TPH (extractable)	mg/L	10	
33MW5S	GW1	5/12/1997	0 - 0	D97-5825-13	TPH (extractable)	mg/L	1 21	
33MW5S	GW1	5/12/1997	0 - 0	D97-5825-13	TPH (volatile)	ug/L	50	U
AOC 1								
A01B03	DP1	3/25/1997	0 - 4	D97-3598-1	TPH (extractable)	mg/Kg	513	J*
A01B03	DP1	3/25/1997	0 - 4	D97-3598-1	TPH (volatile)	ug/Kg	271	J*
A01B03	DP2	3/25/1997	4 - 8	D97-3598-4	TPH (extractable)	mg/Kg	77 9	
A01B03	DP2	3/25/1997	4 - 8	D97-3598-4	TPH (volatile)	ug/Kg	59	U
A01B03	DP3	3/25/1997	8 - 9	D97-3598-5	TPH (extractable)	mg/Kg	120	
A01B03	DP3	3/25/1997	8 - 9	D97-3598-5	TPH (volatile)	ug/Kg	111	
A01B04	DP1	3/25/1997	0 - 4	D97-3598-6	TPH (extractable)	mg/Kg	189	
A01B04	DP1	3/25/1997	0 - 4	D97-3598-6	TPH (volatile)	ug/Kg	220	
A01B04	DP2	3/25/1997	4 - 8	D97-3598-7	TPH (extractable)	mg/Kg	219	
A01B04	DP2	3/25/1997	4 - 8	D97-3598-7	TPH (volatile)	ug/Kg	168	

Appendix U
Analytical Laboratory TPH Data
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
A01B04	DP3	3/25/1997	8 - 10	D97-3598-8	TPH (extractable)	mg/Kg	246	
A01B04	DP3	3/25/1997	8 - 10	D97-3598-8	TPH (volatile)	ug/Kg	835	
A01B07	DP1	3/26/1997	0 - 3	D97-3689-14	TPH (extractable)	mg/Kg	166	
A01B07	DP1	3/26/1997	0 - 3	D97-3689-14	TPH (volatile)	ug/Kg	206	
A01G01	SR1	3/13/1997	0 - 1	D97-3053-1	TPH (extractable)	mg/Kg	65 2	
A01G01	SR1	3/13/1997	0 - 1	D97-3053-1	TPH (volatile)	ug/Kg	53	U
A01G02	SR1	3/13/1997	0 - 1	D97-3053-3	TPH (extractable)	mg/Kg	112	
A01G02	SR1	3/13/1997	0 - 1	D97-3053-3	TPH (volatile)	ug/Kg	378	
A01G03	SR1	3/13/1997	0 - 1	D97-3053-4	TPH (extractable)	mg/Kg	694	D J*
A01G03	SR1	3/13/1997	0 - 1	D97-3053-4	TPH (volatile)	ug/Kg	561	J*
A01G04	SR1	3/13/1997	0 - 1	D97-3053-5	TPH (extractable)	mg/Kg	237	J*
A01G04	SR1	3/13/1997	0 - 1	D97-3053-5	TPH (volatile)	ug/Kg	558	
A01G04	SR1D	3/13/1997	0 - 1	D97-3053-6	TPH (extractable)	mg/Kg	212	J*
A01G04	SR1D	3/13/1997	0 - 1	D97-3053-6	TPH (volatile)	ug/Kg	637	J*
A01G05	SR1	3/13/1997	0 - 1	D97-3053-7	TPH (extractable)	mg/Kg	288	
A01G05	SR1	3/13/1997	0 - 1	D97-3053-7	TPH (volatile)	ug/Kg	611	
A01G06	SR1	3/13/1997	0 - 1	D97-3053-8	TPH (extractable)	mg/Kg	154	
A01G06	SR1	3/13/1997	0 - 1	D97-3053-8	TPH (volatile)	ug/Kg	262	
A01G07	SR1	3/13/1997	0 - 1	D97-3053-9	TPH (extractable)	mg/Kg	145	
A01G07	SR1	3/13/1997	0 - 1	D97-3053-9	TPH (volatile)	ug/Kg	172	
A01G08	SR1	3/13/1997	0 - 1	D97-3053-12	TPH (extractable)	mg/Kg	252	
A01G08	SR1	3/13/1997	0 - 1	D97-3053-12	TPH (volatile)	ug/Kg	606	
A01G09	SR1	5/9/1997	0 - 1	D97-5737-1	TPH (extractable)	mg/Kg	178	
A01G09	SR1	5/9/1997	0 - 1	D97-5737-1	TPH (volatile)	ug/Kg	55	U
A01G10	SR1	5/9/1997	0 - 1	D97-5737-2	TPH (extractable)	mg/Kg	35 3	
A01G10	SR1	5/9/1997	0 - 1	D97-5737-2	TPH (volatile)	ug/Kg	55	U
A01G11	SR1	5/9/1997	0 - 1	D97-5737-3	TPH (extractable)	mg/Kg	40	
A01G11	SR1	5/9/1997	0 - 1	D97-5737-3	TPH (volatile)	ug/Kg	54	U
A01G12	SR1	5/9/1997	0 - 1	D97-5737-4	TPH (extractable)	mg/Kg	101	
A01G12	SR1	5/9/1997	0 - 1	D97-5737-4	TPH (volatile)	ug/Kg	56	U
A01G13	SR1	5/9/1997	0 - 1	D97-5737-5	TPH (extractable)	mg/Kg	94 3	
A01G13	SR1	5/9/1997	0 - 1	D97-5737-5	TPH (volatile)	ug/Kg	57	U
A01G14	SR1	5/9/1997	0 - 1	D97-5737-6	TPH (extractable)	mg/Kg	118	
A01G14	SR1	5/9/1997	0 - 1	D97-5737-6	TPH (volatile)	ug/Kg	56	U
A01MW1	GW1	5/14/1997	0 - 0	D97-5891-7	TPH (extractable)	mg/L	1 31	
A01MW1	GW1	5/14/1997	0 - 0	D97-5891-7	TPH (volatile)	ug/L	50	U
A01MW2	GW1	5/14/1997	0 - 0	D97-5891-8	TPH (extractable)	mg/L	1 19	
A01MW2	GW1	5/14/1997	0 - 0	D97-5891-8	TPH (volatile)	ug/L	50	U
A01MW3	GW1	5/14/1997	0 - 0	D97-5891-9	TPH (extractable)	mg/L	1 8	
A01MW3	GW1	5/14/1997	0 - 0	D97-5891-9	TPH (volatile)	ug/L	50	U
A01MW4	GW1	5/12/1997	0 - 0	D97-5825-14	TPH (extractable)	mg/L	1 57	
A01MW4	GW1	5/12/1997	0 - 0	D97-5825-14	TPH (volatile)	ug/L	55 7	
A01MW4	SB1	4/29/1997	0 - 4	D97-5313-5	TPH (extractable)	mg/Kg	37	
A01MW4	SB1	4/29/1997	0 - 4	D97-5313-5	TPH (volatile)	ug/Kg	54	U
A01MW4	SB1D	4/29/1997	0 - 4	D97-5313-6	TPH (extractable)	mg/Kg	74 8	
A01MW4	SB1D	4/29/1997	0 - 4	D97-5313-6	TPH (volatile)	ug/Kg	54	U
A01MW4	SB2	4/29/1997	4 - 8	D97-5313-7	TPH (extractable)	mg/Kg	54 4	
A01MW4	SB2	4/29/1997	4 - 8	D97-5313-7	TPH (volatile)	ug/Kg	55	U
A01MW5	GW1	5/14/1997	0 - 0	D97-5891-1	TPH (extractable)	mg/L	3 11	
A01MW5	GW1	5/14/1997	0 - 0	D97-5891-1	TPH (volatile)	ug/L	50	U
A01MW5	GW1D	5/14/1997	0 - 0	D97-5891-2	TPH (extractable)	mg/L	1 56	
A01MW5	GW1D	5/14/1997	0 - 0	D97-5891-2	TPH (volatile)	ug/L	50	U
A01MW5	SB1	4/29/1997	0 - 4	D97-5313-1	TPH (extractable)	mg/Kg	36 6	
A01MW5	SB1	4/29/1997	0 - 4	D97-5313-1	TPH (volatile)	ug/Kg	56	U
A01MW5	SB2	4/29/1997	4 - 8	D97-5313-2	TPH (extractable)	mg/Kg	51 6	
A01MW5	SB2	4/29/1997	4 - 8	D97-5313-2	TPH (volatile)	ug/Kg	57	U

Appendix U
Analytical Laboratory TPH Data
Armco Kansas City Facility

Sample Location		Date	Sample Depth	Laboratory			Result	
Point	Designator	Sampled	From - To	Number	Parameter	Units		
A01MW6	GW1	5/14/1997	0 - 0	D97-5891-3	TPH (extractable)	mg/L	2 21	J*
A01MW6	GW1	5/14/1997	0 - 0	D97-5891-3	TPH (volatile)	ug/L	242	
A01MW6	SB1	4/30/1997	0 - 4	D97-5313-9	TPH (extractable)	mg/Kg	58 7	
A01MW6	SB1	4/30/1997	0 - 4	D97-5313-9	TPH (volatile)	ug/Kg	56	U
A01MW6	SB2	4/30/1997	4 - 8	D97-5313-10	TPH (extractable)	mg/Kg	130	
A01MW6	SB2	4/30/1997	4 - 8	D97-5313-10	TPH (volatile)	ug/Kg	150	
A01MW6	SB3	4/30/1997	8 - 10	D97-5313-11	TPH (extractable)	mg/Kg	185	
A01MW6	SB3	4/30/1997	8 - 10	D97-5313-11	TPH (volatile)	ug/Kg	2080	D
A01MW7	GW1	5/14/1997	0 - 0	D97-5891-4	TPH (extractable)	mg/L	4 12	
A01MW7	GW1	5/14/1997	0 - 0	D97-5891-4	TPH (volatile)	ug/L	50	U
A01MW7	SB1	4/29/1997	0 - 4	D97-5313-3	TPH (extractable)	mg/Kg	54 8	
A01MW7	SB1	4/29/1997	0 - 4	D97-5313-3	TPH (volatile)	ug/Kg	53	U
A01MW7	SB2	4/29/1997	4 - 8	D97-5313-4	TPH (extractable)	mg/Kg	103	
A01MW7	SB2	4/29/1997	4 - 8	D97-5313-4	TPH (volatile)	ug/Kg	56	U
AOC 4								
A04B02	DP1	3/24/1997	2 - 4	D97-3627-20	TPH (extractable)	mg/Kg	79 7	
A04B02	DP1	3/24/1997	2 - 4	D97-3627-20	TPH (volatile)	ug/Kg	132	
A04B03	DP1	3/25/1997	4 - 6	D97-3602-4	TPH (extractable)	mg/Kg	12	U
A04B03	DP1	3/25/1997	4 - 6	D97-3602-4	TPH (volatile)	ug/Kg	60	U
A04B04	DP1	3/25/1997	2 - 4	D97-3602-7	TPH (extractable)	mg/Kg	98 2	
A04B04	DP1	3/25/1997	2 - 4	D97-3602-7	TPH (volatile)	ug/Kg	59	U
A04B04	DP2	3/25/1997	4 - 6	D97-3602-1	TPH (extractable)	mg/Kg	17 3	
A04B04	DP2	3/25/1997	4 - 6	D97-3602-1	TPH (volatile)	ug/Kg	61	U
A04B04	DP2D	3/25/1997	4 - 6	D97-3602-2	TPH (extractable)	mg/Kg	12 6	
A04B04	DP2D	3/25/1997	4 - 6	D97-3602-2	TPH (volatile)	ug/Kg	62	U

Notes:

D = Diluted for analysis

J = Qualified as estimated by the laboratory, result below reporting limit

J* = Qualified as estimated by BMWCI during QC evaluation

U = Compound was not detected

Y = A typical fuel pattern was detected but the fuel mixture did not fall 90% within the calibration standard range and exhibit a reasonable pattern match to any of the calibrated fuels

Z = The chromatographic response does not exhibit a pattern of a typical fuel which is characteristic of petroleum hydrocarbons

APPENDIX B
Historical and/or Additional SWMU/AOC Information

APPENDIX B - Historical and/or Additional SWMU/AOC Information (Submitted on CD)

B-1	SWMU 3 -	*Site Investigation, Former Waste Disposal Area South of Bar Fabrication Building, Armco Kansas City Works, Kansas City, Missouri* (Remcor, 1988)
B-2	SWMU 6 -	*Certifications of Closure for Tanks 1, 2, 3, and 5* (Remcor, 1990-1991)
B-3	SWMU 12 -	*AMOCO Sludge Landfarm, Armco Site, Prepared for AMOCO Oil Company* (WCC, 1980)
		Groundwater Monitoring Data (WCC, 1994)
B-4	SWMU 33 -	*Draft Report, Idled Facilities Environmental Investigation, Kansas City Works, Kansas City, Missouri* (Remcor 1990)
		Armco Phase I and II Soil Vapor Survey (Terracon, 1991a)
		Nail Mill Phase II Investigation Report, Worldwide Grinding Systems, Armco, Inc., Kansas City, Missouri (Terracon, 1991b)
		Groundwater Monitoring Report – February 2001 Sampling Event, AK Steel, Kansas City Facility (BMcD, 2001)
		Table 2-4 and Table 2-5 Comparison of Historical Soil Data – *Quality Assurance Sampling and Analysis Plan, Supplemental Investigation, AK Steel, Kansas City, Missouri* (BMcD, 2007)
B-5	AOC 8 -	*Phase II Site Assessment Report, South Riverfront Expressway, Armco Site, Kansas City, Missouri* (WCC, 1994)

"REALISTIC SOLUTIONS FOR HAZARDOUS WASTE PROBLEMS"

REPORT

SITE INVESTIGATION
FORMER WASTE DISPOSAL AREA
SOUTH OF BAR FABRICATION BUILDING

ARMCO KANSAS CITY WORKS
KANSAS CITY, MISSOURI

REMCOR Inc • 701 Alpha Drive • P O Box 38310 • Pittsburgh PA 15238-8310 • 412-963-1106

November 11, 1988

Project No. 88657

Mr. James A. Grantz
Senior Project Engineer
Armco Inc.
Corporate Environmental Engineering
801 Young Street
Middletown, Ohio 45043

Final Report
Site Investigation
Former Waste Disposal Area
South of Bar Fabrication Building
Kansas City Works
Kansas City, Missouri

Dear Mr. Grantz:

Enclosed are five (5) copies of the above-captioned report for your information and use. The review comments received on the previously submitted draft have been incorporated in this final report.

Remcor, Inc. has appreciated this opportunity to be of service to Armco Inc., and we are currently preparing to implement the near-term corrective action for this site. If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

Wayne M Crowley for L.M. Brausch

Leo M. Brausch
Vice President

LMB:rmv
Enclosures

cc: D. W. Kemp, Esquire (all w/enclosure)
K. A. Niebrugge
S. A. Riegel
L. H. Scott

CORPORATE ENGINEERING
NOV 14 1988

REPORT

SITE INVESTIGATION
FORMER WASTE DISPOSAL AREA
SOUTH OF BAR FABRICATION BUILDING

ARMCO KANSAS CITY WORKS
KANSAS CITY, MISSOURI

REPORT

SITE INVESTIGATION
FORMER WASTE DISPOSAL AREA
SOUTH OF BAR FABRICATION BUILDING

ARMCO KANSAS CITY WORKS
KANSAS CITY, MISSOURI

PREPARED FOR

ARMCO INC.
KANSAS CITY, MISSOURI

NOVEMBER 1988

PROJECT NO. 88657

REMCOR, INC.
PITTSBURGH, PENNSYLVANIA

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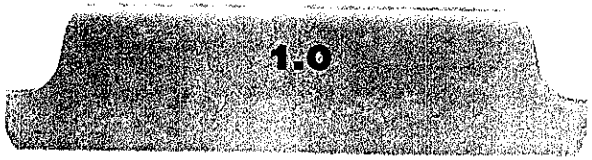
7	Near-Term Corrective Action Plan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1.0 INTRODUCTION

Under contract to Armco Inc. (Armco), Remcor, Inc. (Remcor) has conducted an evaluation of a formerly used solid waste disposal area south of the bar fabrication building at the Armco Kansas City Works in Kansas City, Missouri. The investigation was conducted to evaluate the current conditions of this fill area with respect to the following:

- Horizontal and vertical extent of fill materials
- Chemical characterization of the waste
- Near-surface stratigraphy
- Integrity of the soil cover atop the waste.

This study has involved drilling and subsurface sampling as well as the compilation of available site data. Such data include information from the U.S. Army Corps of Engineers, Kansas City District (COE), regarding the rechannelization of the adjacent (Big) Blue River and from the City of Kansas City (City) concerning the locations of nearby sanitary sewers. Corrective measures to improve waste containment were also evaluated.

1.1 BACKGROUND

The following sections provide a brief summary of pertinent site history and environmental conditions.

1.1.1 Site Location and Disposal History

The waste disposal area of concern occupies a plan area of approximately one acre along the east bank of the Blue River in the southeastern portion of the Kansas City Works (Figure 1). During all or a portion of the period between 1962 and 1980, Armco placed steelmaking solid wastes at this location. Waste materials included electric arc furnace (EAF) dust collected in the baghouses at the melt shops as well as other plant wastes. The volume of waste disposed is not known, but was believed by Armco to be on the order of 10,000 to 20,000 cubic yards (yd^3). The disposal area was closed in 1980 by placing three feet of clean soil fill atop the waste. The soil cover was compacted in place and seeded.

1.1.2 Regulatory Status

Under the requirements of Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Armco notified the U.S. Environmental Protection Agency (EPA) of the existence of this formerly used landfill on June 5, 1981. Armco reported that no releases of wastes to the environment were known nor were such releases likely based on the containment afforded by the cover. Subsequently, Armco also identified this landfill to the EPA as a solid waste management unit (SWMU) under the requirements of Section 3004(u) of the Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA). The former landfill is not a hazardous waste management unit under RCRA regulations.

1.1.3 Recent Construction Activities

The COE has designed and is managing the construction of the rechannelization of the Blue River. As part of this project (Stage II - Contract II), the river channel was widened and reshaped in the area of the formerly used disposal site at approximate river Station 470+00 (Figure 2). Riprap was placed along portions of the channel slopes primarily below the flood stage elevation with limited coverage on the disposal area slope. COE records (COE, 1985) indicate that, after the initial rechannelization work in 1983 and 1984, the reshaped channel side slopes in the vicinity of the disposal area (and elsewhere) were structurally unstable, and slope stabilization activities were subsequently undertaken. Piles were driven to hold the slopes, the channel cross section was modified, and additional riprap was placed (Figure 2).

Inspection of the fill area in May 1988 suggested that, in the rechannelization work, the overlying soil cover and some wastes had been locally removed. Remaining waste materials have been exposed along the riverbank for a distance on the order of 440 feet. The width of the exposed area (perpendicular to the river) averages about 100 feet, of which about 40 is on the riverbank slope.

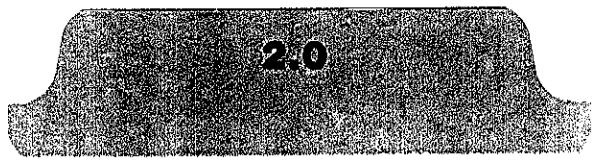
In addition to the COE rechannelization, the City relocated a sanitary sewer in the vicinity of the disposal area (Figure 2). Due to slope instability during channel reconstruction, the City was concerned with the possibility of breakage of the existing sewer line. The line was then moved by the contractor in charge of the rechannelization effort in coordination with the channel construction. Excess materials that were excavated during this construction were incorporated with materials excavated in the rechannelization. This realigned sewer is positioned within the limits of the formerly used disposal area.

1.2 STUDY OBJECTIVES

Because the integrity of the steelmaking waste disposal area was believed to have been compromised, Armco requested an engineering study of the potentially affected area to accomplish the following:

- Define the pre- and post-construction (i.e., river rechannelization and sewer relocation) limits of fill materials
- Characterize the steelmaking wastes, particularly with respect to their total lead and extraction procedure (EP) toxicity metals content
- Evaluate the potential for environmental release of hazardous constituents as a result of the river rechannelization and sewer relocation
- Develop a corrective action plan for minimizing the potential for such releases, if any.

The findings and conclusions of this study are presented in this report.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2.0 SITE INVESTIGATION METHODS

The investigation of the formerly used disposal area involved the retrieval of existing data and a subsurface drilling and sampling program. The following sections describe the data retrieved and methods employed.

2.1 AVAILABLE DATA RETRIEVAL

At the initiation of the field investigation, Remcor contacted COE personnel to acquire copies of the following:

- Stereographic aerial photographs of the Kansas City Works area taken prior to the rechannelization work
- Revised, final COE design drawings for rechannelization near the disposal area
- Rechannelization construction specifications
- Logs and soil classifications from COE boring in the vicinity
- As-built drawings of the rechannelization in the vicinity of the disposal area.

These documents have been reviewed by Remcor in this evaluation.

Immediately after meeting with the COE, Remcor also met with the Assistant City Engineer of Kansas City. Information concerning the relocation of the sanitary sewer through the fill area was collected. These documents included the specifications for the construction of sanitary sewers and the design/as-built drawing of the relocation of the 30-inch sanitary sewer line. As with the information collected from the COE, these materials from the City were examined and used in the evaluation of current site conditions.

2.2 SUBSURFACE INVESTIGATION

Remcor conducted a subsurface investigation at the site by drilling and sampling borings across the waste disposal area. A total of 14 test

borings (labeled TB-1 through TB-14) (Figure 2) were advanced through the fill area using a rotary drill rig. Each of the borings was logged by an experienced Remcor geologist in accordance with the Unified Soil Classification System (USCS); boring logs are included as Appendix A. Soil samples were collected on five-foot vertical centers according to the American Society for Testing and Materials (ASTM) Method D 1586-74 for collection of split-spoon samples. Standard penetration resistance was measured during the collection of split-spoon samples and is recorded on the boring logs (Appendix A).

Samples of fill and suspected waste materials were collected via decontaminated split-spoon samplers. The samples were then placed into new laboratory glass bottles with Teflon-lined lids and labeled with a sample number, project number, and the sampler's initials. Samples were packaged in a protective sample shipping container for shipment to Antech Ltd. (Antech), the analytical laboratory. Chain-of-custody procedures were maintained in accordance with Remcor field operating procedures established on previous investigations performed for Armco.

2.3 LABORATORY ANALYSES

The Remcor field geologist selected 16 of the collected soil/fill material samples for laboratory analysis. This selection was based on the objective of characterizing the range of solid waste materials encountered, with particular emphasis on fine-grained solid waste materials suspected to be emission control dusts from the EAFs.

The selected samples were prepared in the laboratory by first blending the sample jar contents thoroughly and withdrawing a representative portion of the material for testing. The withdrawn portion of the sample was then split into two aliquots for total lead and EP toxicity metals analyses. The total lead determination involved the digestion of the solid material in hot nitric acid and collection of the liquid extract (EPA Method 3050; U.S. Environmental Protection Agency, 1986). The EP toxicity test involved the extended leaching of the sample in an acetic

acid solution and separation and collection of the leachate (EPA Method 1310; U.S. Environmental Protection Agency, 1986). Analyses were performed by atomic absorption spectrophotometry in accordance with EPA methods as follows (U.S. Environmental Protection Agency, 1986):

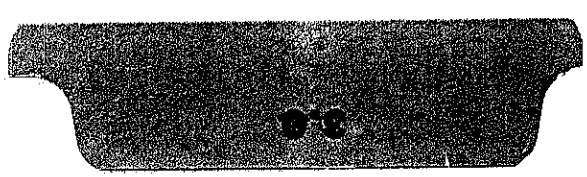
- Arsenic - Method 7060
- Barium - Method 7080
- Cadmium - Method 7130
- Chromium - Method 7190
- Lead - Method 7420
- Mercury - Method 7471
- Selenium - Method 7740
- Silver - Method 7760.

The laboratory testing program included quality control analyses of two total lead samples in duplicate and the preparation and analysis of a matrix spike sample.

2.4 SITE TOPOGRAPHIC SURVEY

In planning the project work, Remcor had expected to receive a comprehensive topographic map of as-built conditions from the COE. The drawings received, however, were not of sufficient areal extent or detail to address the former waste disposal area. To provide the detailed topographic map required to complete the investigation, Remcor subcontracted Anderson Survey Company of Kansas City, Missouri. A site map was produced at a 1 inch equals 30 feet horizontal (1" = 30') scale with a contour interval of one foot in the relatively flat landfill area and two feet along the bank of the Blue River. The site topography was tied to the U.S. Department of the Interior, Geological Survey (USGS) benchmark Monument BBR-L-10-Disc set in a concrete post, flush with the ground surface located six feet south of southwest U.S. Route 24 highway bridge (Elevation 755.16 feet, mean sea level [ft-msl]). The topographic survey plat was used as the base for Figure 2. Rechannelization design features (e.g., channel centerline, construction right-of-way) were located based on COE as-built diagrams provided to Remcor. Test boring locations, manholes, and other site features were located as part of the topographic survey.

The locations of underground utilities were plotted using the determined field location of manholes. Review of the drawing provided by the City concerning the relocation of the sanitary sewer revealed some inconsistencies. The drawing showed the placement of the sewer line further to the east than the surveyed locations of the manhole covers would indicate. After reviewing the COE drawings, aerial photographs, field data collected by the surveyor, and the information provided by the City, Remcor's understanding of actual field locations of sewers is illustrated in Figure 2. Based on conversations with the City, it is understood that this sewer line was constructed of 30-inch diameter reinforced concrete pipe, placed at a depth of approximately 20 feet.



3.0 SITE CHARACTERIZATION

This chapter presents the findings of the site investigation. The regional setting is first described based on reports of the USGS and the Missouri Department of Natural Resources. The site-specific conditions in the landfill area are then discussed.

3.1 REGIONAL SETTING

The following sections outline important aspects of the regional environmental setting.

3.1.1 Topography and Drainage

The Kansas City, Missouri region is an area of rolling and plain topography with dendritic streams of mature developmental stage (McCourt, et al., 1917). Stream valleys are wide and flat-bottomed; meandering streams and oxbow lakes are common.

At Kansas City, the average discharge of the Missouri River is 56,000 cubic feet per second (cfs) (Waite, 1987). In comparison, the average discharge of the Blue River, near its confluence with the Missouri, is on the order of 200 cfs (Waite, 1987). The approximate 100-year flood elevation of the Missouri River at Kansas City is 738 ft-msl. Because the flow of the Missouri River is highly regulated in this area, a 100-year flood may be the function of regulation and not runoff. For this reason, the USGS is reluctant to recognize an official 100-year flood elevation (Waite, 1987).

3.1.2 Geology

The site region is part of the Osage Plains portion of the Interior Plains physiographic province (Emmett, 1985; Anderson, et al., 1979), located midway between the Ozark Plateau and the Great Plains (McCourt, et al., 1917). The geology of the Osage Plains is relatively uncomplicated, predominated by relatively flat-lying sedimentary rocks (dipping 10 to 20 feet per mile to the west-northwest) and unconsolidated alluvial deposits in the valleys (Parizek, et al., 1968).

Figure 3 is a generalized geologic cross section through the site area. As illustrated in this figure, five geologic units are present in this area (Parizek, et al., 1968):

- Marmaton Group
- Pleasanton Group
- Kansas City Group - Bronson Subgroup
- Kansas City Group - Linn Subgroup
- Blue River Alluvium.

These units are Pennsylvanian in age, except for the alluvium, which is of the Quaternary period.

The oldest bedrock unit of these listed, the Marmaton Group, consists of an upper shale, median limestone, and basal sandstone (Anderson, 1979). According to Parizek, et al. (1968), this unit is present at a depth of approximately 100 feet below the ground surface in the area of the Kansas City Works (Figure 3).

Overlying the Marmaton is the Pleasanton Group, comprised of argillaceous to sandy, micaceous shale. Thin, fossiliferous siltstone beds are also present in upper portions of the group (Parizek, et al., 1968). This unit is exposed in the vicinity of the Blue River near the Armco facility. The upper surface of this unit appears to be at the approximate elevation of I-435 to the southeast of the site, based on visual identification by Remcor.

The bedrock units lying above the Pleasanton Group consist of the Bronson and Linn subgroups of the Kansas City Group. Both of these members of the Kansas City Group have been removed by erosion in the vicinity of the Armco facility. The Bronson Group consists of a cyclic sequence of three major limestones separated by shale and clay units. The limestones are commonly quarried but also deep-mined in areas of high-quality material. These mining methods have left mine adits, which have been used by some industries for various purposes. The Linn Subgroup consists of shales, a few persistent limestones, and some thin sandstones.

Locally derived alluvium lines the valley bottom along the Blue River. Near the Armco facility, this material may be as much as 30 feet thick (Parizek, et al., 1968). Based on data provided by exploratory geotechnical drilling performed for the COE in preparation for the Blue River rechannelization project (COE, 1983), the natural alluvial deposits consist primarily of high- and low-plasticity clays (CH and CL). Sandy clays (SC) and poorly graded sands (SP) exist at depth, buried by the clayey and silty surface materials.

3.1.3 Hydrogeology

Aquifers of the site region may occur in either bedrock or unconsolidated materials. Bedrock aquifers typically consist of sandstones, where permeability is controlled by primary porosity, or within limestone, where permeability is generally a function of the density and interconnection of fractures. Typical yields from domestic wells tapping the bedrock aquifer(s) range to less than 20 gallons per minute (gpm) (Imes, 1987). Near major rivers, these bedrock aquifers are not commonly used for domestic, industrial, or municipal water supplies. Unconsolidated formations, such as glacial drift, are relatively unimportant as aquifers in the Kansas City area. These drift deposits are typically thin mantles of silty clay material that transmit very little water.

Deposits of alluvium along major rivers (e.g., Missouri River) are widely used for water supply by both industry and individuals. Wells developed in these deposits commonly yield on the order of several thousand gpm (Emmett, 1985). Ground water is typically encountered at shallow depths (less than 20 feet) with flow directions toward and in the downstream direction of the alluvial valleys.

3.2 SITE SUBSURFACE CONDITIONS

As expected, the test borings drilled in the formerly used disposal area encountered fill materials (both soils and solid wastes) overlying native clay soils. The boring program was successful in defining the current limits of fill materials. Site geologic cross sections showing the

extent of the waste disposal area are presented in Figures 4 and 5. These cross sections were generated from the boring log data (Appendix A) and the topographic map (Figure 2).

3.2.1 Extent of Fill

The locations of the 14 test borings drilled at the site were primarily selected to determine the northern and southern limits of the fill. Borings TB-2 and TB-8 each encountered only minor amounts of sand and gravel fill overlying the dark gray silty clay that has been identified to be the predominant alluvial deposit in the lower portions of the Blue River valley. This soil fill may reflect the soil cover placed atop the waste area (and presumably beyond its limits) or soils used to construct site access roads. These borings demark the northern and southern limits of the fill area. The northern limit of fill has been determined by the drastic reduction of fill material at Boring TB-2 as compared to TB-1. It is believed that the historic topography may have provided a depression into which fill from the steelmaking process was placed. To the south, the boundary of the fill also appears to be controlled by topography (Figure 4).

The eastern limits of the waste disposal area were established from Remcor and COE boring information and from the topographic constraints at the site. The northeastern boundary can be defined by comparing the materials encountered in Borings TB-1, TB-10, and TB-14 to those found at Borings TB-9, TB-11, TB-12, and TB-13. At Borings TB-1, TB-10, and TB-14, 8.0 to 8.5 feet of steelmaking solid wastes and other fill materials were found, whereas no such wastes were encountered at Borings TB-9, TB-11, TB-12, and TB-13. COE Boring AD-178 (drilled in May 1980) showed native soils with no fill (COE, 1983). A thin (one foot) surficial layer of the red/brown waste matrix was identified in Borings TB-11 and TB-12. In the southeastern portion of the site, the high bank of undisturbed bedrock defines the maximum potential extent of filling.

The western limits of the disposal area were estimated by projecting the defined lower elevation of the filled materials to intersect the riverbank. This riverbank was established by the excavation effort associated with the rechannelization of the Blue River.

Overall, the area containing steelmaking solid wastes (including the red/brown fine-grained material likely to be comprised of EAF dust) is estimated to be about 44,000 square feet in plan. The area is nominally 440 feet long (parallel to the river) and 100 feet wide (perpendicular to the river).

Test borings within the limits of the fill area show a maximum (post-rechannelization) thickness of waste materials of 17 feet. The thickest fill is located along the western side (crest of the riverbank) in the area of Borings TB-3 and TB-4. Native soils below the fill are silty clay alluvium. Borings located along the eastern edge of the fill area indicate bedrock is present within four feet of the surface with up to three feet of overlying fill.

3.2.2 Waste Volume

Based on the description of the materials encountered in the borings, Remcor estimates that the total volume of fill remaining within the limits of the disposal area is approximately 14,000 yd^3. Of this total, not more than about 2,000 yd^3 are comprised of clean soil cover.

The COE rechannelization project involved significant excavation along the east bank of the Blue River in the vicinity of the formerly used solid waste disposal area. To estimate the volume of solid wastes removed, Remcor compared the pre-construction topography (COE, 1985) to the site topographic map developed as part of this investigation. Cross sections were then developed on 25-foot centers and the differences between the pre- and post-construction conditions were examined; volumes were calculated by the average end area method. From this evaluation,

Remcor estimates that the volume of solid wastes removed from the disposal area as a result of the rechannelization project is approximately 3,700 yd^3.

The City sanitary sewer line was relocated for an estimated distance of 290 feet through the solid waste disposal area. Information provided by the City indicates that excavated materials were used in backfilling the sewer trench and only excess materials were removed from the site for disposal. On this basis, Remcor estimates that about 200 to 500 yd^3 of steelmaking solid wastes were removed as a result of the sewer line construction.

3.2.3 Ground Water

Several of the borings advanced by Remcor as well as by the COE encountered wet conditions. This ground water was generally within the gray silty clay at an elevation below the fill. Ground water was not found in the Remcor borings within the red/brown matrix fill. Based on observations made in other recent investigations by Remcor, this ground water zone is likely discharged to the Blue River.

3.2.4 Fill Characteristics

3.2.4.1 Field Characterization

The encountered fill material is predominated by sand and gravel with construction debris (i.e., fire bricks, nails, and concrete), cinders, and slag. Traces of mill scale are present, and nearly all materials are contained in a matrix of red/brown fine-grained material. This red/brown material is believed to be comprised, at least in part, of the EAF dust that was disposed of in the landfill. The characteristic of pH was used in the field as a means of identifying the dust. The pH of the red/brown dust was consistently between 11 and 12, whereas the pH of the gray silty clay was on the order of 7 to 8.

3.2.4.2 Laboratory Analyses

Table 1 summarizes the results of the total lead analyses. The range of lead concentrations varied from 34 micrograms per gram (µg/g or parts per million) for sand and gravel fill at Boring TB-13 (0.0- to 1.0-foot depth) to 21,000 µg/g in solid wastes at Boring TB-3 (3.0-foot depth). All but one of the 16 samples were comprised of the solid waste matrix. Differences among these 15 waste samples were principally related to the varying proportions of the various materials present (e.g., red/brown dust, sand and gravel, cinders, slag). The data from these 15 samples exhibit a log-normal distribution, with a log mean of 2,600 µg/g and a median value of 3,300 µg/g. The 75th and 90th percentile values are 7,300 and 16,600 µg/g, respectively.

Of the 16 samples submitted for analysis of total lead, six were chosen for EP toxicity metals analysis. Of these six samples, only one (Boring TB-10, 5.0- to 5.5-foot depth) exhibited the characteristics of an EP toxic hazardous waste. Both leachable lead and cadmium concentrations exceeded EP toxicity limits in this sample. Leachable lead and cadmium values were much lower or not detectable in the remaining samples. No other EP toxicity metals were found in the leachate from any sample significantly above detection limits.

The relationship between EP toxicity lead and total lead within the solid waste samples was examined by correlating data from the four solid waste samples for which both analyses were performed and in which the total lead concentration was appreciable (i.e., greater than 1,000 µg/g). These data are presented graphically in Figure 6. As shown in this figure, there is reasonable correlation between EP toxicity and total lead values for these samples. This relationship indicates that the EP toxicity level for lead would be exceeded for those materials exhibiting a total lead concentration in excess of 9,300 µg/g, which is the approximate 80th percentile value for the available data set.

Also included in the Figure 6 presentation is the similar correlation for EAF dust samples from the No. 1 melt shop at the Kansas City Works. The relationship for the EAF dust shows higher EP toxicity lead values for the same total lead level, when compared to the relationship for the solid waste fill materials. In the range of 1,000 to 10,000 µg/g total lead, the EAF dust samples show about 2 to 5 times the EP toxicity lead as the landfilled solid waste.

3.3 SITE SURFACE FEATURES

The western boundary of the site is formed by the east bank of the Blue River. Although the COE placed riprap along much of the riverbank upon the completion of the rechannelization, a portion of the landfill that was exposed during construction was not covered. Landfill materials are exposed over an area of the riverbank approximately 40 feet wide by 440 feet long (Figure 2).

The soil cover, which was placed to close the site, has been removed over much of the disposal area. Surficial materials are generally described as sand and gravel with red/brown silty matrix. This material is similar in appearance to the fill materials observed and logged in many of the borings. The surficial materials encountered at Borings TB-11 and TB-12 are comprised of the red/brown waste matrix; laboratory analyses indicated elevated total lead in these materials (Section 3.2.4.2). Similar materials were encountered in the surficial materials at Borings TB-4, TB-5, TB-6, TB-7, TB-10, and TB-14.

The site is crossed by three separate sets of overhead power lines. One of these power lines is a trunk line that remains overhead to a point half-way across the site (from the south), then goes underground and runs to the north. This line is reported to be buried at an approximate depth of five feet and may be covered by a concrete protective cover.

4.0 CORRECTIVE ACTION

The need for near-term corrective actions at the formerly used solid waste disposal area at the Kansas City Works results primarily from the recent excavation and subsequent exposure of lead-bearing wastes during the rechannelization of the Blue River. Lead-bearing wastes are similarly exposed on the flat-lying landfill surface beyond the rechannelization construction limits.

This chapter presents Remcor's qualitative evaluation of the potential risks posed by the landfill area in its current condition. Based on this assessment, a plan for corrective measures has been developed.

4.1 EVALUATION OF POTENTIAL RISKS

The potential risks posed by the formerly used solid waste disposal area are associated with the following:

- Direct contact with exposed lead-bearing materials
- Release of lead from exposed, unprotected areas to surface waters in the Blue River due to rainfall runoff or flood scour
- Release of lead to the Blue River through ground water.

These potential risks are discussed in the following sections. In addition, these mechanisms could cause a reportable release of waste under CERCLA requirements.

4.1.1 Direct Contact

The surficial exposure of the EAF dust at the former disposal area could pose health risks to individuals who contact this material. Potential exposure routes include ingestion and dermal absorption of lead by direct contact or inhalation of lead-containing dusts. The isolated location of the site and existing security for the Kansas City Works suggest that routine, inadvertent access to the waste disposal area is

unlikely. The addition of warning signs and replacement of a secure cover atop the exposed waste areas would reduce potential risks.

4.1.2 Surface Water

Exposed lead-bearing materials could be released to surface waters by erosion of the materials with rainfall runoff or by the scouring of these materials during high water flows in the Blue River. The impacts of any such releases would be related to the further degradation of water quality in the Blue River and the health implications of persons who may, in the future, use the Blue River for water supply or recreational purposes.

The fine-grained dust materials are susceptible to erosion, and some of these materials are exposed on a relatively steep (40 percent) slope. Significant rainfall events would be expected to result in sheet and rill erosion of exposed materials. Placement of an erosion-resistant cover atop the exposed waste areas would eliminate this potential release mechanism.

Scouring of the lead-bearing waste materials during high water flows in the Blue River represents a potential pathway for environmental and public health risks. Flood flows that encroach upon the exposed waste would be expected to erode these materials quite readily. The environmental and public health impacts of such erosion would likely be very small, however, because of the dilution effected by the large flow in the Blue River at the stage needed to encounter the exposed waste (approximate Elevation 738 ft-msl). Based on channel hydraulic information provided by the COE, the Blue River channel would pass a flow in excess of 30,000 cfs at this stage. A very significant scouring of the exposed waste (greater than one foot depth in 24 hours) would be needed to materially increase the lead concentration in the river flow (i.e., increase in excess of 50 micrograms per liter [µg/ℓ]). Placement of a cover atop the exposed waste that is resistant to erosion at river flood flow velocities would eliminate this potential release mechanism.

4.1.3 Ground Water

Remcor's site investigation did not involve sampling of the ground water to evaluate lead concentrations, and it is not known whether the ground water has been affected by the presence of the fill in this area. Because the emplaced waste appears to lie above any ground water system present at the site, provision of a lower-permeability cover would be effective in reducing the leaching of lead from the waste in rainwater infiltration.

4.2 NEAR-TERM CORRECTIVE ACTION

4.2.1 Design Basis

Based on the site assessment, Remcor has developed a plan for near-term corrective action at the formerly used solid waste disposal area. This plan calls for placement of a cover atop the exposed waste areas that will satisfy the following criteria:

- Prevent direct contact with exposed materials and minimize the potential for generation of wind-borne dusts
- Resist erosion by rainfall runoff and scour by river flood flows
- Provide a lower-permeability covering to reduce rainwater infiltration in the covered areas.

The need for scour resistance controls the cover design for the river-bank. After reviewing several candidate systems/materials, Remcor selected Fabriform Unimat as the preferred cover system for the area. Selected fine-grained soils are considered appropriate for covering the flat-lying areas where waste is exposed. Posting of warning signs around the waste area to reduce the potential for inadvertent access is also recommended. These near-term actions are considered to be prudent and preventative measures to avoid potential risks associated with the lead-bearing materials in the formerly used solid waste disposal area.

4.2.2 Work Plan

The following paragraphs describe the design and field implementation of the near-term corrective measures.

4.2.2.1 Mobilization

The covering of the formerly used solid waste disposal area involves work in a potentially hazardous environment. Prior to the start of work, a site-specific worker health and safety protection program will be developed. The defined health and safety plan will comply with applicable U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) requirements and will be made an integral part of site operations.

Upon review and acceptance of the health and safety plan, needed personnel, equipment, and materials will be mobilized to the work site. Major equipment items include a Gradall, small bulldozer, grout pumps, health and safety gear, and hand tools.

4.2.2.2 Cover Placement

The surface of the riverbank area to be covered will first be groomed using the Gradall. Exposed rocks, roots, and other irregularities will be removed and stockpiled at the site at a location acceptable to Armco. The Gradall will then grade the slope to form anchor trenches along all four sides of the area to be covered (Figure 7). These trenches will nominally be 12 inches wide and 12 inches deep (Figure 7).

The Fabriform Unimat consists of a double-layer envelope of geotextile, which is placed in the perimeter anchor trenches and spread out over the placement area. The individual section of the Unimat are joined by field sewing. Once in place, cement grout is pumped into the Unimat, forming a continuous, four-inch thick concrete cover. This cover system will also be used for the western end of the drainage swale at the inlet to the 72-inch storm water outfall.

A 12-inch cover of fine-grained soils (i.e., silt and clay) will be placed to cover the flat-lying areas where lead-bearing materials are exposed. The soils will be borrowed from off-site sources, spread into place with a small bulldozer, and seeded.

4.2.2.3 Site Restoration and Demobilization

Upon completion of the cover placement, the work area will be restored as necessary. Six warning signs will then be posted as shown in Figure 7 to prevent inadvertent access to the waste disposal area.

Surfaces of equipment used in the installation that potentially contacted lead-bearing materials will be washed with detergent/water solutions. Spent wash waters will be tested and disposed of according to the results of these analyses. If the metals concentrations are acceptably low, those wastes will be discharged to the wastewater treatment system at the Armco Kansas City Works or the City sewerage system. Disposable items (e.g., certain worker health and safety protection equipment) will be placed in drums and recycled to the EAFs at the Armco Kansas City Works.

4.2.3 Estimated Cost and Implementation Schedule

Table 3 presents Remcor's engineering cost estimate for the described near-term corrective measures. As shown in this table, Remcor estimates a total capital cost of $91,300 for this work.

The described near-term corrective measures can be implemented in an estimated five-week period, barring severely inclement weather and extended delays in material delivery. This schedule is comprised of the following:

- Materials procurement and mobilization - 12 work days
- Field installation - 11 work days
- Site restoration and demobilization - 2 work days.

The site work could not proceed during periods of subfreezing temperatures or significant precipitation.

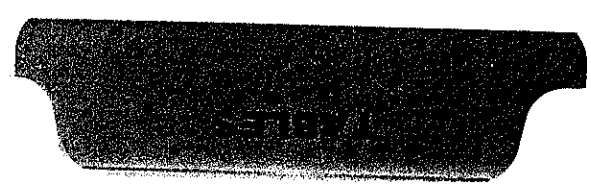


TABLE 1

SUMMARY OF LABORATORY DATA
TOTAL LEAD ANALYSES

SAMPLE NO. (boring/depth in feet)(1)	DESCRIPTION(2)	TOTAL LEAD (µg/g)
TB-1 / 5.0- 6.5	Solid waste	3,300
TB-1 /10.0-10.5	Solid waste	45
TB-3 / 5.0- 5.5	Solid waste	550/560(3)
TB-3 / 3.0	Solid waste	21,000/19,000
TB-3 /10.0-11.0	Solid waste	3,400
TB-4 / 5.5- 6.5	Soild waste	3,000
TB-4 /10.5-11.5	Solid waste	1,900
TB-5 / 5.5- 6.5	Solid waste	2,400
TB-6 /10.0	Solid waste	1,100
TB-7 / 5.0- 6.0	Solid waste	3,700
TB-10/ 5.0- 5.5	Solid waste	16,000
TB-11/ 0.0- 1.0	Solid waste	1,700
TB-12/ 0.0- 1.0	Solid waste	3,800
TB-13/ 0.0- 1.0	Cover soil	34
TB-14/ 2.0	Solid waste	8,900
TB-14/ 8.0	Solid waste	7,300

(1) For boring locations, see Figure 2.

(2) For detailed material descriptions, see boring logs (Appendix A).

(3) "#/#" indicates sample analysis performed in duplicate.

TABLE 2

SUMMARY OF LABORATORY DATA
EP TOXICITY METALS ANALYSES

SAMPLE NO. (boring/depth in feet)[1]	pH[2] (su)	ARSENIC (mg/ℓ)	BARIUM (mg/ℓ)	CADMIUM (mg/ℓ)	CHROMIUM (mg/ℓ)	LEAD (mg/ℓ)	MERCURY (mg/ℓ)	SELENIUM (mg/ℓ)	SILVER (mg/ℓ)
TB-1 /10.0-10.5	11.80	<0.1[3]	<10	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1
TB-4 / 5.5- 6.5	10.80	<0.1	<10	0.4	0.1	0.6	<0.01	<0.1	<0.1
TB-5 / 5.5- 6.5	10.80	<0.1	<10	0.2	<0.1	0.3	<0.01	<0.1	<0.1
TB-10/ 5.0- 5.5	10.65	<0.1	<10	8.0	<0.1	14.0	<0.01	<0.1	<0.1
TB-11/ 0.0- 1.0	9.25	<0.1	<10	0.4	<0.1	0.5	<0.01	<0.1	<0.1
TB-13/ 0.0- 1.0	6.80	<0.1	<10	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1

(1) For boring locations, see Figure 2.

(2) pH measured at initiation of leaching prior to acetic acid addition.

(3) "<" indicates less than method detection limits.

REALISTIC SOLUTIONS FOR HAZARDOUS WASTE PROBLEMS

REMCOR

TABLE 3

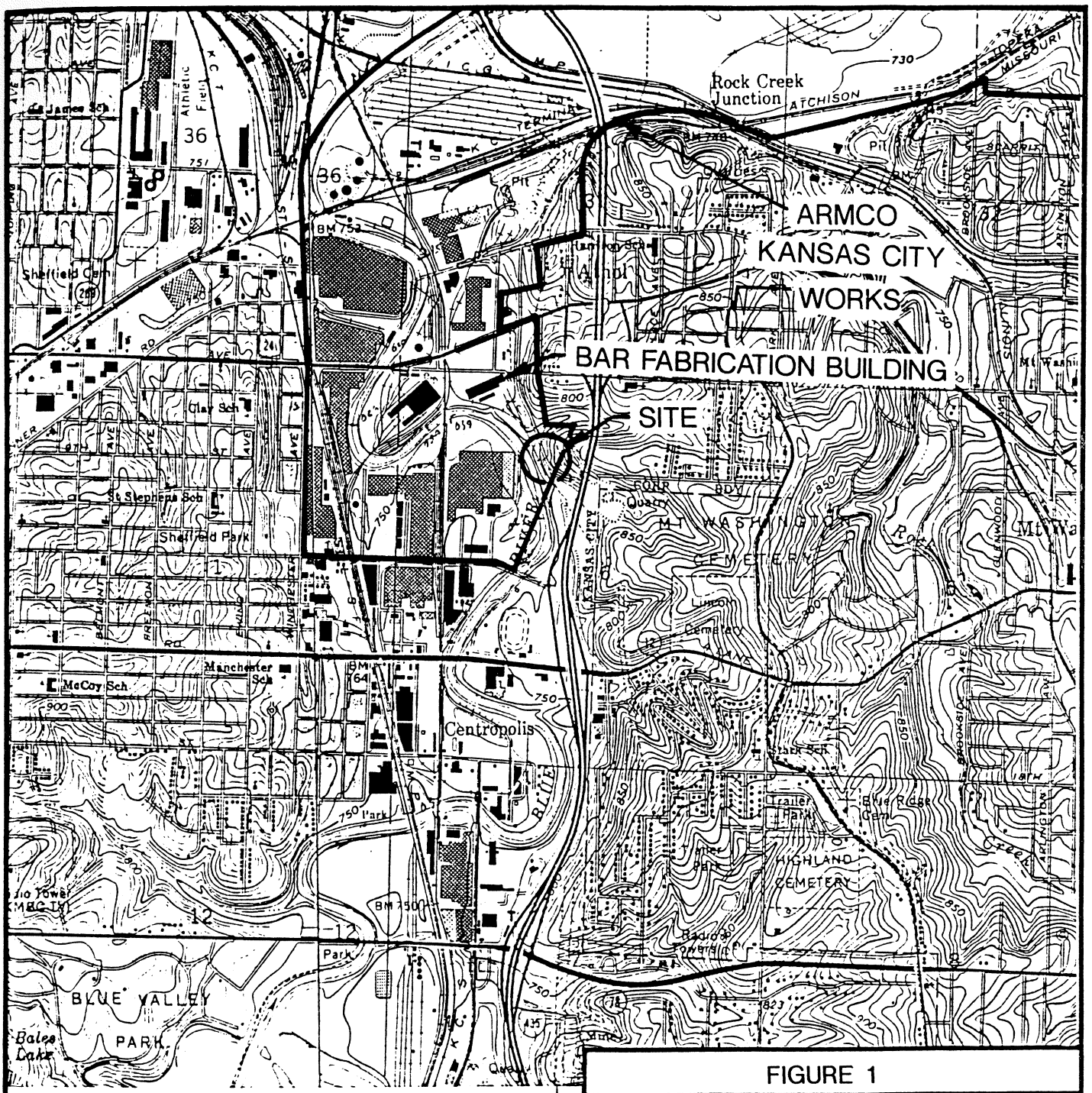
ENGINEER S COST ESTIMATE
NEAR-TERM CORRECTIVE ACTION
FORMER SOLID WASTE DISPOSAL AREA
KANSAS CITY WORKS

**** BREAKDOWN BY WORK ACTIVITY

ACTIVITY DESCRIPTION	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	SUBTOTAL	SITE O/H	INSURANCE	TOTAL
MOBILIZATION	1,540	560	0	1,000	3,100	710	300	4,110
SITE SETUP/PREPARATION	3,070	1,120	100	0	4,290	980	420	5,690
COVERING OF EXPOSED SLOPE AREAS (UNIMAT)	6,450	3,260	24,000	0	33,710	7,670	3,300	44,680
COVERING OF EXPOSED FLAT-LYING AREAS (SOIL)	6,140	2,240	13,000	0	21,380	4,860	2,100	28,340
PLACEMENT OF WARNING SIGNS	310	50	240	0	600	140	60	800
HEALTH & SAFETY PROGRAM	0	1,930	0	0	1,930	440	190	2,560
DEMOBILIZATION	1,540	560	60	1,700	3,860	880	380	5,120
SUBTOTALS	19,050	9,720	37,400	2,700	68,870			
SITE OVERHEAD	14,170	1,000	500	0		15,670		
INSURANCE	2,660	860	3,030	220			6,770	
TOTALS	$35,880	$11,580	$40,930	$2,920				$91,300

**** BREAKDOWN BY WORK UNITS

ACTIVITY DESCRIPTION	UNITS	QUANTITY	UNIT COST ($)	TOTAL COST ($)
MOBILIZATION	JOB	1	--	4,110
SITE SETUP/PREPARATION	JOB	1	--	5,690
COVERING OF EXPOSED SLOPE AREAS (UNIMAT)	SY	1,800	24.82	44,680
COVERING OF EXPOSED FLAT-LYING AREAS (SOIL)	CY	800	35.43	28,340
PLACEMENT OF WARNING SIGNS	EACH	6	133.33	800
HEALTH & SAFETY PROGRAM	MANDAY	65	39.38	2,560
DEMOBILIZATION	JOB	1	--	5,120
TOTAL				$91,300



REFERENCE:

USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES, KANSAS CITY, MO-KS AND INDEPENDENCE, MO, 1974. SCALE 1:24000

FIGURE 1

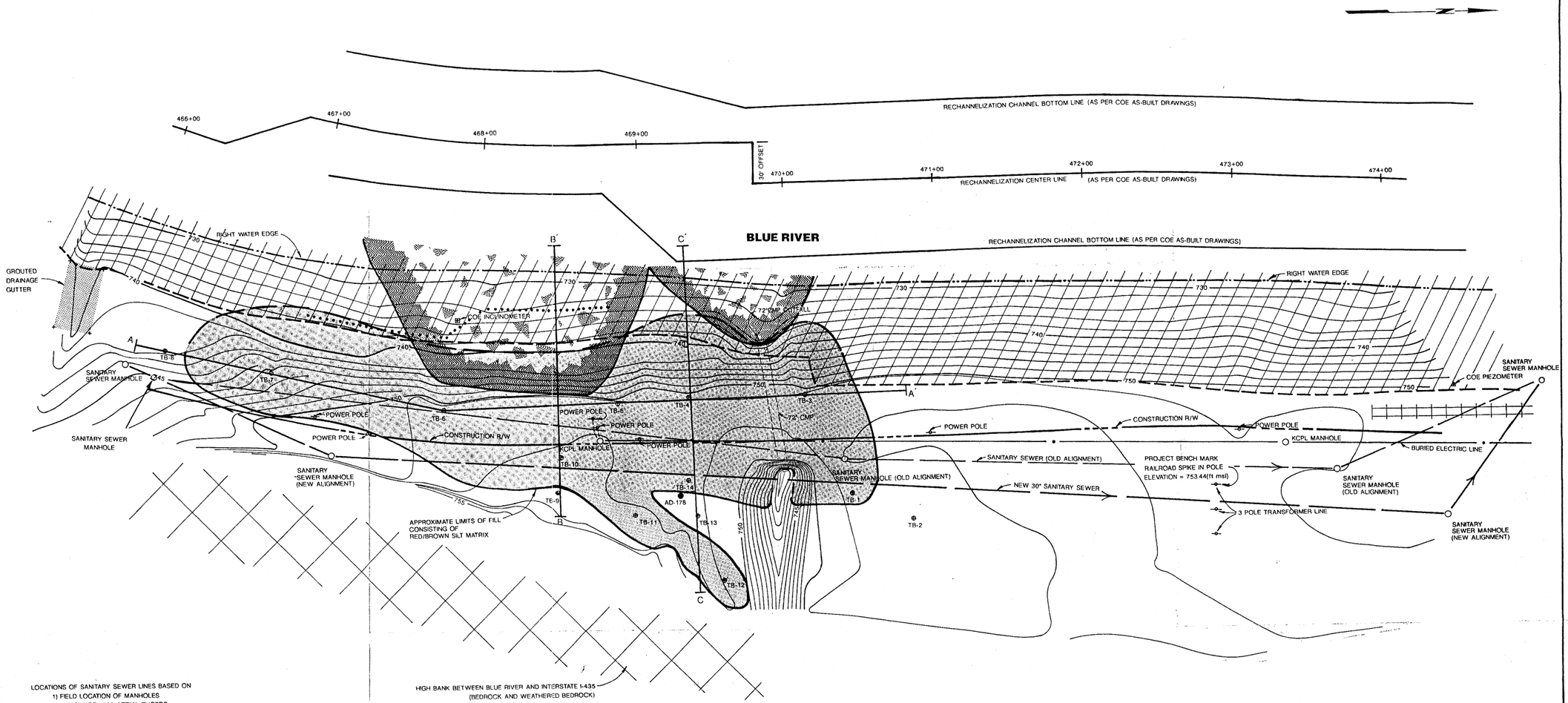
SITE LOCATION MAP

PREPARED FOR
ARMCO, INC.
KANSAS CITY, MISSOURI

DRAWN	C.E.B. 10/4/88	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657-A1
APPROVED	WJC 11/11/88	

REMCOR

128579



LOCATIONS OF SANITARY SEWER LINES BASED ON
1) FIELD LOCATION OF MANHOLES
2) REVIEW OF 1982 AERIAL PHOTOS
3) REVIEW OF COE BLUE RIVER RECHANNELIZATION PROJECT DESIGN AND AS-BUILT DRAWINGS
4) REVIEW OF CITY SANITARY SEWER LINE DRAWINGS

REFERENCE: PLAT OF SURVEY, ANDERSON SURVEY COMPANY, COMPLETED FOR REMCOR INC., SEPTEMBER 26, 1988, DRAWING NO. 88-9-35238-1

LEGEND:

- AD-178 — TEST BORING LOCATION AND NUMBER (BY COE)
- TB-2 — TEST BORING LOCATION AND NUMBER (BY REMCOR)
- A — A' — GEOLOGIC CROSS-SECTION LINE TRACE
- LIMIT OF RIP RAP AREA
- PILINGS - APPROXIMATE LOCATION
- LANDSLIDE AREA AS DEFINED BY COE DESIGN DRAWINGS
- RECHANNELIZATION CONSTRUCTION RIGHT OF WAY

30 0 30 60
scale feet

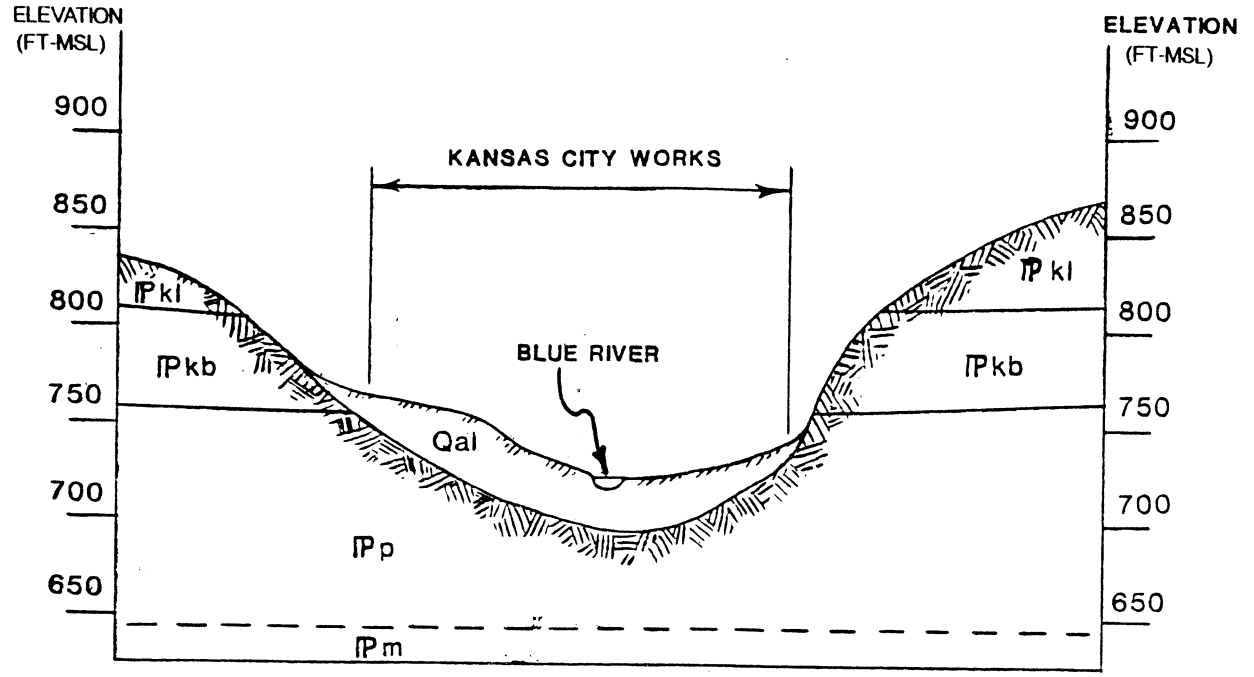
FIGURE 2

SITE PLAN

PREPARED FOR
ARMCO INC.
KANSAS CITY, MISSOURI

DRAWN	10-4-88 LHK	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657-E1
APPROVED	RJ RC 11/11/88	

REMCOR



SCALE:

HORIZ. 1" = 3000'
VERT. 1" = 100'

(VERTICAL EXAGGERATION = 30X)

LEGEND

QUATERNARY SYSTEM
Qal - BLUE RIVER ALLUVIUM -ALLUVIAL SAND, SILT, AND GRAVEL

PENNSYLVANIAN SYSTEM
MISSOURIAN SERIES
IPkl - KANSAS CITY GROUP LINN SUBGROUP -PREDOMINANTLY SHALES WITH A FEW PERSISTANT LIMESTONES AND SOME THIN SANDSTONES

IPkb - KANSAS CITY GROUP BRONSON SUBGROUP -CYCLIC SEQUENCE OF THREE LIMESTONE FORMATIONS AND TWO SHALE-CLAY UNITS

IPp - PLEASANTON GROUP -ARGILLACEOUS TO SANDY, MICACEOUS SHALE AND FOSSILIFEROUS SILTSTONE

IPm - MARMATON GROUP -SHALE, LIMESTONE, SANDSTONE

REF: GEOLOGIC MAP OF INDEPENDENCE QUADRANGLE, JACKSON COUNTY, MISSOURI BY E. J. PARIZEK, 1968

FIGURE 3

GENERALIZED GEOLOGIC CROSS SECTION

PREPARED FOR
ARMCO INC.
KANSAS CITY, MISSOURI

DRAWN	10/7 [illegible]	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657-A2
APPROVED	[illegible] 11/11/88	

REMCOR

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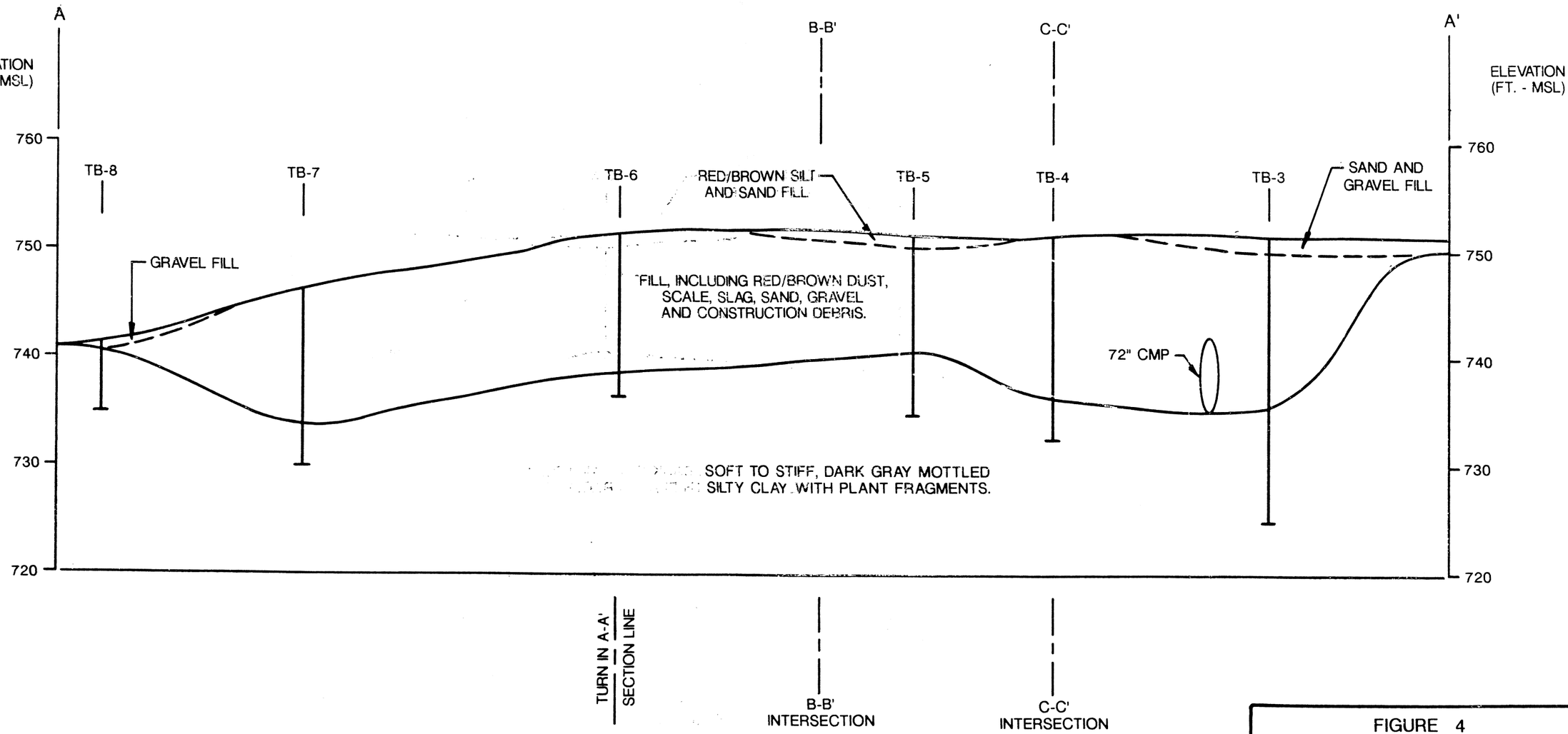


TURN IN A-A' — SECTION LINE

B-B' INTERSECTION

C-C' INTERSECTION

SCALE:

HORIZONTAL: 1" = 40'
VERTICAL: 1" = 10'
VERTICAL EXAGGERATION = 4X

40 0 40 80
scale feet

128579

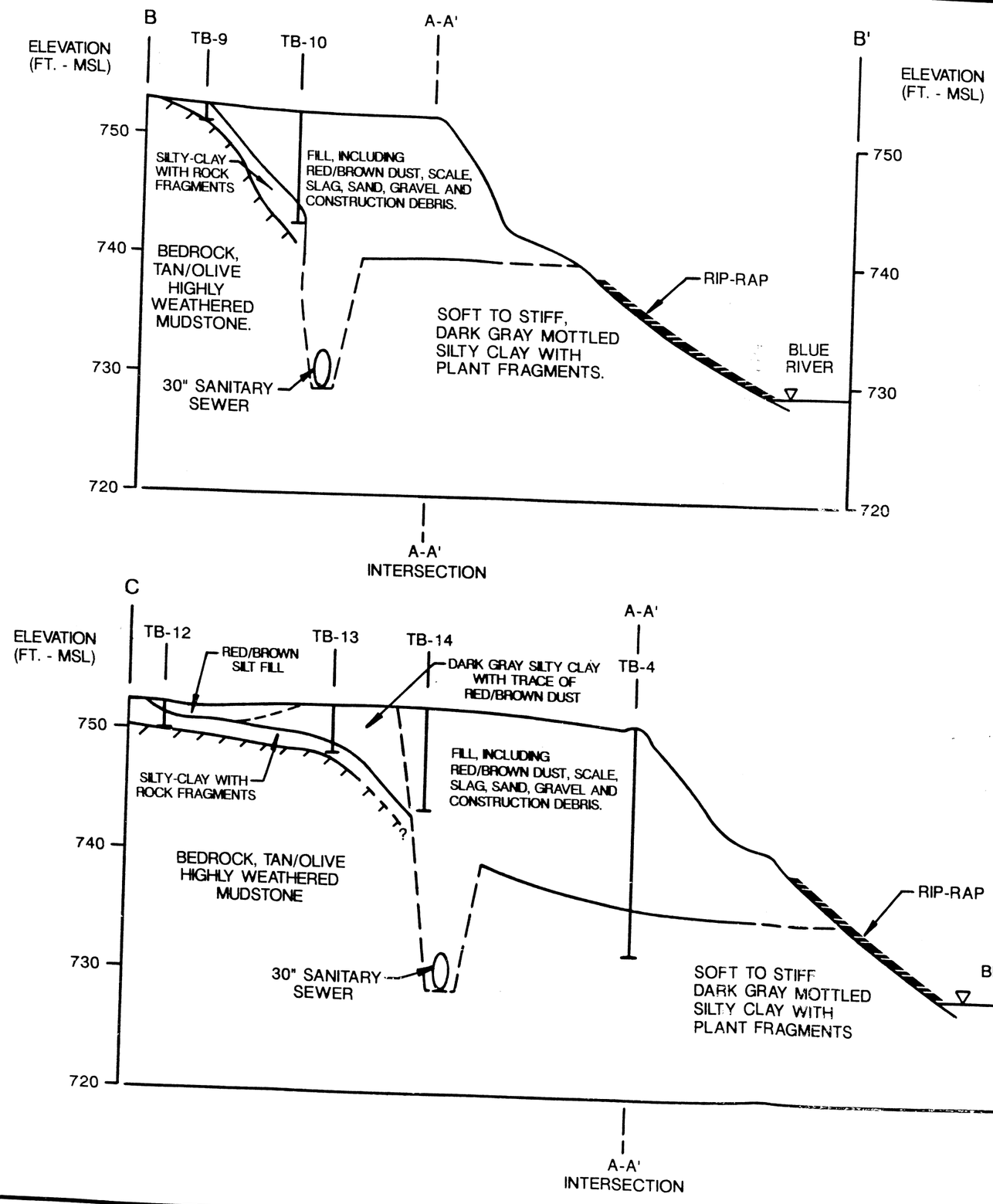
FIGURE 4

SITE GEOLOGIC
CROSS SECTION A-A'

PREPARED FOR
ARMCO INC.
KANSAS CITY, MISSOURI

DRAWN	C.E.B. 10/2/88	DRAWING NUMBER
CHECKED	11/11/88 DMC	88657-B2
APPROVED	[illegible] 11/11/88	

REMCOR



SCALE:

HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'
VERTICAL EXAGGERATION = 3X

30 0 30 60
scale feet

FIGURE 5

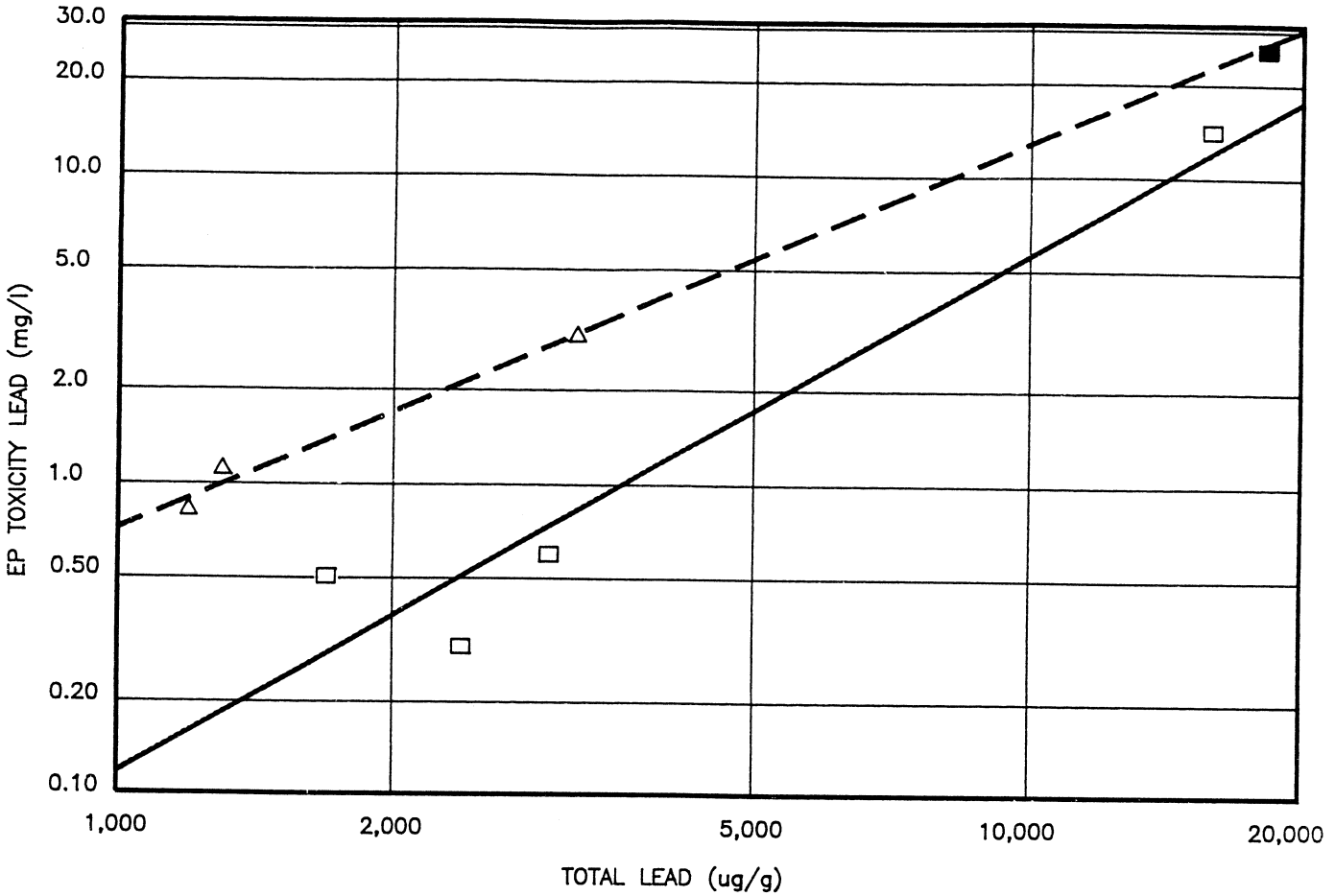
SITE GEOLOGIC
CROSS SECTIONS
B-B' AND C-C'

PREPARED FOR
ARMCO INC.
KANSAS CITY, MISSOURI

DRAWN	C.E.B. 10/4/88	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657-B3
APPROVED	[illegible] 11/11/88	

REMCOR

128579



LEGEND:

- □ FORMER DISPOSAL AREA SAMPLES
- △ EAF DUST FROM WITHIN THE NO. 1 MELT SHOP AT THE KANSAS CITY WORKS.
- ■ EMISSION CONTROL EAF DUST FROM THE PRIMARY BAGHOUSE FOR THE NO. 1 MELT SHOP.

$E = 9.9 \times 10^{-7} T^{1.7}$, $r^2 = 0.96$

$E = 1.3 \times 10^{-4} T^{1.3}$, $r^2 = 0.99$

E = EP TOXICITY LEAD, mg/l

T = TOTAL LEAD, $\mu g/g$

r^2 = CORRELATION COEFFICIENT

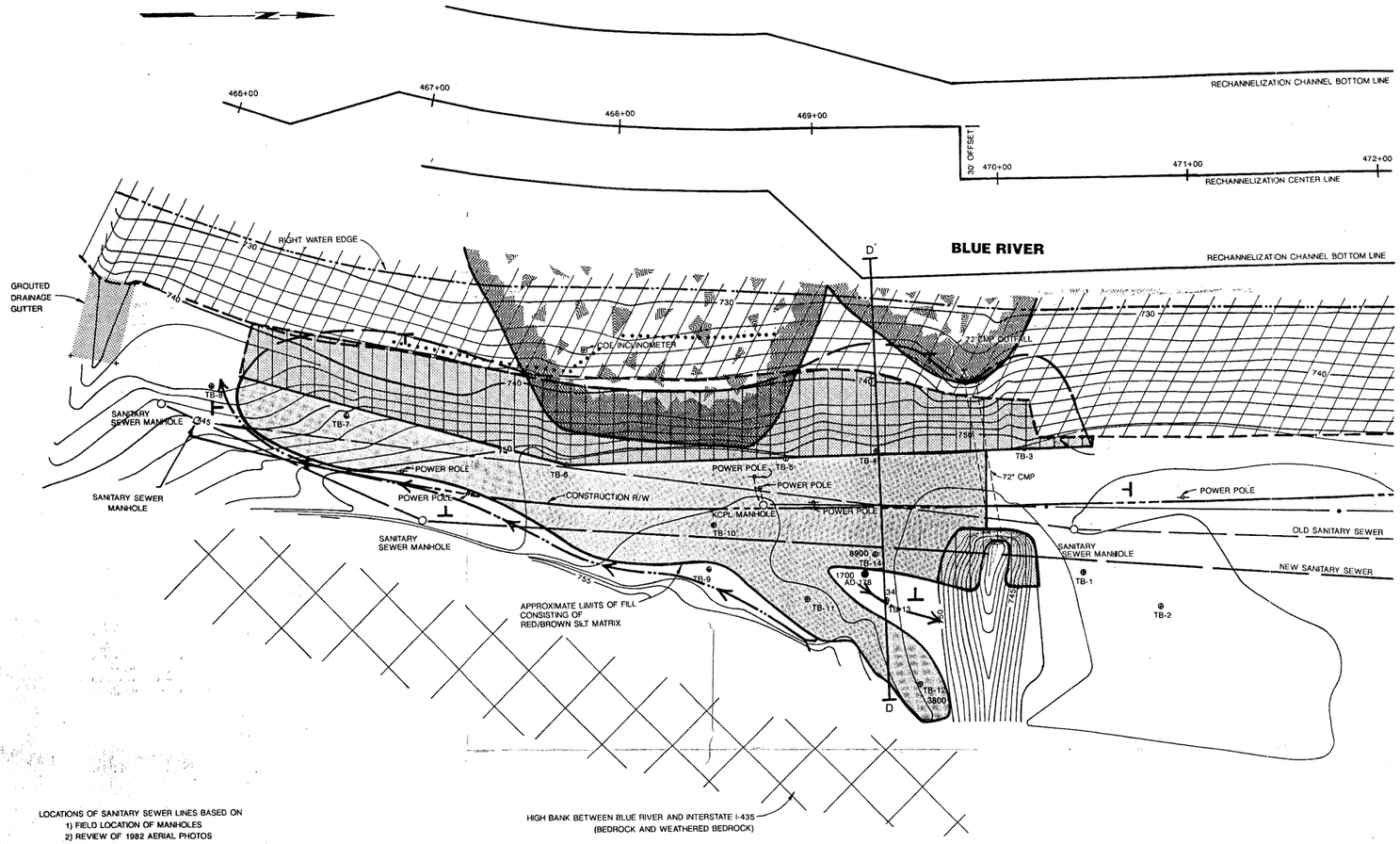
FIGURE 6

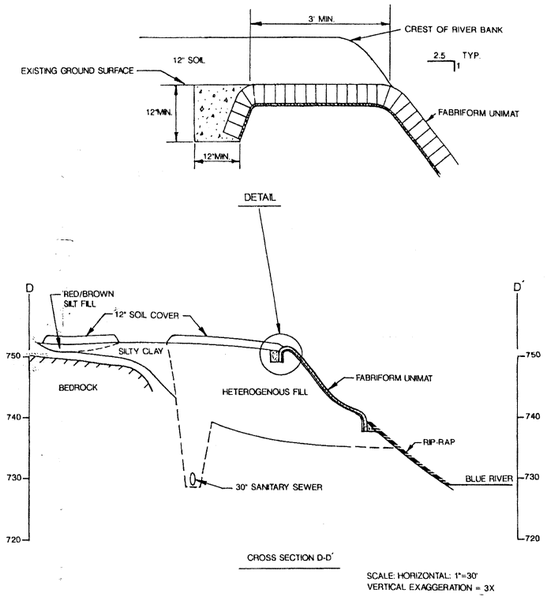
EP TOXICITY vs. TOTAL LEAD RELATIONSHIP

PREPARED FOR
ARMCO, INC.
KANSAS CITY, MISSOURI

DRAWN	10-7-88 LHK	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657--A3
APPROVED	[illegible] 11/11/88	

REMCOR





LOCATIONS OF SANITARY SEWER LINES BASED ON
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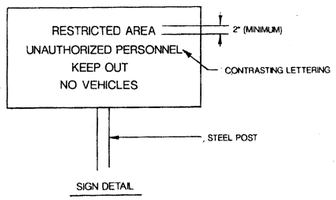
REFERENCE: PLAT OF SURVEY, ANDERSON SURVEY COMPANY, COMPLETED FOR REMCOR INC., SEPTEMBER 26, 1988, DRAWING NO. 88-9-35238-1



SIGN DETAIL

LEGEND:
- FABRIFORM UNIMAT COVER
- SOIL COVER
- WARNING SIGN LOCATION (SEE DETAIL)
- AD-178 TEST BORING LOCATION AND NUMBER (BY COE)
- TB-2 TEST BORING LOCATION AND NUMBER (BY REMCOR)
- D — D' GEOLOGIC CROSS-SECTION LINE TRACE
- LIMIT OF RIP RAP AREA
- PILINGS - APPROXIMATE LOCATION
- LANDSLIDE AREA AS DEFINED BY COE DESIGN DRAWINGS
- RECHANNELIZATION CONSTRUCTION RIGHT OF WAY
- SURFACE WATER DRAINAGE

30 0 30 60
scale feet

FIGURE 7

NEAR-TERM CORRECTIVE ACTION PLAN

PREPARED FOR
ARMCO INC.
KANSAS CITY, MISSOURI

DRAWN	10-11-88 LHK	DRAWING NUMBER
CHECKED	DMC 11/11/88	88657-E2
APPROVED	KJPR 11/11/88	

REMCOR

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APPENDIX A

APPENDIX A

BORING LOGS

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-1	COORDINATES:		DATE: 9/20/88
ELEVATION: 751.4	GWL: Depth	Date/Time	DATE STARTED: 9/13/88
ENGINEER/GEOLOGIST: D. Crowley	Depth	Date/Time	DATE COMPLETED: 9/13/88
DRILLING METHODS: Hollow Stem Auger			PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5	S	35	35	Fill: Dark brown SAND AND gravel - construct on debris, silt + SAND AND cinder fill			- SAMPLE COLLECTED TB1/5.0-6.5
10	S 10-10.5	50/2"	30	- wet, Dark red Brown silt-dust, cinder Fill (dust Rich layer ~ 6" thick)			- SAMPLE COLLECTED TB-1/10.0-10.5 pH ≈ 11.
15	S	7	100	Medium stiff, Dark gray to Black silty clay, wet to moist, w/ Abundant plant fragments	CL		- WET SAMPLE
				Bottom of Boring 16.5'			
20							
25							

NOTES

Boring backfilled w/ mixture of cuttings AND bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: LRNCO Former Waste Disposal Area		
BORING NUMBER: TB-2	COORDINATES:	DATE: 9/20/88	
ELEVATION: 751.7	GWL: Depth / Date/Time	DATE STARTED: 9/13/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/13/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 Foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill: sand, cinders and construction debris			
5	S	8	70	Medium stiff, Dark Gray silty clay, damp to moist with some plant fragments	CL		
10	S	5	65	-some iron staining			
				Bottom of Boring 11.5'			
15							
20							
25							

NOTES:

Boring Backfilled w/ mixture of cuttings and benton-c

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 38657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-3	COORDINATES:	DATE: 9/20'88	
ELEVATION: 751.1	GWL: Depth / Date/Time	DATE STARTED: 9/14/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/14/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill: Sand and Gravel fill - Red Brown Dust @ 1.5'			Sample collected (cuttings) TB3/3'
5	S 5-5.5	50/4"	50	- Brown to Gray Sand and gravel w/ cinders and slag			SAMPLE collected TB3/5.0-5.5 Auger Refusal caused Repositioning of Drill 5' North
10	S 10-11	49	100	- Red/Brown Dust mixed with cinders and slag and fire bricks			SAMPLE COLLECTED TB3/10.0-11.0 pH ≈ 11.
15	S	106	15	- some cinders and slag w/ trace Dust			Auger Refusal caused Repositioning of Drill 10' south
20	S	6	25	Soft, Dark gray silt and clay with sand, moist to wet with Plant fragments	CL/ML		Wet @ 23'
25	S	4	25				
				Bottom of Boring @ 26.5'			

NOTES:

Boring Backfilled with cuttings and Powdered bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-4	COORDINATES:	DATE: 9/20/88	
ELEVATION: 750.7	GWL: Depth / Date/Time	DATE STARTED: 9/14/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/14/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				FILL: Red/Brown Dust w/ SAND AND GRAVEL			
5	S / SS-6S	75	80	- SAND & cinder Fill w/ som slag & construct on debris w/ trace dust			- SAMPLE COLLECTED TB4/SS-6S
10	S / 10.5-11.5	11	50	- Red/Brown, damp to dry SAND w/ cinders and scale with some slag, trace dust			- SAMPLE COLLECTED TB4 10.5-11.5
15	S	12	40	Stiff, Dark Gray/Black, mottled silty clay w/ some SAND	CL		- Wet @ 17'
20				Bottom of Boring @ 19.0'			
25							

NOTES:

Boring Backfilled w/ cuttings AND bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area	
BORING NUMBER: TB-5	COORDINATES:	DATE: 9/20/88
ELEVATION: 751.1	GWL: Depth / Date/Time	DATE STARTED: 9/14/88
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/ /88
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 Foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill: Red Brown silt and sand @ 1'			
5	S / S5-6.5	61	50	Red Brown dust and scale w/ cinders, Dry			SAMPLE COLLECTED TB-5/S5-6.5
10	S	13	50				← pH ≈ 12.0
				Dark Gray silt and clay moist to damp	ML		← pH ≈ 8.
15	S	12	100	stiff Med Gray & Brown silty clay, damp w/ plant fragments	CL		
				Bottom of Boring 16.5'			
20							
25							

NOTES:
Boring Backfilled w/ cuttings and Bentonite.

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: FRMCO Former Waste Disposal Area		
BORING NUMBER: TB-6	COORDINATES:		DATE: 9/20/88
ELEVATION: 751.5	GWL: Depth	Date/Time	DATE STARTED: 9/14/88
ENGINEER/GEOLOGIST: D. Crowley	Depth	Date/Time	DATE COMPLETED: 9/20/88
DRILLING METHODS: Hollow Stem Auger			PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0				Fill			
5	S	NA	10	Red/Brown Dust, scale, sand, gravel and slag?			
10							Sample collected (cuttings) TB6/10: pH ≈ 12
				Dark Gray Silty clay w/ sand - moist to wet	CL		wet @ 14'
15				Total Depth of Boring 15'			
20							
25							

NOTES:

Boring Backfilled w/ cuttings and Bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: LRMCO Former Waste Disposal Area		
BORING NUMBER: TB-7	COORDINATES:		DATE: 9/20/88
ELEVATION: 746.5	GWL: Depth	Date/Time	DATE STARTED: 9/14/88
ENGINEER/GEOLOGIST: D. Crowley	Depth	Date/Time	DATE COMPLETED: 9/20/88
DRILLING METHODS: Hollow Stem Auger			PAGE 1 OF 1

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill Red Brown Sandy Silt w/ Dust, scale and Firebricks			
5	S 5.0 6.0	34	50				Sample collected TB-7/5.0-6.0
							Auger Refusal caused Repositioning of Drill 8' North
10	S	37	40	-Red Brown SAND, Cinders Scale & slag			OH ≈ 11
15	S	7	10	Med Stiff, Dark Gray silty clay w/ siltstone chips, wet with plant fragments.	CL		SAMPLE
				Bottom of Boring @ 16.5'			
20							
25							

NOTES:

Backfilled Boring with cuttings and Benotnite

REMCOR

VISUAL CLASSIFICATION OF SOILS

OJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
ORING NUMBER: TB-8	COORDINATES:	DATE 9/20/88	
EVATION: 241.6	GWL: Depth / Date/Time	DATE STARTED 9/15/88	
IGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED 9/15/88	
RILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

(Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill : Gravel			
				Dark Gray silty clay, moist w/ mottling	CL		
				Tan siltstone highly weathered to a silt and some sand	ML		
5	S	NA	100				
				Bottom of Boring @ 6.5'			
0							
5							
0							
5							

NOTES:
Boring Backfilled with cuttings and Bentonite.

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: LRMCO Former Waste Disposal Area		
BORING NUMBER: TB-9	COORDINATES:	DATE: 9/20/88	
ELEVATION: 752.3	GWL: Depth Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				some fill including gravel			
5				Encountered TAN, weathered Mudstone @ depth of 1.2'			
10				Total Depth of Boring = 1.2'			
5							
0							
5							

NOTES:
Boring Backfilled w/ cuttings

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-10	COORDINATES:	DATE: 9/20/88	
ELEVATION: 752.1	GWL: Depth / Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE / OF	

(Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill Red/Brown Dust & silt			
5	S	NA		Dust, clay cinders w/			COLLECTED SAMPLE TB-10/5.0-5.5
	S	NA					
	S	NA		DARK Gray to TAN Silt & clay w/ TRACE ROCK FRAGMENTS	ML/CL		
0				Bottom of Boring @ 9.5'			
5							
0							
5							

NOTES:
Boring Backfilled with cuttings and Bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-11	COORDINATES:	DATE: 9/20/88	
ELEVATION: 752.4	GWL: Depth / Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Fill Red/Brown silt & SAND fill			SAMPLE COLLECTED (cuttings) TB 11/0-1
				Olive Gray silt w/ mudstone fragments			
				Bedrock: TAN, highly weathered Mudstone			
5				Depth of Boring = 4.5'			
10							
15							
20							
25							

NOTES: Boring Backfilled w/ cuttings and Bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ERMCO Former Waste Disposal Area		
BORING NUMBER: TB-12	COORDINATES:	DATE: 9/20/88	
ELEVATION: 750.7	GWL: Depth / Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 Foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				FILL: Red Brown silt fill			SAMPLE COLLECTED TB12/0-1.0
				TAN SILT AND MUDSTONE FRAGMENTS			
5				Encountered TAN to Olive weathered mudstone Bedrock @ Depth of 2.0'			
				Total Depth = 2.0'			
10							
15							
20							
25							

NOTES:
Boring Backfilled w/ cuttings

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB-13	COORDINATES:	DATE 9/20/88	
ELEVATION: 751.2	GWL: Depth Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (Foot)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				Dark gray silty clay w/ trace of Red Brown Dust Fil			- SAMPLE COLLECTED TB 13/0-1.5
				OLIVE-TAN SILT AND MUDSTONE FRAGMENTS			
5				Encountered olive-tan highly weathered Mudstone @ Depth of 4.0'			
				TOTAL DEPTH = 4.0'			
10							
15							
20							
25							

NOTES:

Backfilled Boring with cuttings and Bentonite

REMCOR

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 88657	PROJECT NAME: ARMCO Former Waste Disposal Area		
BORING NUMBER: TB 14	COORDINATES:	DATE: 9/20/88	
ELEVATION: 751.4	GWL: Depth / Date/Time	DATE STARTED: 9/15/88	
ENGINEER/GEOLOGIST: D. Crowley	Depth / Date/Time	DATE COMPLETED: 9/15/88	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1	

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1 Foot	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5				Fill Red Brown dust gravel & sand			Sample collected TB 14/2'
				Red Brown Dust and coarse sand, well compacted			Auger Refusal caused Relocation 5' EAST
							Auger Refusal caused Relocation 5' EAST
	S	NA		Red Brown Dust, silt, and sand			SAMPLE COLLECTED TB14/8'
10				Bottom of Boring 8 5'			Auger Refusal @ 8 5
15							
20							
25							

NOTES:

Boring Backfilled with cuttings and Bentonite

APPENDIX H

TANK CLOSURE CERTIFICATION

APPENDIX H-1

TANK 1

REMCOR, Inc. • 701 Alpha Drive • P.O. Box 38310 • Pittsburgh, PA 15238-8310 • 412-963-1106

August 2, 1991

Project No. 91171

Mr. Nicholas Di Pasquale
Director of Hazardous Waste
Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri
P.O. Box 176
Jefferson City, Missouri 65102

Certification of Closure
Electric Arc Furnace Dust Storage Tank No. 1
Armco Inc. - Midwestern Steel Division
Kansas City, Missouri

Dear Mr. Di Pasquale:

On behalf of Armco Inc. - Midwestern Steel Division (Armco-MSD), Remcor, Inc. (Remcor) has completed closure of Electric Arc Furnace (EAF) Dust (K061 dust) Storage Tank No. 1 at the Armco-MSD Kansas City Works. This tank is listed under Hazardous Waste Operating Permit No. MOD007118029 issued by the U.S. Environmental Protection Agency (EPA) on September 24, 1984, and in Permit No. OSO-022885 issued by the Missouri Department of Natural Resources (MDNR) on February 28, 1985. This tank has been used to store EAF emissions control system dust, which is a listed hazardous waste (K061) under the Resource Conservation and Recovery Act (RCRA). This tank, which was originally constructed to store fuel oil, has been used to store K061 dust for approximately six years. Armco-MSD management plans to return this tank to fuel oil storage service and, therefore, has initiated closure of this tank as a solid waste management unit.

The closure has been performed in accordance with the approved Closure and Post-Closure Plan in Attachment VII of the hazardous waste operating permits for this tank. This Closure and Post-Closure Plan requires certification of closure by an authorized representative of Armco-MSD and an independent professional engineer registered to practice in the State of Missouri. This letter describes and certifies the completed closure and provides supporting documentation. The closure was completed in full

compliance with the approved Closure and Post-Closure Plan and with the applicable provisions of the Code of Federal Regulations (CFR) Title 40, Part 264.111 (40 CFR 264.111) and the Missouri Code of State Regulations, Title 10, Division 25, Chapter 7.264.111 (10 CSR 25-7.264.111).

Tank No. 1 is 100 feet in diameter and 30 feet high, with a capacity of 1,680,000 gallons, or 224,600 cubic feet. The tank is constructed of welded steel plates. Hatches at ground level provide access for cleaning and hatches in the top provide natural draft ventilation.

The Closure and Post-Closure Plan in the hazardous waste operating permit includes seven tasks in the closure program. These tasks are as follows:

- Removal of bulk material stored in the tank
- Vacuuming of remaining loose material
- Washing of tank interior surfaces
- Collection and analysis of wipe samples from the tank interior surfaces
- Disposal of removed material
- Decontamination of equipment used for closure
- Reporting and certification of closure.

These seven tasks have been completed for K061 Dust Storage Tank No. 1. The work performed in each of these tasks is described in the following paragraphs.

Removal of the bulk material from the tank was performed by Armco-MSD, and the bulk K061 was transported to a permitted, off-site treatment, storage, and disposal facility (TSDF). When the bulk material removal was completed, small quantities of K061 dust remained on perch surfaces, in corners and relatively inaccessible locations, and adhering to interior surfaces of the tank walls and floor.

Cadmium has been selected as the target analyte based on comparison of cadmium and other metal concentrations in K061 dust in terms of potential for contamination of the oil to be stored in the tank. The concentration of cadmium in K061 dust indicates the highest potential for contamination of stored oil relative to EPA

specifications found at 40 CFR 266.40. This specification establishes a maximum cadmium content of 2 parts per million (ppm) for used oil burned for energy recovery not subject to EPA regulation under RCRA.

Two similar electric arc furnace dust storage tanks at the Armco-MSD facility in Kansas City (Nos. 3 and 5) were closed in 1990 using the methods applied to Tank No. 1. During the cleaning of these tanks, wipe samples were taken at contiguous locations before and after a trial of the vacuum and washing methods. This approach was intended as a test of cleaning method effectiveness. The analytical results for these samples indicated that the cleaning method provides a reduction of approximately one order of magnitude in the cadmium content of the wipe sample.

To start closure, Remcor mobilized personnel, equipment, and supplies to the site. Tank No. 1 was opened and ventilated using the top hatches. Vacuuming and washing of the tank interior surfaces was completed within seven working days. Vacuuming was done with hoses and a trailer-mounted, diesel-powered vacuum with high-efficiency particulate air filters. Washing was done with portable sprayers and cloth rags to minimize water usage. Contaminated water was collected and added to the bulk dust from the vacuum unit. Workers used Level C protective clothing and equipment. Scaffolding was erected inside the tank to support workers cleaning elevated surfaces.

Four post-cleaning wipe samples were collected at separate locations inside the tank. Wipe samples were taken with a cotton cloth wetted with distilled water, and each wipe sample covered one square foot of the tank interior surface. Each wipe was analyzed for cadmium in terms of micrograms per wipe, or micrograms per square foot. Analysis results for these samples are shown in Table 1. The approved work plan for closure of this tank specifies a cleanup standard of 270 milligrams per square foot for these wipe samples. Analytical results for these four wipe samples meet this standard.

Two samples of soil from around the perimeter of the tank foundation were collected on June 25, 1991. These samples were analyzed for leachable concentrations of cadmium using the EPA's toxicity characteristic leaching procedure (TCLP). The results of these analyses also are shown in Table 1. Comparison of these results to regulatory thresholds contained in 40 CFR 261.24 indicates that these soils are not characteristic hazardous materials for this metal.

At the conclusion of vacuuming, washing, and sampling, the equipment used in closure was cleaned and decontaminated. Wash waters from equipment decontamination were collected and placed in drums for appropriate off-site disposal. Bulk materials were sent to an appropriately permitted facility for treatment and disposal in compliance with currently applicable regulations.

Federal regulations (40 CFR 264.115), state regulations (10 CSR 25-7.264.115), and the Closure and Post-Closure Plan in the permits require that closure of a RCRA-permitted hazardous waste management unit be certified by an authorized representative of Armco-MSD and by an independent professional engineer registered by the State of Missouri. The form of this certification is specified in 40 CFR 270.11. Therefore, the following certification is provided:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Earl H. Rothfuss

Earl H. Rothfuss

Professional Engineer
Missouri Registration
No. E-23761

STATE OF MISSOURI
EARL H. ROTHFUSS JR.
E-23761
REGISTERED PROFESSIONAL ENGINEER

Robert A Geisel *(name)*

President *(title)*

Armco-MSD

So that this closure program can be recorded as complete, please acknowledge acceptance of this certification and of the K061 Dust Storage Tank No. 1 closure by signing and dating the enclosed copy

of this letter and returning it to ~~Remcor~~ Armco. If you have questions or need additional information, please do not hesitate to contact us. We appreciate your guidance and support in this matter.

Respectfully submitted,

Earl H. Rothfuss

Earl H. Rothfuss, P.E.
Senior Project Manager

EHR:rmv
Attachment

Acceptance of certification and closure as described above.

_____

Nicholas Di Pasquale
Director of Hazardous Waste Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri

_____

Date

TABLE 1

CONFIRMATORY SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 1
(Reported Cadmium Concentrations)

SAMPLE NO.	SAMPLE LOCATION	SAMPLE MEDIUM	SAMPLE ANALYSIS RESULTS FOR CADMIUM	
			mg/wipe[1]	mg/ℓ
1 - 6/25/91	East wall, 3' above floor	Wipe	0.068[2]	-
2 - 6/25/91	West wall, 6' above floor	Wipe	0.065[2]	-
3 - 6/25/91	North wall, 1' above floor	Wipe	0.047[2]	-
4 - 6/25/91	South floor, 2' from wall	Wipe	0.054[2]	-
5 - 6/25/91	North side, 3' outside base	Soil[3]	-	<0.002[4]
6 - 6/25/91	South side, 3' outside base	Soil[3]	-	<0.002[4]

Standard 270 mg/wipe

[1]Wipe area is 1 square foot.

[2]U.S. Environmental Protection Agency Method 6010, detection limit = 0.002 milligram per wipe.

[3]Toxicity characteristic leaching procedure.

[4]U.S. Environmental Protection Agency Method 1311, detection limit = 0.002 milligram per liter.

APPENDIX H-2

TANK 2

REMCOR, Inc. • 701 Alpha Drive • P.O. Box 38310 • Pittsburgh, PA 15238-8310 • 412-963-1106

August 2, 1991

Project No. 91171

Mr. Nicholas Di Pasquale
Director of Hazardous Waste
Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri
P.O. Box 176
Jefferson City, Missouri 65102

Certification of Closure
Electric Arc Furnace Dust Storage Tank No. 2
Armco Inc. - Midwestern Steel Division
Kansas City, Missouri

Dear Mr. Di Pasquale:

On behalf of Armco Inc. - Midwestern Steel Division (Armco-MSD), Remcor, Inc. (Remcor) has completed closure of Electric Arc Furnace (EAF) Dust (K061 dust) Storage Tank No. 2 at the Armco-MSD Kansas City Works. This tank is listed under Hazardous Waste Operating Permit No. MOD007118029 issued by the U.S. Environmental Protection Agency (EPA) on September 24, 1984, and in Permit No. OSO-022885 issued by the Missouri Department of Natural Resources (MDNR) on February 28, 1985. This tank has been used to store EAF emissions control system dust, which is a listed hazardous waste (K061) under the Resource Conservation and Recovery Act (RCRA). This tank, which was originally constructed to store fuel oil, has been used to store K061 dust for approximately six years. Armco-MSD management plans to return this tank to fuel oil storage service and, therefore, has initiated closure of this tank as a solid waste management unit.

The closure has been performed in accordance with the approved Closure and Post-Closure Plan in Attachment VII of the hazardous waste operating permits for this tank. This Closure and Post-Closure Plan requires certification of closure by an authorized representative of Armco-MSD and an independent professional engineer registered to practice in the State of Missouri. This letter describes and certifies the completed closure and provides supporting documentation. The closure was completed in full

compliance with the approved Closure and Post-Closure Plan and with the applicable provisions of the Code of Federal Regulations (CFR) Title 40, Part 264.111 (40 CFR 264.111) and the Missouri Code of State Regulations, Title 10, Division 25, Chapter 7.264.111 (10 CSR 25-7.264.111).

Tank No. 2 is 100 feet in diameter and 40 feet high, with a capacity of 2,350,000 gallons, or 314,000 cubic feet. The tank is constructed of welded steel plates. Hatches at ground level provide access for cleaning and hatches in the top provide natural draft ventilation.

The Closure and Post-Closure Plan in the hazardous waste operating permit includes seven tasks in the closure program. These tasks are as follows:

- Removal of bulk material stored in the tank
- Vacuuming of remaining loose material
- Washing of tank interior surfaces
- Collection and analysis of wipe samples from the tank interior surfaces
- Disposal of removed material
- Decontamination of equipment used for closure
- Reporting and certification of closure.

These seven tasks have been completed for K061 Dust Storage Tank No. 2. The work performed in each of these tasks is described in the following paragraphs.

Removal of the bulk material from the tank was performed by Armco-MSD, and the bulk K061 was transported to a permitted, off-site treatment, storage, and disposal facility (TSDF). When the bulk material removal was completed, small quantities of K061 dust remained on perch surfaces, in corners and relatively inaccessible locations, and adhering to interior surfaces of the tank walls and floor.

Cadmium has been selected as the target analyte based on comparison of cadmium and other metal concentrations in K061 dust in terms of potential for contamination of the oil to be stored in the tank. The concentration of cadmium in K061 dust indicates the highest potential for contamination of stored oil relative to EPA

specifications found at 40 CFR 266.40. This specification establishes a maximum cadmium content of 2 parts per million (ppm) for used oil burned for energy recovery not subject to EPA regulation under RCRA.

Two similar electric arc furnace dust storage tanks at the Armco-MSD facility in Kansas City (Nos. 3 and 5) were closed in 1990 using the methods applied to Tank No. 2. During the cleaning of these tanks, wipe samples were taken at contiguous locations before and after a trial of the vacuum and washing methods. This approach was intended as a test of cleaning method effectiveness. The analytical results for these samples indicated that the cleaning method provides a reduction of approximately one order of magnitude in the cadmium content of the wipe sample.

To start closure, Remcor mobilized personnel, equipment, and supplies to the site. Tank No. 2 was opened and ventilated using the top hatches. Vacuuming and washing of the tank interior surfaces was completed within seven working days. Vacuuming was done with hoses and a trailer-mounted, diesel-powered vacuum with high-efficiency particulate air filters. Washing was done with portable sprayers and cloth rags to minimize water usage. Contaminated water was collected and added to the bulk dust from the vacuum unit. Workers used Level C protective clothing and equipment. Scaffolding was erected inside the tank to support workers cleaning elevated surfaces.

Four post-cleaning wipe samples were collected at separate locations inside the tank. Wipe samples were taken with a cotton cloth wetted with distilled water, and each wipe sample covered one square foot of the tank interior surface. Each wipe was analyzed for cadmium in terms of micrograms per wipe, or micrograms per square foot. Analysis results for these samples are shown in Table 1. The approved work plan for closure of this tank specifies a cleanup standard of 270 milligrams per square foot for these wipe samples. Analytical results for these four wipe samples meet this standard.

Two samples of soil from around the perimeter of the tank foundation were collected on June 25, 1991. These samples were analyzed for leachable concentrations of cadmium using the EPA's toxicity characteristic leaching procedure (TCLP). The results of these analyses also are shown in Table 1. Comparison of these results to regulatory thresholds contained in 40 CFR 261.24 indicates that these soils are not characteristic hazardous materials for this metal.

At the conclusion of vacuuming, washing, and sampling, the equipment used in closure was cleaned and decontaminated. Wash waters from equipment decontamination were collected and placed in drums for appropriate off-site disposal. Bulk materials were sent to an appropriately permitted facility for treatment and disposal in compliance with currently applicable regulations.

Federal regulations (40 CFR 264.115), state regulations (10 CSR 25-7.264.115), and the Closure and Post-Closure Plan in the permits require that closure of a RCRA-permitted hazardous waste management unit be certified by an authorized representative of Armco-MSD and by an independent professional engineer registered by the State of Missouri. The form of this certification is specified in 40 CFR 270.11. Therefore, the following certification is provided:

> *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Earl H. Rothfuss

Earl H. Rothfuss *(name)*

Professional Engineer
Missouri Registration
No. E-23761

STATE OF MISSOURI
EARL H. ROTHFUSS, JR.
E-23761
REGISTERED PROFESSIONAL ENGINEER

President *(title)*
Armco-MSD

So that this closure program can be recorded as complete, please acknowledge acceptance of this certification and of the K061 Dust Storage Tank No. 2 closure by signing and dating the enclosed copy

of this letter and returning it to ~~REMCOR~~ Aemco. If you have questions or need additional information, please do not hesitate to contact us. We appreciate your guidance and support in this matter.

Respectfully submitted,

Earl H Rothfuss

Earl H. Rothfuss, P.E.
Senior Project Manager

EHR:rmv
Attachment

Acceptance of certification and closure as described above.

_____

Nicholas Di Pasquale
Director of Hazardous Waste Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri

_____

Date

TABLE 1

CONFIRMATORY SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 2
(Reported Cadmium Concentrations)

SAMPLE NO.	SAMPLE LOCATION	SAMPLE MEDIUM	SAMPLE ANALYSIS RESULTS FOR CADMIUM	
			mg/wipe(1)	mg/ℓ
1 - 6/29/91	East wall, 1' above floor	Wipe	0.031(2)	-
2 - 6/29/91	West wall, 6' above floor	Wipe	0.022(2)	-
3 - 6/29/91	North wall, 3' above floor	Wipe	0.047(2)	-
4 - 6/29/91	South floor, 2' from wall	Wipe	0.020(2)	-
5 - 6/29/91	North side, 3' outside base	Soil(3)	-	0.031(4)
6 - 6/29/91	South side, 3' outside base	Soil(3)	-	0.006(4)

(1) Wipe area is 1 square foot.

(2) U.S. Environmental Protection Agency Method 6010, detection limit = 0.002 milligram per wipe.

(3) Toxicity characteristic leaching procedure.

(4) U.S. Environmental Protection Agency Method 1311, detection limit = 0.002 milligram per liter.

Tank Closure File

APPENDIX H-3

TANK 3

REMCOR Inc. • 701 Alpha Drive • P.O. Box 38310 • Pittsburgh PA 15238-8310 • 412-963-1106

November 19, 1990

Project No. 89263

Mr. Nicholas Di Pasquale
Director of Hazardous Waste
Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri
P.O. Box 176
Jefferson City, Missouri 65102

Certification of Closure
Electric Arc Furnace Dust Storage Tank No. 3
Armco Inc. - Midwestern Steel Division
Kansas City, Missouri

Dear Mr. Di Pasquale:

On behalf of Armco Inc. - Midwestern Steel Division (Armco-MSD), Remcor, Inc. (Remcor) has completed closure of Electric Arc Furnace (EAF) Dust (K061 dust) Storage Tank No. 3 at the Armco-MSD Kansas City Works. This tank is listed under Hazardous Waste Operating Permit No. MOD007118029 issued by the U.S. Environmental Protection Agency (EPA) on September 24, 1984, and in Permit No. OSO-022885 issued by the Missouri Department of Natural Resources (MDNR) on February 28, 1985. This tank has been used to store EAF emissions control system dust, which is a listed hazardous waste (K061) under the Resource Conservation and Recovery Act (RCRA). This tank, which was originally constructed to store fuel oil, has been used to store K061 dust for approximately six years. Armco-MSD management plans to return this tank to fuel oil storage service and, therefore, has initiated closure of this tank as a solid waste management unit.

The closure has been performed in accordance with the approved Closure and Post-Closure Plan in Attachment VII of the hazardous waste operating permits for this tank. This Closure and Post-Closure Plan requires certification of closure by an authorized representative of Armco-MSD and an independent professional engineer registered to practice in the State of Missouri. This letter describes and certifies the completed closure and provides supporting documentation. The closure was completed in full compliance with the approved Closure and Post-Closure Plan and with the applicable provisions of the Code of Federal Regulations (CFR) Title 40, Part 264.111 (40 CFR 264.111) and the Missouri Code of State Regulations, Title 10, Division 25, Chapter 7.264.111 (10 CSR 25-7.264.111).

Tank No. 3 is 100 feet in diameter and 40 feet high, with a capacity of 2,350,000 gallons, or 314,000 cubic feet. The tank is constructed of welded steel plates. Hatches at ground level provide access for cleaning and hatches in the top provide natural draft ventilation.

The Closure and Post-Closure Plan in the hazardous waste operating permit includes seven tasks in the closure program. These tasks are as follows:

- Removal of bulk material stored in the tank
- Vacuuming of remaining loose material
- Washing of tank interior surfaces
- Collection and analysis of wipe samples from the tank interior surfaces
- Disposal of removed material
- Decontamination of equipment used for closure
- Reporting and certification of closure.

These seven tasks have been completed for K061 Dust Storage Tank No. 3. The work performed in each of these tasks is described in the following paragraphs.

Removal of the bulk material from the tank was performed by Armco-MSD, and the bulk K061 was transported to a permitted, off-site treatment, storage, and disposal facility (TSDF). When the bulk material removal was completed, small quantities of K061 dust remained on perch surfaces, in corners and relatively inaccessible locations, and adhering to interior surfaces of the tank walls and floor.

To start closure, Remcor mobilized personnel, equipment, and supplies to the site. Tank No. 3 was opened and ventilated using the top hatches. Initial wipe samples were collected from the wall of the tank. Wipe samples were taken with a cotton cloth wetted with distilled water, and covered one square foot of the tank interior surface. Each wipe was analyzed for cadmium in terms of micrograms per wipe, or micrograms per square foot. Cadmium was selected as the target analyte based on comparison of cadmium and other metal concentrations in K061 dust in terms of potential for contamination of the oil to be stored in the tank. The concentration of cadmium in K061 dust indicates the highest potential for contamination of stored oil relative to EPA specifications found

at 40 CFR 266.40. This specification establishes a maximum cadmium content of 2 parts per million (ppm) for used oil burned for energy recovery not subject to EPA regulation under RCRA.

Wipe samples were taken at contiguous locations before and after a trial of the vacuum and washing methods. This approach was intended as a test of cleaning method effectiveness. Analysis results for these samples (RAKC-ST-WS-03-01 and RAKC-ST-WS-03-02B) are shown in Table 1, attached to this letter. These analytical results indicate that the cleaning method provides a reduction of approximately one order of magnitude in the cadmium content of the wipe sample.

Vacuuming and washing of the tank interior surfaces was completed within six working days. Vacuuming was done with hoses and a trailer-mounted, diesel-powered vacuum with high-efficiency particulate air filters. Washing was done with portable sprayers and cloth rags to minimize water usage. Contaminated water was collected and added to the bulk dust from the vacuum unit. Workers used Level C protective clothing and equipment. Scaffolding was erected inside the tank to support workers cleaning elevated surfaces.

Four post-cleaning wipe samples were collected at separate locations inside the tank. Analysis results for these samples are shown in Table 1. Two samples of soil from around the perimeter of the tank foundation were collected on June 7, 1990. These samples were analyzed for leachable concentrations of the eight RCRA metals using the EPA's extraction procedure (EP). The results of these analyses are shown in Table 2. Comparison of these results to regulatory thresholds contained in 40 CFR 261.24 indicates that these soils are not characteristic hazardous materials for these metals.

At the conclusion of vacuuming, washing, and sampling, the equipment used in closure was cleaned and decontaminated. Wash waters from equipment decontamination were collected and placed in drums for appropriate off-site disposal. Bulk materials were sent to an appropriately permitted facility for treatment and disposal in compliance with currently applicable regulations.

Federal regulations (40 CFR 264.115), state regulations (10 CSR 25-7.264.115), and the Closure and Post-Closure Plan in the permits require that closure of a RCRA-permitted hazardous waste management unit be certified by an authorized representative of Armco-MSD and by an independent professional engineer registered by the State of Missouri. The form of this certification is specified in 40 CFR 270.11. Therefore, the following certification is provided:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Earl H. Rothfuss
Earl H. Rothfuss

Professional Engineer
Missouri Registration
No. E-23761

Robert D. Cusen *(name)*

President *(title)*
Armco-MSD

So that this closure program can be recorded as complete, please acknowledge acceptance of this certification and of the K061 Dust Storage Tank No. 3 closure by signing and dating the enclosed copy of this letter and returning it to ~~Remcor~~ Armco. If you have questions or need additional information, please do not hesitate to contact us. We appreciate your guidance and support in this matter.

Respectfully submitted,

Earl H. Rothfuss

Earl H. Rothfuss, P.E.
Senior Project Manager

EHR:rmv
Attachments

Acceptance of certification and closure as described above.

_____

Nicholas Di Pasquale
Director of Hazardous Waste Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri

_____

Date

ATTACHMENTS

TABLE 1

SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 3
(Reported Cadmium Concentrations)

SAMPLE NO.	SAMPLE LOCATION	SAMPLE MEDIUM	SAMPLE ANALYSIS RESULTS FOR CADMIUM µg/wipe	mg/ℓ
Samples Before Closure:				
RAKC-ST-WS-03-01	Inside wall, 4' above floor (before trial cleaning)	Wipe	870	-
RAKC-ST-WS-03-02	Inside wall, 4' above floor (after trial cleaning)	Wipe	92	-
Samples After Closure:				
RAKC-89263-04	Inside wall, 4' above floor	Wipe	2.4	-
RAKC-89263-05	Inside wall, 4' above floor	Wipe	11	-
RAKC-89263-06	At joint between wall and floor	Wipe	14	-
RAKC-89263-07	Floor at center of tank	Wipe	24	-
RAKC-89263-14	North side, 1' outside base	Soil(1)	-	0.06
RAKC-89263-15	South side, 6" outside base	Soil(1)	-	0.03

(1) EP Extraction procedure.

TABLE 2

SOIL SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 3
(EP Extraction Procedure Results)

SAMPLE NO.	RAKC-89263-14	RAKC-89263-15
Sample Locations:	North side of tank, 1' outside base	South side of tank, 6" outside base
EP Extraction Results:		
• Silver	ND(1)	ND
• Arsenic	ND	ND
• Barium	1.8 mg/ℓ	1.7 mg/ℓ
• Cadmium	0.06 mg/ℓ	0.03 mg/ℓ
• Chromium	ND	0.02 mg/ℓ
• Mercury	ND	ND
• Lead	0.06 mg/ℓ	0.12 mg/ℓ
• Selenium	0.18 mg/ℓ	0.22 mg/ℓ
EP Extraction Dates:	June 20, 1990	June 20, 1990

(1) "ND" indicates none detected as received at following detection limits:

- Silver - 0.01 mg/ℓ
- Arsenic - 0.10 mg/ℓ
- Barium - 0.20 mg/ℓ
- Cadmium - 0.005 mg/ℓ
- Chromium - 0.01 mg/ℓ
- Mercury - 0.0002 mg/ℓ
- Lead - 0.05 mg/ℓ
- Selenium - 0.10 mg/ℓ

APPENDIX H-4

TANK 5

REMCOR, Inc. • 701 Alpha Drive • P.O. Box 38310 • Pittsburgh PA 15238-8310 • 412-963-1106

November 19, 1990

Project No. 89263

Mr. Nicholas Di Pasquale
Director of Hazardous Waste
Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri
P.O. Box 176
Jefferson City, Missouri 65102

Certification of Closure
Electric Arc Furnace Dust Storage Tank No. 5
Armco Inc. - Midwestern Steel Division
Kansas City, Missouri

Dear Mr. Di Pasquale:

On behalf of Armco Inc. - Midwestern Steel Division (Armco-MSD), Remcor, Inc. (Remcor) has completed closure of Electric Arc Furnace (EAF) Dust (K061 dust) Storage Tank No. 5 at the Armco-MSD Kansas City Works. This tank is listed under Hazardous Waste Operating Permit No. MOD007118029 issued by the U.S. Environmental Protection Agency (EPA) on September 24, 1984, and in Permit No. OSO-022885 issued by the Missouri Department of Natural Resources (MDNR) on February 28, 1985. This tank has been used to store EAF emissions control system dust, which is a listed hazardous waste (K061) under the Resource Conservation and Recovery Act (RCRA). This tank, which was originally constructed to store fuel oil, has been used to store K061 dust for approximately six years. Armco-MSD management plans to return this tank to fuel oil storage service and, therefore, has initiated closure of this tank as a solid waste management unit.

The closure has been performed in accordance with the approved Closure and Post-Closure Plans in Attachment VII of the hazardous waste operating permits for this tank. This Closure and Post-Closure Plan requires certification of closure by an authorized representative of Armco-MSD and an independent professional engineer registered to practice in the State of Missouri. This letter describes and certifies the completed closure and provides supporting documentation. The closure was completed in full compliance with the approved Closure and Post-Closure Plan and with the applicable provisions of the Code of Federal Regulations (CFR) Title 40, Part 264.111 (40 CFR 264.111) and the Missouri Code of State Regulations, Title 10, Division 25, Chapter 7.264.111 (10 CSR 25-7.264.111).

Tank No. 5 is 100 feet in diameter and 40 feet high, with a capacity of 2,350,000 gallons, or 314,000 cubic feet. The tank is constructed of welded steel plates. Hatches at ground level provide access for cleaning and hatches in the top provide natural draft ventilation.

The Closure and Post-Closure Plan in the hazardous waste operating permit includes seven tasks in the closure program. These tasks are as follows:

- Removal of bulk material stored in the tank
- Vacuuming of remaining loose material
- Washing of tank interior surfaces
- Collection and analysis of wipe samples from the tank interior surfaces
- Disposal of removed material
- Decontamination of equipment used for closure
- Reporting and certification of closure.

These seven tasks have been completed for K061 Dust Storage Tank No. 5. The work performed in each of these tasks is described in the following paragraphs.

Removal of the bulk material from the tank was performed by Armco-MSD, and the bulk K061 was transported to a properly permitted, off-site treatment, storage, and disposal facility (TSDF). When the bulk material removal was completed, small quantities of K061 dust remained on perch surfaces, in corners and relatively inaccessible locations, and adhering to interior surfaces of the tank walls and floor.

To start closure, Remcor mobilized personnel, equipment, and supplies to the site. Tank No. 5 was opened and ventilated using the top hatches. Initial wipe samples were collected from the wall of the tank. Wipe samples were taken with a cotton cloth wetted with distilled water, and covered one square foot of the tank interior surface. Each wipe was analyzed for cadmium in terms of micrograms per wipe, or micrograms per square foot. Cadmium was selected as the target analyte based on comparison of cadmium and other metal concentrations in K061 dust in terms of potential for contamination of the oil to be stored in the tank. The concentration of cadmium in K061 dust indicates the highest potential for contamination of stored oil relative to EPA specifications found

at 40 CFR 266.40. This specification establishes a maximum cadmium content of 2 parts per million (ppm) for used oil burned for energy recovery not subject to EPA regulation under RCRA.

Wipe samples were taken at contiguous locations before and after a trial of the vacuum and washing methods. This approach was intended as a test of cleaning method effectiveness. Analysis results for these samples (RAKC-ST-WS-05-01 and RAKC-ST-WS-05-02B) are shown in Table 1, attached to this letter. These analytical results indicate that the cleaning method provides a reduction of approximately one order of magnitude in the cadmium content of the wipe sample.

Vacuuming and washing of the tank interior surfaces was completed within five working days. Vacuuming was done with hoses and a trailer-mounted, diesel-powered vacuum with high-efficiency particulate air filters. Washing was done with portable sprayers and cloth rags to minimize water usage. Contaminated water was collected and added to the bulk dust from the vacuum unit. Workers used Level C protective clothing and equipment. Scaffolding was erected inside the tank to support workers cleaning elevated surfaces.

Four post-cleaning wipe samples were collected at separate locations inside the tank. Analysis results for these samples are shown in Table 1. Two samples of soil from around the perimeter of the tank foundation were collected on June 7, 1990. These samples were analyzed for leachable concentrations of the eight RCRA metals using the EPA's extraction procedure (EP). The results of these analyses are shown in Table 2. Comparison of these results to regulatory thresholds contained in 40 CFR 261.24 indicates that these soils are not characteristic hazardous materials for these metals.

At the conclusion of vacuuming, washing, and sampling, the equipment used in closure was cleaned and decontaminated. Wash waters from equipment decontamination were collected and placed in drums for appropriate off-site disposal. Bulk materials were sent to an appropriately permitted facility for treatment and disposal in compliance with currently applicable regulations.

Federal regulations (40 CFR 264.115), state regulations (10 CSR 25-7.264.115), and the Closure and Post-Closure Plan in the permit require that closure of a RCRA-permitted hazardous waste management unit be certified by an authorized representative of Armco-MSD and by an independent professional engineer registered by the State of Missouri. The form of this certification is specified in 40 CFR 270.11. Therefore, the following certification is provided:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Earl H. Rothfuss
Earl H. Rothfuss

Professional Engineer
Missouri Registration
No. E-23761

x ~~Robert D. Geisel~~ *(name)*

President *(title)*
Armco-MSD

So that this closure program can be recorded as complete, please acknowledge acceptance of this certification and of the K061 Dust Storage Tank No. 5 closure by signing and dating the enclosed copy of this letter and returning it to ~~Remcor~~ Armco. If you have questions or need additional information, please do not hesitate to contact us. We appreciate your guidance and support in this matter.

Respectfully submitted,

Earl H. Rothfuss

Earl H. Rothfuss, P.E.
Senior Project Manager

EHR:rmv
Attachments

Acceptance of certification and closure as described above.

_____

Nicholas Di Pasquale
Director of Hazardous Waste Management
Division of Environmental Quality
Department of Natural Resources
State of Missouri

_____

Date

ATTACHMENTS

TABLE 1

SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 5
(Reported Cadmium Concentrations)

SAMPLE NO.	SAMPLE LOCATION	SAMPLE MEDIUM	SAMPLE ANALYSIS RESULTS FOR CADMIUM µg/wipe	mg/ℓ
Samples Before Closure:				
RAKC-ST-WS-05-01	Inside wall, 4' above floor (before trial cleaning)	Wipe	350	-
RAKC-ST-WS-05-02B	Inside wall, 4' above floor (after trial cleaning)	Wipe	30	-
Samples After Closure:				
RAKC-89263-08	Inside wall, 4' above floor	Wipe	5.7	-
RAKC-89263-09	Inside wall, 4' above floor	Wipe	7.6	-
RAKC-89263-10	At joint between wall and floor	Wipe	20	-
RAKC-89263-11	Floor at center of tank	Wipe	40	-
RAKC-89263-12	North side, 1' outside base	Soil(1)	-	ND(2)
RAKC-89263-13	South side, 6" outside base	Soil(1)	-	0.21

(1) EP Extraction procedure.

(2) "ND" indicates not detected at detection limit of 0.005 mg/ℓ.

TABLE 2

SOIL SAMPLE ANALYSIS RESULTS
ELECTRIC ARC FURNACE DUST STORAGE TANK NO. 5
(EP Extraction Procedure Results)

SAMPLE NO.	RAKC-89263-12	RAKC-89263-13
Sample Locations:	North side of tank, 1' outside base	South side of tank, 6" outside base
EP Extraction Results:		
• Silver	ND(1)	ND
• Arsenic	ND	ND
• Barium	1.0 mg/ℓ	1.6 mg/ℓ
• Cadmium	ND	0.21 mg/ℓ
• Chromium	0.01 mg/ℓ	0.01 mg/ℓ
• Mercury	ND	ND
• Lead	ND	0.21 mg/ℓ
• Selenium	0.19 mg/ℓ	0.20 mg/ℓ
EP Extraction Dates:	June 20, 1990	June 20, 1990

(1) "ND" indicates none detected as received at following detection limits:

- Silver - 0.01 mg/ℓ
- Arsenic - 0.10 mg/ℓ
- Barium - 0.20 mg/ℓ
- Cadmium - 0.005 mg/ℓ
- Chromium - 0.01 mg/ℓ
- Mercury - 0.0002 mg/ℓ
- Lead - 0.05 mg/ℓ
- Selenium - 0.10 mg/ℓ

ATTACHMENT 1

AMOCO SLUDGE LANDFARM
ARMCO SITE

Prepared for:

AMOCO OIL COMPANY
SUGAR CREEK REFINERY
SUGAR CREEK, MISSOURI

December 12, 1980

By:

Woodward-Clyde Consultants
5055 Antioch Road
Overland Park, Kansas 66203
(913)432-4242

5055 Antioch Road
Overland Park Kansas 66203
913-432-4242

Woodward-Clyde Consultants

December 29, 1980
WCC Project K80-73

Amoco Oil Company
P. O. Box 8507
Sugar Creek, Missouri 64054

Attention: Mr. John Lamkin

AMOCO SLUDGE LANDFARM
ARMCO SITE

Gentlemen:

We transmit in the accompanying report our observations, findings and recommendations for services on the Amoco Sludge Landfarm, Armco Site. Our efforts were performed in general accordance with our proposal dated April 29, 1980.

J. D. Campbell, WCC Associate, managed our work and Phil Knotts acted as Project Engineer. Please contact either of these engineers as questions arise or clarifications are required.

We appreciate the opportunity of being of continued service.

Very truly yours,

Donald M. Duncan, P. E.
Vice President

J. D. Campbell,
Vice President

Attachment

jg

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INTRODUCTION

In response to the 1980 Missouri Hazardous Waste Management Law, Amoco Oil Company's Sugar Creek Refinery has retained the services of Woodward-Clyde Consultants for the purpose of evaluating some of Amoco's waste management facilities. At the request of Mr. John Lamkin, Superintendent of Laboratories at Amoco, one of the sites investigated was a sludge landfarm operated by Amoco on property leased from Armco Steel. Three borings were drilled at this site and soil samples were obtained at selected shallow depths for laboratory testing. Tests were performed to determine general engineering index properties of the soil and EPA Toxic Extraction Procedure (TEP) tests were performed to determine whether the landfarmed sludge, incorporated with the soil, is considered a hazardous waste. Groundwater levels were monitored in the two wells existing at the site and water samples were collected for chemical analysis. This report presents a summary of our field investigation and laboratory analyses for the sludge landfarm on Armco property.

SITE CHARACTERIZATION

The landfarm occupies approximately a 10-acre tract on the Missouri River floodplain. It is located on a peninsula of land between the Rock Creek sewage treatment plant effluent ditch and Rock Creek (the old Missouri River channel). Amoco has operated the landfarm at this site for approximately four years with an estimated application rate of approximately 6 to 8 inches of sludge per year. The sludge has been

surface spread and incorporated into the soil by discing. Amoco has not placed sludge on the landfarm since the fall of 1979.

The landfarm is surrounded by a low dike and road system whereby the surface run-off is controlled and provision has been made for collection of residual oily water before it leaves the landfarm.

SUBSURFACE INVESTIGATION

Three borings (B-306, B-307, and B-308) ranging in depth from 5 feet to 30 feet were drilled at the site at the approximate locations shown on the site plan, Figure 1. The borings were logged during drilling and the logs were modified, if necessary, based on the laboratory test results. A summary of the soil laboratory test results is presented in Table 1. The borings indicate sludge has been incorporated into the top 1 to 4 feet of soil resulting in a loose, black, highly plastic organic clay. Underlying the sludge-incorporated soil are 3 to 4 feet of firm to stiff, gray, highly plastic, silty clay which grades into a soft, low plastic, silty clay. Underlying the clay strata is a loose, gray, medium-grained sand which typically grades to coarse sand and gravel with depth. This sand was encountered at a depth of approximately 28 feet in boring B-306. Generalized boring logs are shown in Figure 2. Detailed boring logs are presented in Figures 3 through 6.

The Missouri River alluvial aquifer is comprised of a thick strata of sand and gravel which is very productive and has been reported as thick as 80 feet in the Kansas City area. Observation wells which

penetrate into the alluvium in this area indicate a good hydraulic connection exists between the groundwater and the river. As the river stage rises and falls the groundwater level rises and falls accordingly when the aquifer is unconfined.

If the aquifer is confined, a layer of low permeability (i.e., clay) prevents the groundwater table from reaching rapid equilibrium with the river stage. The water level in a well penetrating through the confining layer and into the alluvium will rise to a level in equilibrium with the river. Adjacent wells not penetrating into the alluvium will typically have higher water levels due to surface water infiltration and retarded seepage into the lower alluvium.

Boring B-306 indicates the alluvial aquifer is confined in the vicinity of this site. The deep boring was augered through the clay to 28 feet with no evidence of groundwater. Groundwater was detected when the boring penetrated into the alluvium and fifteen minutes later the water level in the boring was 8 feet above the clay-alluvial aquifer contact and still rising.

Two observation wells were installed at this site prior to Woodward-Clyde Contultants' investigation. OWA-6 is located immediately north of the landfarm and is 23.8 feet deep. OWA-5 is located immediately east of the landfarm and is 22.3 feet deep. Based on the performance and depth of each well, neither well penetrates into the alluvial aquifer. Figure 7 shows the relationship between the groundwater levels in wells OWA-5 and 6, the Missouri River stage and well OWA-8 on Amoco property which penetrates the alluvium. Unlike wells such as OWA-8 which penetrate

into the alluvium, recharge to wells OWA-5 and 6 is very slow (>1 to 2 days for full recovery after bailing) indicating the low permeability of the clay. The groundwater levels in wells OWA-5 and 6 have dropped steadily since sampling began on May 29, 1980. This may be a result of the general lack of recharge water to the upper clay strata through the summer and fall.

GROUNDWATER CHEMICAL ANALYSES

Tables 2 and 3 present the results of the groundwater chemical analyses performed to date from samples obtained from wells OWA-5 and 6. In general the water quality complies with the groundwater recharge standards specified by the Missouri Department of Natural Resources (Mo.DNR). Small exceedences were recorded for chemical oxygen demand (COD), total dissolved solids (TDS), odor and phenols. With the exception of the first set of samples from well OWA-6, no heavy metal concentrations exceeded the recharge standards. Samples collected from OWA-6 on June 3, 1980, exceeded the standards for zinc and arsenic, possibly because the well was not adequately flushed. Arsenic and zinc concentrations were much less than the standards when well OWA-6 was sampled on August 26, 1980.

TOXIC EXTRACTION PROCEDURE TEST RESULTS

During the field investigation, near-surface (0 to 1 foot) samples of the sludge-incorporated soil were obtained from borings B-307 and B-308, for EPA Toxic Extraction Procedure (TEP) testing. The test results are

presented in Table 4. The results indicate that the sludge-incorporated soil is non-hazardous. The concentrations of elements in the extract from TEP tests on the soil are less than the concentrations specified by EPA and the 1980 Missouri Hazardous Waste Management Law for defining a toxic hazardous waste.

Samples of sludges produced and stored by Amoco were also obtained for TEP testing. Some of the sludges produced by Amoco are listed by EPA in the May 19, 1980 Federal Register as toxic hazardous wastes. The listed sludges are: dissolved air flotation float, K048; slop oil emulsion solids, K049; and API separator sludge, K051. These sludges are identified as being produced by the petroleum refining industry and are listed as toxic hazardous wastes because of potentially high concentrations of chromium and lead. The Toxic Extraction Procedure test results, presented in Table 5, indicate that the concentrations of chromium and lead in the sludges produced by Amoco, a portion of which were landfarmed at the Armco site, are well below the concentrations specified by EPA and the state of Missouri for toxic hazardous wastes.

FUTURE SITE UTILIZATION

Non-Hazardous Sludge Landfarm

The potential for subsurface migration of wastes landfarmed at the existing site is low. A thick stratum (28 feet at one location) of silty clay exists above the alluvial aquifer. The silty clay generally has a low permeability and a high potential for waste adsorption and

attenuation. The degree of permeability and waste attenuation at this site can be estimated by performing field permeability tests and by chemically analyzing depth-integrated soil samples. The presence of a thick clay strata which appears to be present in this area would tend to resist the infiltration of wastes into the alluvial aquifer.

Some remedial work may be done to further reduce the potential for infiltration and surface migration of wastes at the site:

1. The site may be diked to divert precipitation run-on and to prevent inundation by a design flood on the Missouri River. The 100-year flood elevation is 740 MSL at river mile 375.5.

2. Precipitation run-off from the landfarm may be controlled in such a manner as to provide for separation of residual oil from discharged waters. If the collected run-off is discharged through a point source to waters of the State, an NPDES permit may be required.

3. The site may be graded to increase the quantity of surface run-off to the control facility and decrease infiltration through the landfarm.

Armco Plant Expansion

We do not anticipate land-use restrictions at this site from the Resource Conservation and Recovery Act of 1976 (RCRA) because the sludges being landfarmed are non-hazardous; nor with the exception of the shallow sludge-incorporated soil, do we expect the engineering properties of the soil to be significantly affected by the landfarming practices conducted at this site. We do recommend a thorough foundation investigation be conducted at the site prior to future development to aid in the facility

design. Depending upon the facility, the shallow, loose, organic soil may need to be stripped during the initial site grading as normally performed at most construction sites.

SUMMARY

1. Based on the results of the Toxic Extraction Procedure tests performed on the sludges produced by Amoco and the sludge-incorporated soil, the sludges and the soil at the Armco landfarm are non-hazardous.

2. Because the sludges and soil are non-hazardous, future land-use restrictions as detailed in the Resource Conservation and Recovery Act of 1976 and the 1980 Missouri Hazardous Waste Management Law are not anticipated.

3. Based on our preliminary site investigation, the existing site (with the proposed improvements) has the potential for good containment of landfarmed wastes. Because the site is located on the Missouri River floodplain, future use of this site for landfarming may require the approval of the Missouri Department of Natural Resources.

4. With the exception of the shallow sludge-incorporated soil, we do not expect the engineering properties of the soil to be significantly affected by past landfarming practices at the site. We do recommend a thorough foundation investigation be conducted prior to future building construction to aid in the facility design. The shallow loose organic soil may have to be stripped during the initial site grading, depending on the facility to be constructed.

LIMITATIONS

The information presented in this report has been prepared for Amoco Oil Company's Sugar Creek Refinery to aid in evaluating the future landfarming potential of the Amoco landfarm on Armco Steel's property. This report may not contain sufficient information for other parties or other uses. The boring logs depict subsurface conditions for the indicated locations and dates. With the passage of time changes in subsurface conditions may occur, especially with respect to groundwater.

TABLE 1

SUMMARY OF LABORATORY TEST DATA

AMOCO REFINERY WASTE DISPOSAL STUDY
SUGAR CREEK, MISSOURI
K80-73

BORING OR TEST PIT NUMBER	SAMPLE DEPTH, ft.	UNIFIED SOIL CLASSIFICATION SYMBOL[1]	CLASSIFICATION PROPERTIES						PHYSICAL PROPERTIES										
									COMPRESSIVE STRENGTH						VOLUME CHANGE				
									UNCONFINED			TRIAXIAL							
			AVERAGE NATURAL WATER CONTENT, %	DRY UNIT WEIGHT, pcf	LIQUID LIMIT, %	PLASTIC LIMIT, %	LIMIT SAMPLE WATER CONTENT, %	GRAIN SIZE DATA - FIGURE	COMPRESSIVE STRENGTH, ksf	WATER CONTENT AT END OF TEST, %	STRAIN AT FAILURE, %	TRIAXIAL DATA - FIGURE	TYPE OF TEST	WATER CONTENT START - END, %	VOLUME CHANGE DATA - FIGURES	EXISTING OVERBURDEN STRESS, ksf	ESTIMATED PRECONSOL. - IDATION STRESS, ksf	VOLUME CHANGE, INUN - DATED @ 1 psi, %	SWELL PRESSURE MAXIMUM - CONFINED INNUNDATED, psi
306	2	CH	28		59	19													
	4	CH	29		56	18													
	6	CH	38		69	21													
307	1	CH	34		54	25													
	3	CH	28		67	20													
	5	CH	38		65	19													
308	1	CH	36		58	25													
	3	CH	34		61	19													
	5	CL	28		41	15													

[1] CL Clays of low to medium plasticity; silty, sandy or gravelly clays
CH Inorganic clays of high plasticity; fat clays

TABLE 2

AMOCO OIL REFINERY - WATER QUALITY ANALYSIS

ANALYSES	Observation Well #OWA-5 3:15 p.m. 6/3/80 8006-66	Observation Well #OWA-5 3:06 p.m. 8/26/80	Groundwater Recharge Standards 10CSR 20-7.020(12)
Unfiltered Samples			
Specific Conductance, μ mhos/cm	1370	937	
COD, mg/l	ND(10) *	(22)	10 mg/l
Total Dissolved Solids, mg/l	(762)	463	500 mg/l
Chloride, mg/l	23	13	250 mg/l
pH	6.9	6.85	
Nitrate, as NO_3, mg/l	.44 *	ND(.44)	10 mg/l +
Linear Alkylate Sulfonates, mg/l	ND(0.044)	ND(.044)	1 mg/l
Odor, T.O.N.	8.3	16	3
Sulfate, mg/l	10 *	20	250 mg/l
Fluoride, mg/l	.23	.37	1.2 mg/l
Sulfide, mg/l	ND(0.01)	-	
Phenol, mg/l	ND(0.005)	-	.005 mg/l
Benzene, μ g/l	ND(10)	-	
Toluene, μ g/l	ND(10)	-	
Xylene, μ g/l	ND(10)	-	
Total Organic Carbon, mg/l	11	6	
Ion Balance	-28%	-10%	
Total Coliform, colonies/100 ml	-	-	
Free Cyanide, mg/l	-	-	.010 mg/l
Filtered Samples, 0.45 micron filter			
Hexavalent Chromium, mg/l	ND(0.003)	ND(.005)	
Total Chromium, mg/l	.04	.0076	.500 mg/l
Zinc, mg/l	ND(0.05)	.02	.100 mg/l
Lead, mg/l	.0011	.004	.050 mg/l
Beryllium, mg/l	ND(0.0001)	ND(0.0002)	
Selenium, mg/l	ND(0.001)	.001	.010 mg/l
Nickel, mg/l	.003	ND(0.005)	.800 mg/l
Arsenic, mg/l	.007	.012	.050 mg/l
Barium, mg/l	.21	.19	1.000 mg/l
Cadmium, mg/l	.0019	.00028	.030 mg/l
Copper, mg/l	.0012	.0041	.020 mg/l
Silver, mg/l	.00007	ND(0.0005)	.050 mg/l
Calcium, mg/l	6	98	
Iron, mg/l	2.5	20	
Magnesium, mg/l	65	32.5	
Potassium, mg/l	10	7.3	
Sodium, mg/l	15	11	
Phosphate, mg/l	ND(0.2)	ND(0.2)	
Silica, mg/l	34	30	
Heavy Metal Ratio[A]	.73	.51	1.00

ND denotes none detected (detection limit)
* filtered through glass fiber filter
(-) indicates analysis not performed
(?) indicates data not yet available
(A) calculated using detection limit where no metal detected

NOTES: Test performed by Wilson Laboratories, Salina, Kansas. Total metals analyses were performed in accordance with the procedure for the Determination of Total Metals, Section 4.1.3, Metals - 6 Methods for Chemical Analysis of Water and Wastes, U.S.E.P.A., March 1979. All analyses were performed on the samples as received and in accordance with accepted methods of the Water Quality Office, Environmental Protection Agency.
(+) nitrate as N limit = 10 mg/l; nitrate as NO_3 limit = 45 mg/l

TABLE 3

AMOCO OIL REFINERY - WATER QUALITY ANALYSIS

ANALYSES	Observation Well #OWA-6 2:30 p.m. 6/3/80 8006-67	Observation Well #OWA-6 3:00 p.m. 8/26/80	Groundwater Recharge Standards 10CSR 20-7.020(12)
Unfiltered Samples			
Specific Conductance, μmhos/cm	1410	1370	
COD, mg/l	22 *	26	10 mg/l
Total Dissolved Solids, mg/l	738	604	500 mg/l
Chloride, mg/l	8.3	7.0	250 mg/l
pH	7.2	7.45	
Nitrate, as NO_3, mg/l	1.3 *	ND(.44)	10 mg/l *
Linear Alkylate Sulfonates, mg/l	ND(0.044)	ND(.044)	1 mg/l
Odor, T.O.N.	72	4	3
Sulfate, mg/l	ND(4.0)	ND(10)	250 mg/l
Fluoride, mg/l	.23	.17	1.2 mg/l
Sulfide, mg/l	ND(0.01)	-	
Phenol, mg/l	.009	-	.005 mg/l
Benzene, μg/l	ND(10)	-	
Toluene, μg/l	ND(10)	-	
Xylene, μg/l	ND(10)	-	
Total Organic Carbon, mg/l	10	14	
Ion Balance	-8%	-15%	
Total Coliform, colonies/100 ml	-	-	
Free Cyanide, mg/l	-	-	.010 mg/l
Filtered Samples, 0.45 micron filter			
Hexavalent Chromium, mg/l	ND(0.003)	ND(.005)	
Total Chromium, mg/l	.006	ND(0.0005)	.500 mg/l
Zinc, mg/l	.67	.02	1.00 mg/l
Lead, mg/l	.0013	.005	.050 mg/l
Beryllium, mg/l	ND(0.0001)	ND(0.0003)	
Selenium, mg/l	ND(0.001)	ND(0.001)	.010 mg/l
Nickel, mg/l	.003	ND(0.005)	.800 mg/l
Arsenic, mg/l	.053	.033	.050 mg/l
Barium, mg/l	.17	.23	1.000 mg/l
Cadmium, mg/l	.0044	.00055	.030 mg/l
Copper, mg/l	.0007	.0048	.020 mg/l
Silver, mg/l	ND(0.00005)	ND(0.0005)	.050 mg/l
Calcium, mg/l	13	72	
Iron, mg/l	14.5	21	
Magnesium, mg/l	69	70	
Potassium, mg/l	10	9.8	
Sodium, mg/l	33	33	
Phosphate, mg/l	ND(0.2)	ND(0.2)	
Silica, mg/l	34	33	
Heavy Metal Ratio[A]	6.92	.56	1.00

ND denotes none detected (detection limit)
* filtered through glass fiber filter
(-) indicates analysis not performed
(?) indicates data not yet available
(A) calculated using detection limit where no metal detected

NOTES: Test performed by Wilson Laboratories, Salina, Kansas. Total metals analyses were performed in accordance with the procedure for the Determination of Total Metals, Section 4.1.3, Metals - 6 Methods for Chemical Analysis of Water and Wastes, U.S.E.P.A., March 1979. All analyses were performed on the samples as received and in accordance with accepted methods of the Water Quality Office, Environmental Protection Agency.
(*) nitrate as N limit = 10 mg/l; nitrate as NO_3 limit = 45 mg/l

TABLE 4

AMOCO OIL REFINERY
TOXICANT EXTRACTION TEST ON SOIL

CONSTITUENT IN EXTRACT ANALYSIS (mg/l)	B-307 0-1'	B-308 0-1'	Missouri Standards	EPA Standards
Chromium	.11	.029	5.0	5.0
Lead	.25	.26	5.0	5.0
Selenium	ND(.001)	ND(.001)	1.0	1.0
Arsenic	ND(.005)	ND(.005)	5.0	5.0
Barium	.33	.17	100.0	100.0
Cadmium	.0024	.0022	1.0	1.0
Silver	.00039	.00006	5.0	5.0
Mercury	.00029	.00035	0.2	.20

Samples tested by Wilson Laboratories in accordance with the toxicant extraction procedure as described in 10CSR-25 Chapter 4.010, Section 5, Paragraph (B), Missouri Hazardous Waste Management Law.

ND denotes none detected (detection limit).

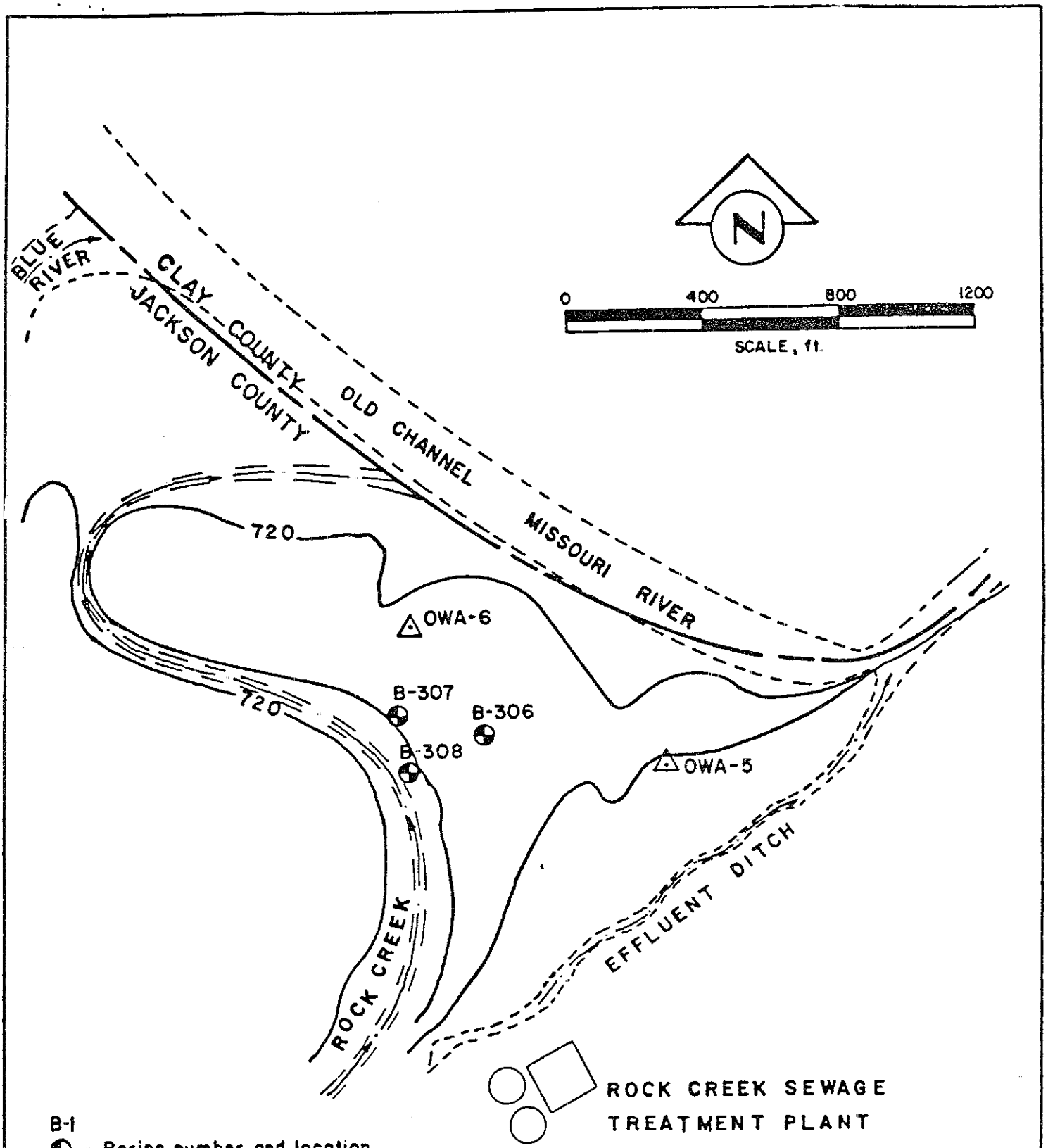
TABLE 5

AMOCO OIL REFINERY
TOXICANT EXTRACTION TEST ON SLUDGE

CONSTITUENT IN EXTRACT	Lagoon Aeration Basin	West Plant Separator Box	Lower Refinery Separator Box	Sludge Pond	Skimming Pond	EPA & Missouri Standards
Chromium	.30	1.4	.07	.91	.21	5.0
Lead	.22	.021	.30	.33	.029	5.0
Selenium	ND(.0001)	ND(.004)	ND(.003)	ND(.001)	ND(.002)	1.0
Arsenic	ND(.005)	.010	.007	.033	.016	5.0
Barium	.80	.10	1.8	1.3	.29	100.0
Cadmium	.0034	.0037	.038	.022	.0006	1.0
Silver	.0016	.0006	.0012	ND(.001)	ND(.0001)	5.0
Mercury	.0003	.0042	.0059	ND(.0002)	.0002	0.2

Samples tested by Wilson Laboratories in accordance with the toxicant extraction procedure as described in 10 CSR-25 Chapter 4.010, Section 5, Paragraph (B), Missouri Hazardous Waste Management Law.

ND denotes none detected (detection limit)



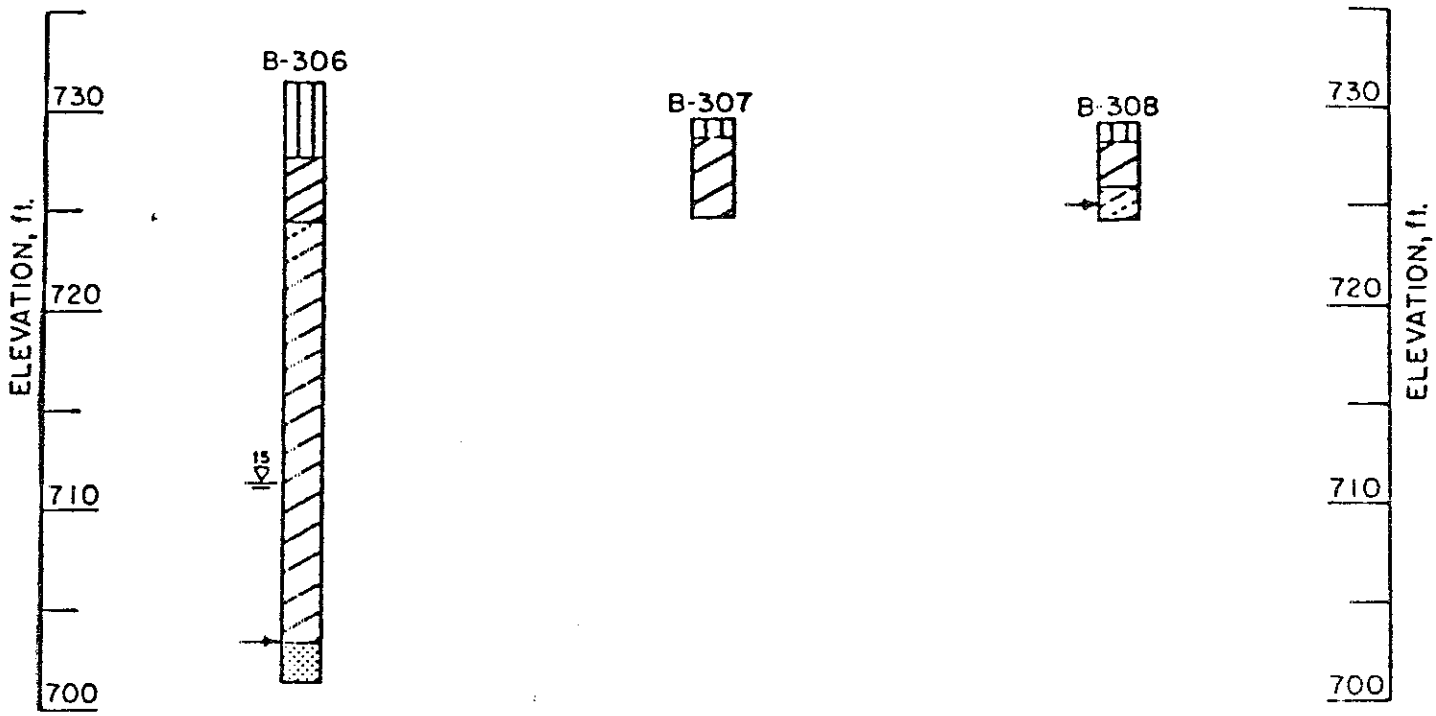
B-1
◐ – Boring number and location

OWA-1
△ – Observation well number and location.

AMOCO OIL REFINERY SUGAR CREEK, MISSOURI SLUDGE LAND FARM — ARMCO SITE	PROJECT NO. K80-73

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS
CENTRAL REGION

DRN. BY: R Lee 11-18-80 CHKD BY: DK	SITE PLAN	FIG. NO. 1



FILL

Soft, very Silty CLAY (CL)

Firm to Stiff, highly plastic CLAY (CH)

Loose, medium grained SAND (SP)

NOTE: THESE LOGS HAVE BEEN GENERALIZED TO SHOW SUBSURFACE CONDITIONS REFER TO INDIVIDUAL LOGS FOR DETAILS.

B-306 WAS SAMPLED THROUGHOUT THE FIRST 6 FEET. B-307 AND B-308 WERE SAMPLED THROUGHOUT BORING

15 — WATER LEVEL 15 MIN AFTER DRILLING

→ ELEVATION WATER ENTERED BORING

AMOCO OIL REFINERY
SUGAR CREEK, MISSOURI

PROJECT NO. K80-73

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS
CENTRAL REGION

DRN BY: CKC 7-7-80 | GENERALIZED | FIG NO.

BORING LOG

LEGEND AND NOMENCLATURE

Items shown on boring logs refer to the following:

1. Depth - Depth below reference elevation, ground surface unless otherwise shown.

2. Sample - Types designated by letter

   D - Disturbed sample, obtained from auger cuttings or wash water for classification purposes only.

   S - Split-Spoon sample, obtained by driving 2-inch split-spoon to determine penetration resistance and allow classification.

   C - Liner tube sample, obtained by penetration of thick, wall sampler containing 2-inch diameter liner-tubes (California sampler).

   U - Undisturbed sample, obtained by penetration of minimum 3 inch diameter, thin-wall tube using an open or, where indicated, fixed-piston sampling head.

   Rec - Recovery is expressed as a ratio of the length recovered to the total length pushed or driven (in inches) i.e. $\frac{8}{12}$

   Resist - Resistance is designated as follows:

   P - Sample pushed in one continuous movement by hydraulic rig action, maximum hydraulic pressure shown where pertinent.

   3_{6_9} - Numbers indicate blows per 6 inches of sampler penetration when driven by a 140-pound hammer falling freely 30 inches. The Standard Penetration Resistance is the number of blows for the last 12 inches of penetration of the split-spoon sampler, e.g. 15. Note that a blow count can be given for the California sampler, but this is not the Standard Penetration Resistance.

3. Description - Description of material according to the Unified Soil Classification: word description gives soil constituents, consistency or density, and other appropriate classification characteristics. Unified Soil Classification symbols are shown on the USC column. Geologic names, where appropriate, are shown under Special Notes. A solid line indicates stratigraphic change; a dashed line indicates approximate location of stratigraphic change.

4. Special Notes and Field Observations - Pertinent observations made by inspector during drilling including type of boring, free water level, water seepage, fluid loss, hole termination depth, etc.

5. Legend -

CFA - Continuous flight auger
ATD - At time of drilling
AD - After drilling
DWL - Drill water loss

▼ Water depth at specified time after drilling

← Water entry depth at time

BORING LOG

SHEET 1 OF 2

PROJECT NAME AMOCO REFINERY WASTE DISPOSAL STUDY (Site "E")

PROJECT NO. K80-73

B-306

PROJECT LOCATION Sugar Creek, Missouri

DATE 6-5-80

RIG CME 55

LOGGED BY W. Prosser DRILLED BY B. Herber

WATER ENTERS El 703 ATD

SURFACE ELEVATION 731 ELEVATION DATUM USC & GS

El 711 15 min. AD

DEPTH	SAMPLE TYPE	SAMPLE REC	SAMPLE RESIST	DESCRIPTION	U.S.C.	SPECIAL NOTES AND FIELD OBSERVATIONS
0	D			Loose, black, highly plastic, Organic Clay FILL	FILL	Boring advanced with 4" diameter CFA
	D					
5	D			Firm, gray, highly plastic, Silty CLAY	CH	
				Soft, blue-gray, very Silty CLAY with some fine sand	CL	
						▼ Water level 15 min AD

BORING LOG

SHEET 2 OF 2

PROJECT NAME AMOCO REFINERY WASTE DISPOSAL STUDY (Site "E")

PROJECT NO. K80-73

DATE 6-5-80

B-306

PROJECT LOCATION Sugar Creek, Missouri

RIG CME 55

LOGGED BY W. Prosser DRILLED BY B. Herber

WATER ENTERS El 703 ATD

El 711 15 min. AD

SURFACE ELEVATION 731 ELEVATION DATUM USC & GS

DEPTH	SAMPLE TYPE	SAMPLE REC	SAMPLE RESIST	DESCRIPTION	U.S.C.	SPECIAL NOTES AND FIELD OBSERVATIONS
25				SAME: Soft, blue-gray, very Silty CLAY with some fine sand	CL	
						Water detected ATD
				Loose, gray, medium grained SAND	SP	
30						Bottom of boring 30.0'

BORING LOG

SHEET 1 OF 1

PROJECT NAME AMOCO REFINERY WASTE DISPOSAL STUDY (Site "E")

PROJECT NO. K80-73

B-307

PROJECT LOCATION Sugar Creek, Missouri

DATE 6-5-80

LOGGED BY W. Prosser DRILLED BY

RIG Hand Auger

SURFACE ELEVATION 730 ELEVATION DATUM USC & GS

WATER ENTERS None detected ATD

DEPTH	SAMPLE TYPE	SAMPLE REC	SAMPLE RESIST	DESCRIPTION	U.S.C.	SPECIAL NOTES AND FIELD OBSERVATIONS
0	D			Sludge incorporated into highly plastic CLAY	FILL	Boring advanced with 6" diameter power auger
	D			Stiff, dark gray, highly plastic CLAY	CH	
	D					
5						Bottom of boring 5.0'

BORING LOG

SHEET 1 OF 1

PROJECT NAME AMOCO REFINERY WASTE DISPOSAL STUDY (Site "E")

PROJECT NO K80-73

DATE 6-5-80

B-308

PROJECT LOCATION Sugar Creek, Missouri

RIG Hand Auger

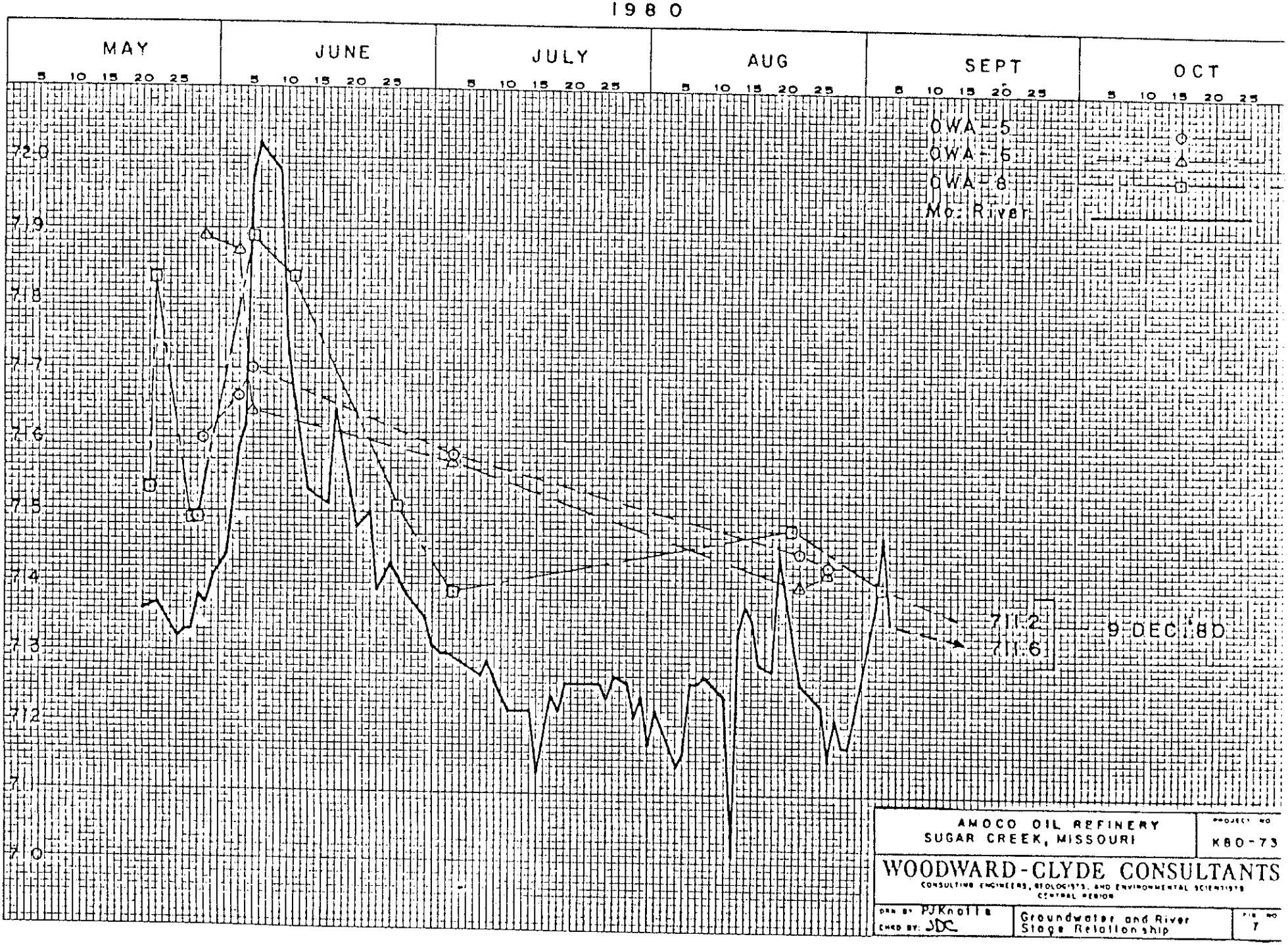
LOGGED BY W. Prosser DRILLED BY

WATER ENTERS El 725 ATD

SURFACE ELEVATION 729 ELEVATION DATUM USC & GS

DEPTH	SAMPLE TYPE	SAMPLE REC	SAMPLE RESIST	DESCRIPTION	U.S.C.	SPECIAL NOTES AND FIELD OBSERVATIONS
0	D			Sludge incorporated into highly plastic CLAY	FILL	Boring advanced with 6" diameter power auger
	D			Stiff, gray, highly plastic CLAY	CH	
	D			Becoming silty and low plastic	CL	← Water detected ATD
5						Bottom of boring 5.0'

NO. 341-79 DIETZGEN GRAPH PAPER
6 MONTHS BY DAYS
DIETZGEN CORPORATION
MADE IN U.S.A.



DEC 19 1994

SWMU 12

Amoco Oil Company
One Prudential Plaza
130 East Randolph Drive
Post Office Box 7513
Chicago Illinois 60680-7513
Engineering & Construction

December 14, 1994

Mr. Myrl Wear
Manager, Environmental Affairs
Armco, Inc.
7000 Winner Road
Kansas City, MO 64125-1416

Re: Amoco's Sugar Creek Former Refinery
Armco Landfarm - Results of Groundwater Sampling

Dear Mr. Wear:

Attached are the results of the analytical data taken at the two monitoring wells on SWMU Number 12, the Armco Landfarm. The results from these two wells, OWA 5 and OWA 6, indicate that for the compounds analyzed in the groundwater, there were no detectable concentrations. I wanted your contractor to have access to this data while preparing the Interim Measures Plan.

If you have any questions, please feel free to call me at (312) 856-7014.

Sincerely,

Vanessa A. Harris, P.E.
Liability Manager
Environmental Health and Safety

cc: G. B. Engen, Ecova
M. S. Paules, Geowest
Amoco Sugar Creek File: General

ECOVA CORPORATION
FIELD DATA SHEET 1
Water Level Data

Site Name: Armco	Date Of Water Levels: 10-14-94
Location: Emissions Control Dust Landfill	Sampler(s): Jerry Hammer / Jeff McKarus / Mike Mitchell
Project #: 5006	Weather Conditions: 70° F / dry

	Well No.	Time/Date Measured	PID/FID Breathing Zone (PPM)	Well Dia./Casing Material(1) (IN)	Depth to Product (FT)	Depth to Water (FT)	Total Depth of Well (FT)	Height of Water in Well (FT)	Calculated Purge Volume (GAL)	Actual Purge Volume (GAL)	Purge Method(2)
1	OWA 6		—	4"-PVC	—	21.10	23.40	2.30	4.5	2 dry	B
2	OWA 5		—	4"-PVC	—	21.99	24.80	2.81	5.5	1 dry	B
3											
4											
5											
6											
7											
8											
9											
10											

	Well No.	Observations
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Notes:
(1) PVC = Polyvinyl Chloride, SS = Stainless Steel, O = Other
(2) B = Bailer, P = Pump, O = Other

Calculated Purge Volume In Gallons:
2-Inch Dia. Well = 0.49 x Height of Water In Well
4-Inch Dia. Well = 1.96 x Height of Water In Well
(Based On A Three Well Volume Purge)

ECOVA CORPORATION
FIELD DATA SHEET 2
Field Parameters Collected During Well Purging

Site Name: Armco
Location: Emissions Control Dust Landfill
Project #: 5006

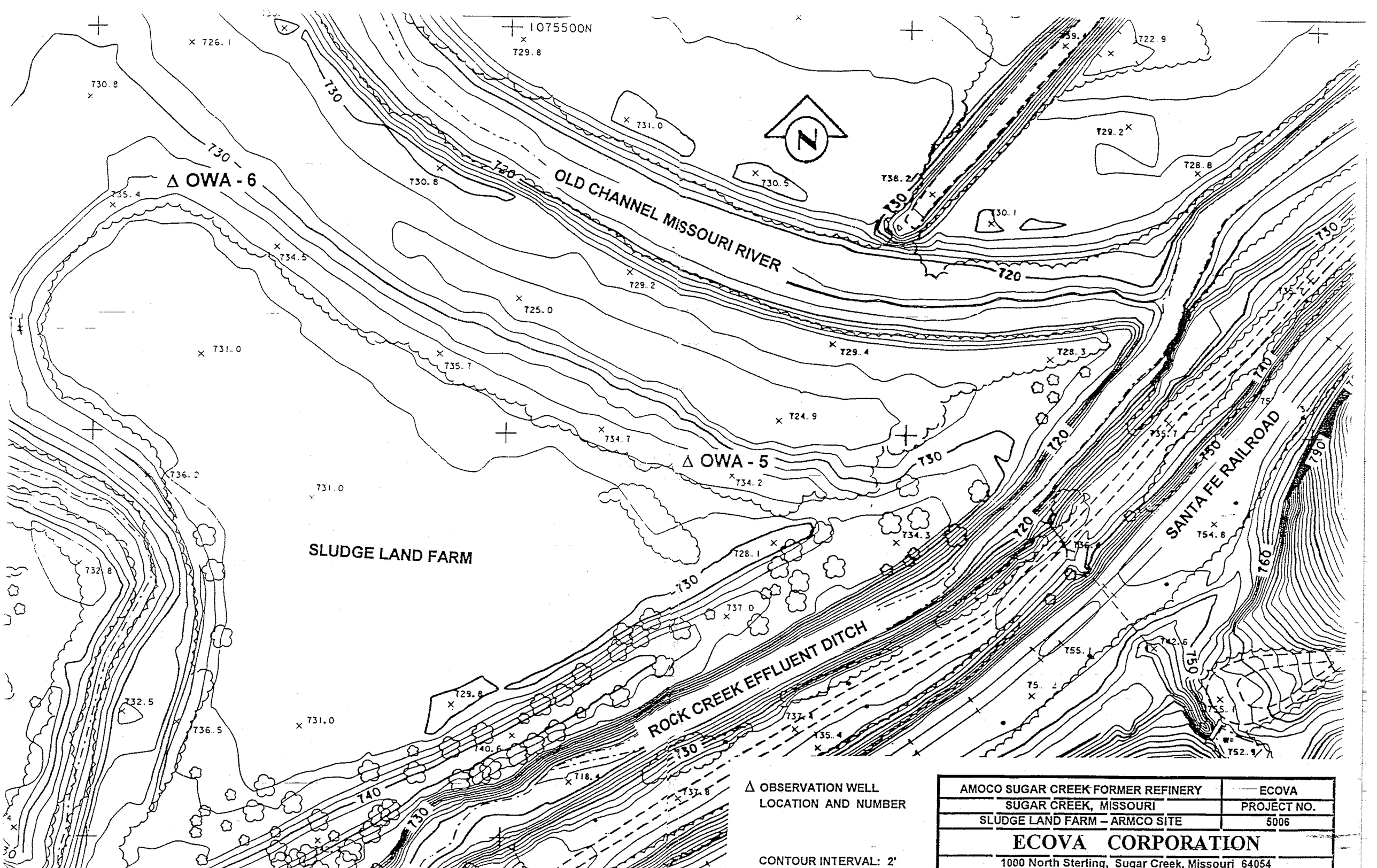
Sampler(s): 10-14-94 Jerry Hammer / Jeff McNarus/Mike Mi
Weather Conditions: 70° F / dry

Well No.	Date Purged	Time Purged	Purge Volume (GAL)	pH	Specific Cond. (uS/cm)	Temp. (Degrees C)	Turbidity (NTUs)	Observations
OWA 6	10-14-94	10:10	1.5	6.64	1090	14.0	—	
		10:15	2.0	7.08	1040	14.1	—	well purged dry
OWA 5	10-14-94	10:35	1.0	6.90	1060	14.3	—	well purged dry

ECOVA CORPORATION
FIELD DATA SHEET 3
Field Parameters Collected During Well Sampling

Site Name: Armco	Sampler(s): Hammer / McKarus / Mitchell
Location: Emissions Contol Dust Landfill	
Project #: 5006	Weather Conditions: 70° F / dry

	Well No.	Date Sampled	Time Sampled	pH	Specific Cond. (uS/cm)	Temp. (Degrees C)	Turbidity (NTUs)	Observations
1	OWA 6	10-14-94	11:00	6.89	1050	14.5	—	very dark brown with sediment
2	OWA 5	10-14-94	10:45*	6.89	1080	14.8	—	light brown rusty color
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17	*note:	Jeff	McKarus	and	Mike	Means	returned	at 14:00 to finish collecting metals
18		sample	because	well	went	dry	after	volatiles and semi-volatiles samples
19		collected						
20								



Δ OBSERVATION WELL LOCATION AND NUMBER

CONTOUR INTERVAL: 2'

AMOCO SUGAR CREEK FORMER REFINERY	ECOVA
SUGAR CREEK, MISSOURI	PROJECT NO.
SLUDGE LAND FARM – ARMCO SITE	5006
ECOVA CORPORATION	
1000 North Sterling, Sugar Creek, Missouri 64054	

INCORPORATED
ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

October 31, 1994

Mr. Jerry Hammer
ECOVA Corporation
1000 N. Sterling
PO BOX 7770
Sugar Creek, MO 64054

RE: PACE Project Number: 601903
Client Project ID: ARMCO

Dear Mr. Hammer:

Enclosed are the results of analyses for samples received on October 14, 1994. If you have any questions concerning this report, please feel free to contact me.

Sincerely

Ted Tanuis
Project Manager

Enclosures

9608 Loriet Boulevard
Lenexa, KS 66219
TEL: 913-599-5665
FAX: 913-599-1759

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PACE ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 10/31/94
PAGE: 1

ECOVA Corporation
1000 N. Sterling
PO BOX 7770
Sugar Creek, MO 64054

PACE Project Number: 601903
Client Project ID: ARMCO

Attn: Mr. Jerry Hammer
Phone: (816)254-1185

PACE Sample No: 60124831
Client Sample ID: OWA5

Date Collected: 10/14/94
Date Received: 10/14/94

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Lead, AAS Furnace								
Lead	ND	ug/L	5	10/19/94	EPA 7421	SMS	7439-92-1	
Date Digested				10/18/94				
Metals, ICP								
Cadmium	ND	mg/L	0.005	10/21/94	EPA 6010	JAH	7440-43-9	
Chromium	ND	mg/L	0.02	10/21/94	EPA 6010	JAH	7440-47-3	
Date Digested				10/20/94				

Comments : All filtered metals samples are reported as the dissolved analyte.

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ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 10/31/94
PAGE: 2

PACE Project Number: 601903
Client Project ID: ARMCO

PACE Sample No: 60124856
Client Sample ID: OWA6

Date Collected: 10/14/94
Date Received: 10/14/94

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Metals								
Lead, AAS Furnace								
Lead	ND	ug/L	5	10/19/94	EPA 7421	SMS	7439-92-1	
Date Digested				10/18/94				
Metals, ICP								
Cadmium	ND	mg/L	0.005	10/24/94	EPA 6010	JAH	7440-43-9	
Chromium	ND	mg/L	0.02	10/24/94	EPA 6010	JAH	7440-47-3	
Date Digested				10/20/94				

Comments : All filtered metals samples are reported as the dissolved analyte.

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REPORT OF LABORATORY ANALYSIS

PACE Project Number: 601903
Client Project ID: ARMCO

PARAMETER FOOTNOTES

ND	Not Detected
PRL	PACE Reporting Limit

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PACE INCORPORATED
ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 10/31/94
PAGE: 4

ECOVA Corporation
1000 N. Sterling
PO BOX 7770
Sugar Creek, MO 64054

PACE Project Number: 601903
Client Project ID: ARMCO

Attn: Mr. Jerry Hammer
Phone: (816)254-1185

QC Batch ID: 2382
QC Batch Method: EPA 3020
Date of Batch: 10/12/94
Associated PACE Samples: 60124831 60124856

METHOD BLANK: 60122991
Associated PACE Samples: 60124831 60124856

Parameter	Units	Method Blank Result	PRL	Footnotes
Antimony	ug/L	ND	10	
Selenium	ug/L	ND	5	
Arsenic	ug/L	ND	5	
Thallium	ug/L	ND	5	
Lead	ug/L	ND	5	

MATRIX SPIKE: 60119765

Parameter	Units	60118395	Spike Conc.	Matrix Spike Result	Spike % Rec	Footnotes
Thallium	ug/L	ND	40	35.9	90	
Antimony	ug/L	ND	40	32.8	82	
Arsenic	ug/L	ND	40	45.2	113	
Lead	ug/L	6.5	40	36.1	74	
Selenium	ug/L	ND	40	32.3	80	

LABORATORY CONTROL SAMPLE: 60119781

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Lead	ug/L	40	36.5	91	

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 10/31/94
PAGE: 5

PACE Project Number: 601903
Client Project ID: ARMCO

LABORATORY CONTROL SAMPLE: 60119781

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Thallium	ug/L	40	38.1	95	
Antimony	ug/L	40	37.4	94	
Arsenic	ug/L	40	45.9	115	
Selenium	ug/L	40	37.4	94	

LABORATORY CONTROL SAMPLE: 60123007

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Antimony	ug/L	40	39.4	99	
Selenium	ug/L	40	38.3	96	
Lead	ug/L	40	34.9	87	
Arsenic	ug/L	40	46.7	117	
Thallium	ug/L	40	37.2	93	

LABORATORY CONTROL SAMPLE: 60129822

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Arsenic	ug/L	40	37.6	94	
Thallium	ug/L	40	33.1	83	

SAMPLE DUPLICATE: 60119773

Parameter	Units	60118395	Dup Result	RPD	Footnotes
Thallium	ug/L	ND	ND	0	
Antimony	ug/L	ND	ND	0	
Arsenic	ug/L	ND	ND	0	
Lead	ug/L	6.5	6	8	
Selenium	ug/L	ND	ND	0	

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 10/31/94
PAGE: 6

ECOVA Corporation
1000 N. Sterling
PO BOX 7770
Sugar Creek, MO 64054

Attn: Mr. Jerry Hammer
Phone: (816)254-1185

PACE Project Number: 601903
Client Project ID: ARMCO

QC Batch ID: 2579
QC Batch Method: EPA 3010
Date of Batch: 10/19/94
Associated PACE Samples: 60124831 60124856

METHOD BLANK: 60127503
Associated PACE Samples: 60124831 60124856

Parameter	Units	Method Blank Result	PRL	Footnotes
Cadmium	mg/L	ND	0.005	
Chromium	mg/L	ND	0.02	
Lead	mg/L	ND	0.1	
Nickel	mg/L	ND	0.05	

MATRIX SPIKE: 60128246

Parameter	Units	60124831	Spike Conc.	Matrix Spike Result	Spike % Rec	Footnotes
Cadmium	mg/L	ND	0.1	0.098	97	
Chromium	mg/L	ND	1	0.627	62	
Lead	mg/L		1	0.887	87	
Nickel	mg/L		1	0.932	93	

LABORATORY CONTROL SAMPLE: 60127537

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Aluminum	mg/L	1	0.991	99	
Barium	mg/L	1	0.951	95	
Beryllium	mg/L	0.1	0.111	111	
Boron	mg/L	1	1.06	106	

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LABORATORY CONTROL SAMPLE: 60127537

Parameter	Units	Spike Conc	LCS Result	Spike % Rec	Footnotes
Cadmium	mg/L	0.1	0.106	106	
Chromium	mg/L	1	0.658	66	
Cobalt	mg/L	1	1.03	103	
Copper	mg/L	1	0.983	98	
Iron	mg/L	1	0.986	99	
Lead	mg/L	1	0.941	94	
Manganese	mg/L	1	1.01	101	
Molybdenum	mg/L	1	0.984	98	
Nickel	mg/L	1	1	100	
Silver	mg/L	0.1	0.091	91	
Titanium	mg/L	1	0.941	94	
Vanadium	mg/L	1	1.01	101	
Zinc	mg/L	1	0.964	96	

LABORATORY CONTROL SAMPLE: 60129012

Parameter	Units	Spike Conc	LCS Result	Spike % Rec	Footnotes
Aluminum	mg/L	1	1	100	
Barium	mg/L	1	0.935	94	
Beryllium	mg/L	0.1	0.112	112	
Cadmium	mg/L	0.1	0.11	110	
Chromium	mg/L	1	0.692	69	
Cobalt	mg/L	1	1.06	106	
Copper	mg/L	1	0.976	98	
Iron	mg/L	1	1.02	102	
Lead	mg/L	1	1.01	101	
Manganese	mg/L	1	1.03	103	
Molybdenum	mg/L	1	1.01	101	
Nickel	mg/L	1	1.03	103	
Silver	mg/L	0.1	0.108	108	
Titanium	mg/L	1	0.958	96	
Vanadium	mg/L	1	1.02	102	
Zinc	mg/L	1	1.02	102	

9608 Loriet Boulevard
Lenexa, KS 66219
TEL: 913-599-5665
FAX: 913-599-1759

SAMPLE DUPLICATE: 60128253

Parameter	Units	60124831	Dup. Result	RPD	Footnotes
Cadmium	mg/L	ND	ND	0	
Chromium	mg/L	ND	ND	72	
Lead	mg/L	ND	ND	0	
Nickel	mg/L	ND	ND	0	

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REPORT OF LABORATORY ANALYSIS

PACE Project Number: 601903
Client Project ID: ARMCO

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropiate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

ND Not Detected
PRL PACE Reporting Limit
RPD Relative Percent Difference

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*794

pace

CHAIN-OF-CUSTODY RECORD

Analytical Request

Client:	ECOVA-AMOCO
Address:	1000 N. Sterling
	Sugar Creek, MO 64054
Phone #:	(816) 836-6045 / 254-1185
Fax #:	(816) 461-7205

Report To:	Jay Burns
Bill To:	Jay Burns / ECOVA
P.O.# / Billing Reference:	
Project Name / No:	ARMCO
Sampled By:	Jerry Hammer
Date Sampled:	10/14/94

Lab:	Pace
Lab Project Manager:	Ted Tanis
Lab Project No.:	601903
Turn Around Time	10 Days
Requested Due Date:	10/31/94
Method Shipped:	Jeff McKenna Owner

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	LAB NO.	PRESERVATIVES: # of containers	HNO3	HEX RINSE	HCL	ANALYSES REQUESTED: Dissolved Pb, Cd, Cr	Volatiles*	Semivolatiles*	REMARKS
1	OWA 5	10:45	Water	60134831	6	1	2	3	X	X	X	
2	OWA 6	11:00	Water	60	6	1	2	3	X	X	X	
3												
4												
5												
6												
7												
8												

ADDITIONAL COMMENTS

* Per attached skinner list

Note: Metals have been field filtered

ITEM NUMBER	RELINQUISHED BY	ACCEPTED BY / AFFIL	DATE	TIME
	Jeff McKenna	Rodney L. [illegible]	10/14/94	1530
			10/14/94	16:45

COOLER TEMPERATURE:

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REPORT OF LABORATORY ANALYSIS

October 31, 1994
Report No.: 00035620
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: PACE INCORPORATED-KANSAS
ADDRESS: 9608 LOIRET BOULEVARD
LENEXA, KS 66219-
ATTENTION: TED TANIUS

SAMPLE ID: OWA 5
SAMPLE NO: H285282

LIMS CLIENT: 0719 0544
PACE PROJECT: K30383
PACE CLIENT: 000560
P.O. NO: VERBAL

DATE SAMPLED: 14-OCT-94
DATE RECEIVED: 19-OCT-94
PROJECT MANAGER: Debbie Proctor

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVSKW	Skinner List Volatiles in Water		
		1,2-Dichloroethane	< 5	ug/L
		1,4-Dioxane	< 500	ug/L
		Benzene	< 5	ug/L
		Carbon Disulfide	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chloroform	< 5	ug/L
		Ethyl Benzene	< 5	ug/L
		Ethylene Dibromide	< 10	ug/L
		Methyl Ethyl Ketone	< 5	ug/L
		Styrene	< 5	ug/L
		Toluene	< 5	ug/L
		Xylene		
3	OSVSKW	Skinner List Semi-volatiles in Water	< 10	ug/L
		1-Methyl naphthalene	< 10	ug/L
		2,4-Dimethylphenol	< 50	ug/L
		2,4-Dinitrophenol	< 50	ug/L
		4-Nitrophenol	< 10	ug/L
		7,12-Dimethylbenz(a)anthracene	< 10	ug/L
		Anthracene	< 10	ug/L
		Benzenethiol	< 10	ug/L
		Benzo(a)anthracene	< 10	ug/L
		Benzo(a)pyrene	< 10	ug/L
		Benzo(b)fluoranthene	< 10	ug/L
		Benzo(k)fluoranthene	< 10	ug/L
		Bis(2-ethylhexyl)phthalate	< 10	ug/L
		Butyl benzyl phthalate	< 10	ug/L
		Chrysene	< 10	ug/L
		Di(n)butyl phthalate	< 10	ug/L
		Di(n)octyl phthalate	< 10	ug/L
		Dibenz(a,h)acridine	< 10	ug/L
		Dibenz(a,h)anthracene	< 10	ug/L
		Dichlorobenzenes	< 10	ug/L
		Diethyl phthalate	< 10	ug/L
		Dimethyl phthalate	< 10	ug/L
		Fluoranthene	< 10	ug/L
		Indene		
		Methyl chrysene		

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REPORT OF LABORATORY ANALYSIS

October 31, 1994
Report No.: 00035620

LABORATORY ANALYSIS REPORT

CLIENT NAME: PACE INCORPORATED-KANSAS
ADDRESS: 9608 LOIRET BOULEVARD
LENEXA, KS 66219-
ATTENTION: TED YANIUS

SAMPLE ID: OWA 6
SAMPLE NO: H285283

LIMS CLIENT: 0719 0544
PACE PROJECT: H30383
PACE CLIENT: 000560
P.O. NO: VERBAL

DATE SAMPLED: 14-OCT-94
DATE RECEIVED: 19-OCT-94
PROJECT MANAGER: Debbie Proctor

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVSKW	Skinner List Volatiles in Water		
		1,2-Dichloroethane	< 5	ug/L
		1,4-Dioxane	< 500	ug/L
		Benzene	< 5	ug/L
		Carbon Disulfide	130	ug/L
		Chlorobenzene	< 5	ug/L
		Chloroform	< 5	ug/L
		Ethyl Benzene	< 5	ug/L
		Ethylene Dibromide	< 10	ug/L
		Methyl Ethyl Ketone	< 5	ug/L
		Styrene	< 5	ug/L
		Toluene	< 5	ug/L
		Xylene	< 10	ug/L
3	OSVSKW	Skinner List Semi-volatiles in Water		
		1-Methyl nephthalene	< 10	ug/L
		2,4-Dimethylphenol	< 50	ug/L
		2,4-Dinitrophenol	< 50	ug/L
		4-Nitrophenol	< 10	ug/L
		7,12-Dimethylbenz(a)anthracene	< 10	ug/L
		Anthracene	< 10	ug/L
		Benzenethiol	< 10	ug/L
		Benzo(a)anthracene	< 10	ug/L
		Benzo(a)pyrene	< 10	ug/L
		Benzo(b)fluoranthene	< 10	ug/L
		Benzo(k)fluoranthene	< 10	ug/L
		Bis(2-ethylhexyl)phthalate	< 10	ug/L
		Butyl benzyl phthalate	< 10	ug/L
		Chrysene	< 10	ug/L
		Di(n)butyl phthalate	< 10	ug/L
		Di(n)octyl phthalate	< 10	ug/L
		Dibenz(a,h)acridine	< 10	ug/L
		Dibenz(a,h)anthracene	< 10	ug/L
		Dichlorobenzenes	< 10	ug/L
		Diethyl phthalate	< 10	ug/L
		Dimethyl phthalate	< 10	ug/L
		Fluoranthene	< 10	ug/L
		Indene	< 10	ug/L
		Methyl chrysene		

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LABORATORY ANALYSIS REPORT

CLIENT NAME: PACE INCORPORATED-KANSAS
SAMPLE ID: CWA 6
SAMPLE NO: M285283

LN	TEST CODE	DETERMINATION	RESULT	UNITS
			< 10	ug/L
		Naphthalene	< 10	ug/L
		Phenanthrene	< 10	ug/L
		Phenol	< 10	ug/L
		Pyrene	< 20	ug/L
		Pyridine	< 10	ug/L
		Quinoline	< 10	ug/L
		m-Cresol	< 10	ug/L
		o-Cresol	< 10	ug/L
		p-Cresol		

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REPORT OF LABORATORY ANALYSIS

SUPPLEMENTAL INFORMATION

LN	TEST CODE	LCSR BLNK BATCH	DUP/MS MS/MSD BATCH	SAMPLE PREPARATION LR-METHOD	SAMPLE PREPARATION DATE/TIME	SAMPLE PREPARATION ANALYST	SAMPLE ANALYSIS LR-METHOD	SAMPLE ANALYSIS DATE/TIME	SAMPLE ANALYSIS ANALYST	SAMPLE ANALYSIS INSTRUMENT
SAMPLE ID: OWA 5								SAMPLE NO: M285282		
1	OVSKW	44275	44266	NA			19-8240	21-OCT-94 1810	EHM	GCMSQ
3	OSVSKW	44182	43935	19-3520A	20-OCT-94 0300	RDQ	19-8270	30-OCT-94 1140	CAR	GCMST
SAMPLE ID: OWA 6								SAMPLE NO: M285283		
1	OVSKW	44275	44266	NA			19-8240	21-OCT-94 1841	EHM	GCMSQ
3	OSVSKW	44182	43935	19-3520A	20-OCT-94 0300	RDQ	19-8270	30-OCT-94 1224	CAR	GCMST

LR Method Literature Reference

19 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986 and updates

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REPORT OF LABORATORY ANALYSIS

October 31, 1994
Report No.: 00035620
Section C Page 1

SURROGATE STANDARD RECOVERY

LN	TEST CODE	SURROGATE COMPOUND	PERCENT RECOVERY	ACCEPTANCE LIMITS	REF LN
SAMPLE ID: OWA 5				SAMPLE NO: M285282	
2	SVOAW	GC/MS Volatiles Surrogates			1
		4-Bromofluorobenzene	103	-	
		Dibromofluoromethane	100	-	
		Toluene-d8	100	-	
4	SBNAW	GC/MS BNA Surrogates			3
		2,4,6-Tribromophenol	90	-	
		2-Fluorobiphenyl	90	-	
		2-Fluorophenol	84	-	
		Nitrobenzene-d5	72	-	
		Phenol-d5	87	-	
		p-Terphenyl-d14	121	-	
SAMPLE ID: OWA 6				SAMPLE NO: M285283	
2	SVOAW	GC/MS Volatiles Surrogates			1
		4-Bromofluorobenzene	103	-	
		Dibromofluoromethane	111	-	
		Toluene-d8	102	-	
4	SBNAW	GC/MS BNA Surrogates			3
		2,4,6-Tribromophenol	89	-	
		2-Fluorobiphenyl	81	-	
		2-Fluorophenol	75	-	
		Nitrobenzene-d5	64	-	
		Phenol-d5	76	-	
		p-Terphenyl-d14	109	-	

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October 31, 1994
Report No.: 00035620

LABORATORY CONTROL SAMPLE RECOVERY

TEST CODE	DETERMINATION	LCS % RECOVERY	ACCEPTANCE LIMITS
			SAMPLE NO: R338262
BATCH NO: 44275			
OVSKW	Skinner List Volatiles in Water		
	1,1-Dichloroethylene	81	"
	Benzene	92	"
	Chlorobenzene	90	"
	Toluene	87	"
	Trichloroethene	91	"

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October 31, 1996
Report No.: 00035620

METHOD BLANK DATA

TEST CODE	DETERMINATION	RESULT	UNIT
		SAMPLE NO:	H338139
BATCH NO:	44182		
OSVSKW	Skinner List Semi-volatiles in Water	< 10	ug/L
	1-Methyl naphthalene	< 10	ug/L
	2,4-Dimethylphenol	< 50	ug/L
	2,4-Dinitrophenol	< 50	ug/L
	4-Nitrophenol	< 10	ug/L
	7,12-Dimethylbenz(a)anthracene	< 10	ug/L
	Anthracene	< 10	ug/L
	Benzenethiol	< 10	ug/L
	Benzo(a)anthracene	< 10	ug/L
	Benzo(a)pyrene	< 10	ug/L
	Benzo(b)fluoranthene	< 10	ug/L
	Benzo(k)fluoranthene	< 10	ug/L
	Bis(2-ethylhexyl)phthalate	< 10	ug/L
	Butyl benzyl phthalate	< 10	ug/L
	Chrysene	< 10	ug/L
	Di(n)butyl phthalate	< 10	ug/L
	Di(n)octyl phthalate	< 10	ug/L
	Dibenz(a,h)acridine	< 10	ug/L
	Dibenz(a,h)anthracene	< 10	ug/L
	Dichlorobenzenes	< 10	ug/L
	Diethyl phthalate	< 10	ug/L
	Dimethyl phthalate	< 10	ug/L
	Fluoranthene	< 10	ug/L
	Indene	< 10	ug/L
	Methyl chrysene	< 10	ug/L
	Naphthalene	< 10	ug/L
	Phenanthrene	< 10	ug/L
	Phenol	< 10	ug/L
	Pyrene	< 20	ug/L
	Pyridine	< 10	ug/L
	Quinoline	< 10	ug/L
	m-Cresol	< 10	ug/L
	o-Cresol	< 10	ug/L
	p-Cresol		
		SAMPLE NO:	H338263
BATCH NO:	44275		
OVSKW	Skinner List Volatiles in Water	< 5	ug/L
	1,2-Dichloroethane	< 500	ug/L
	1,4-Dioxane	< 5	ug/L
	Benzene	< 5	ug/L
	Carbon Disulfide	< 5	ug/L
	Chlorobenzene	< 5	ug/L
	Chloroform	< 5	ug/L
	Ethyl Benzene		

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REPORT OF LABORATORY ANALYSIS

METHOD BLANK DATA

TEST CODE	DETERMINATION	RESULT	UNIT
		< 5	ug/L
	Ethylene Dibromide	< 10	ug/L
	Methyl Ethyl Ketone	< 5	ug/L
	Styrene	< 5	ug/L
	Toluene	< 5	ug/L
	Xylene		

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REPORT OF LABORATORY ANALYSIS

October 31, 1994
Report No.: 00035620
Section B Page 1

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE DATA

TEST CODE	DETERMINATION	MS RESULT	MSD RESULT	UNITS	RPD	MS PCT RCVRY	MSD PCT RCVRY
BATCH NO: 43935						SAMPLE NO: N284744	
OSVPPW	Semi-volatile Extractables in Water						
	1,2,4-Trichlorobenzene	83.5	76.2	ug/L	9.1	83.5	76.2
	1,4-Dichlorobenzene	75.4	67.5	ug/L	11	75.4	67.5
	2,4-Dinitrotoluene	73.8	71.2	ug/L	3.6	73.8	71.2
	2-Chlorophenol	76.9	67.6	ug/L	13	76.9	67.6
	4-Nitrophenol	92.0	97.5	ug/L	5.6	92.0	97.5
	Acenaphthene	79.5	71.2	ug/L	11	79.5	71.2
	N-Nitrosodi-n-propylamine	82.0	76.4	ug/L	7.1	82.0	76.4
	Pentachlorophenol	57.1	50.1	ug/L	13	57.1	50.1
	Phenol	80.6	71.3	ug/L	12	80.6	71.3
	Pyrene	75.0	78.6	ug/L	8.2	75.0	78.6
	p-Chloro-m-cresol	84.5	82.1	ug/L	2.9	84.5	82.1
BATCH NO: 44266						SAMPLE NO: N284460	
OVIXW	Appendix IX Volatiles in Water						
	1,1-Dichloroethene	103	96	ug/L	7	103	96
	Benzene	178	152	ug/L	16	178	152
	Chlorobenzene	111	105	ug/L	6	111	105
	Toluene	122	113	ug/L	8	122	113
	Trichloroethene	117	104	ug/L	12	117	104

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CHAIN-OF-CUSTODY RECORD

Analytical Request

Client:	ECOVA-AMOCO	Report To:	Jay Burns	Lab:	Pace
Address:	1000 N. Sterling	Bill To:	Jay Burns / ECOVA	Lab Project Manager:	Ted Tanis
	Sugar Creek, MO 64054	P.O.# / Billing Reference:		Lab Project No.:	401903
Phone #:	(816) 836-6045 / 254-1185	Project Name / No:	ARMCO	Turn Around Time	10 Days
Fax #:	(816) 461-7205	Sampled By:	Jerry Hammer	Requested Due Date:	10/31/94
		Date Sampled:	10/14/94	Method Shipped:	Courier

					PRESERVATIVES							ANALYSES REQUESTED												
ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	LAB NO.	# of containers	HNO3	HEX RINSE	HCL				Dissolved Pb, Cd, Cr	Volatiles*	Semivolatiles*										REMARKS
1	OWA 5	10:45	Water	401483	6	1	2	3				X	X	X										
2	OWA 6	11:00	Water	401484	6	1	2	3				X	X	X										
3																								
4																								
5																								
6																								
7																								
8																								

ADDITIONAL COMMENTS

* Per attached skinner list

Note: Metals have been field filtered

COOLER TEMPERATURE:

ITEM NUMBER	RELINQUISHED BY	ACCEPTED BY / AFFIL.	DATE	TIME
	J. Hammer	Pathy Fo / Pace	10/14/94	1530
			10/14/94	16:45

REMCOR

"REALISTIC SOLUTIONS FOR HAZARDOUS WASTE PROBLEMS"

Return to Drawer 52

DRAFT REPORT

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

KANSAS CITY WORKS
KANSAS CITY, MISSOURI

DRAFT REPORT

IDLED FACILITIES
ENVIRONMENTAL INVESTIGATION

KANSAS CITY WORKS
KANSAS CITY, MISSOURI

DRAFT REPORT

IDLED FACILITIES
ENVIRONMENTAL INVESTIGATIONS

KANSAS CITY WORKS
KANSAS CITY, MISSOURI

PREPARED FOR

ARMCO INC.
KANSAS CITY, MISSOURI

NOVEMBER 2, 1990

PROJECT NO. 89316.15

REMCOR, INC.
PITTSBURGH, PENNSYLVANIA

REALISTIC SOLUTIONS FOR HAZARDOUS WASTE PROBLEMS

REMCOR

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1.0 INTRODUCTION

This report presents the findings of the environmental investigation conducted by Remcor, Inc. (Remcor) for Armco Inc. (Armco) at certain idled facilities within the Kansas City Works (Figure 1). The idled facilities that were the subject of this study included the aboveground portions of the following:

- Open hearth and soaking pits
- Blooming mill and 18-inch mill
- 10-inch mill
- Wire mill
- Nail mill
- 7 electrical substations.

In addition, a limited subsurface investigation was conducted within the nail degreasing area of the nail mill. The idled facilities ("the site") are depicted in Figure 2.

The objectives of this investigation were threefold:

- Characterize and evaluate identified environmental issues (hydraulic systems, electrical substations, accumulated dusts, the nail degreasing area, refractory brick, and oil rooms)
- Define potential correction action requirements
- Develop corrective action work plans and cost estimates, as required.

This report describes the activities conducted during the environmental investigation, presents the results of the sample collection and analysis programs, and documents Remcor's conclusion and recommendations with respect to the three investigation objectives.

1.1 BACKGROUND

The subject site facilities have been idle since June 1983. These facilities are currently being used for storage or have remained unused since shutdown. While future uses remain undetermined, the probable disposition of the site facilities includes:

- Scrapping or resale of equipment
- Demolition and scrap recovery of certain buildings
- Land surface regrading.

The site may be sold for industrial redevelopment. It is unlikely, however, the site will be sold for reuse as steelmaking facilities.

1.2 KANSAS CITY WORKS

The Armco Kansas City Works is located in Jackson County, Missouri, on a tract of land more than 1,000 acres in size. The Kansas City Works occupies both sides of the (Big) Blue River just south and immediately upstream of its confluence with the Missouri River in the Kansas City area (Figure 1). The site is comprised of a portion of the Kansas City Works.

Activities at the Kansas City Works have consisted of steelmaking, primary steel forming, and steel finishing operations. Steelmaking operations utilized two open hearth furnaces and two melt shops. Primary steel forming and finishing operations were performed within the site limits at the blooming mill, 10-inch mill, wire mill, and nail mill.

Currently, only the No. 2 melt shop and its associated continuous caster (primary billet-forming operation) are operational.

1.3 REGIONAL SETTING

The following subsections briefly discuss the topography, drainage, geology, and hydrogeology of the region that surrounds the site.

1.3.1 Topography and Drainage

The majority of the site lies at approximately 750 feet above mean sea level (ft-msl). The region surrounding the site is an area of rolling and plain topography with dendritic streams of mature developmental stage (McCourt, et al., 1917). River and stream valleys are wide and flat-bottomed.

The average annual flow rate of the Missouri River in Kansas City is 56,000 cubic feet per second (cfs) (Waite, 1987). In comparison, the average annual flow rate of the Blue River, near its confluence with the Missouri, is on the order of 200 cfs (Waite, 1987). The approximate 100-year flood elevation of the Missouri River at Kansas City is 738 ft-msl. Because the flow of the Missouri River is highly regulated in this area, the occurrence of a 100-year flood may be more a function of river regulation than a significant rainfall event(s). For this reason, the U.S. Department of Labor, Geological Survey is reluctant to recognize an official 100-year flood elevation for the Missouri River near the site (Waite, 1987).

1.3.2 Geology

The site region is part of the Osage Plains portion of the Interior Plains physiographic province (Emmett, 1985; Anderson, et al., 1979), located midway between the Ozark Plateau and the Great Plains (McCourt, et al., 1917). The geology of the Osage Plains is relatively uncomplicated, predominated by relatively flat-lying sedimentary rocks (dipping 10 to 20 feet per mile to the west-northwest) and unconsolidated alluvial deposits in the valleys (Parizek, et al., 1968).

Locally derived alluvium deposits form the valley bottom along the Blue River. Blue River alluvium deposits may be as much as 30 feet thick in the vicinity of the site (Parizek, et al., 1968). The natural alluvial deposits consist primarily of high- and low-plasticity clays (U.S. Army Corps of Engineers, 1983). Sandy clays and poorly graded sands exist at depth, buried by the clayey and silty surface materials.

The upper bedrock is comprised of argillaceous to sandy, micaceous shale of the Pleasanton Group. Thin, fossiliferous siltstone beds are also present in upper portions of the Pleasanton Group (Parizek, et al., 1968).

1.3.3 Hydrogeology

Aquifers in the site region may occur in either bedrock or unconsolidated materials. Bedrock aquifers typically consist of sandstones, where permeability is controlled by primary porosity, or within limestone, where permeability is generally a function of the density and interconnection of fractures. Typical yields from domestic wells tapping regional bedrock aquifers are less than 20 gallons per minute (gpm) (Imes, 1987). Near major rivers, these bedrock aquifers are not commonly used for domestic, industrial, or municipal water supplies.

Deposits of alluvium deposits along the Missouri River near the site are widely used ground water supply sources by both industry and individuals. Wells developed in these deposits commonly yield on the order of several thousand gpm (Emmett, 1985). Ground water is typically encountered at shallow depths (less than 20 feet) with flow directions toward the center line of the alluvial valleys.

Other unconsolidated deposits (nonalluvial), such as glacial drift, are present within the site region. These drift deposits typically consist of thin mantles of silty clay material that transmit only small quantities of ground water.

2.0 ENVIRONMENTAL ISSUES AND FIELD ASSESSMENT PROCEDURES

The following chapter describes the environmental issues associated with the site facilities. Environmental issues and field assessment procedures were identified from a site inspection of September 13, 1989 and Remcor's prior experiences at the Kansas City Works and similar plants.

2.1 HYDRAULIC SYSTEMS

Hydraulic systems are present throughout the site. The rolling mills, in particular, contain numerous hydraulic rolling machinery and other hydraulic systems. There are accumulations of oils, greases, and related solids in areas surrounding this machinery. The scale and sediment in the scale pits may contain oil and grease concentrations. Oil and grease accumulations on equipment and machinery were assessed through visual inspections. Hydraulic fluids from these systems (which were sampled to determine whether they contained polychlorinated biphenyls [PCBs]) also remain on site as residues and in bulk form.

Fire-retardant and/or heat-resistant oils may have been used in some hydraulic systems associated with rolling operations and material handling systems. The main hydraulic reservoirs and pumps for these systems are housed in below-grade oil cellars or above-grade reservoir systems. Most hydraulic lines, fittings, pumps, and auxiliary reservoirs are located on the main level of

the facilities. Prior to 1978, the hydraulic fluids in these systems may have contained concentrations of PCBs. Potential for PCB contamination may exist in the following areas:

- Mill scale, scale handling, and storage areas (including the scale pits)
- Oils in equipment, reservoirs, and storage tanks
- Exterior surfaces of hydraulic system components or electrical switchgear
- Walls and floors coated with oil and grease as a result of fluid spills or leaks during active operation of the mill
- Interiors of electrical substations.

To assess the possible presence of PCBs, hydraulic system fluids and residues were sampled and analyzed for PCBs using both wipe sampling and bulk sampling techniques.

2.2 ELECTRICAL SUBSTATIONS

Electrical substations containing transformers and other fluid-filled electrical equipment containing PCBs are present throughout the site. Armco has maintained an accurate account of transformers containing PCB fluids, which enabled Remcor to identify areas of potential contamination. PCB wipe samples were collected at each substation location to assess the potential for past spills and determine whether PCB has become spread throughout the substations.

2.3 ACCUMULATED DUSTS

Accumulated dusts generated during steelmaking and forming activities may contain metals in concentrations that require special handling. These dusts were sampled and analyzed for extraction procedure (EP) toxicity metals and selected total metals to assess special handling needs associated with reuse or demolition of site facilities (such as open hearth furnace and soaking pit areas), with large quantities of accumulated dusts.

2.4 NAIL DEGREASING AREA

Volatile organic compounds (VOCs) (chlorinated solvents) were used in degreasing operations within the site nail mill. Flooring test boring concrete core and subsurface soil samples were collected and analyzed for VOCs to assess to the potential for past releases of VOCs in the nail degreasing area.

2.5 REFRACTORY BRICK AND MORTAR

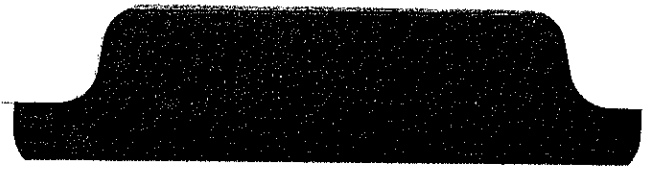
Refractory brick and mortar in the soaking pits may contain metals in concentrations that require special handling. To assess this potential environmental issue, mortar and brick samples were collected from the soaking pits for EP toxicity analyses.

2.6 OIL ROOMS

Several oil storage rooms and vaults (cellars) are present within the idled facilities. These cellars were inspected to assess areas potentially requiring remediation. Each cellar houses oil tanks, which were used to supply above-grade hydraulic systems.

2.7 WASTE ACID STORAGE

The waste acid storage area may present an environmental issue due to its historic use and known acid spills. However, this issue was not assessed at this time due to work being conducted in this area by Armco.



3.0 INVESTIGATION METHODOLOGY

This chapter describes the procedures used in the environmental investigation for the collection and analysis of samples. Techniques for proper sample handling and documentation are also addressed.

3.1 SAMPLE DOCUMENTATION

Due to the large number of samples collected and the wide array of chemical and physical characterizations in the environmental investigation, specialized collection nomenclature and chain-of-custody (COC) procedures were employed. These procedures are discussed below.

3.1.1 Sample Nomenclature

Samples of the following media were collected from the idled facilities:

- Dust accumulations on interior horizontal perched and floor surfaces
- Wipes of surfaces showing oil staining associated with hydraulic systems and electrical substations
- Wood flooring, concrete cores, and soil cores in the nail degreasing area
- Refractory brick and mortar linings from soaking pits
- Hydraulic fluid residues from equipment associated with hydraulic systems.

The following nomenclature was used for samples collected during the investigation:

AKC-AA-AAA-NN

where:

AKC - Armco Kansas City Works

AA - two-letter code to identify the plant area from which the sample was collected, for example:

- TM - 10-inch mill
- SP - scale pit
- ND - nail mill degreasing
- BM - blooming mill/18-inch mill
- WM - wire mill
- NM - nail mill

AAA - sampled medium:

- HSW - hydraulic system wipe
- HSB - hydraulic system bulk
- ESW - electrical substation wipe
- ADB - accumulated dust bulk
- RBB - refractory brick bulk
- WCB - wood core bulk
- NDC - nail degreasing core
- S1 - Substation 1
- S3 - Substation 3
- S4 - Substation 4
- S5 - Substation 5
- S9 - Substation 9
- S14 - Substation 14

NN - two-digit number identifying the sample in sequence of collection within the sample type and area.

3.1.2 Sample Chain of Custody

Each sample bottle label contained the following information:

- Client name and Remcor project number
- Sample identification (name)
- Analytical requirements
- Date and time of collection
- Sampler's initials.

A label containing the sample name, date, and time of collection was also attached to each container's lid. Samples were kept secure (under lock and key) in Remcor's on-site supply room during the project. COC forms were maintained by Remcor's sampling personnel and accompanied samples to the laboratory. Samples were sealed in rigid plastic coolers for shipment. The samples were shipped via overnight delivery to Antech Ltd. of Export, Pennsylvania.

3.2 SAMPLE COLLECTION TECHNIQUES

Techniques for collecting samples of the different sample matrices (Section 2.1.1) are presented below.

3.2.1 Wipe Samples

Wipe samples were collected from 12- by 12-inch areas delineated by a chalk outline in all but one case. One sample required collection from an area that measured 12 by 15 inches. The sterile gauze wipes were soaked in laboratory-grade hexane in individual 250-milliliter (mℓ) glass jars prior to use. Prior to collection of the sample, the gauze wipe was removed from the container, and excess hexane was discarded. The sample was collected after loose debris was removed from the sample area by wiping the outlined area once with horizontal strokes and once with vertical strokes with the hexane soaked wipe. The wipe was then placed inside its container and labeled accordingly. Wipe samples were collected from both machinery and masonry surfaces in areas of potential PCB contamination.

Blank wipe samples were prepared so that of the sampling methodology could be assessed. Blank wipe samples were prepared by using a randomly chosen sample container, removing the gauze pad, discarding the excess hexane, and replacing the gauze pad in the container for PCB analyses.

3.2.2 Bulk Samples

Bulk accumulated dust samples were collected using decontaminated stainless steel trowels. Accumulated dust samples were then placed into 250-mℓ glass jars with Teflon™-lined lids. Accumulated dust samples represent a composite of dust from relatively small areas with similar use patterns (e.g., lead baths, galvanizing area).

Bulk samples from hydraulic system residues were collected in a fashion similar to that of the bulk accumulated dust samples. These samples were composited from much smaller areas, usually associated with a single hydraulic unit or operation.

Wood chips from the floor beneath degreasing equipment were collected using a hammer, chisel, and stainless steel spatula. The shavings were collected from the surface to approximately 4 inches and placed into 250-mℓ glass jars. Since the target analysis was for VOCs, these sample jars were packed with minimal headspace and placed on ice. The delivery of these samples to the laboratory was expedited to maintain the appropriate sample holding times.

Bulk samples of refractory brick and mortar, which displayed a charred surface, were collected from the soaking pits by chipping sample fragments into a sample bottle. Samples were also collected of apparently unused bricks and in-place mortar from the hood rebuilding area adjacent to the soaking pits.

Bulk soil and concrete samples were collected from beneath the wood flooring in the nail degreasing area. The soil and concrete samples were collected using coring techniques and placed immediately into glass sample jars. Since the target analysis was for VOCs, these sample jars were packed with minimal headspaces and placed upon ice. The delivery of the soil and concrete samples to the laboratory was expedited to maintain the appropriate sample holding times.

3.3 SAMPLE LOCATIONS AND ANALYTICAL REQUIREMENTS

Remcor followed a focused sampling approach based on experience from similar investigations and visual observations made during several site walk-throughs. Remcor's intent was to adequately, accurately, and efficiently characterize the site. Samples were collected from areas with the greatest probability for contamination. Tables 1 through 5 summarize sample location and type; Figures 3 through 8 present sample locations.

3.3.1 Hydraulic System Wipe and Bulk Samples

Samples were collected from oily surfaces and material on and around hydraulic equipment that would have been subject to extreme heat. These areas would be more likely to have required the use of hydraulic fluids containing PCBs. The samples were analyzed for PCBs.

Although oil and grease concentrations may pose an environmental issue, hydraulic system sample location points were not considered to pose a threat of environmental release since each was housed inside a site building. However, it is believed that most of the hydraulic system samples would have exhibited oil and grease concentrations in excess of 10 percent by weight.

A total of 9 wipe and 10 bulk samples were collected during the environmental investigation from hydraulic systems. One wipe sample was collected from the nail mill. Three and five wipes were taken from the 10-inch and blooming mills, respectively. As a quality assurance, two blank wipes were prepared and submitted for analysis.

Four hydraulic system bulk samples were collected from the blooming mill; four were collected from the 10-inch mill and one replicate sample was collected from the exterior scale pit. These samples were submitted to the laboratory for PCB analysis.

One of the replicate bulk samples (AKC-HSB-SP-01) collected from the scale pit was submitted for total chromium analysis as well as for PCBs since chromium concentrations could be elevated in the scale pit as a result of the scaling operations.

3.3.2 Electrical Substation Wipe Samples

Based upon a review of Armco records, six electrical substations (Substations 1, 3, 4, 5, 9, and 14) as well as the 10-inch mill motor control room were found to house PCB-containing transformers. A total of 14 wipe samples were collected from these seven areas and analyzed for PCBs. Generally, two samples were collected at each substation. One sample was collected immediately adjacent to the transformer(s) (within the confines of the containment dike around PCB-containing transformers), and one was collected from the floor in a relatively high-traffic area within the substation. One substation (No. 5) required the collection of three wipes, while Substation 9 required only one wipe to achieve these objectives. Ceilings and walls were inspected for visual evidence of fire or other events that could have caused a release of the transformer fluids.

3.3.3 Accumulated Dust Samples

Eight samples of accumulated dusts were collected from locations throughout the site. Two samples were collected from the blooming mill, three from the 10-inch mill, and three from the wire

mill. Samples were analyzed for EP toxicity metals, total chromium, total cadmium, total zinc, and total lead. The guiding philosophy was to collect samples from areas that would likely contain the greatest metals concentrations (e.g., wire mill lead baths).

3.3.4 Nail Degreasing Area Samples

Bulk samples of wood flooring, concrete core, and soil core were collected from two locations near the two degreasing units in the nail mill. The handling techniques for these samples are discussed in Section 4.2.2. The nail degreasing area samples were analyzed for the priority pollutant list of VOCs since the solvent in primary use was TCE, a priority pollutant.

3.3.5 Refractory Brick and Mortar Samples

Two bulk samples of refractory brick and one sample of the associated mortar were collected; one brick sample from soaking pit No. 5 and one mortar and one brick sample from the hood of the hoist rebuilding mold. These samples were analyzed for total chromium and were also subjected to the EP toxicity leaching procedure. Chromium is often detected in bricks in EP toxic (i.e., RCRA hazardous) concentrations.

3.4 OIL ROOM OBSERVATION

An oil cellar was noted in the blooming mill area (Figure 3). This cellar was found to have free oil on the floor. Because this oil cellar was used in support of above-grade hydraulic systems, which were thoroughly sampled for PCB, samples were not collected from this cellar.

4.0 REGULATORY FRAMEWORK AND REMEDIATION STANDARDS

Federal and state regulations have been reviewed to establish standards for remediation of the environmental issues identified for the site. The resulting remediation standards are described in this chapter with regulatory references where applicable.

4.1 OIL AND GREASE RESIDUES

Under state hazardous waste regulations found at Title 10 of the Missouri Code of State Regulations, Division 25 (10 CSR 25), bulk material containing 10 percent or more petroleum products (i.e., oil and grease) by weight is classified as a hazardous waste. Bulk materials that exceed this threshold require corrective action such as removal and disposal in an appropriate landfill. Bulk materials that do not exceed this criterion and do not pose a release threat to surface waters do not require corrective action under these state regulations.

4.2 POLYCHLORINATED BIPHENYLS

The residues and any contamination due to PCB leaks or spills may be subject to control under the Toxic Substances Control Act (TSCA). TSCA requirements would apply directly to any PCB contamination resulting from activities occurring after the effective date of the TSCA (February 17, 1978). Since the site facilities were in operation before and after that date, it may not be possible to accurately date evidence of historic spills or

leaks if they have occurred. In any case, the regulations and guidelines published under TSCA should be used as remediation performance standards if PCB contamination is found in the site facilities.

The U.S. Environmental Protection Agency (EPA) has published an extensive policy under TSCA, with respect to cleanup of spills and leaks of PCBs (EPA PCB Spill Cleanup Policy, Federal Register 10688, April 2, 1987). This policy is directly applicable only to spills or leaks occurring after the effective date of the policy, May 2, 1987. Although the EPA PCB Spill Cleanup Policy may not be directly applicable, it does provide cleanup standards that may be suitable guidance. Within the assumptions on which the policy is based, the policy states that a residual PCB level of 10 micrograms per 100 square centimeters (µg/100 cm^2) on indoor, low-contact surfaces (including concrete floors) in industrial areas would not be expected to result in significant exposure to workers or the public. As an alternative to cleaning to the 10 µg/100 cm^2 standard, the EPA PCB Spill Cleanup Policy also allows cleaning of low-contact, indoor nonimpervious surfaces to 100 µg/100 cm^2 with encapsulation of the surface provided that failure of the encapsulant will not result in an imminent hazard. Also, areas that are considered impervious solid surfaces are required by the policy to be cleaned to the 10 µg/100 cm^2 criterion. Although it may not be a specific legal

requirement for the idled facilities site, the EPA PCB Spill Cleanup Policy offers adequate protection from future exposure to PCB and appropriate guidance for corrective actions regarding PCBs.

PCB concentrations in solids should be compared to a cleanup standard of 10 micrograms per gram (µg/g). The EPA PCB Spill Cleanup Policy requires that for spills in nonrestricted access areas, which are subject to the policy, soil be decontaminated to 10 µg/g PCBs by weight, provided that soil is excavated to a minimum depth of 10 inches and be replaced by clean soil. The standard for nonrestricted access areas is applied to the idled facilities because future use for the building and site are not currently known.

PCB concentrations in oils are compared to a cleanup standard of 2 µg/g. This concentration is the EPA action level for examining PCB contamination of equipment.

4.3 METALS CONCENTRATIONS IN ACCUMULATED DUSTS AND BUILDING MATERIALS

Accumulated dust and building materials in the furnace ducts may contain metals regulated under the Resource Conservation and Recovery Act (RCRA). If laboratory-prepared leachates produced using the EPA EP contain certain metals at concentrations above

those identified at Title 40, Code of Federal Regulations (CFR), Part 261.241 (40 CFR 251.241), the dust or material from which the leachate was extracted would be defined as a characteristic hazardous waste.(1)

4.4 VOLATILE ORGANIC COMPOUNDS

Trichloroethylene (TCE) was used in nail finishing operations as a degreaser. TCE is a hazardous substance as defined under the Comprehensive Environmental Response, Compensation, and Liability Act, and currently generated spent solvents containing TCE are identified in the RCRA regulations as listed hazardous wastes (40 CFR 261, Subpart D). Even if not a RCRA hazardous waste, materials contaminated with TCE may be considered evidence of a solid waste management unit under provision of RCRA as amended by the Hazardous and Solid Waste Amendments of 1984. A discussion of potential notification requirements regarding TCE releases is presented as Appendix A.

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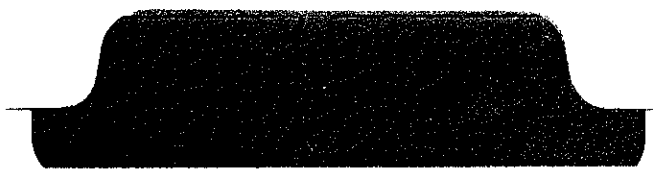
(1) Under state and federal hazardous waste regulations, the EP toxicity test procedure has been replaced by the toxicity characteristic leaching (TCL) procedure effective September 25, 1990. Remcor's experience to date in comparing EP and TCL testing results suggests that these tests will produce similar data for metals-bearing dusts. The conclusions drawn in this study based on EP data are not expected to change significantly based on the new TCL testing requirements.



5.0 SUMMARY OF FINDINGS

This chapter discusses the results of the analyses of samples collected during the environmental investigation of the idled facilities. Sample results are summarized in Tables 1 through 5 and detailed in Appendix B.

5.1 HYDRAULIC SYSTEM SAMPLES

Wipe and bulk samples collected from hydraulic systems were analyzed for PCB and metals, but not for oil and grease. Most of the sampled areas were visually determined to be covered with oil and grease, and removed residues would most likely exceed 10 percent oil and grease by weight. Areas with the greatest oil and grease accumulations were the blooming mill conveyor and oil vault.

5.1.1 Wipe Samples

Nine wipe samples were collected from oily surfaces on hydraulic system equipment. The samples were analyzed for PCBs. The results are shown in Table 1. None of the samples contained detectable concentrations of PCBs. Likewise, the two blank wipe samples and the sample of hexane contained no detectable PCBs.

5.1.2 Bulk Samples

Ten bulk samples and one replicate were collected of hydraulic fluid residues (grease and oily scale). These samples were analyzed for PCBs, and one grease sample, AKC-HSB-SP-01, from the interior of the blooming mill scale pit was analyzed for total chromium as well. None of the samples contained detectable concentrations of PCBs. Sample AKC-HSB-SP-01 contained 570 µg/g of total chromium. These results are shown in Table 1.

5.2 ELECTRICAL SUBSTATIONS

A total of 14 wipe samples were collected from seven substations located within the idled facilities. Samples from Substations 1, 3, and 14 and the 10-inch mill motor control center did not contain detectable concentrations of PCBs. Samples AKC-ESW-S4-01 and AKC-ESW-S4-02 from Substation 4 contained 194 and 22 µg/100 cm^2 PCB, respectively. Samples AKC-ESW-S5-01, AKC-ESW-S5-02, and AKC-ESW-S5-03 from Substation 5 contained 226, 100, and 2 µg/100 cm^2, respectively. The sample from Substation 9 contained 2 µg/100 cm^2. These results are shown in Table 2.

5.3 ACCUMULATED DUST

Eight samples of accumulated dust were collected from the blooming mill, the 10-inch mill, and the wire mill and analyzed for total cadmium, total chromium, total lead, and total zinc. Two of those samples, AKC-ADB-WM-03 and AKC-ADB-TM-03, were also analyzed for EP toxicity metals. These sample results are summarized in Table 3.

Total cadmium concentrations ranged from 0.8 µg/g in Sample AKC-ADB-TM-03 from the soaking pits to 13 µg/g in Sample AKC-ADB-WM-03 from the area near the wire mill acid baths. The average cadmium concentration is 4.7 µg/g. Total chromium concentrations ranged from 170 µg/g in Sample AKC-ADB-TM-03 from the soaking pit area to 670 µg/g in Sample AKC-ADB-BM-02 from a perched area near the blooming mill ingot receiving table. The average chromium concentration from all the samples is 400 µg/g. Lead concentrations ranged from 150 to 39,000 µg/g in Sample AKC-ADM-TM-03 in the 10-inch mill and Sample AKC-ADA-WM-01 in the wire mill near the former lead baths, respectively. Sample AKC-ADB-WM-01 was collected from an area near the lead baths in the wire mill. Similarly, Sample AKC-ADB-WM-03 from near the wire coating acid baths contained 2,400 µg/g of lead. The average concentration from the other samples is 350 µg/g. Zinc concentrations range from 400 to 28,000 µg/g in Samples AKC-ADB-TM-01 and AKC-ADB-WM-03, respectively. Sample AKC-ADB-TM-01 was collected from on top of the reheat furnace in the blooming mill, while Sample AKC-ADB-WM-03 was collected from the former acid baths on the wire coating lines. The average zinc concentration, excluding Sample AKC-ADB-WM-03, is 2,000 µg/g. Neither of the samples that were analyzed for EP toxicity metals exhibited the characteristic of an EP toxic hazardous waste.

5.4 NAIL DEGREASING AREA

Two bulk samples of wood flooring material (Samples AKC-WCB-ND-01 and AKC-WCB-NO-02) were collected from near the two nail degreasing units. The samples were analyzed for priority pollutant VOCs. Sample AKC-WCB-ND-01 contained 28,000 micrograms per kilogram (µg/kg) TCE. Sample AKC-WCB-ND-02 contained 17,000 µg/kg TCE and 1,400 µg/kg 1,1,1-trichlorothane (1,1,1-TCA).

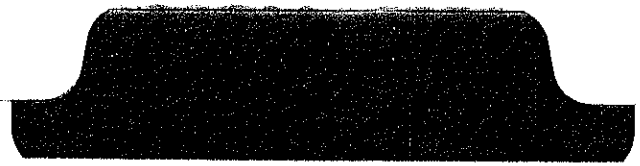
Sampling of the concrete core revealed lower levels of 1,1,1-TCA and TCE. One concrete sample showed 290 µg/kg 1,1,1-TCA and 1,400 µg/kg TCE, while the other showed 22 µg/kg TCE and 49 µg/kg benzene. It is likely that the VOC concentrations shown in the concrete cores are lower than in other matrices due to the procedures required to sample and analyze the core samples.

Soil Sample AKC-NDC-015 showed 22,000 µg/kg 1,1,1-TCA, 850 µg/kg 1,1-dichloroethene, 1,200 µg/kg tetrachloroethene, and 100,000 µg/kg TCE. Soil Sample AKC-NDC-052 showed 67,000 µg/kg TCE. Detection levels for all compounds were elevated to 625 µg/kg. Summarized results are shown in Table 4.

5.5 REFRACTORY BRICK

Two samples of refractory brick and one mortar sample were collected as discussed above. These samples were analyzed for total chromium and EP toxicity metals. Summarized results are shown in Table 5.

Total chromium concentrations ranged from 9 to 150 µg/g on Samples AKC-RBB-TM-01 and AKC-RBB-TM-03, respectively. Sample AKC-RBB-TM-01 represents an apparently new refractory brick from the hood of the northern hoist rebuilding mold, while Sample AKC-RBB-TM-03 was a charred brick from the lining of the No. 5 soaking pit. The latter is representative of the chromium concentrations found in used liner bricks. None of the refractory brick and mortar samples exhibited the characteristic of an EP toxic hazardous waste.



6.0 CONCLUSIONS

The following conclusions, which are intended to characterize the site, are based upon our evaluation of the environmental issues presented herein.

6.1 HYDRAULIC SYSTEMS

Materials containing oil and grease are located on much of the hydraulic equipment within the site facilities. Hydraulic equipment in the blooming mill and the 10-inch mill appear to contain the greatest quantities of oil and grease accumulation. Based on visual observations, the majority of these accumulations contain oil and grease in excess of 10 percent by weight. The analytical data indicate that PCBs are not present in hazardous concentrations either on hydraulic equipment surfaces or in hydraulic system bulk residues. The only corrective action associated with site hydraulic systems would be the removal of oil and grease residuals during the course of any equipment removal.

6.2 ELECTRICAL SUBSTATIONS

Analytical data and visual inspections of 10-inch mill motor control room as well as Substations 1, 3, and 14 do not indicate historical PCB releases. The data do indicate that low concentrations of PCBs exist in Substation 9, and the surfaces in Substations 4 and 5 do contain surface PCB concentrations that exceed the criteria set forth in the EPA PCB Spills Cleanup

Policy. The only corrective action associated with the site electrical substations would be the remediation of PCB-contaminated surfaces within Substations 4 and 5. Remcor assumes that Armco will continue the appropriate TSCA inventory and control of PCB transformers at the idled facilities until these transformers are removed from the site.

6.3 ACCUMULATED DUST

Accumulated dusts are prevalent throughout the site facilities and would need to be addressed during site redevelopment and demolition. Metals concentrations in the dusts are generally not high enough to render these materials hazardous wastes when removed. Exceptions to this may include the dust in the wire mill lead baths (which contained 39,000 µg/g total lead). The dust within the acid baths contained 280,000 µg/g of total zinc.

Throughout most of the facility, the dusts could reasonably be addressed as nuisance dust. Environmental actions associated with site accumulated dusts would involve sampling and selective removal (for proper disposal) of dusts with potentially hazardous total metal concentrations.

6.4 NAIL DEGREASING AREA

TCE is present in the wood flooring, concrete slab, and near-surface soils at the former nail degreasing area. The most likely source of the TCE contamination is from spills associated

with the use of TCE in the degreasing units. Anticipated corrective actions associated with the nail degreasing area include defining the extent of the TCE contamination and remediating the materials that are contaminated.

6.5 REFRACTORY BRICK AND MORTAR

Hazardous concentrations of metals were not detected within samples of refractory brick and mortar. No corrective actions associated with the site refractory brick and mortar are associated.

6.6 OIL ROOMS

Based on sampling of the idled facilities, it is evident that PCB hydraulic systems were not in use. The oils accumulated in the oil cellar will include the removal of the free oil in accordance with state regulations.

7.0 CORRECTIVE ACTION WORK OUTLINE

Based on Remcor's current knowledge of the site and the applicable environmental regulations, several corrective actions are considered prudent.

7.1 REMOVAL OF OIL AND GREASE ACCUMULATIONS

Oil and grease accumulations found on site hydraulic equipment and other machinery, especially in the blooming and 10-inch mills, should be cleaned via scraping and scrubbing. Some analytical testing may be required to assess concentrations of other contaminants in these accumulations. Oil and grease collected during the cleaning process should be disposed of as a hazardous waste in accordance with Missouri regulations. This work is estimated to involve expenditures on the order of $30,000 and require 2 weeks to complete.

7.2 REMEDIATION OF POLYCHLORINATED BIPHENYL-CONTAMINATED SUBSTATION SURFACES

The concrete surfaces within Substations 4 and 5 should be scrubbed and washed clean until the surfaces contain less than 10 µg/100 cm^2 of PCBs or 100 µg/100 cm^2 (if encapsulated). In some areas, pressure washing or concrete grinding may be necessary to meet this criteria, established by the EPA PCB Spill Cleanup Policy. This cleaning would likely require expenditures estimated to be $30,000 and 2 weeks to complete. As necessary, electrical transformers containing PCBs should be removed from the site.

7.3 NAIL DEGREASING AREA REMEDIATION

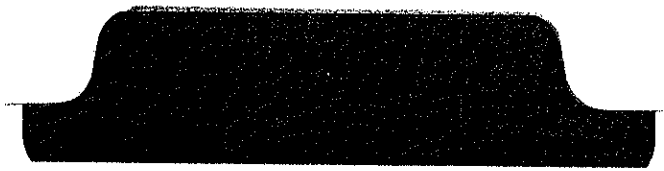
The extent of the subsurface TCE soil contamination should be established via a soil vapor monitoring survey. Once defined, the affected soils (as well as wood flooring and concrete slab material) should be remediated via the design, installation, and operation of a soil vapor extraction system or via material excavation and disposal. The method of remediation should be evaluated and established following the completion of the soil vapor monitoring survey.

7.4 REMOVAL OF ACCUMULATED DUST

Accumulated dusts in the wire mill lead baths and acid baths should be collected, containerized, and disposed of in accordance with hazardous waste regulations. Removal of accumulated dusts should begin within these two areas and proceed radially outward until the collected dust passes current RCRA hazardous waste standards for leachable metals. Sampling of accumulated dusts for total metals content may also be required in order to characterize the dust for landfill disposal.

7.5 OIL ROOM

The free product that has spilled to the oil room floor will be pumped to containers for off-site disposal. Once all free oil and sludges are removed from the area and all equipment is removed, the oil cellar may be closed by backfilling with standard grade fill.



IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 1
HYDRAULIC SYSTEMS - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	Polychlorinated Biphenyls (PCBs)			Total Metals (ug/g)				Sample Collection Location
			Wipe Sample (ug/100 sq.cm.)	Wipe Sample Aroclor Source	Bulk Sample (ug/g)	Cadium	Chromium	Lead	Zinc	
AKC-HSW-NM-01	Nail Mill	Wipe	<5	NA	NA	NA	NA	NA	NA	Vertical Conveyor Shroud
AKC-HSW-TM-01	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Roller Table @ Column FM18
AKC-HSW-TM-02	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Stands Shroud Near Furnace
AKC-HSW-TM-03	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	West Hydraulic Oil Tank
AKC-HSW-BM-01	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Hydraulic Ingot Press
AKC-HSW-BM-02	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	No. 3 Rolling Stand
AKC-HSW-BM-03	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Roller Near Old Water Tower
AKC-HSW-BM-04	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Gear Shroud @ Final Shear
AKC-HSW-BM-05	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Ingot Receiving Table
AKC-HSW-WB-01	Wipe Blank	Blank	<1	NA	NA	NA	NA	NA	NA	-
AKC-HSW-BW-02	Wipe Blank	Blank	<1	NA	NA	NA	NA	NA	NA	-
AKC-HSW-WM-01	Wire Mill	Wipe	<5	NA	NA	NA	NA	NA	NA	Beam @ end of Galvinizing Line
Hexane	Hexane Blank	Liquid	NA	NA	<10	NA	NA	NA	NA	-
AKC-HSB-SP-01	Scale Pit	Grease	NA	NA	<1	<0.1	570	110	86	Scale Pit Interior
AKC-HSB-SP-02	Scale Pit	Grease	NA	NA	<1	NA	NA	NA	NA	Replicate of AKC-HSB-SP-01
AKC-HSB-TM-01	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Kickoff Table
AKC-HSB-TM-02	10-inch Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Below Furnace Pushers
AKC-HSB-TM-03	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Below Conveyor of 18-inch Mill
AKC-REP-01	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Replicate of AKC-HSB-TM-03
AKC-HSB-TM-04	10-inch Mill	Scale	NA	NA	<1	NA	NA	NA	NA	Near Removed Turning Tables
AKC-HSB-BM-01	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Ingot Turning Table
AKC-HSB-BM-02	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Hydraulic Press Near Shear
AKC-HSB-BM-03	Blooming Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Below Process Line
AKC-HSB-BM-04	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Hydraulic Tank for Ingot Table

Notes:
1. "NA" indicates that the sample was not analyzed for this parameter.
2. Hydraulic system samples were collected on by Remcor personnel during the period of December 7, 8, 11, 12, and 14, 1989.
3. Hydraulic System samples were analyzed by Antech Ltd, of Export, Pennsylvania.
4. Refer to the Appendicies for copies of the detailed sample analysis results.
5. Except where noted otherwise, wipe samples were collected from 12-inch by 12-inch areas.
6. Wipe sample ACK-HSW-BM-05 was collected from a 12-inch by 15-inch area.
7. Wipe samples were collected from steel surfaces.

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 1
HYDRAULIC SYSTEMS - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	Polychlorinated Biphenyls (PCBs)			Total Metals (ug/g)				Sample Collection Location
			Wipe Sample (ug/100 sq.cm.)	Wipe Sample Aroclor Source	Bulk Sample (ug/g)	Cadium	Chromium	Lead	Zinc	
AKC-HSW-NM-01	Nail Mill	Wipe	<5	NA	NA	NA	NA	NA	NA	Vertical Conveyor Shroud
AKC-HSW-TM-01	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Roller Table @ Column FM18
AKC-HSW-TM-02	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Stands Shroud Near Furnace
AKC-HSW-TM-03	10-inch Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	West Hydraulic Oil Tank
AKC-HSW-BM-01	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Hydraulic Ingot Press
AKC-HSW-BM-02	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	No. 3 Rolling Stand
AKC-HSW-BM-03	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Roller Near Old Water Tower
AKC-HSW-BM-04	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Gear Shroud @ Final Shear
AKC-HSW-BM-05	Blooming Mill	Wipe	<1	NA	NA	NA	NA	NA	NA	Ingot Receiving Table
AKC-HSW-WB-01	Wipe Blank	Blank	<1	NA	NA	NA	NA	NA	NA	-
AKC-HSW-BW-02	Wipe Blank	Blank	<1	NA	NA	NA	NA	NA	NA	-
AKC-HSW-WM-01	Wire Mill	Wipe	<5	NA	NA	NA	NA	NA	NA	Beam @ end of Galvinizing Line
Hexane	Hexane Blank	Liquid	NA	NA	<10	NA	NA	NA	NA	-
AKC-HSB-SP-01	Scale Pit	Grease	NA	NA	<1	<0.1	570	110	86	Scale Pit Interior
AKC-HSB-SP-02	Scale Pit	Grease	NA	NA	<1	NA	NA	NA	NA	Replicate of AKC-HSB-SP-01
AKC-HSB-TM-01	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Kickoff Table
AKC-HSB-TM-02	10-inch Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Below Furnace Pushers
AKC-HSB-TM-03	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Below Conveyor of 18-inch Mill
AKC-REP-01	10-inch Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Replicate of AKC-HSB-TM-03
AKC-HSB-TM-04	10-inch Mill	Scale	NA	NA	<1	NA	NA	NA	NA	Near Removed Turning Tables
AKC-HSB-BM-01	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Ingot Turning Table
AKC-HSB-BM-02	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Hydraulic Press Near Shear
AKC-HSB-BM-03	Blooming Mill	Oil/Scale	NA	NA	<1	NA	NA	NA	NA	Below Process Line
AKC-HSB-BM-04	Blooming Mill	Grease	NA	NA	<1	NA	NA	NA	NA	Hydraulic Tank for Ingot Table

Notes: 1. "NA" indicates that the sample was not analyzed for this parameter.
2. Hydraulic system samples were collected on by Remcor personnel during the period of December 7, 8, 11, 12, and 14, 1989.
3. Hydraulic system samples were analyzed by Antech Ltd, of Export, Pennsylvania.
4. Refer to the Appendicies for copies of the detailed sample analysis results.
5. Except where noted otherwise, wipe samples were collected from 1/2 inch by 12 inch areas.
6. Wipe sample AKC-HSW-BM-05 was collected from a 12 inch by 12 inch area.
7. Wipe samples were collected from steel surfaces.

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 2
ELECTRICAL SUBSTATIONS - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	Polychlorinated Biphenyls (PCBs)		Sample Collection Location
			Wipe Sample (ug/100 sq.cm.)	Wipe Sample Aroclor Source	
AKC-ESW-S1-01	Substation NO. 1	Wipe	<1	NA	Floor Near Transformer No. 231
AKC-ESW-S1-02	Substation NO. 1	Wipe	<1	NA	Floor @ Entrance to Room
AKC-ESW-S3-01	Substation NO. 3	Wipe	<1	NA	Floor Near Transformer No. 128
AKC-ESW-S3-02	Substation NO. 3	Wipe	<1	NA	Floor Near in High Trafic Area
AKC-ESW-S4-01	Substation NO. 4	Wipe	194	NA	Floor Near Transformer No. 127
AKC-ESW-S4-02	Substation NO. 4	Wipe	22	NA	Floor Near in High Trafic Area
AKC-ESW-S5-01	Substation NO. 5	Wipe	226	NA	Floor Near Transformer No. 126
AKC-ESW-S5-02	Substation NO. 5	Wipe	10	NA	Floor Near Transformer No. 125
AKC-ESW-S5-03	Substation NO. 5	Wipe	2	NA	Floor Near in High Trafic Area
AKC-ESW-S9-01	Substation NO. 9	Wipe	2	NA	Floor Near Transformer No. 120
AKC-ESW-S14-01	Substation NO. 14	Wipe	<1	NA	Floor Near Transformer No. 112
AKC-ESW-S14-02	Substation NO. 14	Wipe	<1	NA	Floor Near in High Trafic Area
AKC-ESW-TM-01	10-inch Mill MCR	Wipe	<1	NA	Floor Near Manhole
AKC-ESW-TM-02	10-inch Mill MCR	Wipe	<1	NA	Floor Inside of Containment Dike

Notes
1. Electrical substation samples were analyzed by Antech Ltd, of Export, Pennsylvania.
2. Refer to the Appendicies for copies of the detailed sample analysis results.
3. Wipe samples were collected from 12-inch by 12-inch areas.
4. Wipe samples were collected from concrete surfaces.

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 3
ACCUMULATED DUST - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	EP Toxicity Metals (mg/l)		Total Metals (ug/g)				Sample Collection Location
			Lead	Silver	Cadium	Chromium	Lead	Zinc	
AKC-ADB-WM-01	Wire Mill	Dust	NA	NA	3.5	290	39,000	7,900	Low Beam Near Lead Bath
AKC-ADB-WM-02	Wire Mill	Dust	NA	NA	1.5	190	420	1,100	Undwinding End Galvanizer
AKC-ADB-WM-03	Wire Mill	Dust	1.4	0.2	13	520	2,400	280,000	Acid Baths - Wire Coating
AKC-ADB-TM-01	10-inch Mill	Dust	NA	NA	1.6	510	240	400	Top of Reheat Furnace
AKC-ADB-TM-02	10-inch Mill	Dust	NA	NA	1.9	440	430	760	Southwest Corner of Mill
AKC-ADB-TM-03	10-inch Mill	Dust	1.5	<0.1	0.8	170	150	860	Teeming Side of Soaking Pits
AKC-ADB-BM-01	Blooming Mill	Dust	NA	NA	6.5	410	710	1,600	Crane Pulpit Near Old Tower
AKC-ADB-BM-02	Blooming Mill	Dust	NA	NA	8.5	670	150	1,400	Perched Areas Ingot Rec.

Notes: 1. "NA" indicates that the sample was not analyzed for this parameter.
2. Accumulated dust samples were collected on by Remcor personnel during the period of December 7, 8, 11, and 14, 1989.
3. Accumulated dust samples were analyzed by Antech Ltd, of Export, Pennsylvania.
4. Compounds which were not detected in the above-referenced samples are not listed. Refer to the Appendicies for copies of the detailed sample analysis results.

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 4
NAIL DEGREASING AREA - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	Volatile Organic Compounds (ug/kg)					Sample Collection Location
			Benzene	1,1,1-TCA	1,1-DCE	PCE	TCE	
AKC-NDC-01S	Nail Degreasing Area	Soil Core	<625	22,000	850	1,200	100,000	Beneath Concrete Floor @ Degreaser Area
AKC-NDC-02S	Nail Degreasing Area	Soil Core	<625	<625	<625	<625	67,000	Beneath Concrete Floor @ Degreaser Area
AKC-NDC-01C	Nail Degreasing Area	Concrete Core	<5	290	<5	13	1,400	Concrete Slab @ Degreaser Area
AKC-NDC-02C	Nail Degreasing Area	Concrete Core	49	<5	<5	<5	22	Concrete Slab @ Degreaser Area
AKC-WCB-ND-01	Nail Degreasing Area	Wood Chips	<10	<10	<10	<10	28,000	Wooden Floor Blocks @ Degreaser Area
AKC-WCB-ND-02	Nail Degreasing Area	Wood Chips	<10	1,400	<10	<10	17,000	Wooden Floor Blocks @ Degreaser Area

Notes:
1. Nail degreaser area samples were collected on by Remcor personnel during the period of December 7, 1989 and June 7, 1990.
2. Nail degreaser area samples were analyzed by Antech Ltd, of Export, Pennsylvania.
3. Compounds which were not detected in the above-referenced samples are not listed. Refer to the Appendicies for copies of the detailed sample analysis results.
4. Compound abbreviations: 1,1,1-TCA (1,1,1-Trichloroethane), 1,1-DCE (1,1-Dichloroethene), PCE (Tetrachloroethene), and TCE (Trichloroethene).

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

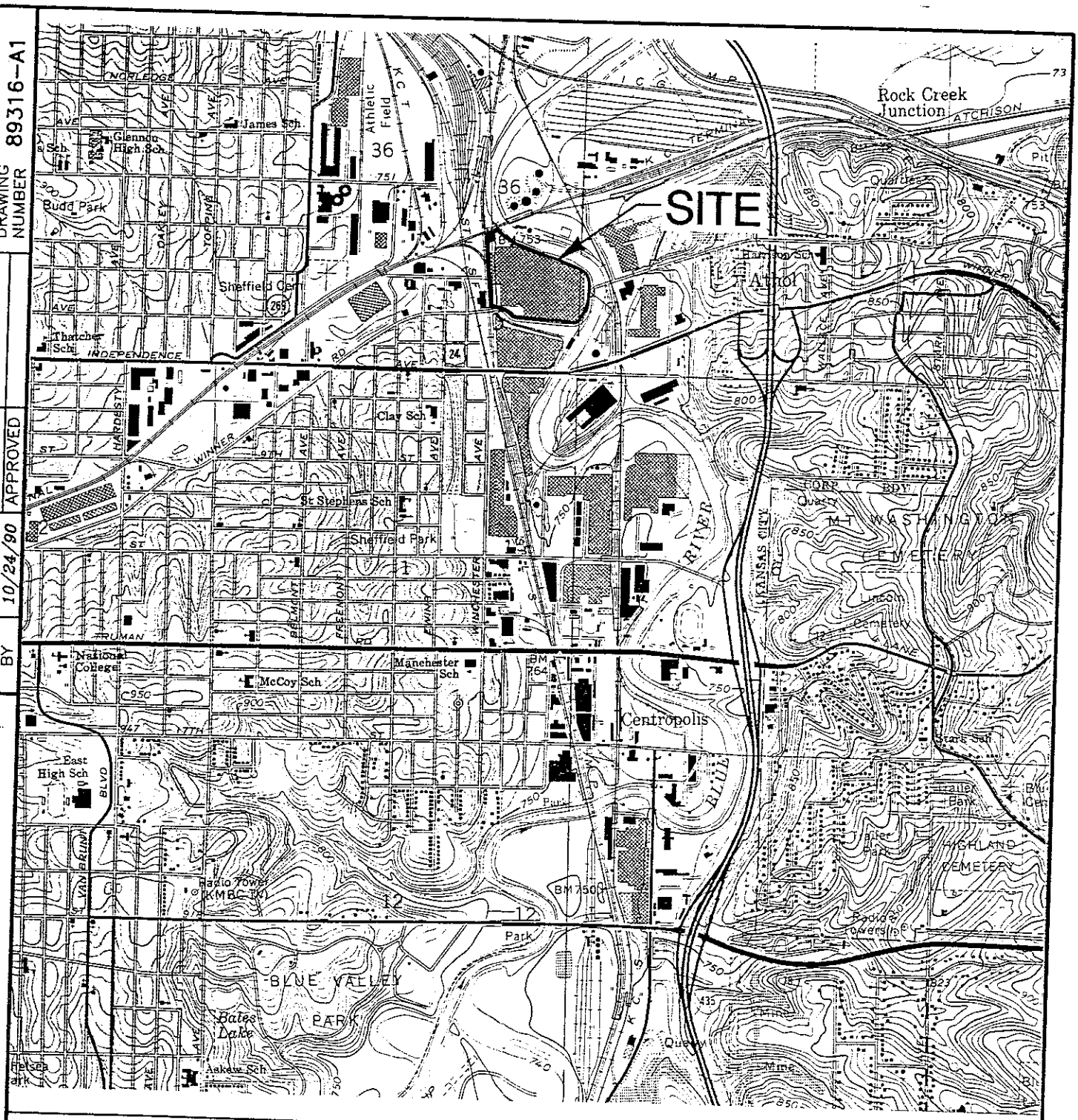
Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 5
REFRACTORY BRICK & MORTAR - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	EP Toxicity Metals (mg/l)		Total Metals (ug/g)	Sample Collection Location
			Arsenic	Lead	Chromium	
AKC-RBB-TM-01	10-inch Mill	Brick	<0.1	0.4	<10	Hood of Hoist Rebuilding Mold
AKC-RBB-TM-02	10-inch Mill	Mortar	0.1	0.2	16	Hood of Hoist Rebuilding Mold
AKC-RBB-TM-03	10-inch Mill	Brick	1.1	1.5	150	Liner No. 5 Soaking Pit

Notes:
1. Refractory brick and mortar samples were collected on by Remcor personnel on December 8, 1989.
2. Refractory brick and mortar samples were analyzed by Antech Ltd, of Export, Pennsylvania.
3. Compounds which were not detected in the above-referenced samples are not listed. Refer to the Appendicies for copies of the detailed sample analysis results.



DRAWING NUMBER 89316-A1

CHECKED

APPROVED

DRAWN BY L.H.K. 10/24/90

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES KANSAS CITY, MO.-KANS., 1964 & INDEPENDENCE, MO., 1964, BOTH PHOTO-REVISED 1970 & 1975. SCALE 1=24,000.

FIGURE 1

SITE LOCATION MAP
IDLED FACILITIES
ENVIRONMENTAL INVESTIGATION

ARMCO INC.
KANSAS CITY, MISSOURI

PREPARED FOR

ARMCO INC.
MIDDLETOWN, OHIO

REMCOR

DRAWN BY	CHECKED	DRAWING NUMBER
L.H.K. 10/24/90	APPROVED	89316-B2

APPROXIMATE LIMITS OF IDLED FACILITIES INVESTIGATION SITE

N

MOTOR ROOM
BLOOMING MILL
BILLET STORAGE
10" MILL & HOT BED
CONDITIONING
STORAGE (FORMER OPEN HEARTH PIT BUILDING)
STORAGE (FORMER OPEN HEARTH PIT BUILDING)
SOAKING PIT BUILDING
BRICK STORAGE
NO. 1 BUILDING (SHIPPING)
NO. 2 BUILDING (BAR STORAGE)
BILLET YARD STORAGE
NO. 1 ROD MILL
BAR STORAGE
NO. 3 BUILDING
NO. 4 BUILDING
ROD BUNDLE STORAGE
BAR JOIST DEPARTMENT
FENCE & NAIL STORAGE
NAIL MILL
WIRE MILL
CLEANING HOUSE
MESH DEPARTMENT
STORAGE
STORAGE
MESH DEPARTMENT
MESH STORAGE
TRUCK LOADING DOCK
WIRE MILL SHIPPING
WIRE MILL STORAGE
WINNER ROAD
BIG BLUE RIVER

FIGURE 2

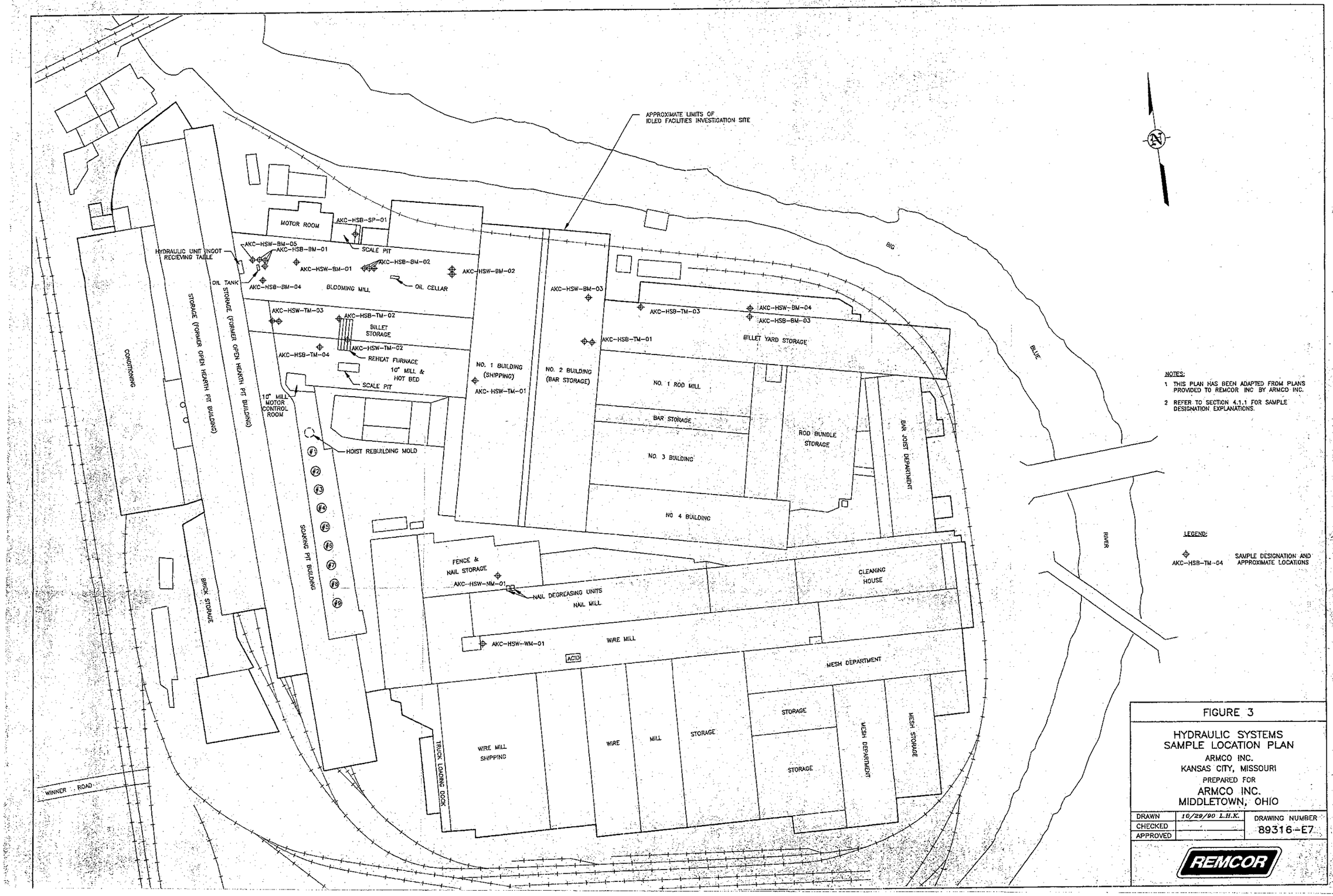
IDLED FACILITIES PLAN

ARMCO INC.
KANSAS CITY, MISSOURI

PREPARED FOR

ARMCO INC.
MIDDLETOWN, OHIO

REMCOR



NOTES:

1 THIS PLAN HAS BEEN ADAPTED FROM PLANS PROVIDED TO REMCOR INC BY ARMCO INC.

2 REFER TO SECTION 4.1.1 FOR SAMPLE DESIGNATION EXPLANATIONS.

LEGEND:

AKC-HSB-TM-04 — SAMPLE DESIGNATION AND APPROXIMATE LOCATIONS

FIGURE 3

HYDRAULIC SYSTEMS
SAMPLE LOCATION PLAN
ARMCO INC.
KANSAS CITY, MISSOURI
PREPARED FOR
ARMCO INC.
MIDDLETOWN, OHIO

DRAWN	10/29/90 L.H.K.	DRAWING NUMBER
CHECKED		89316-E7
APPROVED		

REMCOR

APPROXIMATE LIMITS OF IDLED FACILITIES INVESTIGATION SITE

SUBSTATION #14
AKC-ESW-S14-01
AKC-ESW-S14-02
MOTOR ROOM
SCALE PIT
HYDRAULIC UNIT INGOT RECIEVING TABLE
OIL TANK
BLOOMING MILL
OIL CELLAR
BILLET STORAGE
REHEAT FURNACE
10" MILL & HOT BED
AKC-ESW-TM-01
AKC-ESW-TM-02
SCALE PIT
10" MILL MOTOR CONTROL ROOM
SUBSTATION #1
AKC-ESW-S1-02
AKC-ESW-S1-01
HOIST REBUILDING MOLD
#1
#2
#3
#4
#5
#6
#7
#8
#9
CONDITIONING
STORAGE (FORMER OPEN HEARTH PIT BUILDING)
OIL STORAGE (FORMER OPEN HEARTH PIT BUILDING)
SOAKING PIT BUILDING
BRICK STORAGE
NO. 1 BUILDING (SHIPPING)
NO. 2 BUILDING (BAR STORAGE)
NO. 3 BUILDING
NO 4 BUILDING
BILLET YARD STORAGE
NO. 1 ROD MILL
BAR STORAGE
ROD BUNDLE STORAGE
AKC-ESW-S9-01
SUBSTATION #9
BAR JOIST DEPARTMENT
BIG BLUE
FENCE & NAIL STORAGE
NAIL DEGREASING UNITS
NAIL MILL
CLEANING HOUSE
WIRE MILL
ACID
SUBSTATION #4
AKC-ESW-S4-01
AKC-ESW-S4-02
MESH DEPARTMENT
SUBSTATION #3
AKC-ESW-S3-01
AKC-ESW-S3-02
WIRE MILL SHIPPING
WIRE
MILL
SUBSTATION #5
AKC-ESW-S5-01
AKC-ESW-S5-03
AKC-ESW-S5-02
STORAGE
STORAGE
STORAGE
MESH DEPARTMENT
MESH STORAGE
TRUCK LOADING DOCK
WINNER ROAD
RIVER

NOTES:

1 THIS PLAN HAS BEEN ADAPTED FROM PLANS PROVIDED TO REMCOR INC BY ARMCO INC.

2 REFER TO SECTION 4.1.1 FOR SAMPLE DESIGNATION EXPLANATIONS.

LEGEND:

AKC-ESW-S1-01 SAMPLE DESIGNATION AND APPROXIMATE LOCATIONS

FIGURE 4

ELECTRICAL SUBSTATIONS
SAMPLE LOCATION PLAN
ARMCO INC.
KANSAS CITY, MISSOURI
PREPARED FOR
ARMCO INC.
MIDDLETOWN, OHIO

DRAWN	10/29/90 L.H.K.	DRAWING NUMBER
CHECKED		89316-E9
APPROVED		

REMCOR

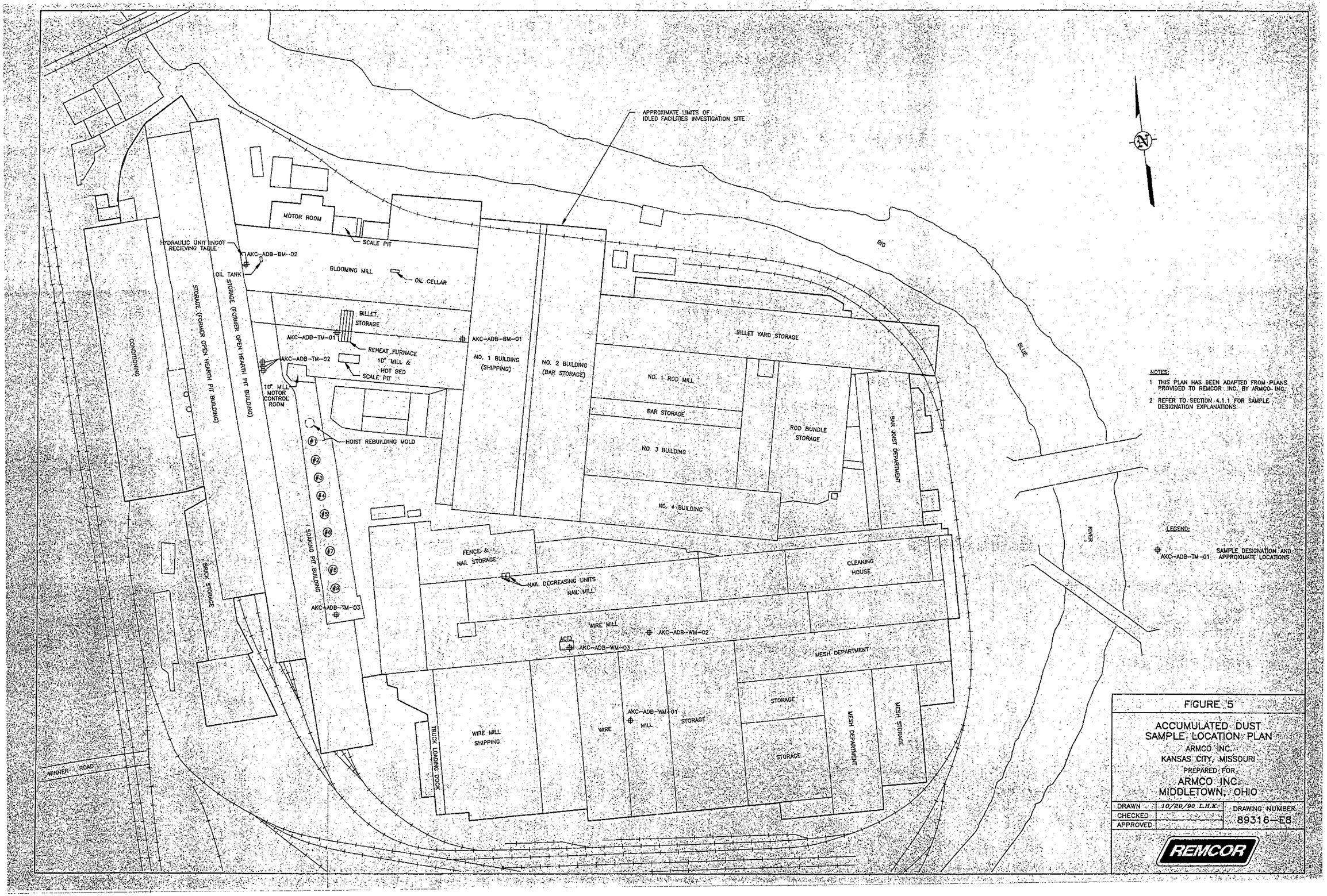


FIGURE 5

ACCUMULATED DUST SAMPLE LOCATION PLAN

ARMCO INC.
KANSAS CITY, MISSOURI

PREPARED FOR
ARMCO INC.
MIDDLETOWN, OHIO

DRAWN	10/20/90 L.H.K.	DRAWING NUMBER
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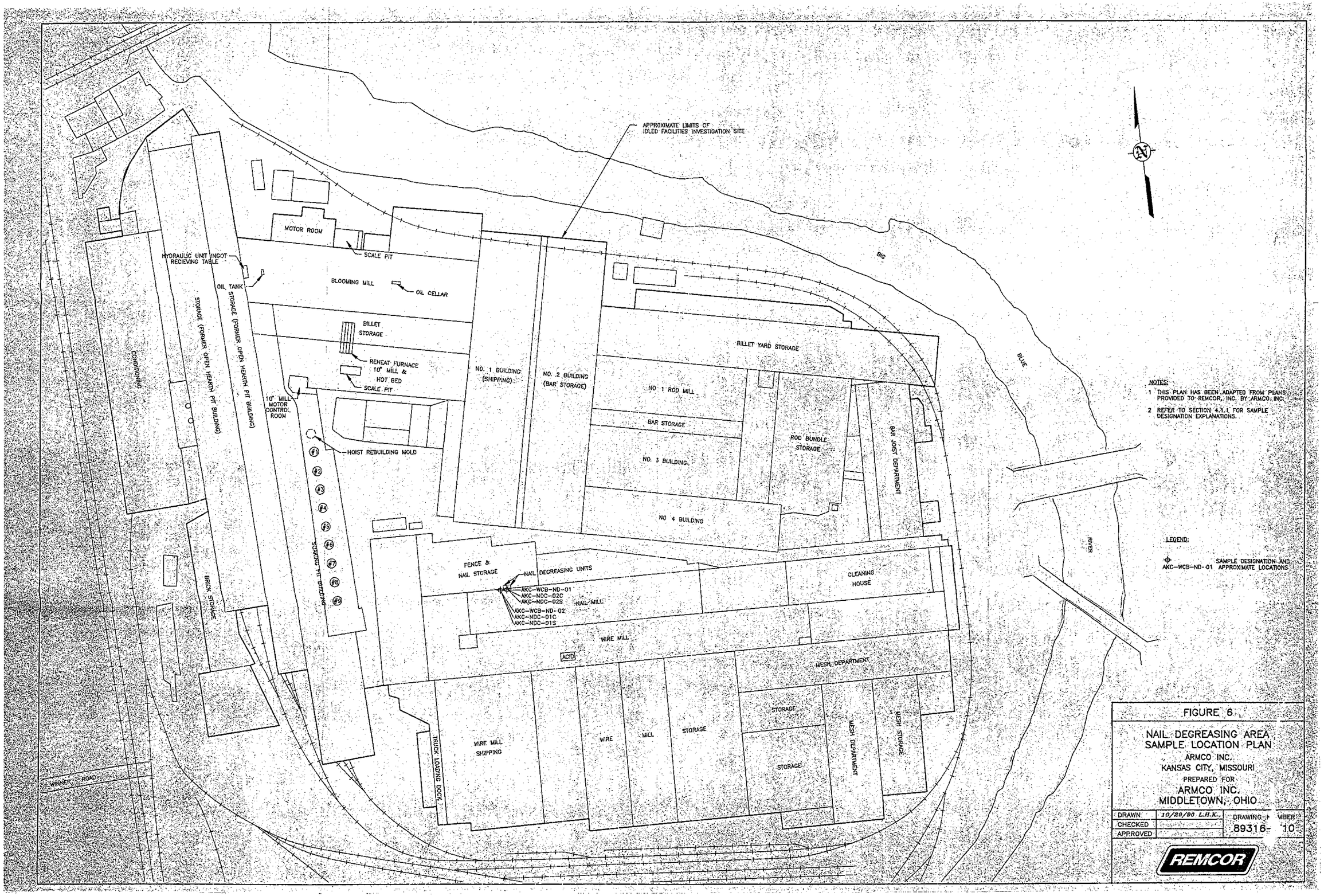

FIGURE 6

NAIL DEGREASING AREA SAMPLE LOCATION PLAN

ARMCO INC.
KANSAS CITY, MISSOURI

PREPARED FOR
ARMCO INC.
MIDDLETOWN, OHIO

DRAWN	10/20/90 L.H.K.	DRAWING NUMBER
CHECKED		89316-10
APPROVED		

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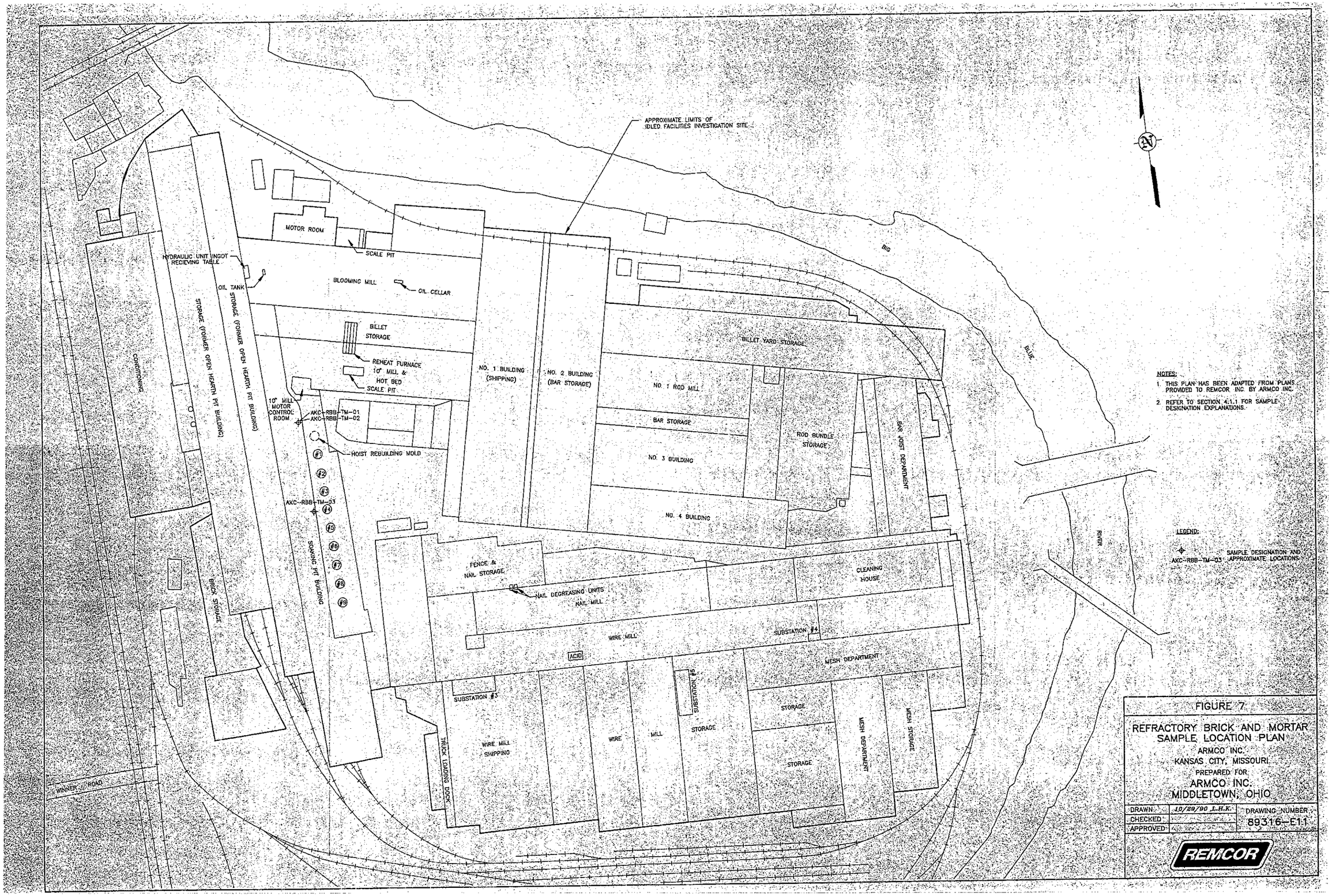

FIGURE 7

REFRACTORY BRICK AND MORTAR SAMPLE LOCATION PLAN

ARMCO INC.
KANSAS CITY, MISSOURI

PREPARED FOR:
ARMCO INC.
MIDDLETOWN, OHIO

DRAWN	10/20/00 L.H.K.	DRAWING NUMBER
CHECKED		89316-E11
APPROVED		

REMCOR

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APPENDIX A

POTENTIAL HAZARDOUS SUBSTANCE RELEASE NOTIFICATION REQUIREMENTS ARMCO INC. KANSAS CITY WORKS

APPENDIX A

POTENTIAL HAZARDOUS SUBSTANCE RELEASE NOTIFICATION REQUIREMENTS ARMCO INC. KANSAS CITY WORKS

Potential notification requirements applicable to the trichloroethylene (TCE) that has recently been discovered in the soil and ground water at the Armco Inc. (Armco) Kansas City Works in Kansas City, Missouri have been reviewed. According to Armco personnel, TCE was used extensively as a degreaser in the wire mill. Spills of TCE may have leached through the wooden block floor into the soil and ground water. The following federal and state requirements have been evaluated with respect to this circumstance:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Missouri Code of State Regulations, Title 10, Division 24 (10 CSR 24), Hazardous Substance Rules
- Annotated Missouri Statutes, Title 24, Chapter 204, Clean Water Law.

Potential requirements are summarized in the following sections.

Comprehensive Environmental Response, Compensation, and Liability Act

TCE is defined as a hazardous substance in Title 40 of the Code of Federal Regulations Part 302 (40 CFR 302), and a reportable quantity (RQ) of 500 pounds has been established for it.

Notification is required for releases of hazardous substances in quantities exceeding the RQ. A release is defined as:

> "... any spilling, leaching, pumping, pouring, emitting, emptying, discharging, injecting, escaping, dumping, or disposing into the environment, but excludes (1) any release which results in exposure to persons solely within a work-place, with respect to a claim which such persons may asset against such persons, (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine, (3) release of source, byproduct, or special nuclear material from a nuclear incident ..."

The notification requirements are only applicable to releases that exceed the RQ within a 24-hour period. The migration of TCE from the process into the environment meets the definition of a release. The quantity of TCE released from the wire mill is not known.

Resource Conservation and Recovery Act

According to RCRA, corrective action is required for all solid waste management units (SWMUs) at facilities seeking final (Part B) RCRA permits for hazardous waste operations. A SWMU is defined as follows:

> "any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of a solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released."

TCE was used as a degreasing solvent in the mill, and spent solvent containing TCE would be considered a hazardous waste if it were generated currently. A facility is comprised of all contiguous property under the same ownership.

Armco is seeking a RCRA Part B permit for operations at the Kansas City Works, and these operations are located on property that is contiguous to the wire mill. The release of TCE at the wire mill could meet the definition of a SWMU subject to corrective action requirements. The proposed corrective action regulations specify that within 30 days of discovering additional SWMUs, Armco would need to submit the following information to the U.S. Environmental Protection Agency (EPA):

- Unit location on a topographic map
- Designation of type of unit
- General dimensions
- Period(s) of unit operation
- All available specifications for wastes that have been managed in the unit
- All available information pertaining to any release of hazardous wastes or hazardous constituents from the unit.

The EPA may then request that Armco prepare a SWMU Assessment Plan. The scope of a SWMU assessment will be similar to the scope of RCRA Facility Assessments (RFA) now performed by the EPA or EPA contractors. An RFA usually consists of a records search,

interviews, a site visit, and, possibly, some limited sampling. The assessment can be performed by Armco instead of by the EPA; 90 days will probably be allowed for preparation of the plan.

Missouri Hazardous Substance Rules

The Missouri Hazardous Substance Rules (Rules) are similar to the hazardous substance rules under CERCLA. The Missouri rules require notification of "hazardous substance emergencies," defined as releases that exceed RQs established under CERCLA. There is no limit to the period during which the released occurred; thus, slow releases that have occurred over many years become subject to the notification requirements when the quantity exceeds the RQ.

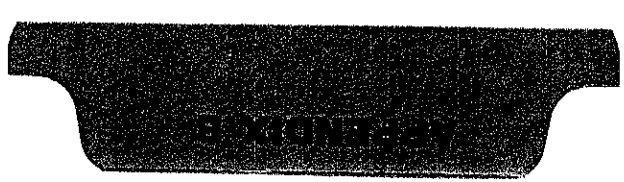
If the amount of TCE in the soil and ground water exceeds 500 pounds, Armco is subject to the state notification requirements. According to Mr. Dean Martin of the Missouri Department of Natural Resources (MDNR), the MDNR and regulated community use some discretion because the notification requirements are generally geared towards sudden releases.

Missouri Clean Water Law

The Missouri Clean Water Law states that it is unlawful to cause pollution of any waters of the state (including subsurface waters) or to place any water contaminant in a location where it is reasonably certain to cause pollution of any waters of the state. TCE meets the definition of water contaminants. There are no notification requirements.

APPENDIX B

LABORATORY ANALYSIS REPORTS


EXXON

Antech Ltd
One Triangle Drive
Export
Pennsylvania 15632
412-733-1161

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No. 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0517 (AKC-ADB-WM-03)	Sample Identification 12-0524 (AKC-ADB-TM-03)
EP Toxicity Metals:			
Arsenic	mg/l	<0.1	<0.1
Barium	mg/l	<10	<10
Cadmium	mg/l	<0.1	<0.1
Chromium	mg/l	<0.1	<0.1
Lead	mg/l	1.4	1.5
Mercury	mg/l	<0.01	<0.01
Selenium	mg/l	<0.1	<0.1
Silver	mg/l	0.2	<0.1
EP Toxicity Data:			
Initial pH	pH units	5.20	8.50
Final pH	pH units	5.10	4.85
Amount of 0.5N Acetic Acid added per 100 grams sample	ml	55	90
Total Metals:			
Cadmium	µg/g	13	0.8
Chromium	µg/g	520	170
Lead	µg/g	2,400	150
Zinc	µg/g	280,000	860

C.C. D. Crowley

Approved: Dominic J. Angelelli

Antech Ltd.
One Triangle Drive
Export
Pennsylvania 15632
412-733-1161

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No. 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0518 (AKC-ADB-TM-01)	12-0519 (AKC-ADB-BM-02)
Total Metals:			
Cadmium	µg/g	1.6	8.5
Chromium	µg/g	510	670
Lead	µg/g	240	150
Zinc	µg/g	400	1,400

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0520 (AKC-ADB-WM-01)	12-0521 (AKC-ADB-WM-02)
Total Metals:			
Cadmium	µg/g	3.5	1.5
Chromium	µg/g	290	190
Lead	µg/g	39,000	420
Zinc	µg/g	7,900	1,100

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No. 89316; Idled Facility Invetigation

Parameter	Units	Sample Identification 12-0522 (AKC-ADB-BM-01)	12-0523 (AKC-ADB-TM-02)
Total Metals:			
Cadmium	µg/g	6.5	1.9
Chromium	µg/g	410	440
Lead	µg/g	710	430
Zinc	µg/g	1,600	760

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No. 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0528 (AKC-HSB-SP-01)
Total Metals:		
Cadmium	µg/g	<0.1
Chromium	µg/g	570
Lead	µg/g	110
Zinc	µg/g	86

C.C. D. Crowley

Approved: Dominic F. Gentile

Antech Ltd.
One Triangle Drive
Export
Pennsylvania 15632
412-733-4161

General Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No. 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0525 (AKC-RBB-TM-01)	12-0526 (AKC-RBB-TM-02)
EP Toxicity Metals:			
Arsenic	mg/l	<0.1	0.1
Barium	mg/l	<10	<10
Cadmium	mg/l	<0.1	<0.1
Chromium	mg/l	<0.1	<0.1
Lead	mg/l	0.4	0.2
Mercury	mg/l	<0.01	<0.01
Selenium	mg/l	<0.1	<0.1
Silver	mg/l	<0.1	<0.1
EP Toxicity Data:			
Initial pH	pH units	5.60	9.55
Final pH	pH units	5.10	4.80
Amount of 0.5N Acetic Acid added per 100 grams sample	ml	2	14
Total Metals:			
Chromium	µg/g	<10	16

General Data Iable

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Waste Characterization; Project No 89316; Idled Facility Investigation

Parameter	Units	Sample Identification 12-0527 (AKC-RBB-TM-03)
EP Toxicity Metals:		
Arsenic	mg/l	1.1
Barium	mg/l	<10
Cadmium	mg/l	<0.1
Chromium	mg/l	<0.1
Lead	mg/l	1.5
Mercury	mg/l	<0.01
Selenium	mg/l	<0.1
Silver	mg/l	<0.1
EP Toxicity Data:		
Initial pH	pH units	5.50
Final pH	pH units	5.10
Amount of 0.5N Acetic Acid added per 100 grams sample	ml	1
Total Metals:		
Chromium	µg/g	150

C.C. D. Crowley

Approved: Dominic J. Mastrocco

Antech Ltd.
One Triangle Drive
Export
Pennsylvania 15632
412-733-1161

PCB Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Solid Characterization; Project No. 89316; Idled Facility Investigation; EPA Method 8080

Antech I.D.	Remcor I.D.	Polychlorinated Biphenyls Concentration (µg/g)
12-0503	(AKC-HSB-BM-03)	<1
12-0505	(AKC-HSB-BM-04)	<1
12-0506	(AKC-HSB-TM-03)	<1
12-0507	(AKC-HSB-TM-04)	<1
12-0509	(AKC-REP-01)	<1
12-0528	(AKC-HSB-SP-01)	<1/<1[1]
12-0512	(AKC-HSB-SP-02)	<1
12-0513	(AKC-HSB-BM-01)	<1
12-0514	(AKC-HSB-BM-02)	<1
12-0515	(AKC-HSB-TM-01)	<1
12-0516	(AKC-HSB-TM-02)	<1

[1]Duplicate analyses performed and analyzed.

Approved: Dominic J. Fabasi

C.C. D. Crowley

Antech Ltd
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Export
Pennsylvania 15632
412-733-1161

PCB Data Table

Client: Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Antech Project No.: 89-2219
Receipt Date: 12/18/89
Verbal Report Date: NR
Report Date: 1/22/90

Reference: Wipe Characterization; Project No. 89316; Idled Facility Investigation
EPA Method 608[1]

Antech I.D.	Remcor I.D.	Polychlorinated Biphenyls Wipe Concentration (µg)	Aroclor Source
12-0479	(AKC-HSW-TM-02)	<10	-
12-0480	(AKC-HSW-TM-01)	<10	-
12-0481	(AKC-HSW-WB-01)	<10	-
12-0482	(AKC-HSW-BM-03)	<10	-
12-0483	(AKC-HSW-BM-04)	<10	-
12-0484	(AKC-HSW-NM-01)	<50[2]	-
12-0485	(AKC-HSW-WM-01)	<50[2]	-
12-0486	(AKC-HSW-BM-01)	<10	-
12-0487	(AKC-HSW-BM-02)	<10	-
12-0488	(AKC-ESW-TM-01)	<10	-
12-0489	(AKC-ESW-TM-02)	<10	-
12-0490	(AKC-ESW-S1-01)	<10	-
12-0491	(AKC-ESW-S1-02)	<10	-
12-0492	(AKC-ESW-S3-01)	<10	-
12-0493	(AKC-ESW-S3-02)	<10	-
12-0494	(AKC-ESW-S5-01)	2,100	1260
12-0495	(AKC-ESW-S5-02)	95	1260
12-0496	(AKC-ESW-S5-03)	19	1260
12-0497	(AKC-ESW-S4-01)	1,800	1260
12-0498	(AKC-ESW-S4-02)	200	1260
12-0499	(AKC-ESW-S9-01)	14	1260
12-0500	(AKC-ESW-S14-01)	<10	-
12-0501	(AKC-ESW-S14-02)	<10	-
12-0502	(Hexane)	<10	-
12-0504	(AKC-HSW-BM-05)	<10	-
12-0508	(AKC-HSW-TM-03)	<10	-
12-0510	(AKC-HSW-BW-02)	<10	-

[1]Boomer, B. A., M. D. Erickson, S. E. Swanson, G. L. Kelso, D. C. Cox, and B. D. Schultz, August 1985, Verification of PCB Spill Cleanup by Sampling and Analysis, EPA-560/5-85-026, U.X. Environmental Protection Agency, Office of Toxic Substances, Washington, D.C.
[2]Increase detection level due to matrix interferences.

C.C. D. Crowley

Approved: Dominic F. Potasii

Antech Ltd
One Triangle Drive
Export
Pennsylvania 15632
412-733-1161

July 2, 1990

Ms. Joanne Cope
Office Manager
Remcor, Inc.
701 Alpha Drive
Pittsburgh, PA 15238

Dear Ms. Cope:

Enclosed are the volatile organic analyses for Remcor, Inc. (Project No. 89316) (Antech Ltd. Project No. 90-1025). The samples were received by Antech Ltd. on June 8, 1990. If you have any questions, please do not hesitate to call.

Sincerely,

Thomas W. Hill
Vice President

TWH:dmm

Enclosure

cc: R. Crowley

Volatile Organic Analyses
EPA Method 624
Remcor, Inc
Project No. 89316
Antech Project No. 90-1025
Waste Characterization
Dilution Factor 125
Collected June 7, 1990

Parameter	Units	Sample Identification 06-0182 (AKC-NDC-01S)	Sample Identification 06-0183 (AKC-NDC-02S)
Date of Analysis	-	6/21/90	6/21/90
Acrolein	µg/kg	<31,250	<31,250
Acrylonitrile	µg/kg	<31,250	<31,250
Benzene	µg/kg	<625	<625
Carbon Tetrachloride	µg/kg	<625	<625
Chlorobenzene	µg/kg	<625	<625
1,2-Dichloroethane	µg/kg	<625	<625
1,1,1-Trichloroethane	µg/kg	22,000	<625
1,1-Dichloroethane	µg/kg	<625	<625
1,1,2-Trichloroethane	µg/kg	<625	<625
1,1,2,2-Tetrachloroethane	µg/kg	<625	<625
Chloroethane	µg/kg	<625	<625
2-Chloroethylvinyl Ether	µg/kg	<625	<625
Chloroform	µg/kg	<625	<625
1,1-Dichloroethene	µg/kg	850	<625
Trans-1,2-Dichloroethene	µg/kg	<625	<625
1,2-Dichloropropane	µg/kg	<625	<625
1,3-Dichloropropene	µg/kg	<625	<625
Ethylbenzene	µg/kg	<625	<625
Methylene Chloride	µg/kg	<625	<625
Chloromethane	µg/kg	<625	<625
Bromomethane	µg/kg	<625	<625
Bromoform	µg/kg	<625	<625
Dichlorobromomethane	µg/kg	<625	<625
Chlorodibromomethane	µg/kg	<625	<625
Tetrachloroethene	µg/kg	1,200	<625
Toluene	µg/kg	<625	<625
Trichloroethene	µg/kg	100,000	67,000
Vinyl Chloride	µg/kg	<1,250	<1,250

Volatile Organic Analyses
EPA Method 624
Remcor, Inc.
Project No. 89316
Antech Project No. 90-1025
Waste Characterization
Dilution Factor 1
Collected June 7, 1990

Parameter	Units	Sample Identification 06-0184 (AKC-NDC-01C)	Sample Identification 06-0185 (AKC-NDC-02C)
Date of Analysis	-	6/27/90	6/27/90
Acrolein	µg/kg	<250	<250
Acrylonitrile	µg/kg	<250	<250
Benzene	µg/kg	<5	49
Carbon Tetrachloride	µg/kg	<5	<5
Chlorobenzene	µg/kg	<5	<5
1,2-Dichloroethane	µg/kg	<5	<5
1,1,1-Trichloroethane	µg/kg	290	<5
1,1-Dichloroethane	µg/kg	<5	<5
1,1,2-Trichloroethane	µg/kg	<5	<5
1,1,2,2-Tetrachloroethane	µg/kg	<5	<5
Chloroethane	µg/kg	<5	<5
2-Chloroethylvinyl Ether	µg/kg	<5	<5
Chloroform	µg/kg	<5	<5
1,1-Dichloroethene	µg/kg	<5	<5
Trans-1,2-Dichloroethene	µg/kg	<5	<5
1,2-Dichloropropane	µg/kg	<5	<5
1,3-Dichloropropene	µg/kg	<5	<5
Ethylbenzene	µg/kg	<5	<5
Methylene Chloride	µg/kg	<5	<5
Chloromethane	µg/kg	<5	<5
Bromomethane	µg/kg	<5	<5
Bromoform	µg/kg	<5	<5
Dichlorobromomethane	µg/kg	<5	<5
Chlorodibromomethane	µg/kg	<5	<5
Tetrachloroethene	µg/kg	13	<5
Toluene	µg/kg	<5	<5
Trichloroethene	µg/kg	1,400	22
Vinyl Chloride	µg/kg	<10	<10

Volatile Organic Analyses
(Continued)

Parameter	Units	Sample Identification 12-0248 (AKC-WCB-ND-01[4])	Sample Identification 12-0249 (AKC-WCB-ND-02[4])
Acrolein	µg/kg	<500	<500
Acrylonitrile	µg/kg	<500	<500
Benzene	µg/kg	<10	<10
Carbon Tetrachloride	µg/kg	<10	<10
Chlorobenzene	µg/kg	<10	<10
1,2-Dichloroethane	µg/kg	<10	<10
1,1,1-Trichloroethane	µg/kg	<10	1,400
1,1-Dichloroethane	µg/kg	<10	<10
1,1,2-Trichloroethane	µg/kg	<10	<10
1,1,2,2-Tetrachloroethane	µg/kg	<10	<10
Chloroethane	µg/kg	<10	<10
2-Chloroethylvinyl Ether	µg/kg	<10	<10
Chloroform	µg/kg	<10	<10
1,1-Dichloroethene	µg/kg	<10	<10
Trans-1,2-Dichloroethene	µg/kg	<10	<10
1,2-Dichloropropane	µg/kg	<10	<10
1,3-Dichloropropene	µg/kg	<10	<10
Ethylbenzene	µg/kg	<10	<10
Methylene Chloride	µg/kg	<10	<10
Chloromethane	µg/kg	<10	<10
Bromomethane	µg/kg	<10	<10
Bromoform	µg/kg	<10	<10
Dichlorobromomethane	µg/kg	<10	<10
Chlorodibromomethane	µg/kg	<10	<10
Tetrachloroethene	µg/kg	<10	<10
Toluene	µg/kg	<10	<10
Trichloroethene	µg/kg	28,000	17,000
Vinyl Chloride	µg/kg	<10	<10

See footnotes at end of report.

REMCOR

CHAIN OF CUSTODY RECORD

PROJECT NO.: 89316

PROJECT NAME: ARMCO STEEL KC MO

SAMPLERS: HLO/BCM — HARRY L OWENS

BEUEL MILLET

SAMPLE	DATE	TIME	SAMPLE MEDIUM	SAMPLE LOCATION	NO. OF CON-TAINERS	ASBESTOS SAMPLE						REMARKS
RAK-001-01	10/26/89	1000	BULK	WIRE MILL	1	1						ANALYZE BULK SAMPLE BY POLARIZED LIGHT MICROSCOPY
RAK-001-02	10/26/89	1005	BULK	WIRE STORAGE MILL	1	1						"
RAK-001-03	10/26/89	1020	BULK	WIRE STORAGE MILL	1	1						"
RAK 001-04	10/26/89	1205	BULK	"	1	1						"
RAK 001-05	10/26/89	1325	BULK	"	1	1						"
RAK 001-06	10/26/89	1330	BULK	"	1	1						"
RAK 001-07	10/26/89	1335	BULK	"	1	1						"
RAK 001-08	10/26/89	1440	BULK	"	1	1						"
RAK 001-09	10/26/89	1450	BULK	"	1	1						"
RAK 001-10	10/26/89	1500	BULK	"	1	1						"
RAK 001-11	10/26/89	1525	BULK	"	1	1						"
RAK 001-12	10/31/89	0845	BULK	NAIL MILL	1	1						ANALYZE BULK SAMPLE BY POLARIZED LIGHT MICROSCOPY

RELINQUISHED BY:	DATE/TIME 11-21-89 1230	RECEIVED BY:	RELINQUISHED BY: / DATE/TIME / RECEIVED BY:
RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY: / DATE/TIME / RECEIVED BY:
RELINQUISHED BY:	DATE/TIME	RECEIVED FOR LAB BY:	DATE/TIME / POSSIBLE HAZARD:

REMCOR

CHAIN OF CUSTODY RECORD

PROJECT NO.: 89316

PROJECT NAME: ARMCO STEEL K.C. MO.

SAMPLERS: HLO / BCM — HARRY L. OWENS, BEVEL MILLET

SAMPLE	DATE	TIME	SAMPLE MEDIUM	SAMPLE LOCATION	NO. OF CONTAINERS	ASBESTOS SAMPLE	REMARKS
RAK 001-13	10/31/89	0847	BULK	NAIL CLEANING AREA	1	1	ANALYZE BULK SAMPLES BY POLARIZED LIGHT MICRO...PY
RAK 001-14	10/31/89	0850	BULK	WIRE COATING FURNACE	1	1	"
RAK 001-15	10/31/89	0855	BULK	NAIL CLEANING AREA	1	1	"
RAK 001-16	10/31/89	0900	BULK	NAIL COATING	1	1	"
RAK 002-17	11-1-89	0915	BULK	OPEN HEARTH	1	1	"
RAK 002-18	11-1-89	1000	BULK	"	1	1	"
RAK 002-19	11-1-89	1255	BULK	10 INCH RODMILL	1	1	"
RAK 002-20	11-1-89	1315	BULK	"	1	1	"
RAK 002-21	11-1-89	1340	BULK	"	1	1	"
RAK 002-22	11-1-89	1410	BULK	BLOOMING MILL	1	1	"
RAK 002-23	11-1-89	1430	BULK	10 INCH RODMILL	1	1	"
RAK 002-24	11-1-89	1500	BULK	RODMILL	1	1	ANALYZE BULK SAMPLES BY POLARIZED LIGHT MICROSCOPY

RELINQUISHED BY:	DATE/TIME: 11-21-89 1230	RECEIVED BY:	RELINQUISHED BY: / DATE/TIME: / RECEIVED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	RELINQUISHED BY: / DATE/TIME: / RECEIVED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:	DATE/TIME: / POSSIBLE HAZARD:

REMCOR

CHAIN OF CUSTODY RECORD

PROJECT NO.: 89316

PROJECT NAME: ARMCO STEEL KCMO

SAMPLERS: HLO/BCM — HARRY L. OWENS, BEVEL C. MILLET

SAMPLE	DATE	TIME	SAMPLE MEDIUM	SAMPLE LOCATION	NO. OF CONTAINERS	ASBESTOS SAMPLE							REMARKS
RAK 002-25	11-7-89	0900	BULK	BILLET	1	1							ANALYZE BULK SAMPLES BY POLARIZED LIGHT MICROSCOPY
RAK 002-26	11-7-89	0915	BULK	BILLET NO. 1 BLDG.	1	1							"
RAK 002-27	11-7-89	0935	BULK	BLOOMING MILL	1	1							"
RAK 002-28	11-7-89	1010	BULK	"	1	1							"
RAK 002-29	11-7-89	1020	BULK	"	1	1							"
RAK 002-30	11-7-89	1255	BULK	NO. 2 BUILDING	1	1							"
RAK 002-31	11-7-89	1420	BULK	18 INCH COOLING BED	1	1							"
RAK 003-32	11-16-89	1300	BULK	NO. 2 BOILER HOUSE	1	1							"
RAK 003-33	11-16-89	1320	BULK	"	1	1							"
RAK 003-34	11-16-89	1400	BULK	"	1	1							"
RAK 002-35	11-21-89	1000	BULK	POT ANNEALING CONTROL ROOM	1	1							"
RAK 002-36	11-21-89	1050	BULK	"	1	1							ANALYZE BULK SAMPLES BY POLARIZED LIGHT MICROSCOPY

RELINQUISHED BY:	DATE/TIME: 11-21-89 1230	RECEIVED BY:	RELINQUISHED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	RELINQUISHED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:	DATE/TIME:

DATE/TIME:	RECEIVED BY:
DATE/TIME:	RECEIVED BY:
POSSIBLE HAZARD:	

Terracon
ENVIRONMENTAL, INC.
7810 N. W. 100th
P.O. Box 901541
Kansas City, Missouri 64190-1541
(816) 891-7717

James A. Cunningham, P.E.
John F. Hartwell, P.E.
Robert L. Sholar
Stephen F. Loosbrock, C.P.G.
Robert L. Fine II, E.I.T.
Michael S. Kukuk, C.P.G.
David M. Beem, CIH
Julie H. Pflugradt

July 3, 1991

Mr. Charlie Fillinger
Armco Midwestern Steel Division
7000 Roberts Street
Kansas City, Missouri 64125

RE: Armco Soil Survey
Project No. 50915012

Dear Charlie:

Terracon Environmental, Inc. has completed Phase I and Phase II of a soil vapor survey of the area surrounding the degreasing unit located within the nail mill facility, and the adjacent outside area immediately to the north. The purpose of this investigation was to provide information on both the vertical and lateral extent of the volatile organic compound (VOC's) contamination discovered previously at this site.

Data acquisition was conducted in general accordance with the attached Terracon Standard Field Procedure No. 3050-2.

Soil vapor sampling was accomplished by hydraulically advancing a hollow one inch diameter rod to the desired sampling depth. A space for soil vapor to enter the rods was created by retracting the rods a specified distance. A conical drive point detaches from the lead rod when it is retracted thus creating a void in the soil from which to extract vapors. Flexible tubing was then attached to the rods and a vacuum applied. Three volumes of soil vapor were purged through the rods before a sample was collected. Once the purging was completed and the negative pressure within the rods returned to atmospheric pressure, a sample was collected.

The extracted vapor sample was then directly injected into the 30-meter column of the gas chromatograph using a disposable syringe. The sample was analyzed by both a 10.2eV photo- ionization detector (PID) and an electron capture detector (ECD). The detector response of the vapor sample was compared with detector response to a quantitative standard. The results of this comparison provides both identification of the compound (based on retention time) and quantification of the identified compounds.

The concentrations are reported in micro grams per liter air (ug/L air). Total VOC's results represent total detector response to a sample as compared to detector response to a standard of the compound tetrachloroethylene (PCE). Identification of compounds was based upon retention times of known analytical standards. It is possible for more than one compound to possess the same retention time; therefore, the presence of other contaminants in the soil may not be detected.

The soil gas survey was conducted in two investigative phases. Phase I concentrated on the area immediately surrounding the degreasing unit located within the nail mill facility. Phase II activities concentrated on delineating the areal extent of contamination north of the nail mill and consisted of probes being placed outside of the structure along the access road between two buildings.

During the Phase I investigation a total of fifteen probes were advanced in a radial pattern extending outward from the degreasing unit. Soil vapor samples were collected at two sampling intervals within each probe. These sampling intervals were 5 to 6 feet below surface, and a deeper interval typically from 9 to 12 feet or 10 to 15 feet below surface. As the survey progressed, the 10 to 15 foot sample interval was selected because vapor recovery was enhanced with depth and also the depth to groundwater increased.

Upon review of the data generated by the first phase of the investigation, it was determined that additional work outside of the facility was necessary to further define the areal extent of contamination to the north (the direction of groundwater flow). The second phase of the investigation included advancing nine additional probes outside of the building to the north along the driveway.

Results of the soil gas survey confirm the presence of trichloroethylene (TCE), trichloroethane (TCA) and possibly tetrachloroethylene (PCE), along with their associated major breakdown constituents. These compounds were detected in both the saturated and unsaturated zones underlying the nail mill building and also to the north.

Attached are several figures that show the probe locations and respective concentrations for TCE, TCA, and total volatile organics (VOC's). Reported values were as high as 291 ug/L air for TCE, greater than 1000 ug/L air for TCA, and greater than 1000 ug/L air for total VOC's. Confidence levels of .005 ug/L air for TCE, TCA and 5 ug/L for total VOCs were calculated for this assessment.

Chlorinated VOC's, such as those encountered at the nail mill, are denser than water (TCE specific gravity 1.4) relatively insoluble (<1%), and possess moderate to high vapor pressures (100 mm Hg at 31°c). When volatile organic compounds are released into the subsurface they exist in four phases: as vapor within the interstitial pore space of the subsurface material, a phase which is sorbed onto individual particles of both the matrix of the aquifer and the vadose zone, a dissolved phase in the ground water, and as free product liquids which can migrate vertically downward through subsurface material. Dense products, such as chlorinated VOC's, and may reach a less permeable zone in the aquifer when they will either collect or move along the surface in response to gravity.

The soil gas vapor survey conducted by Terracon addressed the vapor phase properties of the VOC's above the ground water. The VOC vapor above the groundwater is a result of the off-gassing of the dissolved phase as it migrates with groundwater flow. The aereal extent of the distribution vapor phase will usually correlate (for chlorinated VOC's), with known contamination of the aquifer by the dissolved phase. An isopleth map representing the dissolved phase VOC's is attached and is interpreted from total instrument VOC response. If a free product phase plume is present, the plume will generally be present either within the boundaries of the dissolved phase plume or hydrogeologically upgradient to the dissolved VOC plume.

Please note that the plume depicted in the figure is defined by a limited number of probe locations. Therefore the isopleth map should be interpreted as an indicator of contaminant migration, and to a lessor extent, the magnitude. Additional data could alter the present configuration of the isopleth contours.

Soil vapor data generated during the Phase I investigation strongly indicates that the source of contamination underlying the building was due to past operations or surface spillage near the nail mill and that relatively high concentrations of the degreasing materials remain sorbed onto the shallower soils underlying the degreaser area. This is supported by the fact that several of the Phase I probe locations (P-2, P-4, P-7, P-10, and P-13) exhibited greater concentrations of VOC's within the shallow 5-6 foot probe test interval than from the 9-15 foot probe test interval.

The VOC concentration distribution within the soil indicates that the VOC's are not at equilibrium within the soil column (the sorbtive capacity of the upper soil has been exceeded) and that downward migration of the VOC's through the soil column is continuing to take place.

Lateral migration of VOC's in both the sorbed and vapor phases is most likely occurring within the shallow soils of the nail mill area. This type of lateral migration is enhanced by the vapor barrier effect of the concrete floor preventing the volatilized VOC's to escape to the atmosphere, thus forcing them to migrate horizontally and to sorb onto the soils underlying the concrete.

An analysis of the combined data from the Phase I and Phase II soil vapor surveys indicates that localized soil contamination by chlorinated VOC's exists at the nail mill facility. The data strongly suggests that a ground water plume of dissolved VOC's is emanating from the former nail mill facility and migrating downgradiant in a generally northwesterly direction. Present soil vapor data suggests that the plume is localized lies within the boundaries of the phase II soil vapor survey. The present data are insufficient to determine if a free product phase chlorinated VOC plume exists at depth in the groundwater at this site. This can only be confirmed by collecting samples to determine groundwater quality.

Terracon at present is preparing a proposal addressing future work needed at this site to provide contaminant, hydrogeologic, and soil information required for the successful design of a cost effective remediation system.

We have enjoyed providing Armco with environmental services. If we may answer any questions on this report, please do not hesitate to contact us at (816)891-7717.

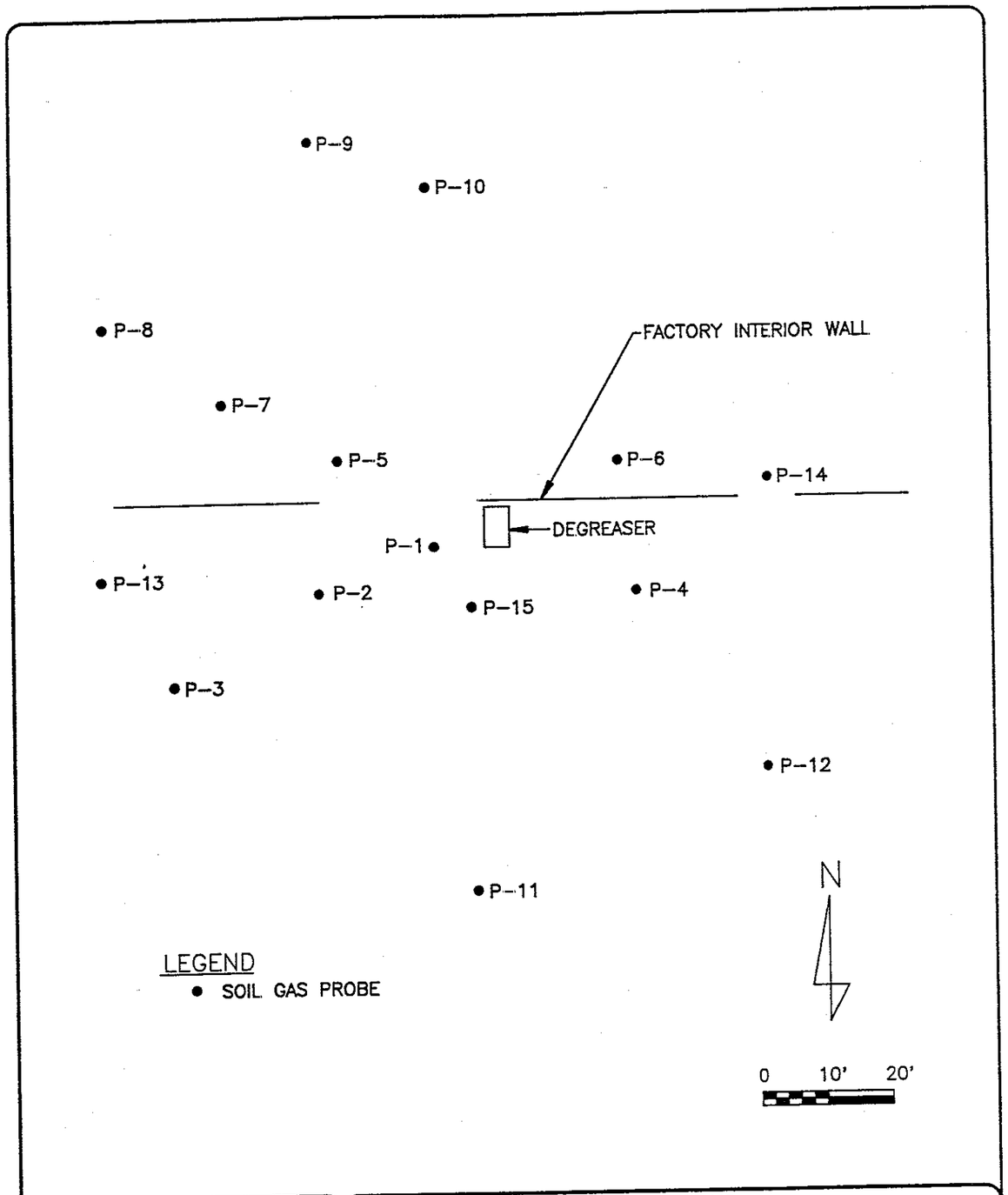
Sincerely,

TERRACON ENVIRONMENTAL, INC.

Ronald W. Wood
Project Geologist

Stephen F. Loosbrock
Hydrogeologist
Principal

RWW/SFL:jd
(d)rww\armco2.let

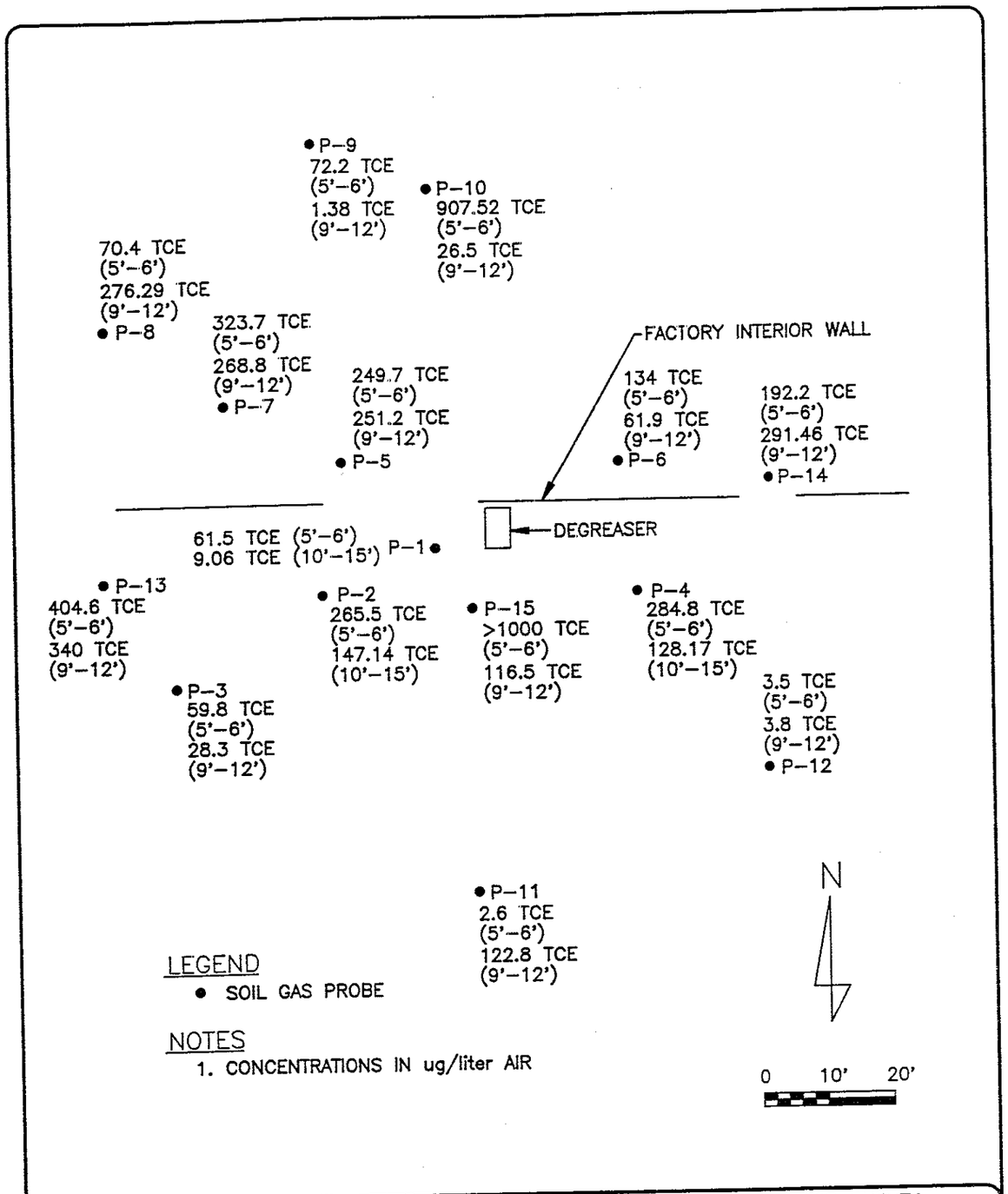


PROJ.# 50915012	PAGE#
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

FIGURE 1. SOIL GAS PROBE LOCATIONS

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon

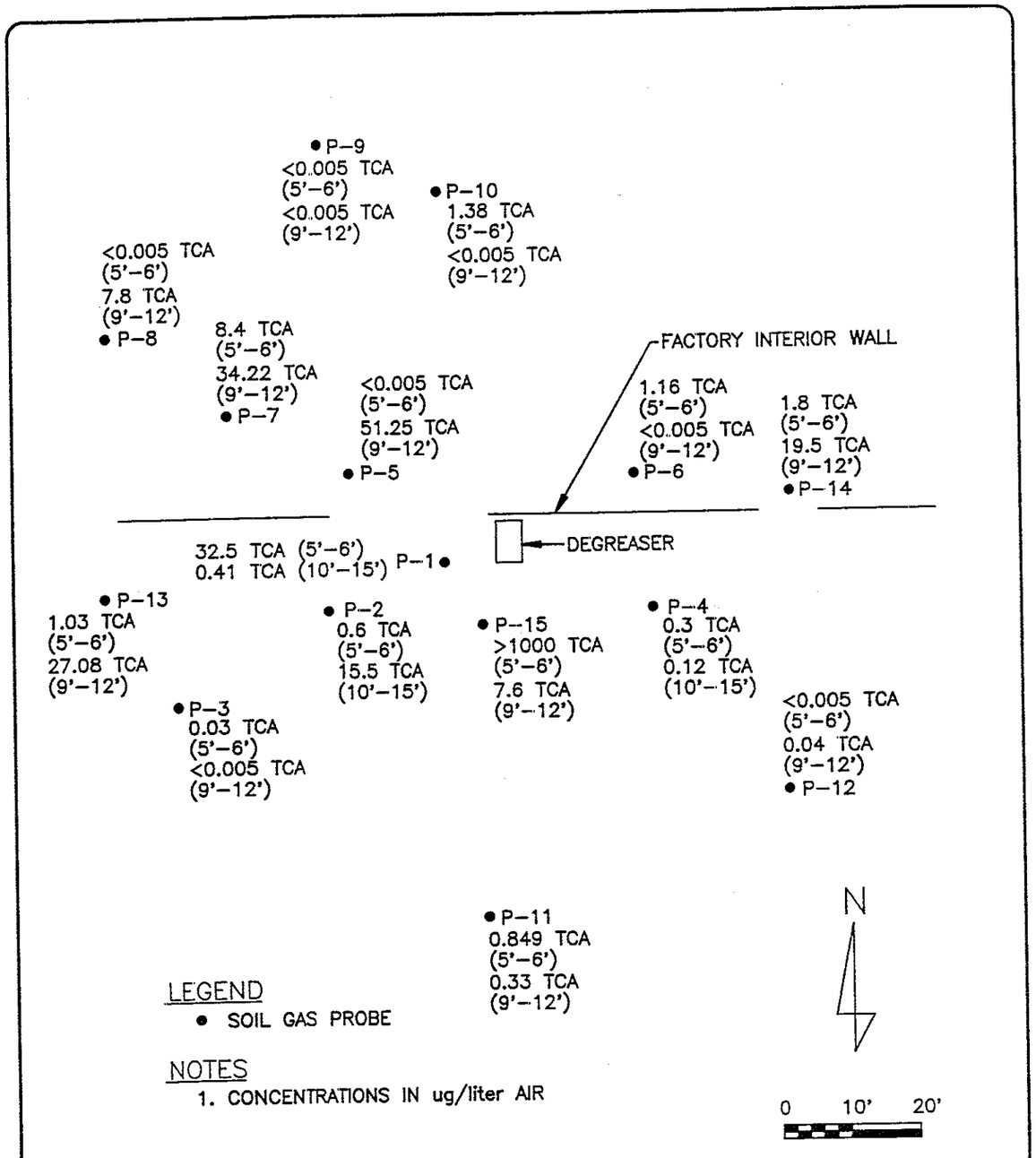


PROJ.# 50915012	PAGE#
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

FIGURE TCE CONCENTRATIONS – SOIL VAPOR SURVEY

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon



LEGEND

- SOIL GAS PROBE

NOTES

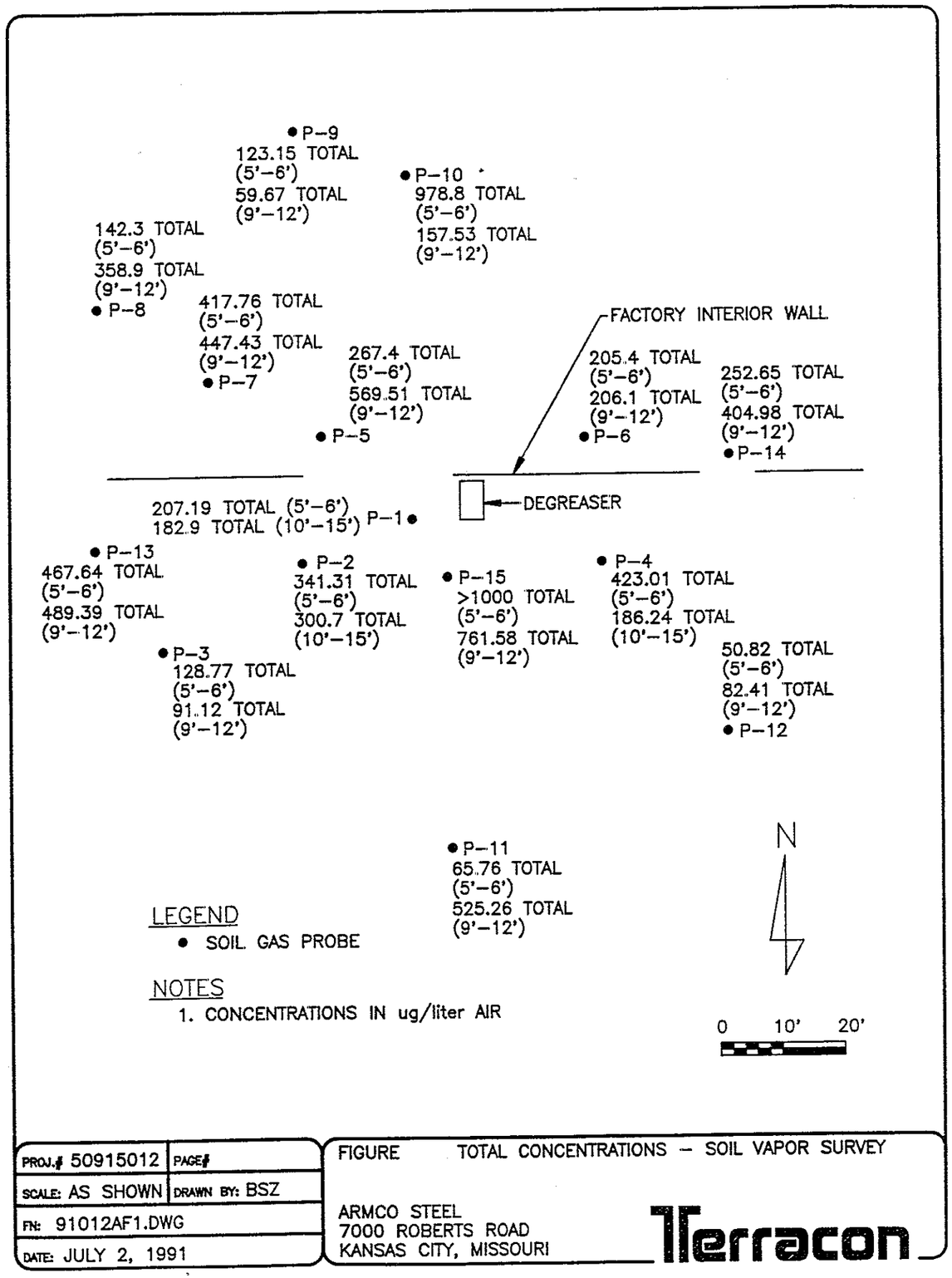
1. CONCENTRATIONS IN ug/liter AIR

PROJ.# 50915012	PAGE#
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

FIGURE TCA CONCENTRATIONS -- SOIL VAPOR SURVEY

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon

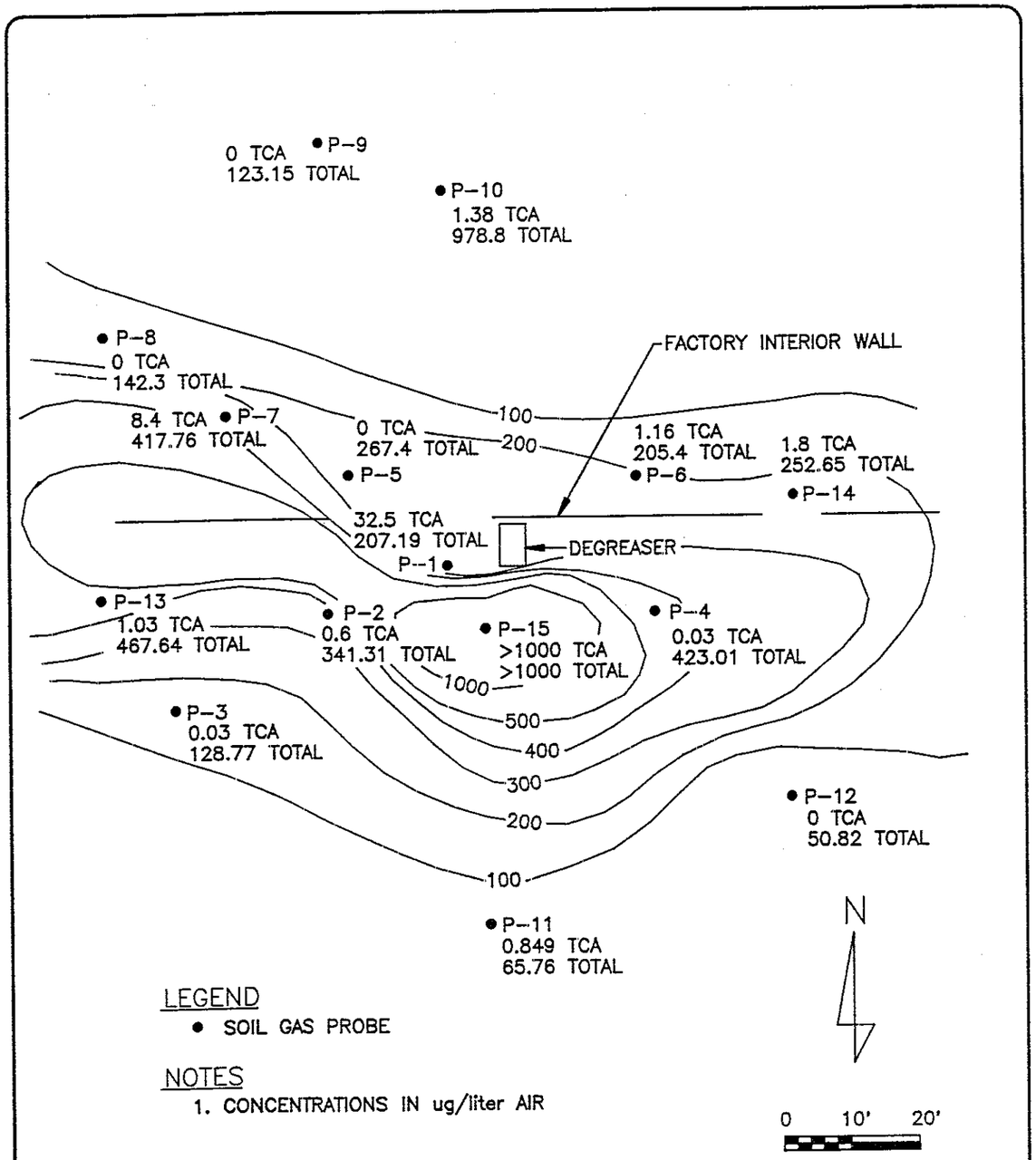


PROJ.# 50915012	PAGE#
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

FIGURE TOTAL CONCENTRATIONS – SOIL VAPOR SURVEY

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon



LEGEND

- SOIL GAS PROBE

NOTES

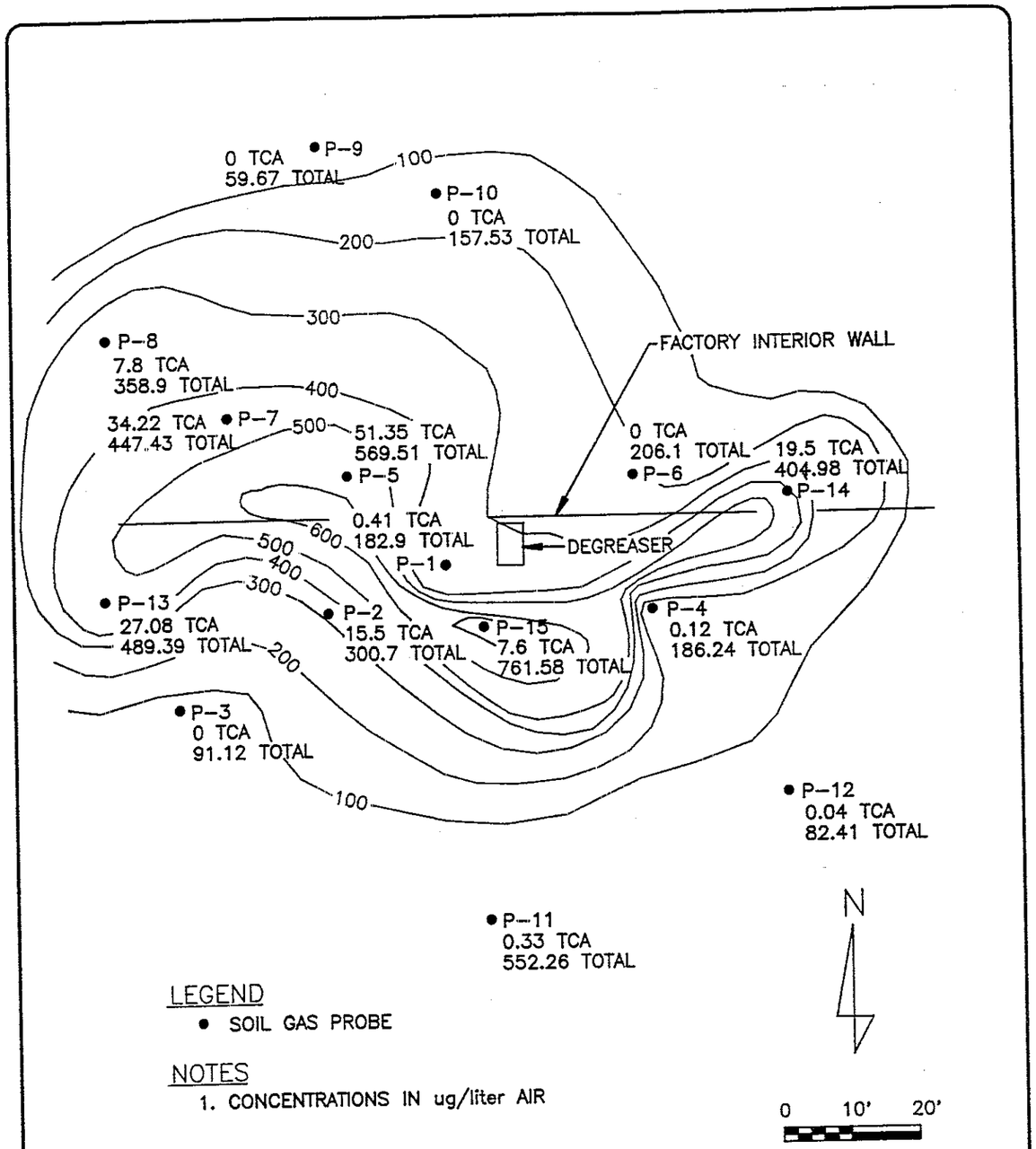
1. CONCENTRATIONS IN ug/liter AIR

PROJ.# 50915012	PAGE#
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

FIGURE 5'–6' DEPTH TCA AND TOTAL CONCENTRATIONS

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon



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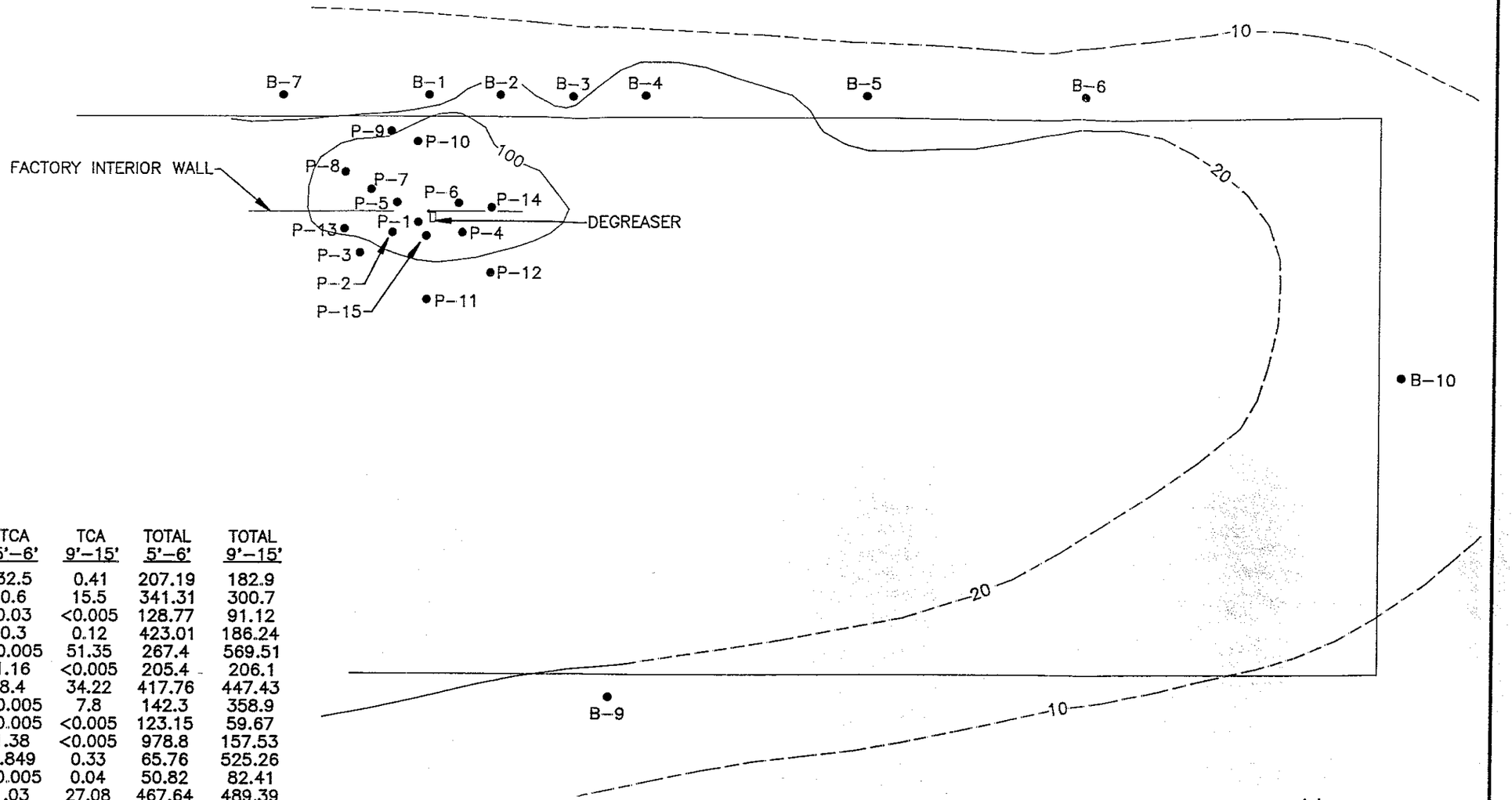
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91012AF1.DWG	
DATE: JULY 2, 1991	

9'–15' DEPTH TCA AND TOTAL CONCENTRATIONS

ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

Terracon



	TCE 5'–6'	TCE 9'–15'	TCA 5'–6'	TCA 9'–15'	TOTAL 5'–6'	TOTAL 9'–15'
P–1	61.5	9.06	32.5	0.41	207.19	182.9
P–2	265.5	147.14	0.6	15.5	341.31	300.7
P–3	59.8	28.3	0.03	<0.005	128.77	91.12
P–4	284.8	128.17	0.3	0.12	423.01	186.24
P–5	249.7	251.2	<0.005	51.35	267.4	569.51
P–6	134.0	61.9	1.16	<0.005	205.4	206.1
P–7	323.7	268.8	8.4	34.22	417.76	447.43
P–8	70.4	276.29	<0.005	7.8	142.3	358.9
P–9	72.2	1.38	<0.005	<0.005	123.15	59.67
P–10	907.52	26.5	1.38	<0.005	978.8	157.53
P–11	2.6	122.8	0.849	0.33	65.76	525.26
P–12	3.5	3.8	<0.005	0.04	50.82	82.41
P–13	404.6	340	1.03	27.08	467.64	489.39
P–14	192.2	291.46	1.8	19.5	252.65	404.98
P–15	>1000	116.5	>1000	7.6	>1000	761.58
B–1		1.89		0.017		16
B–2		12.5		0.027		26
B–3		1.9		<0.005		16.78
B–4		15.3		0.04		42.68
B–5		0.08		0.106		15.03
B–6		2.6		<0.005		17.48
B–7		<0.005		<0.005		17
B–9		<0.005		<0.005		16.8
B–10		<0.005		<0.005		15.5

LEGEND

- SOIL GAS PROBE

NOTES

1. ISOPLETH FOR TOTAL VOLATILE ORGANIC CONCENTRATIONS IN ug/L AIR
2. "P" SERIES SAMPLED MARCH 20–21, 1991
3. "B" SERIES SAMPLED MAY 17, 1991

N

0 40' 80'

FIGURE TCE, TCA, AND TOTAL CONCENTRATIONS – SOIL VAPOR SURVEY
ARMCO STEEL
7000 ROBERTS ROAD
KANSAS CITY, MISSOURI

REVISED:

PROJ.# 50915012 | DRAWN BY: BSZ
FN: 91012AF2.DWG | SCALE: AS SHOWN
DATE: JULY 2, 1991 | PAGE#

7810 NORTHWEST 100th
KANSAS CITY, MISSOURI 64053
PHONE: (816) 891–7717
FAX: (816) 891–7048

Terracon
ENVIRONMENTAL, INC.

RECEIVED APR 1 2 1991

CAS CONTINENTAL ANALYTICAL SERVICES, INC.
1804 GLENDALE ROAD • SALINA, KANSAS 67401
(913) 827-1273 • (800) 535-3076 • FAX (913) 823-7830

CLIENT: TERRACON CONSULTANTS INC.
ATTN:ROBERT BAYER
P.O. BOX 901541
KANSAS CITY, MO 64190-1541

DATE SAMPLE RPTD: 04/10/91
DATE SAMPLE RECD: 03/25/91
CAS FILE NO: 91-5018
CAS ORDER NO: 6167
CLIENT P.O.: PROJ 50915012

LAB NUMBER: 91031180
SAMPLE DESCRIPTION: P-1

DATE SAMPLED: 03/20/91
TIME SAMPLED: 1200

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE
1,1,1-TRICHLOROETHANE/METHCLOR	100.	UG/KG	141/95
TRICHLOROETHYLENE	130000.	UG/KG	141/93

CONCLUSION OF LAB NUMBER: 91031180

LAB NUMBER: 91031181
SAMPLE DESCRIPTION: P-2

DATE SAMPLED: 03/20/91
TIME SAMPLED: PM

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE
1,1,1-TRICHLOROETHANE/METHCLOR	ND(500)	UG/KG	141/95
TRICHLOROETHYLENE	4600.	UG/KG	141/93

CONCLUSION OF LAB NUMBER: 91031181

LAB NUMBER: 91031182
SAMPLE DESCRIPTION: P-9

DATE SAMPLED: 03/21/91
TIME SAMPLED: 1400

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE
1,1,1-TRICHLOROETHANE/METHCLOR	ND(500)	UG/KG	141/95
TRICHLOROETHYLENE	ND(500)*	UG/KG	141/93

*HIGH DETECTION LIMIT IS DUE TO HYDROCARBON INTERFERENCES.

CONCLUSION OF LAB NUMBER: 91031182

LAB NUMBER: 91031183
SAMPLE DESCRIPTION: P-15

DATE SAMPLED: 03/21/91
TIME SAMPLED: 1900

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE
1,1,1-TRICHLOROETHANE/METHCLOR	ND(5000)	UG/KG	141/95
TRICHLOROETHYLENE	18000.	UG/KG	141/93

-CONTINUED-

CONTINENTAL ANALYTICAL SERVICES, INC.

LABORATORY REPORT PAGE: 2

CLIENT: TERRACON CONSULTANTS INC.
LAB NUMBER: 91031183

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE

CONCLUSION OF LAB NUMBER: 91031183

Uuality control analyses were performed on samples at time of analysis in accordance with procedures published in Title 40 of the Code of Federal Regulations part 136, July 1, 1986 or in EPA Publication, SW-846, 3rd edition, Nov. 1986. ND(), where noted, indicates none detected with the detection limit in parentheses.

CONTINENTAL ANALYTICAL SERVICES, INC.

Kathleen A. Mitchell
for

Clifford J. Baker
Laboratory Director

Terracon
CONSULTANTS EC, INC.

7810 N. W. 100th
PO Box 901541
Kansas City, Missouri 64190-1541
(816) 891-7717

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME
50915012	ARMCO

SAMPLERS: (Signature) Robert P. Bayer III

STATION NUMBER	DATE	TIME	STATION LOCATION	SAMPLE PARAMETER: TCA	SAMPLE PARAMETER: TCE	OTHER	NUMBER OF CONTAINERS	REMARKS
P-1	3/20/91	~ NOON	5' W OF DG.	X	X		1	SOIL
P-2	3/20/91	PM	14'S & 24' W OF X-0, Y-0	X	X		1	
P-9	3/21/91	1400	54'N & 26' W of X-0, Y-0	X	X		1	
P-15	3/21/91	1900	16'S & 1' W of X-0, Y-0	X	X		1	
						TOTAL NUMBER OF CONTAINERS	4	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
Robert P. Bayer III	3/22/91	17:00					
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)

METHOD OF SHIPMENT	SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
			Beth Palmateer	1130 3-25-91

APPENDIX A: HISTORIC DOCUMENTS

APR 09 1997

IDLED FACILITIES ENVIRONMENTAL INVESTIGATION

Kansas City Works
KANSAS CITY, MISSOURI

Project No. 89316.15
Prepared October 1990

Table 4
NAIL DEGREASING AREA - SAMPLE ANALYSIS RESULTS SUMMARY

Sample Designation	Site Area	Medium	Volatile Organic Compounds (ug/kg)					Sample Collection Location
			Benzene	1,1,1-TCA	1,1-DCE	PCE	TCE	
AKC-NDC-01S	Nail Degreasing Area	Soil Core	<625	22,000	850	1,200	100,000	Beneath Concrete Floor @ Degreaser Area
AKC-NDC-02S	Nail Degreasing Area	Soil Core	<625	<625	<625	<625	67,000	Beneath Concrete Floor @ Degreaser Area
AKC-NDC-01C	Nail Degreasing Area	Concrete Core	<5	290	<5	13	1,400	Concrete Slab @ Degreaser Area
AKC-NDC-02C	Nail Degreasing Area	Concrete Core	49	<5	<5	<5	22	Concrete Slab @ Degreaser Area
AKC-WCB-ND-01	Nail Degreasing Area	Wood Chips	<10	<10	<10	<10	28,000	Wooden Floor Blocks @ Degreaser Area
AKC-WCB-ND-02	Nail Degreasing Area	Wood Chips	<10	1,400	<10	<10	17,000	Wooden Floor Blocks @ Degreaser Area

Notes:
1. Nail degreaser area samples were collected on by Remcor personnel during the period of December 7, 1989 and June 7, 1990.
2. Nail degreaser area samples were analyzed by Antech Ltd, of Export, Pennsylvania.
3. Compounds which were not detected in the above-referenced samples are not listed. Refer to the Appendicies for copies of the detailed sample analysis results.
4. Compound abbreviations: 1,1,1-TCA (1,1,1-Trichloroethane), 1,1-DCE (1,1-Dichloroethene), PCE (Tetrachloroethene), and TCE (Trichloroethene).

APPENDIX B: BORING LOGS

LOG OF BORING NO. MW-1

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

TOP OF CASING: 742.51 ft
GROUND SURFACE ELEV.: 742.91 ft

GRAPHIC LOG	DESCRIPTION	DEPTH (FT.)	USCS SYMBOL	NUMBER	TYPE	RECOVERY	BLOWS / FT.	FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	CLAY FILL, dark gray-brown, dry and loose, surface covered by gravel		-	1	C	0		0.0	
	2.7 / 740.2								
	3.5 / 739.4 **SILTY CLAY**, dark gray with a trace of gravel, moist and loose	5	-	2	C	0		0.5	
	CLAYEY SILT, light brown with a trace of organic material, moist ▼								
	Root casts and trace of cobbles	10	-	3	C	100		0.2	
	15.0 / 727.9	15	-	4	C	80		0.7	
	SILTY CLAY, light brown with black mottling and some orange iron staining, some seams of very fine to fine iron stained sand and some rootlets and root casts, moist and becoming saturated at 19 feet	20	-	5	C	100		1.3	

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

BOREHOLE DIA.: 8.2 in
WELL DIA.: 2 in

WATER LEVEL OBSERVATIONS

WL	▼ 12.5	wd	▼ 6.0	ad
WL	21.5	ab	20.31	ws
WL				

Terracon

BORING STARTED	8-27-91
BORING COMPLETED	8-28-91
RIG C.M.E. 75	FOREMAN R.W.W.
APPROVED G.M.Z.	JOB # 50915113

LOG OF BORING NO. MW-1

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	TESTS: COMMENTS OR FIELD NOTES
	Becoming dark gray with some silt laminations and iron staining and trace iron nodules		25	-	6	C	100		1.7	
				-	7	C	100		1.8	
	29.0 713.9									
	29.4 713.5 GRAVEL, angular		30							
	SILTY CLAY, dark gray, moist and firm with some stiff zones			-	8	C	100		0.2	
	38.0 704.9		35							
	CLAY, gray, moist and firm to stiff			-	9	C	100		0.1	
	41.0 701.9		40							
	42.5 SILTY CLAY, dark gray 700.4			-	10	C	20		0.0	
	Continued Next Page									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
WL	▽ 12.5	wd	▽ 6.0	ad
WL	21.5	ab	20.31	ws
WL				

Terracon

BORING STARTED	8-27-91
BORING COMPLETED	8-28-91
RIG C.M.E. 75	FOREMAN R.W.W.
APPROVED G.M.Z.	JOB # 50915113

LOG OF BORING NO. MW-1

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	CLAY, gray		45							
				-	11	C	20		0.0	
			50							
	51.0 / 691.9									
	51.4 / 691.5 FINE TO COARSE SAND									
	54.0 / 688.9 CLAY, gray with some quarter inch thick fine sand seams, moist and firm			-	12	C	100		0.0	
	54.3 / 688.6		55							
	56.0 / 686.9									
	56.5 / 686.4 FINE SAND, 2 to 4 inch thick seam									
	CLAY, gray									
	GRAVEL			-	13	C	100		0.0	
			60							
	62.5 / 680.4 CLAY, gray with trace of cobbles between 57 and 62 feet Organic matter with roots and wood			-	14	C	100		0.0	
			65							

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
WL	▽ 12.5	wd	▼ 6.0	ad
WL	21.5	ab	20.31	ws
WL				

Terracon

BORING STARTED	8-27-91		
BORING COMPLETED	8-28-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-1

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	65.4 SHALE, dark gray, highly weathered — 677.5									
	Auger refusal and bottom of boring at 65.4 feet									
	Classification based on modified Wentworth scale (USGS standard) and Shepard (1954) triangle system.									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
WL	▽ 12.5	wd	▼ 6.0	ad
WL	21.5	ab	20.31	ws
WL				

Terracon

BORING STARTED	8-27-91		
BORING COMPLETED	8-28-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-2

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

TOP OF CASING: 744.90 ft
GROUND SURFACE ELEV.: 745.30 ft

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	0.8 CONCRETE — 744.5									
	SILTY CLAY, brown with a trace of medium sand, moist			-	1	C	100		233	
	Becoming trace of coarse sand			-	2	C	100		190	
			5	-	3	ST	100		-	
	Becoming gray mottling with iron staining			-	4	C	100		233	
			10	-	5	C	100		48	
			15	-	6	C	100		8	
			20							

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

BOREHOLE DIA.: 8.2 in
WELL DIA.: 2 in

WATER LEVEL OBSERVATIONS			
WL	▽ 21.5 ad	7.98 ws	
WL			
WL			

Terracon

BORING STARTED	8-28-91
BORING COMPLETED	8-28-91
RIG C.M.E. 75	FOREMAN R.W.W.
APPROVED G.M.Z.	JOB # 50915113

LOG OF BORING NO. MW-2

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	Becoming dark gray with some sand seams		25	-	7	C	80		7	
	26.0 719.3									
	26.3 719.0 GRAVEL									
	28.0 717.3 SILTY CLAY, dark gray with some sand seams, moist Beoming increasing sand content		30	-	8	C	0		-	
				-	9	C	100		7	
	SILTY, CLAYEY VERY FINE TO FINE SAND, with muscovite, wet		35	-	10	C	100		7	
	36.0 709.3									
	Bottom of boring at 36 feet.									
	Classification based on modified Wentworth scale (USGS standard) and Shepard (1954) triangle system.									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
WL	▽ 21.5 ad	7.98 ws	
WL			
WL			

Terracon

BORING STARTED	8-28-91		
BORING COMPLETED	8-28-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-3

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

TOP OF CASING: 745.01 ft

GROUND SURFACE ELEV.: 745.41 ft

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	0.8 **CONCRETE** 744.6									
	SILTY CLAY, with trace of medium sand, brown, moist			-	1	C	100		116	
	Trace sand becoming coarse		5	-	2	C	100		78	
	Becoming brown with gray mottling and iron staining		10	-	3	C	100		172	
			15	-	4	C	100		68	
			20	-	5	C	100		73	

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

BOREHOLE DIA.: 8.2 in

WELL DIA.: 2 in

WATER LEVEL OBSERVATIONS

WL	▽ 21.0	ad	23.38	ws
WL				
WL				

Terracon

BORING STARTED 8-29-91

BORING COMPLETED 8-29-91

RIG C.M.E. 75 FOREMAN R.W.W.

APPROVED G.M.Z. JOB # 50915113

LOG OF BORING NO. MW-3

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	Trace sand becoming sand seams, brown becoming dark gray		25							
	26.0 719.4									
	26.3 719.1 GRAVEL			-	6	C	100		64	
	28.0 717.4 SILTY CLAY, very fine to fine sand seams, dark gray, moist. Increasing sand content		30	-	7	ST	100		27	
	SILTY-CLAYEY VERY FINE TO FINE SAND, with muscovite, gray and dark gray, wet. Increasing silt content			-	8	C	60		10	
			35							
				-	9	C	50		0.0	
	41.0 704.4		40							
	SILTY CLAY, trace of fine sand, dark gray, moist and firm			-	10	C	100		0.0	
	43.0 702.4									

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
WL	▽ 21.0	ad 23.38	ws
WL			
WL			

Terracon

BORING STARTED	8-29-91		
BORING COMPLETED	8-29-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-3

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	SANDY-SILTY CLAY, very fine to fine sand, dark gray, moist		45							
45.7 / 699.7										
	SILTY CLAY, dark gray with iron staining			-	11	C	100		0.0	
			50							
				-	12	C	100		0.0	
			55							
56.0 / 689.4										
56.3 / 689.1	**FINE TO MEDIUM SAND**									
	CLAY, with cobbles and gravel, dark gray with some iron staining			-	13	C	100		0.0	
			60							
61.8 / 683.6										
63.0 / 682.4	**Weathered Shale**, dark gray									
63.3 / 682.1	**SHALE**, dark gray									

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
WL	▽ 21.0 ad	23.38 ws	
WL			
WL			

Terracon

BORING STARTED	8-29-91		
BORING COMPLETED	8-29-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-3

OWNER: Midwestern Steel Division, ARMCO, Inc.	ARCHITECT/ENGINEER: Terracon Environmental, Inc.
SITE: 700 Roberts Street, Kansas City, Missouri	PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	TESTS: COMMENTS OR FIELD NOTES
	Auger refusal and bottom of boring at 63.0 feet. Classification based on modified Wentworth scale (USGS standard) and Shepard (1954) triangle system.									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
WL	▽ 21.0	ad	23.38 ws
WL			
WL			

Terracon

BORING STARTED	8-29-91		
BORING COMPLETED	8-29-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-4

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

TOP OF CASING: 744.66 ft

GROUND SURFACE ELEV.: 745.06 ft

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	0.3 — 744.8 **ASPHALT**			-		CUT			0.0	
	GRAVEL, with coarse sand and clay and brick, dark gray									
	4.2 — 740.9 **SANDY-SILTY CLAY**, dark gray		5	-		CUT			0.0	
	6.5 — 738.6									
	7.5 — 737.6 **BRICK**, gray to yellow									
	SANDY CLAY, dark gray, moist, firm		10	-		CUT			0.0	
	Dark gray becoming gray									
	Gray and moist becoming brown ▽ and wet									
	14.7 — 730.4		15	-		CUT			0.0	
	CLAY, brown, wet, firm									
			20	-	1	C	100		0.0	

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

BOREHOLE DIA.: 8.2 in

WELL DIA.: 2 in

WATER LEVEL OBSERVATIONS

WL	▽ 12.5	wd	26.91	ws
WL				
WL				

Terracon

BORING STARTED	8-30-91
BORING COMPLETED	8-30-91
RIG C.M.E. 75	FOREMAN R.W.W.
APPROVED G.M.Z.	JOB # 50915113

LOG OF BORING NO. MW-4

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
	25.0 720.1		25							
	SILTY CLAY, dark gray, wet			-	2	C	100		0.0	
	27.0 718.1									
	CLAY, dark gray, wet, firm									
	28.7 716.4		30	-	3	C	100		0.0	
	SILTY CLAY, dark gray, wet, firm									
	32.5 712.6									
	CLAY, with trace of very fine to fine sand, dark gray, moist, firm		35	-	4	C	100		0.0	
	Trace sand no longer present		40	-	5	C	100		0.0	

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
WL	▽ 12.5	wd	26.91	ws
WL				
WL				

Terracon

BORING STARTED	8-30-91		
BORING COMPLETED	8-30-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-4

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	COMMENTS OR FIELD NOTES
			45	-		CUT	0		0.0	
	Trace sand again present, becoming iron stained		50	-	6	C	90		0.0	
	52.0 693.1									
	SILTY CLAY, with very fine to fine sand, dark gray, moist		55	-	7	C	100		0.0	
	With cobbles and gravel		60	-	8	C	100		0.0	
			65							

Continued Next Page

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS			
WL	▽ 12.5 wd	26.91 ws	
WL			
WL			

Terracon

BORING STARTED	8-30-91		
BORING COMPLETED	8-30-91		
RIG	C.M.E. 75	FOREMAN	R.W.W.
APPROVED	G.M.Z.	JOB #	50915113

LOG OF BORING NO. MW-4

OWNER: Midwestern Steel Division, ARMCO, Inc.

ARCHITECT/ENGINEER: Terracon Environmental, Inc.

SITE: 700 Roberts Street, Kansas City, Missouri

PROJECT: Nail Mill Phase II Investigation

GRAPHIC LOG	DESCRIPTION	WELL DETAIL	DEPTH (FT.)	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY	TESTS: BLOWS / FT.	TESTS: FIELD VAPOR TESTS (ppm)	TESTS: COMMENTS OR FIELD NOTES
	With cobbles, becoming iron stained			-	9	C	100		0.0	
	68.0 677.1									
	WEATHERED SHALE, dark gray, moist, stiff									
	70.0 675.1		70							
	70.3 674.8									
	SHALE dark gray									
	Auger refusal and bottom of boring at 70.0 feet.									
	Classification based on modified Wentworth scale (USGS standard) and use of Shepard (1954) triangle system.									

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS				
WL	▽ 12.5	wd	26.91	ws
WL				
WL				

Terracon

BORING STARTED	8-30-91
BORING COMPLETED	8-30-91
RIG C.M.E. 75	FOREMAN R.W.W.
APPROVED G.M.Z.	JOB # 50915113

APPENDIX C: PACE ANALYTICAL DATA/CHAIN-OF-CUSTODY SHEETS

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REPORT OF LABORATORY ANALYSIS

October 03, 1991

Mr. G.M. Zemansky
Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510830.517
Client Reference: Proj. #50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received August 30, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

Enclosures

9608 Loiret Boulevard
Lenexa, KS 66219
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FAX: 913 599 1759

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

October 03, 1991
PACE Project Number: 510830517

Attn: Mr. G.M. Zemansky

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120536	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	8-13'	DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 LOW				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/12/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/12/91
Vinyl Chloride	ug/kg	10	ND	09/12/91
Chloroethane	ug/kg	10	ND	09/12/91
Methylene Chloride	ug/kg	10	ND	09/12/91
Acetone	ug/kg	10	ND	09/12/91
Carbon Disulfide	ug/kg	10	ND	09/12/91
1,1-Dichloroethylene	ug/kg	10	ND	09/12/91
1,1-Dichloroethane	ug/kg	10	ND	09/12/91
1,2-Dichloroethylene (Total)	ug/kg	10	300	09/12/91
Chloroform	ug/kg	10	ND	09/12/91
1,2-Dichloroethane	ug/kg	10	ND	09/12/91
2-Butanone (MEK)	ug/kg	10	ND	09/12/91
1,1,1-Trichloroethane	ug/kg	10	11	09/12/91
Carbon Tetrachloride	ug/kg	10	ND	09/12/91
Vinyl Acetate	ug/kg	10	ND	09/12/91
Dichlorobromomethane	ug/kg	10	ND	09/12/91
1,2-Dichloropropane	ug/kg	10	ND	09/12/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/12/91
Trichloroethylene	ug/kg	1000	2500	09/12/91
Chlorodibromomethane	ug/kg	10	ND	09/12/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/12/91
Benzene	ug/kg	10	ND	09/12/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/12/91
Bromoform	ug/kg	10	ND	09/12/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120536	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	8-13'	DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 LOW				
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/12/91
2-Hexanone	ug/kg	10	ND	09/12/91
Tetrachloroethylene	ug/kg	10	ND	09/12/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/12/91
Toluene	ug/kg	10	ND	09/12/91
Chlorobenzene	ug/kg	10	ND	09/12/91
Ethylbenzene	ug/kg	10	ND	09/12/91
Styrene	ug/kg	10	ND	09/12/91
Xylenes (Total)	ug/kg	10	ND	09/12/91
Dichlorodifluoromethane	ug/kg	10	ND	09/12/91
Trichlorofluoromethane	ug/kg	5	ND	09/12/91
Acrolein	ug/kg	100	ND	09/12/91
Acrylonitrile	ug/kg	100	ND	09/12/91
Iodomethane	ug/kg	5	ND	09/12/91
Dibromomethane	ug/kg	5	ND	09/12/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/12/91
Ethylmethacrylate	ug/kg	5	ND	09/12/91
1,2,3-Trichloropropane	ug/kg	5	ND	09/12/91
1,4-Dichloro-2-butene	ug/kg	5	ND	09/12/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,2-Dichloroethane-d4 (Surrogate)	%		107	09/12/91
Toluene-d8 (Surrogate)	%		114	09/12/91
4-Bromofluorobenzene (Surrogate)	%		104	09/12/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Lenexa, KS 66219
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REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120781	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	15-18'	DATE ANALYZED
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Methylene Chloride	ug/kg	10	ND	09/13/91
Acetone	ug/kg	10	ND	09/13/91
1,1-Dichloroethylene	ug/kg	10	ND	09/13/91
1,1-Dichloroethane	ug/kg	10	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	10	120	09/13/91
Chloroform	ug/kg	10	ND	09/13/91
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	10	ND	09/13/91
2-Butanone (MEK)	ug/kg	10	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	10	ND	09/13/91
Carbon Tetrachloride	ug/kg	10	ND	09/13/91
Dichlorobromomethane	ug/kg	10	ND	09/13/91
1,2-Dichloropropane	ug/kg	10	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Trichloroethylene	ug/kg	10	980	09/13/91
Chlorodibromomethane	ug/kg	10	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/13/91
Benzene	ug/kg	10	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Bromoform	ug/kg	10	ND	09/13/91
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/13/91
2-Hexanone	ug/kg	10	ND	09/13/91
Tetrachloroethylene	ug/kg	10	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120781 08/29/91 08/30/91 MW2 15-18'	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Toluene	ug/kg	10	ND	09/13/91
Chlorobenzene	ug/kg	10	ND	09/13/91
Ethylbenzene	ug/kg	10	ND	09/13/91
Styrene	ug/kg	10	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Xylenes (Total)	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
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October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120790 08/29/91 08/30/91 MW1 3-8'	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Methylene Chloride	ug/kg	10	ND	09/13/91
Acetone	ug/kg	10	ND	09/13/91
1,1-Dichloroethylene	ug/kg	10	ND	09/13/91
1,1-Dichloroethane	ug/kg	10	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	10	ND	09/13/91
Chloroform	ug/kg	10	13	09/13/91
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	10	ND	09/13/91
2-Butanone (MEK)	ug/kg	10	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	10	ND	09/13/91
Carbon Tetrachloride	ug/kg	10	ND	09/13/91
Dichlorobromomethane	ug/kg	10	ND	09/13/91
1,2-Dichloropropane	ug/kg	10	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Trichloroethylene	ug/kg	10	69	09/13/91
Chlorodibromomethane	ug/kg	10	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/13/91
Benzene	ug/kg	10	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Bromoform	ug/kg	10	ND	09/13/91
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/13/91
2-Hexanone	ug/kg	10	ND	09/13/91
Tetrachloroethylene	ug/kg	10	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120790 08/29/91 08/30/91 MW1 3-8'	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Toluene	ug/kg	10	ND	09/13/91
Chlorobenzene	ug/kg	10	ND	09/13/91
Ethylbenzene	ug/kg	10	ND	09/13/91
Styrene	ug/kg	10	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Xylenes (Total)	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	PACE Sample Number: 60 0120803 Date Collected: 08/29/91 Date Received: 08/30/91 Client Sample ID: MW4 10-15'	DATE ANALYZED
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Methylene Chloride	ug/kg	10	ND	09/13/91
Acetone	ug/kg	10	ND	09/13/91
1,1-Dichloroethylene	ug/kg	10	ND	09/13/91
1,1-Dichloroethane	ug/kg	10	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	10	ND	09/13/91
Chloroform	ug/kg	10	20	09/13/91
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	10	ND	09/13/91
2-Butanone (MEK)	ug/kg	10	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	10	ND	09/13/91
Carbon Tetrachloride	ug/kg	10	ND	09/13/91
Dichlorobromomethane	ug/kg	10	ND	09/13/91
1,2-Dichloropropane	ug/kg	10	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Trichloroethylene	ug/kg	10	ND	09/13/91
Chlorodibromomethane	ug/kg	10	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/13/91
Benzene	ug/kg	10	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Bromoform	ug/kg	10	ND	09/13/91
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/13/91
2-Hexanone	ug/kg	10	ND	09/13/91
Tetrachloroethylene	ug/kg	10	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120803	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW4	
Parameter	Units	MDL	10-15'	DATE ANALYZED
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Toluene	ug/kg	10	ND	09/13/91
Chlorobenzene	ug/kg	10	ND	09/13/91
Ethylbenzene	ug/kg	10	ND	09/13/91
Styrene	ug/kg	10	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Xylenes (Total)	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120811	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	29-32'	DATE ANALYZED
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Methylene Chloride	ug/kg	10	ND	09/13/91
Acetone	ug/kg	10	ND	09/13/91
1,1-Dichloroethylene	ug/kg	10	ND	09/13/91
1,1-Dichloroethane	ug/kg	10	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	10	ND	09/13/91
Chloroform	ug/kg	10	10	09/13/91
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	10	ND	09/13/91
2-Butanone (MEK)	ug/kg	10	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	10	ND	09/13/91
Carbon Tetrachloride	ug/kg	10	ND	09/13/91
Dichlorobromomethane	ug/kg	10	ND	09/13/91
1,2-Dichloropropane	ug/kg	10	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Trichloroethylene	ug/kg	10	83	09/13/91
Chlorodibromomethane	ug/kg	10	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/13/91
Benzene	ug/kg	10	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/13/91
Bromoform	ug/kg	10	ND	09/13/91
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/13/91
2-Hexanone	ug/kg	10	ND	09/13/91
Tetrachloroethylene	ug/kg	10	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
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October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120811	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	29-32'	DATE ANALYZED
ORGANIC ANALYSIS				
CHLORINATED HYROCARBONS				
Toluene	ug/kg	10	ND	09/13/91
Chlorobenzene	ug/kg	10	ND	09/13/91
Ethylbenzene	ug/kg	10	ND	09/13/91
Styrene	ug/kg	10	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Xylenes (Total)	ug/kg	10	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

These data have been reviewed and are approved for release.

Neal R. Hudson
Manager, Organic Chemistry

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QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

VOLATILE ORGANIC COMPOUNDS/ALLIED LOW 91
Batch: 60 07769
Samples: 60 0120536, 60 0120781, 60 0120790, 60 0120803, 60 0120811

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	60 0116792	Spike	Spike Recv	Spike Dupl Recv	RPD
1,2-Dichloroethylene (Total)	ug/kg	10	ND	50	115%	110%	4%
Trichloroethylene	ug/kg	10	ND	50	78%	78%	0%
Benzene	ug/kg	10	ND	50	91%	94%	3%
Toluene	ug/kg	10	ND	50	91%	93%	2%
Chlorobenzene	ug/kg	10	ND	50	82%	83%	1%

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

55935

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: terracon
Address: project # 50915113
Phone: 816 891 7717

Report To: Gil Zemansky
Bill To:
P.O. # / Billing Reference: 50915113
Project Name / No.

Pace Client No.
Pace Project Manager
Pace Project No.
*Requested Due Date:

Sampled By (PRINT):
Sampler Signature
Date Sampled: 27, 28, AND 30 AUG. 91

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA			ANALYSES REQUEST: 8240 / 8010	REMARKS
1	MW 2 → 8'-13'											X	
2	MW 2 → 15'-18'												
3	MW1 → 3'-8'												
4	MW4 → 21'												
5	MW4 → 10'-15'												
6	MW2 → 29-32'												
7													
8													

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	RETURNED / DATE

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ronald Wood	[signature]	8/30	1100

SEE REVERSE SIDE FOR INSTRUCTIONS

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REPORT OF LABORATORY ANALYSIS

September 20, 1991

Mr. G.M. Zemansky
Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510905.503
Client Reference: 50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received September 05, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

Enclosures

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

September 20, 1991
PACE Project Number: 510905503

Attn: Mr. G.M. Zemansky

Client Reference: 50915113

PACE Sample Number:			60 0123160	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	45	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	31	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Bromodichloromethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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September 20, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123160	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

September 20, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123179	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-3	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	5	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Bromodichloromethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

September 20, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123187	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	ND	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Bromodichloromethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

September 20, 1991
PACE Project Number: 510905503

Client Reference: 50915113

These data have been reviewed and are approved for release.

Neal R. Hudson
Manager, Organic Chemistry

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55309

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: TERRACON ENVIRONMENTAL, INC. (TT)
Address: P.O. Box 901541
KC MO 64190-1541
Phone: 891-7717

Report To: G. M. ZEMANSKY
Bill To: "
P.O. # / Billing Reference:
Project Name / No.: 5091 5113

Pace Client No.:
Pace Project Manager:
Pace Project No.:
*Requested Due Date: NORMAL

Sampled By (PRINT): G. M. ZEMANSKY
Sampler Signature: G. M. Zemansky
Date Sampled: 4 SEP. 91

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	4°C	ANALYSES REQUEST: VOC-USEPA 8010	REMARKS
1	MW-1		H_2O		2	✓				✓	✓	
2	MW-3		↓		↓	↓				↓	↓	
3	MW-4		↓		↓	↓				↓	↓	
4												
5												
6												
7												
8												

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	M Zemansky, TERRACON	J Bauer	5/5	0745

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REPORT OF LABORATORY ANALYSIS

October 03, 1991

Mr. G.M. Zemansky
Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510906.507
Client Reference: 50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received September 06, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

D.R Boline

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

Enclosures

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

October 03, 1991
PACE Project Number: 510906507

Attn: Mr. G.M. Zemansky

Client Reference: 50915113

PACE Sample Number:			60 0123195	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	81	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Bromodichloromethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123195	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 3

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Alkalinity, Bicarbonate by 310.1	mg/L	1	490	09/30/91
Arsenic by 206.2	mg/L	0.006	0.021 ✓	09/24/91
Calcium by 200.7	mg/L	0.10	450 ✓	09/24/91
Chloride, Total by STD 4500B	mg/L	1.0	804	09/17/91
Iron by 200.7	mg/L	0.020	ND 46.0	09/24/91
Lead 239.1	mg/L	0.050	0.27 ✓	09/24/91
Magnesium by 200.7	mg/L	0.10	93.7 ✓	09/24/91
Manganese by 200.7	mg/L	0.010	ND 2.88	09/24/91
Nitrogen, Nitrate by 353.3	mg/L	0.01	ND	09/13/91
Potassium by 258.1	mg/L	0.10	10.34 ✓	09/24/91
Selenium by 270.2	mg/L	0.005	ND ✓	09/24/91
Sodium by 200.7	mg/L	0.10	35.3 ✓	09/24/91
Solids, Total Suspended by 160.2	mg/L	1	38300	09/10/91
Sulfate, Total by 375.3	mg/L	1.0	297	09/09/91
Turbidity by 180.1			N/A	10/02/91
FIVE COMMON ICP METALS FOR ICP IN WATER by 200.7				
Zinc	mg/L	0.020	ND .023	09/24/91
Chromium	mg/L	0.020	ND ✓	09/24/91
Cadmium	mg/L	0.002	ND .035	09/24/91
Copper	mg/L	0.010	ND ✓	09/24/91
Nickel	mg/L	0.050	ND ✓	09/24/91
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 4

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Methylene Chloride	ug/L	5	ND	09/16/91
Acetone	ug/L	10	ND	09/16/91
Carbon Disulfide	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
2-Butanone (MEK)	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
Vinyl Acetate	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	87	09/16/91
Chlorodibromomethane	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Benzene	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
4-Methyl-2-Pentanone (MIBK)	ug/L	5	ND	09/16/91
2-Hexanone	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Toluene	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
Ethylbenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 5

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Styrene	ug/L	5	ND	09/16/91
Xylenes (Total)	ug/L	5	ND	09/16/91
Dichlorodifluoromethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Acrolein	ug/L	100	ND	09/16/91
Acrylonitrile	ug/L	100	ND	09/16/91
Iodomethane	ug/L	5	ND	09/16/91
Dibromomethane	ug/L	5	ND	09/16/91
2-Chloroethylvinyl ether (mixed)	ug/L	5	ND	09/16/91
Ethylmethacrylate	ug/L	5	ND	09/16/91
1,2,3-Trichloropropane	ug/L	5	ND	09/16/91
1,4-Dichloro-2-butene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichloroethane-d4 (Surrogate)	%		81	09/16/91
Toluene-d8 (Surrogate)	%		98	09/16/91
4-Bromofluorobenzene (Surrogate)	%		93	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 6

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

These data have been reviewed and are approved for release.

Brian J. Smith
Manager, Inorganic Chemistry

Neal R. Hudson
Manager, Organic Chemistry

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Alkalinity, Bicarbonate
Batch: 60 08058
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0128480	Duplicate of 60 0128480	RPD
Alkalinity, Bicarbonate	mg/L	1	316	311	2%

MDL Method Detection Limit
RPD Relative Percent Difference

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Chloride, Total
Batch: 60 07529
Samples: 60 0123209

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	60 0122172	Duplicate of 60 0122172	RPD
Chloride, Total	mg/L	1.0	ND	21.2	21.2	0%

MDL Method Detection Limit
RPD Relative Percent Difference

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REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 9

QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Nitrogen, Nitrate by 353.3
Batch: 60 07639
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0125511	Duplicate of 60 0125511	RPD
Nitrogen, Nitrate by 353.3	mg/L	0.01	0.47	0.48	2%

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Nitrogen, Nitrate by 353.3	mg/L	0.01	0.50	110%

MDL Method Detection Limit
RPD Relative Percent Difference

REPORT OF LABORATORY ANALYSIS

Mr. G.M. Zemansky
Page 10

QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Solids, Total Suspended by 160.2
Batch: 60 07554
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0123225 38	Duplicate of 60 0123225 38	RPD
Solids, Total Suspended by 160.2	mg/L	1			0%

MDL Method Detection Limit
RPD Relative Percent Difference

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REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

October 03, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Sulfate, Total
Batch: 60 07495
Samples: 60 0123209

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	60 0122180	Duplicate of 60 0122180	RPD
Sulfate, Total	mg/L	1.0	ND	198	204	3%

SPIKE:

Parameter	Units	MDL	60 0122300	Spike	Spike Recv
Sulfate, Total	mg/L	1.0	99	40	110%

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Sulfate, Total	mg/L	1.0	40	100%

MDL Method Detection Limit
RPD Relative Percent Difference

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: TERRACON ENVIRONMENTAL

Address:

Phone:

Report To:

Bill To:

P.O. # / Billing Reference:

Project Name / No.:

Pace Client No.:

Pace Project Manager:

Pace Project No.: 910906.507

*Requested Due Date:

Sampled By (PRINT):

Sampler Signature: Date Sampled:

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA		ANALYSES REQUEST	REMARKS
1	MW-5			012319-5		✓			✓		✓	
2	MW-2			013209		✓			✓		✓	
3												
4												
5												Ca, Fe, Mg, Mn, K, As, Cd, Cr, Cu,
6												
7												
8												

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

Additional Comments:

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
			9/5	1700

SEE REVERSE SIDE FOR INSTRUCTIONS

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55305

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: TERRACON ENVIRONMENTAL, INC.
Address: P.O. BOX 901541
KC MO 64190-1541
Phone: 891-7717

Report To: G.M. ZEMANSKY
Bill To: "
P.O. # / Billing Reference:
Project Name / No.: 50915113

Pace Client No.:
Pace Project Manager:
Pace Project No.:
*Requested Due Date: Above

Sampled By (PRINT): G.M. ZEMANSKY
Sampler Signature: GMZemansky
Date Sampled: 5 SEP 91

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	4°C	ANALYSES REQUEST: VOC USEPA 8010	VOC USEPA 8240	NO3 USEPA 353.1	HCO_3 SM A500-CO_2 ALKALINITY	Cl- USEPA 325.2	354.1 USEPA 375.4	METALS USEPA 6010 or 200.7	TSS USEPA 160.2	TURBIDITY USEPA 180.1	REMARKS
1	MW-5		H_2O		2	✓				✓	✓									
2	MW-2				2	✓				✓		✓								
3					1		✓			✓			✓							
4					1	✓				✓				✓	✓	✓		✓	✓	
5					1		✓			✓							✓			Ca, Fe, Mg, Mn, K, Na, As, Cd, Cr, Cu, Pb, Ni, Se, Zn
6																				
7																				
8																				

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	GMZemansley, TERRACON		9/5	1700

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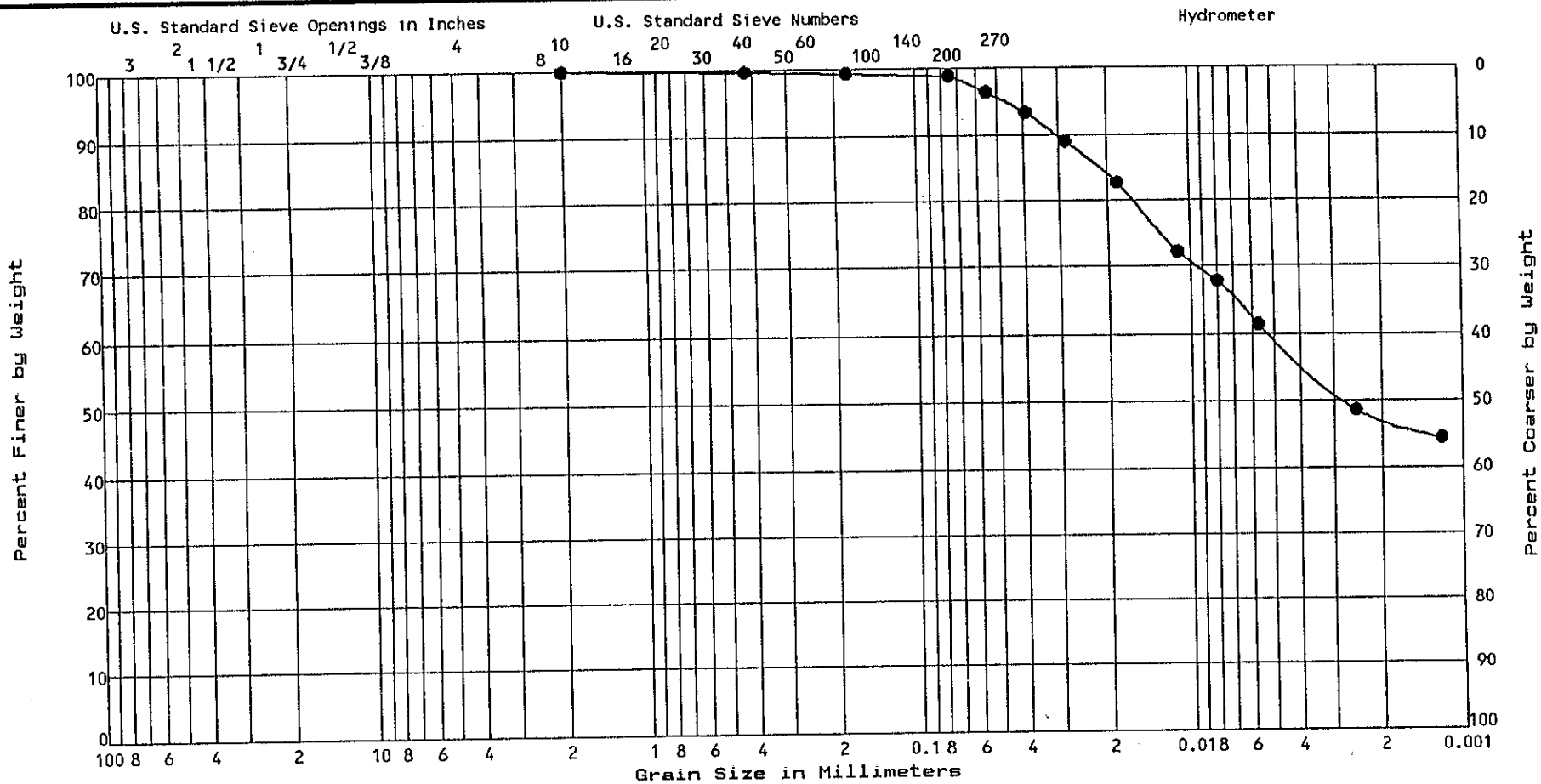
APPENDIX D: TERRACON SOIL PHYSICAL ANALYSIS RESULTS



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	fine	

GRAIN SIZE DISTRIBUTION CURVE

Boring No.	Sample No.	Depth	Description	Unified Symbol	Natural WC	LL	PL	PI
● MW-1		28.0-30.0	LEAN TO FAT CLAY TRACE SAND, LIGHT GRAY & DARK BROWN					

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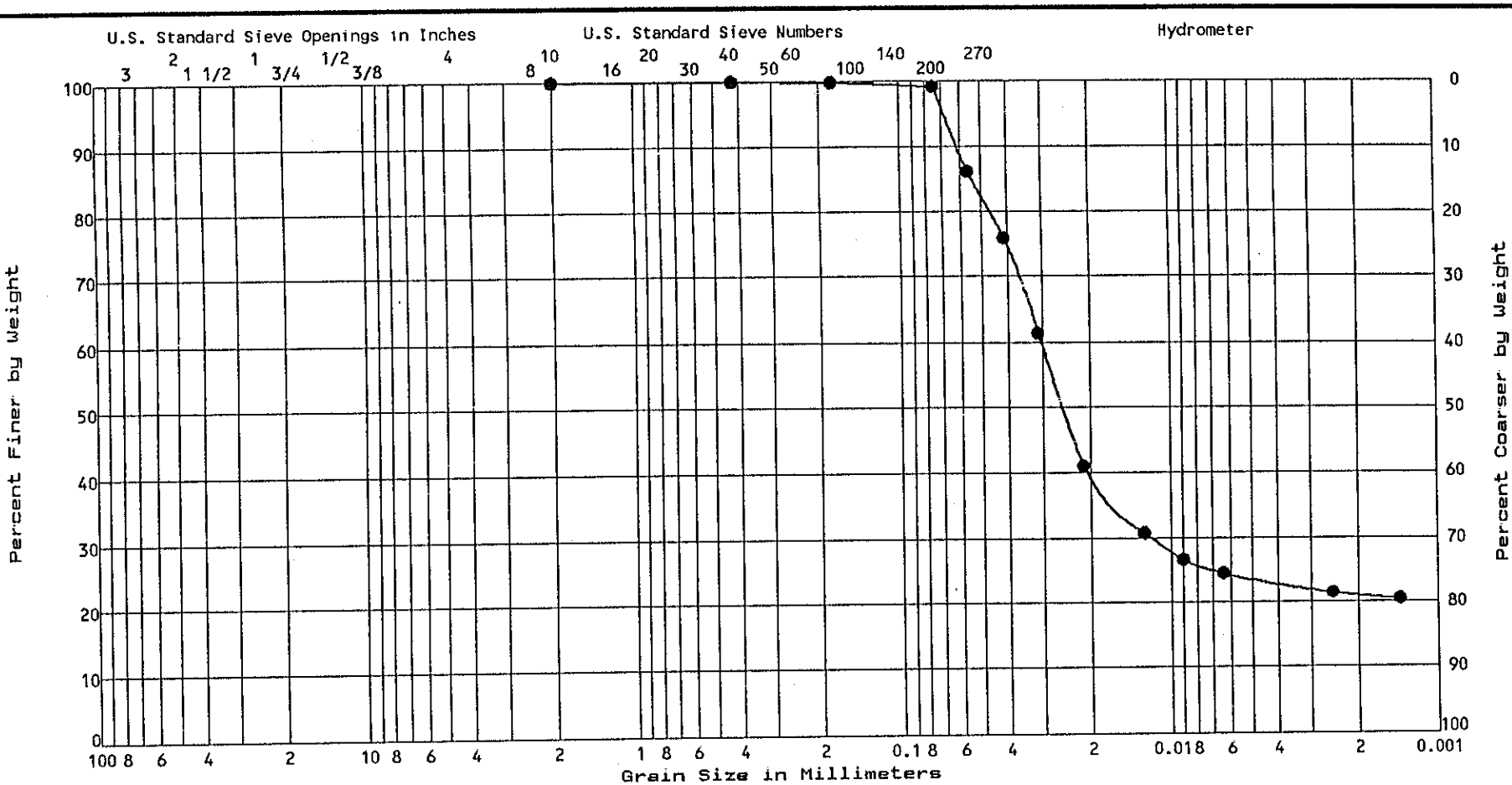

GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

Boring No.	Sample No.	Depth	Description	Unified Symbol	Natural WC	LL	PL	PI
● MW-2		5.0-7.0	LEAN CLAY, LIGHT BROWN & LIGHT GRAY BROWN TRACE DARK BROWN		27			

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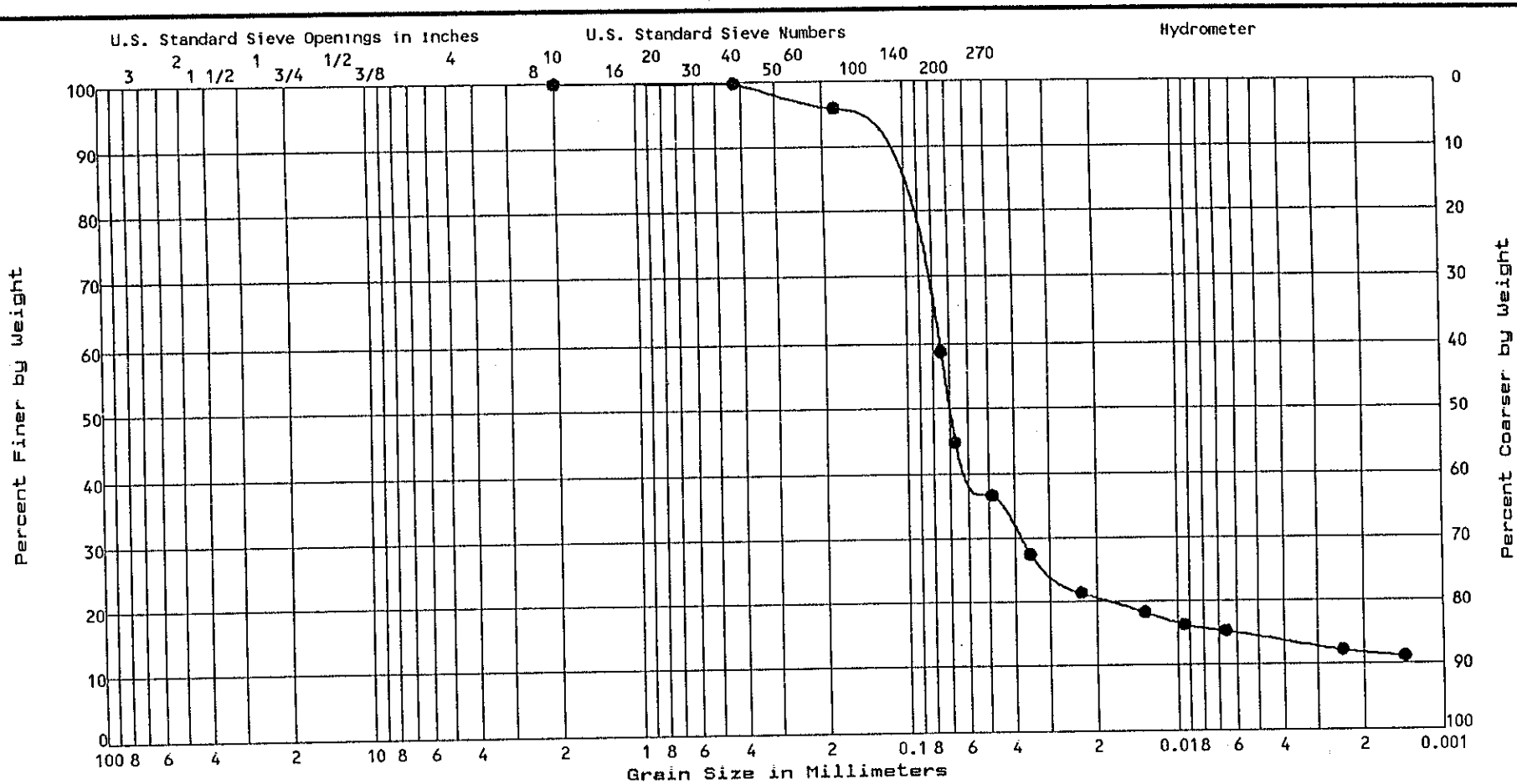

GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

Boring No.	Sample No.	Depth	Description	Unified Symbol	Natural WC	LL	PL	PI
● MW-3		29.0-31.0	SANDY SILT TRACE CLAY, DARK GRAY		26			

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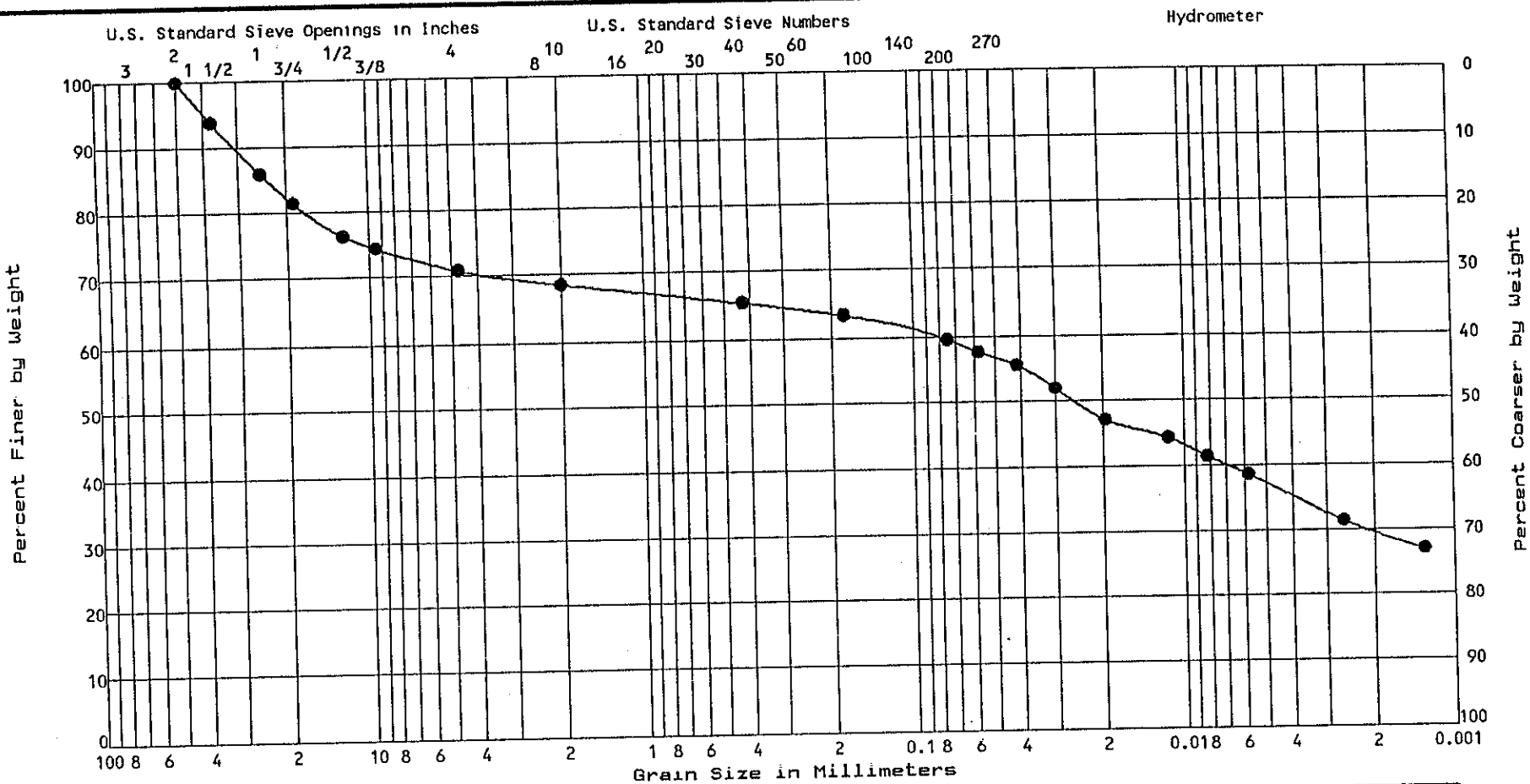

GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

Boring No.	Sample No.	Depth	Description	Unified Symbol	Natural WC	LL	PL	PI
● MW-4		61.0-65.0	CLAY WITH GRAVEL & SILT TRACE SAND, DARK BROWN					

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SUMMARY OF FALLING HEAD PERMEABILITY
ARMCO - - 50915113
TERRACON CONSULTANTS, INCORPORATED - 9/9/91

POINT IDENTIF-ICATION	DEPTH feet	DESCRIPTION	DRY DENSITY PCF	WATER CONTENT %	COEFFICIENT OF PERMEABILITY CM PER SECOND
MW-2	5.00	LEAN CLAY, LIGHT BROWN & LIGHT GRAY BROWN TR~	93.7	26.8	6.8 X 10-6
MW-3	29.00	SANDY SILT TRACE CLAY, DARK GRAY	96.0	26.4	1.6 X 10-4

ARMCO

50915113
9/9/91

TEST RESULTS

SAMPLE ID	MOISTURE CONTENT, %	DRY DENSITY, pcf	ORGANIC CONTENT, %	SPECIFIC GRAVITY	VOID RATIO	POROSITY, %	SATURATION, %
MW-2 5' TO 7'	26.8	93.6	2.82	2.695	0.796	44.3	90.7
MW-3 9' TO 31'	26.4	96.0	2.20	2.694	0.751	42.9	94.7

APPENDIX E: AQUIFER TEST DATA

ARMCO MW-2 (Run No. 1, 05 Sep 91)

H_0	=	17.91	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	15.0	ft.
L	=	9.00	ft.
H_s	=	26.42	ft.

Time	Drawdown
0.0833	17.70
0.1666	17.51
0.2500	17.31
0.3333	17.11
0.4167	16.92
0.5000	16.73
0.5833	16.54
0.6667	16.36
0.7500	16.18
1.25	15.14
1.75	14.18
2.25	13.28
2.75	12.46
3.25	11.69
3.75	10.97
4.25	10.31
4.75	9.69
5.25	9.12
5.75	8.58
6.25	8.09
6.75	7.63
7.25	7.20
7.75	6.80
8.25	6.42
8.75	6.08
10.75	4.91
12.75	3.99
14.75	3.31
16.75	2.76
18.75	2.34
20.75	2.04
22.75	1.77
24.75	1.56
26.75	1.38
28.75	1.23
30.75	1.11
32.75	1.02
34.75	0.93
36.75	0.86
38.75	0.81
40.75	0.75
42.75	0.71
44.75	0.68
46.75	0.64
48.75	0.61

ARMCO MW-2 (Run No. 2, 05 Sep 90)

H_0	=	5.51	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	15.0	ft.
L	=	9.00	ft.
H_s	=	26.42	ft.

Time	Drawdown
0.0167	5.39
0.0333	5.35
0.0500	5.30
0.0667	5.25
0.0833	5.22
0.100	5.19
0.1167	5.16
0.1333	5.14
0.1500	5.12
0.1667	5.10
0.1833	5.08
0.2000	5.06
0.2167	5.04
0.2333	5.04
0.2500	5.02
0.3334	4.94
0.4167	4.88
0.5000	4.81
0.5834	4.75
0.6667	4.69
0.7500	4.63
0.8334	4.57
0.9167	4.51
1.0000	4.46
1.0834	4.40
1.1667	4.35
1.2500	4.30
1.3333	4.24
1.4167	4.19
1.5000	4.14
1.5834	4.09
1.6667	4.04
1.7500	3.99
1.8334	3.94
1.9167	3.90
2.4167	3.63
2.9167	3.37
3.4167	3.14
3.9167	2.92
4.4167	2.73
4.9167	2.54
5.4167	2.37
5.9167	2.20
6.4167	2.06
6.9167	1.91
7.4167	1.79
7.9167	1.66
8.4167	1.54
8.9167	1.44
9.4167	1.34
9.9167	1.25
11.9167	0.91
13.9167	0.67
15.9167	0.48
17.9167	0.32
19.9167	0.20
21.9167	0.10
23.9167	0.03

ARMCO MW-3 (Run No. 1, 04 Sep 91)

H_0	=	4.60	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	15.0	ft.
L	=	9.00	ft.
H_s	=	38.44	ft.

Time	Drawdown
0.0167	3.69
0.0334	2.57
0.0500	2.83
0.0667	2.52
0.0834	2.25
0.1000	2.03
0.1167	1.84
0.1334	1.67
0.1500	1.52
0.1667	1.40
0.1834	1.29
0.2000	1.19
0.2167	1.10
0.2334	1.02
0.2500	0.95
0.2667	0.88
0.3501	0.63
0.4334	0.48
0.5167	0.38
0.6001	0.31
0.6834	0.27
0.7667	0.23
0.8501	0.21
0.9334	0.19

ARMCO MW-3 (Run No. 2, 04 Sep 91)

H_0	=	4.05	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	15.0	ft.
L	=	9.00	ft.
H_s	=	38.44	ft.

Time	Drawdown
0.0033	3.95
0.0200	3.59
0.0366	3.18
0.0533	2.87
0.0700	2.57
0.0866	2.34
0.1033	2.11
0.1200	1.93
0.1366	1.75
0.1533	1.61
0.1700	1.48
0.1866	1.36
0.2033	1.26
0.2200	1.16
0.2366	1.07
0.2533	1.00
0.2700	0.93
0.2866	0.86
0.3033	0.80
0.3867	0.58
0.4700	0.44
0.5533	0.35
0.6367	0.28
0.7200	0.24
0.8033	0.21
0.8867	0.18
0.9700	0.16

ARMCO MW-4 (Run No. 1, 04 Sep 91)

H_0	=	3.38	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	20.0	ft.
L	=	9.00	ft.
H_s	=	40.0	ft.

Time	Drawdown
0.0050	2.05
0.0216	0.80
0.0383	0.07

ARMCO MW-4 (Run No. 2, 05 Sep 91)

H_0	=	3.38	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	20.0	ft.
L	=	9.00	ft.
H_s	=	40.0	ft.

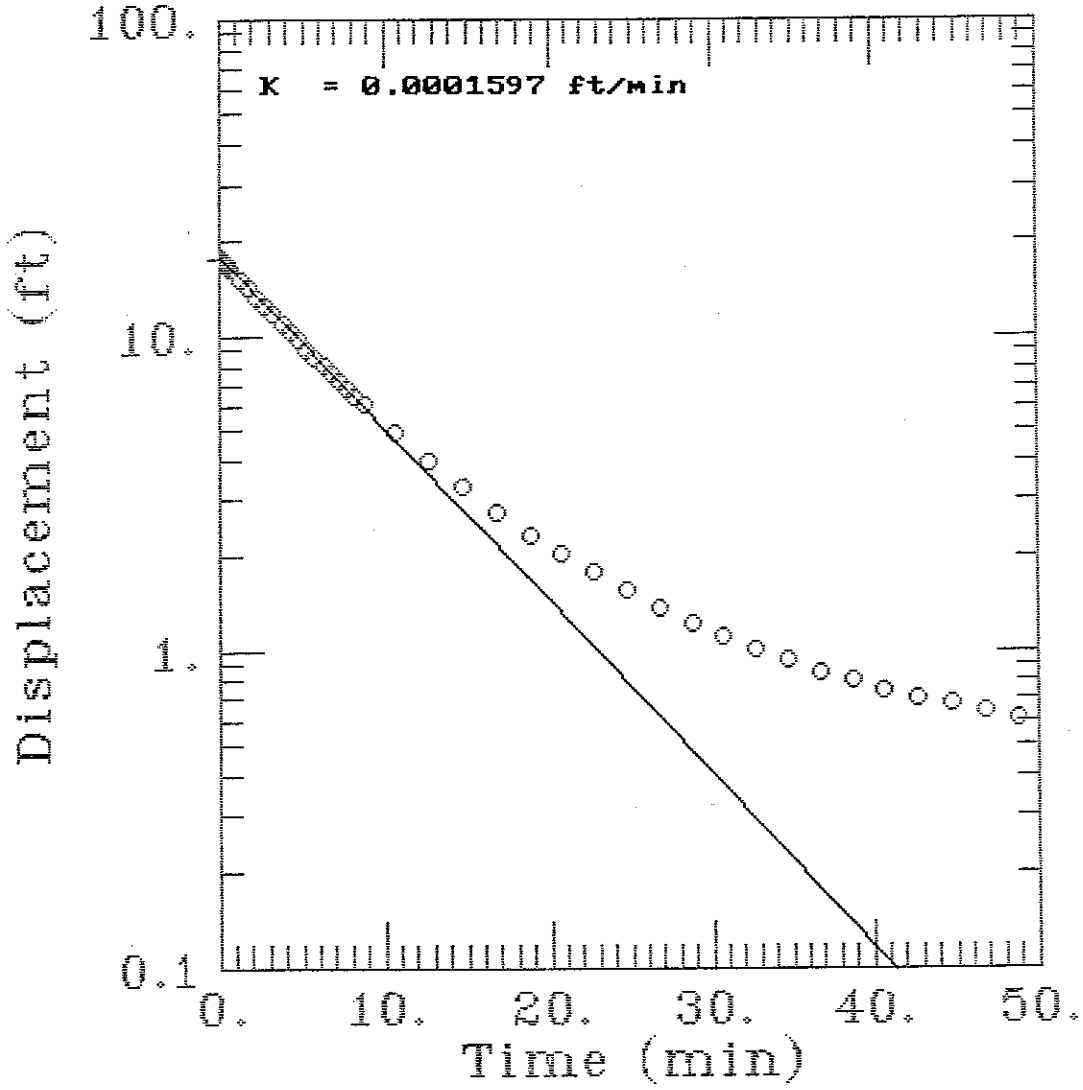
Time	Drawdown
0.0050	0.97
0.0217	0.46
0.0383	0.04

ARMCO MW-4 (Run No. 3, 04 Sep 91)

H_0	=	5.08	ft.
r_c	=	0.0861	ft.
r_w	=	0.344	ft.
b	=	20.0	ft.
L	=	9.00	ft.
H_s	=	40.0	ft.

Time	Drawdown
0.0050	2.69
0.0083	2.25
0.0250	1.31
0.0416	0.32

ARMCO MW-2 (Run No. 1, 05 Sep 91)



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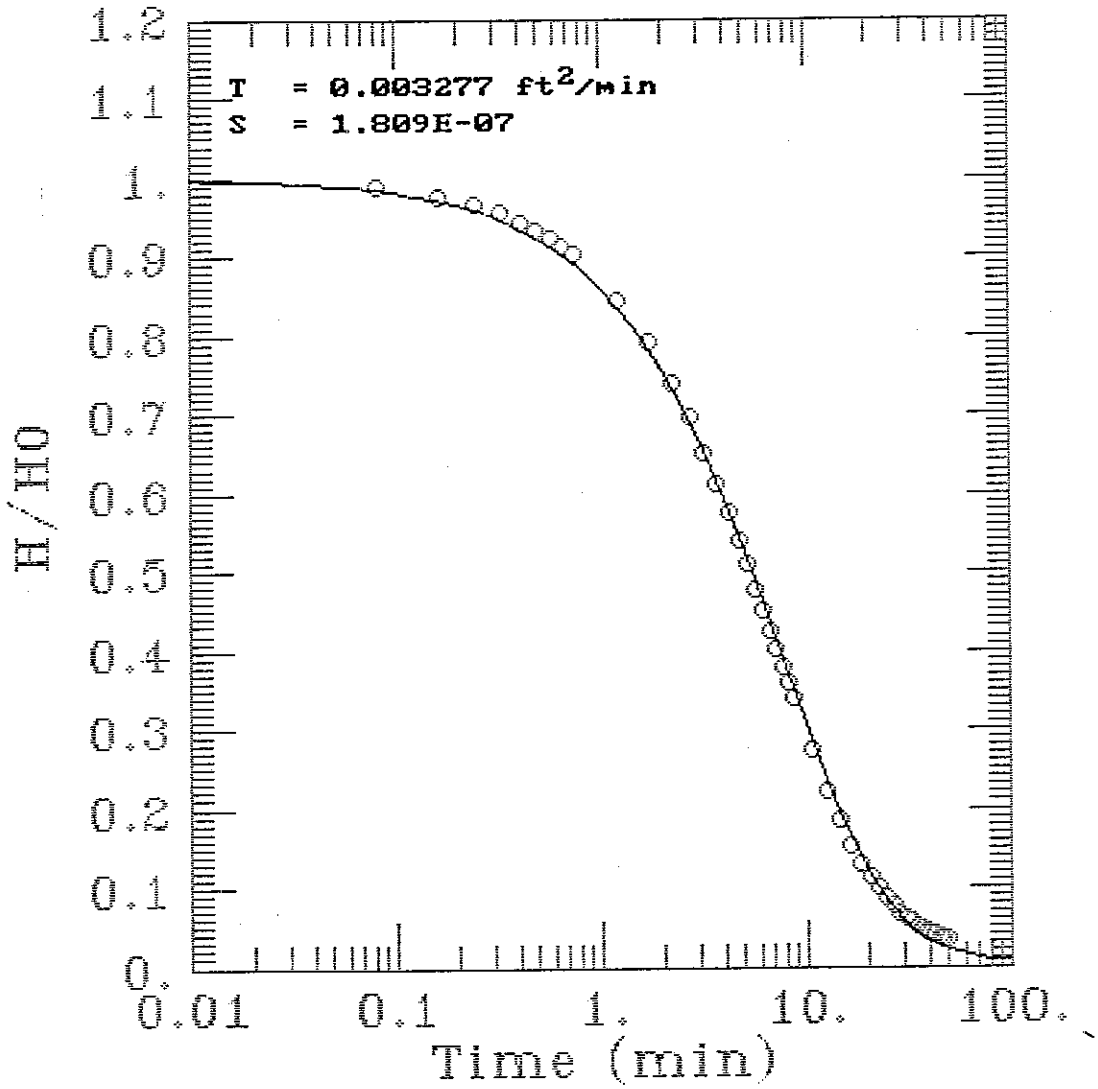

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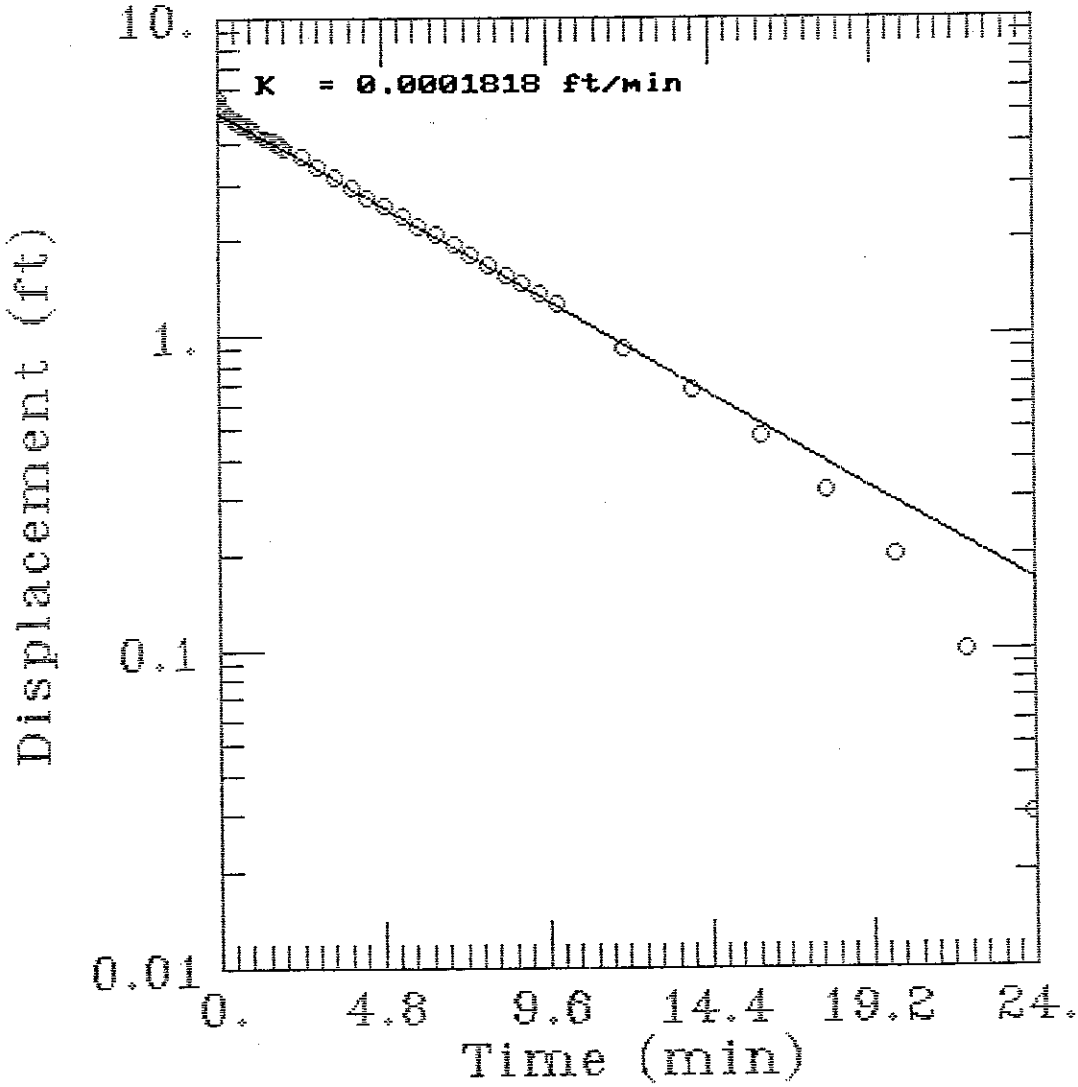

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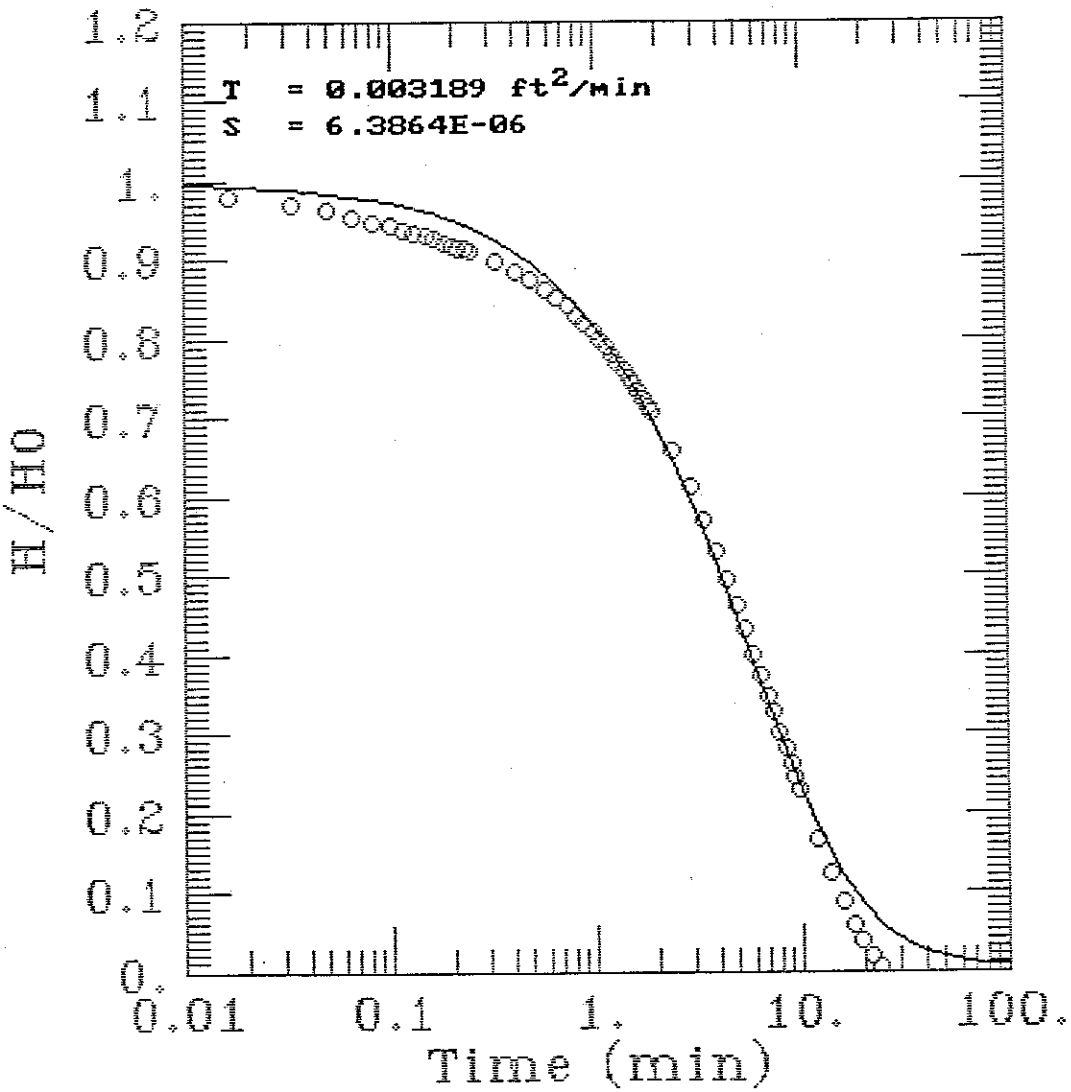
ARMCO MW-2 (Run No. 2, 05 Sep 90)



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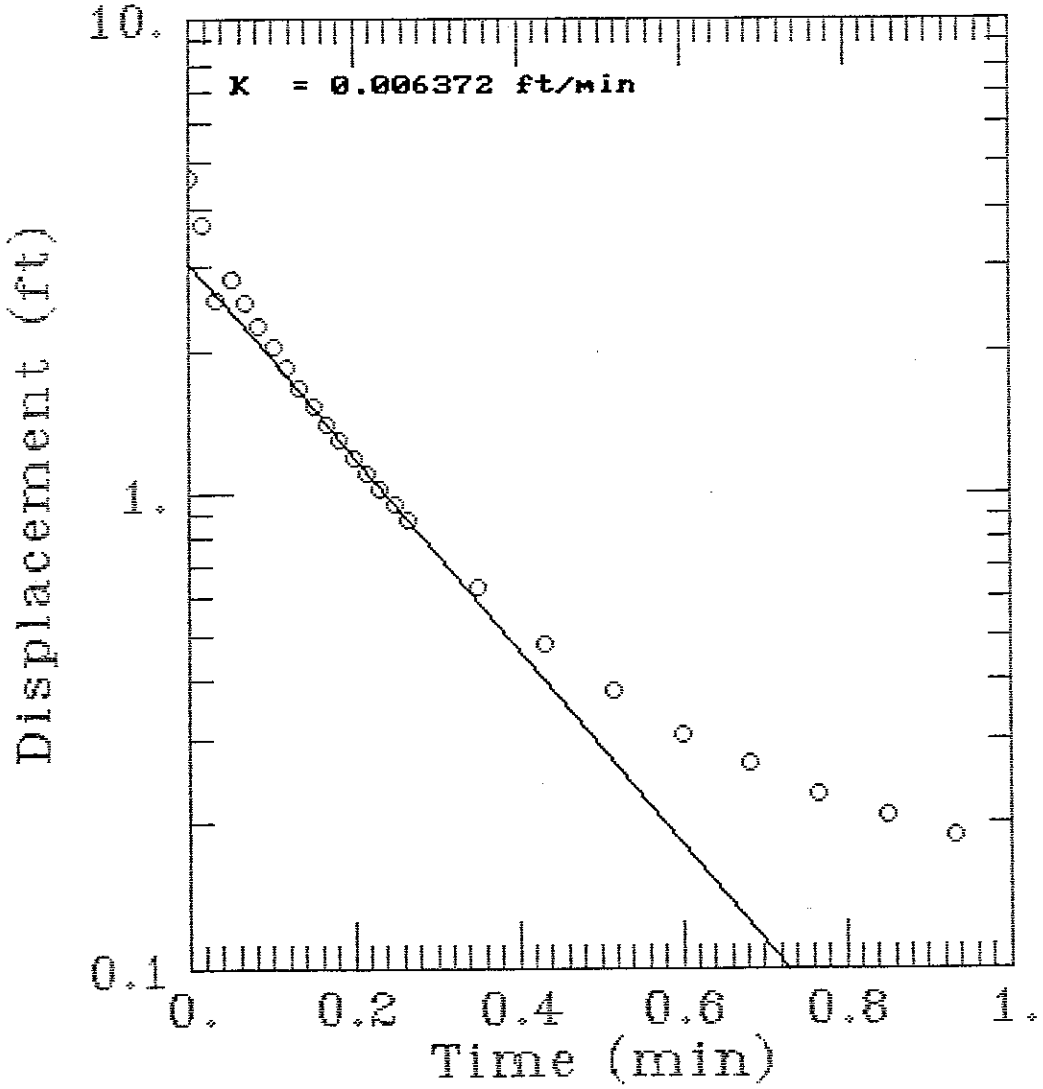
ARMCO MW-3 (Run No. 1, 04 Sep 91)



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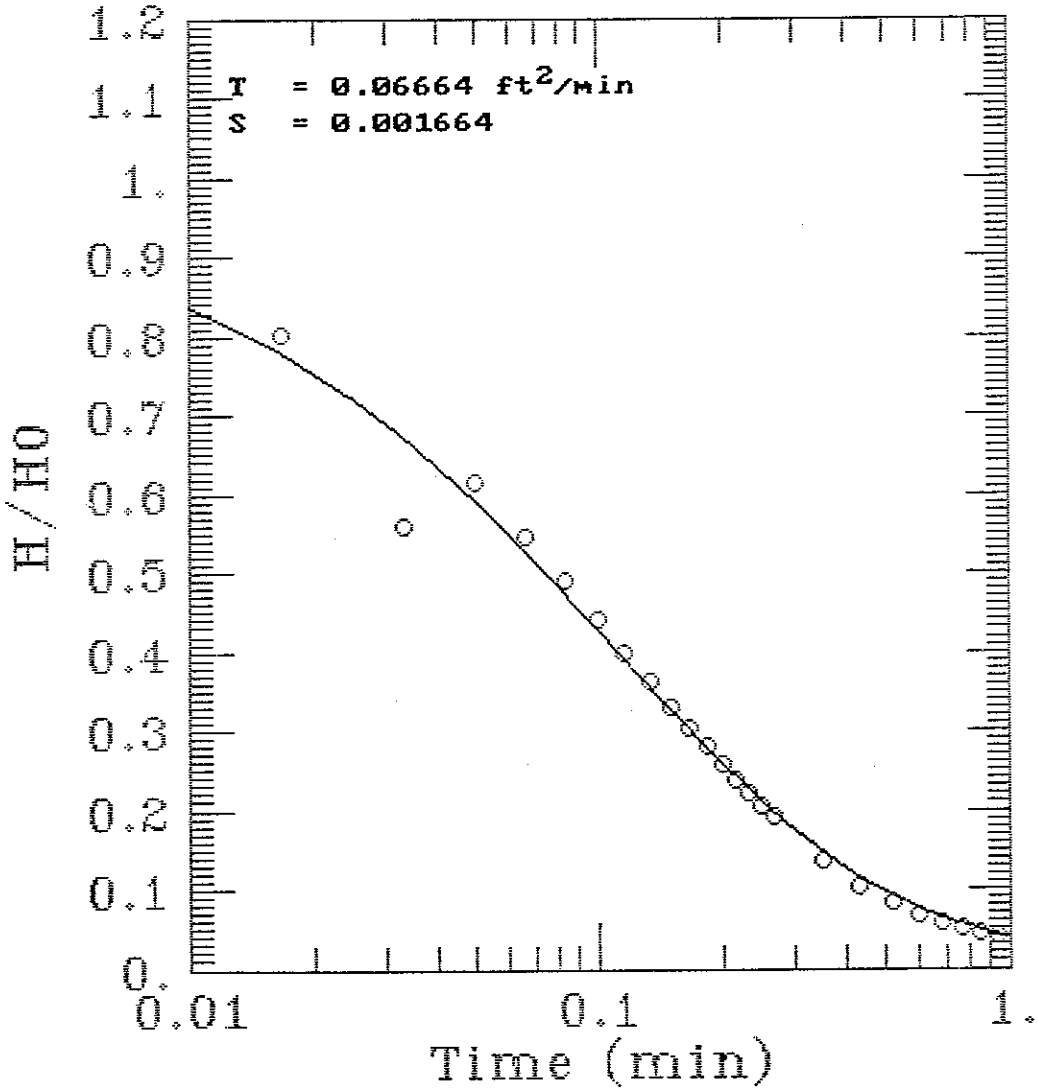
ARMCO MW-3 (Run No. 1, 04 Sep 91)



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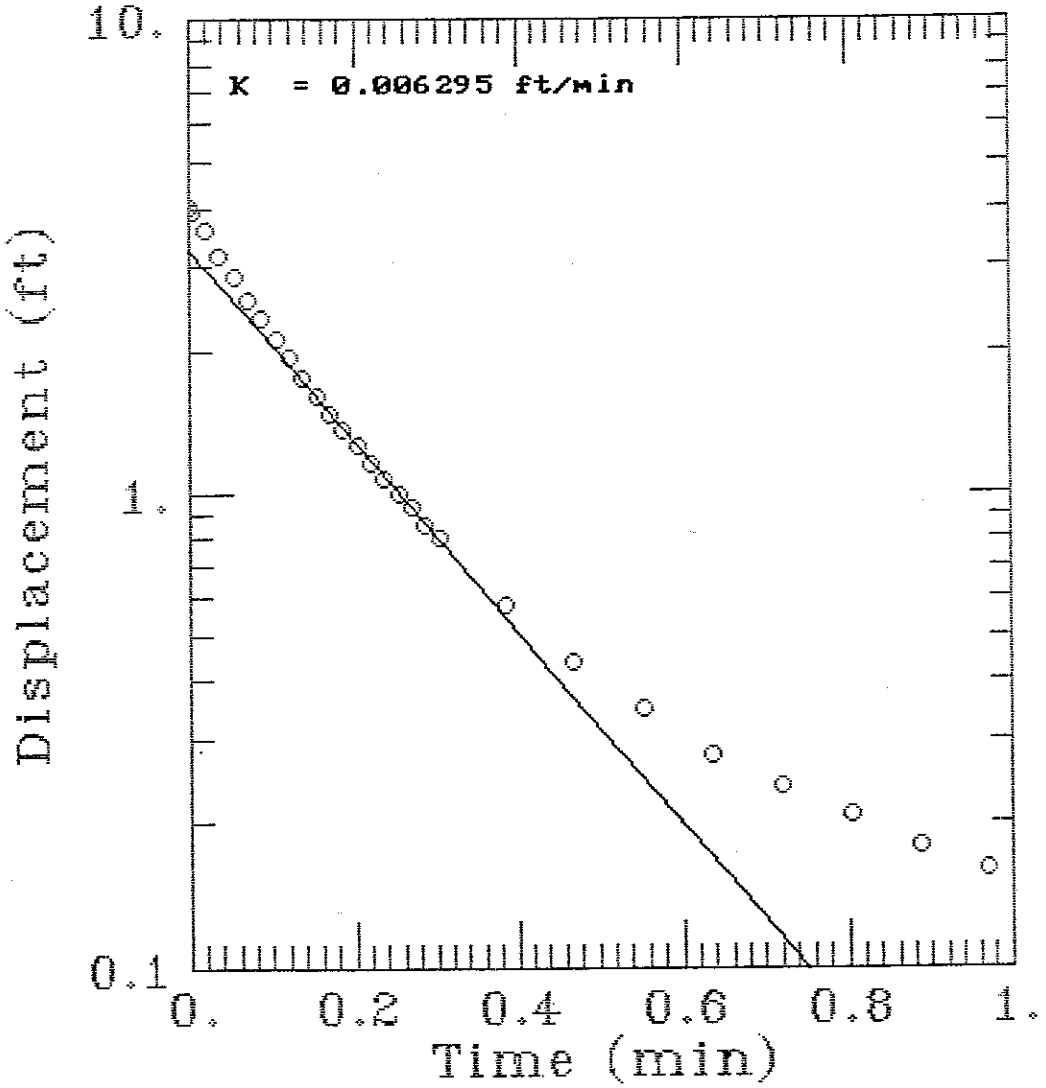

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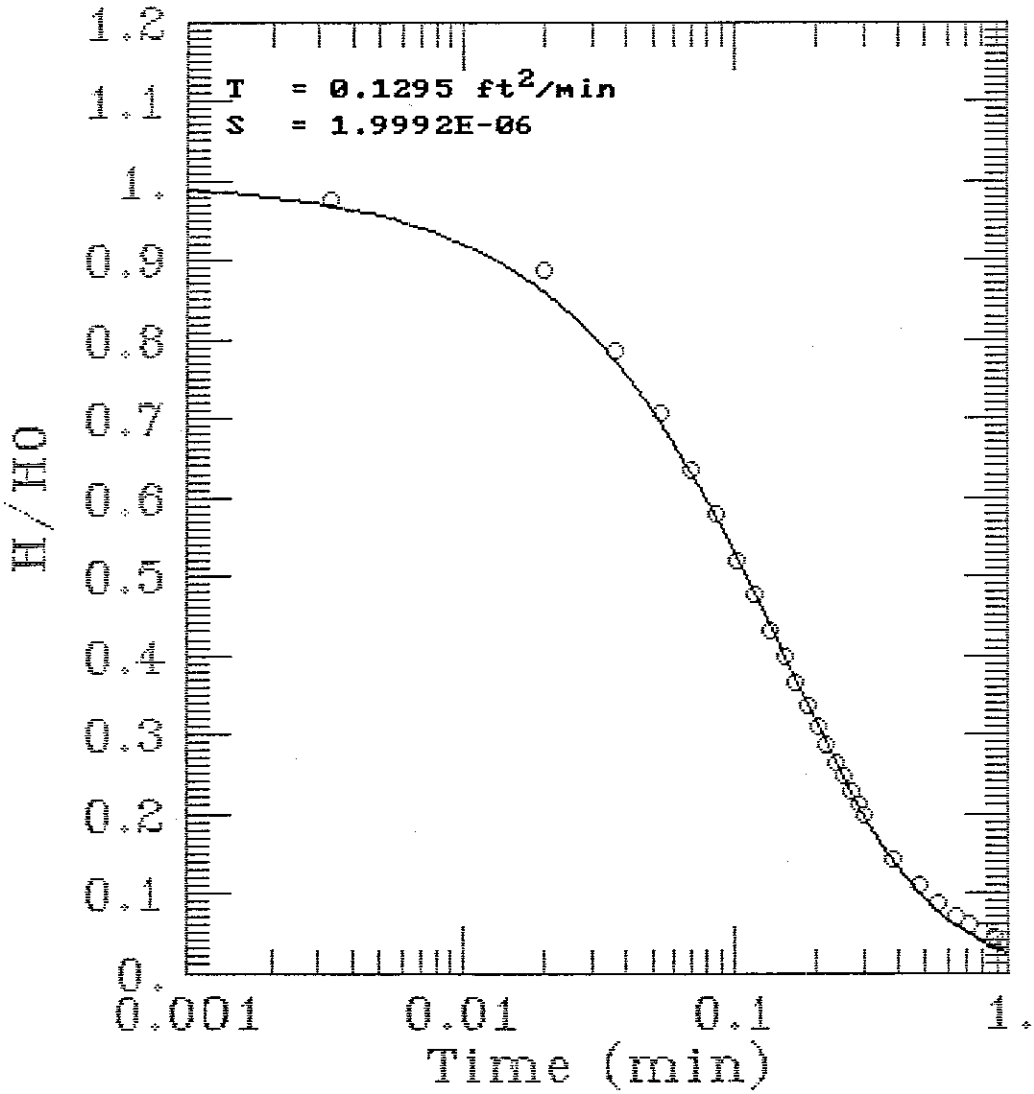
ARMCO MW-3 (Run No. 2, 04 Sep 91)



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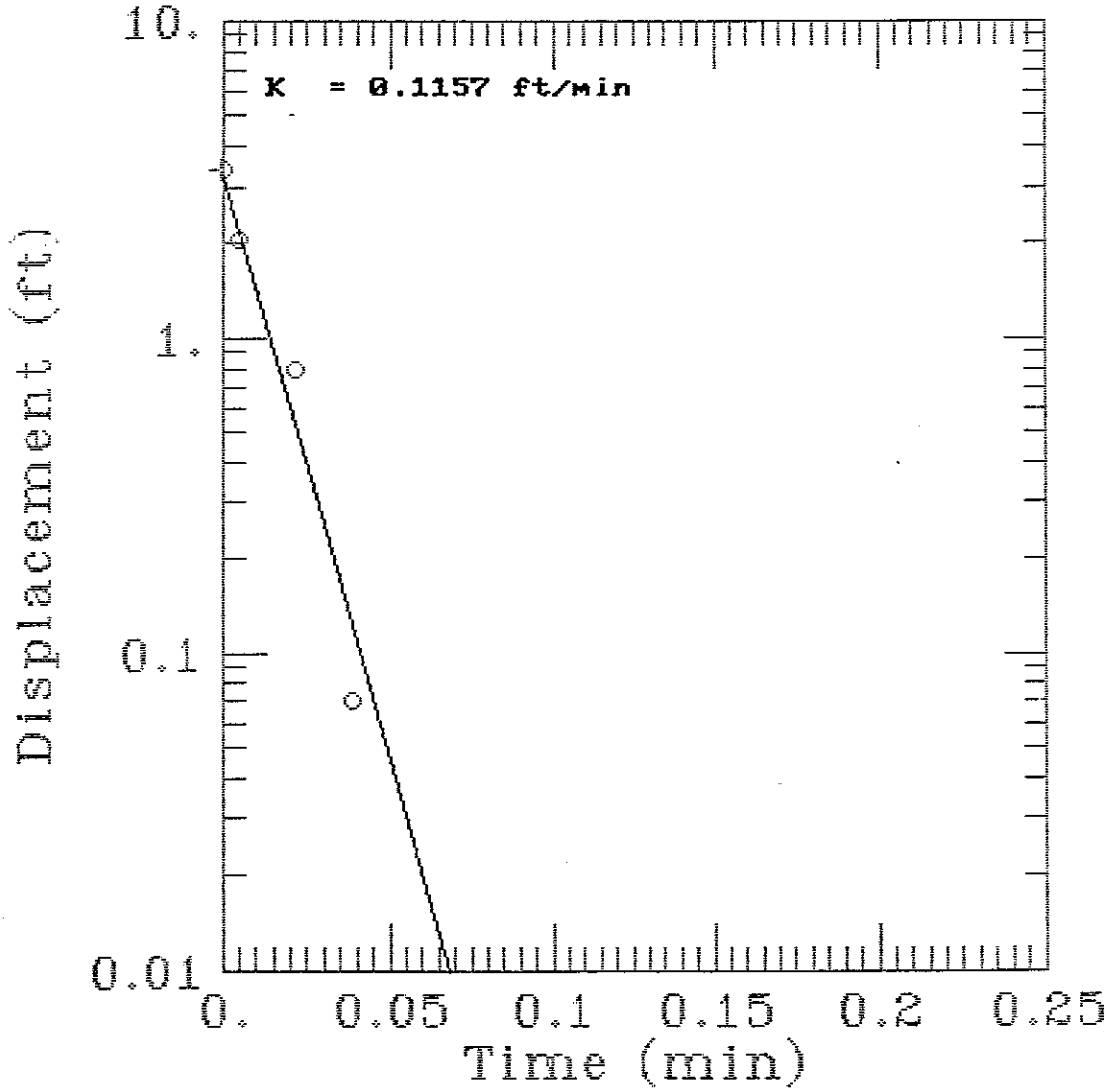
ARMCO MW-4 (Run No. 1, 04 Sep 91)



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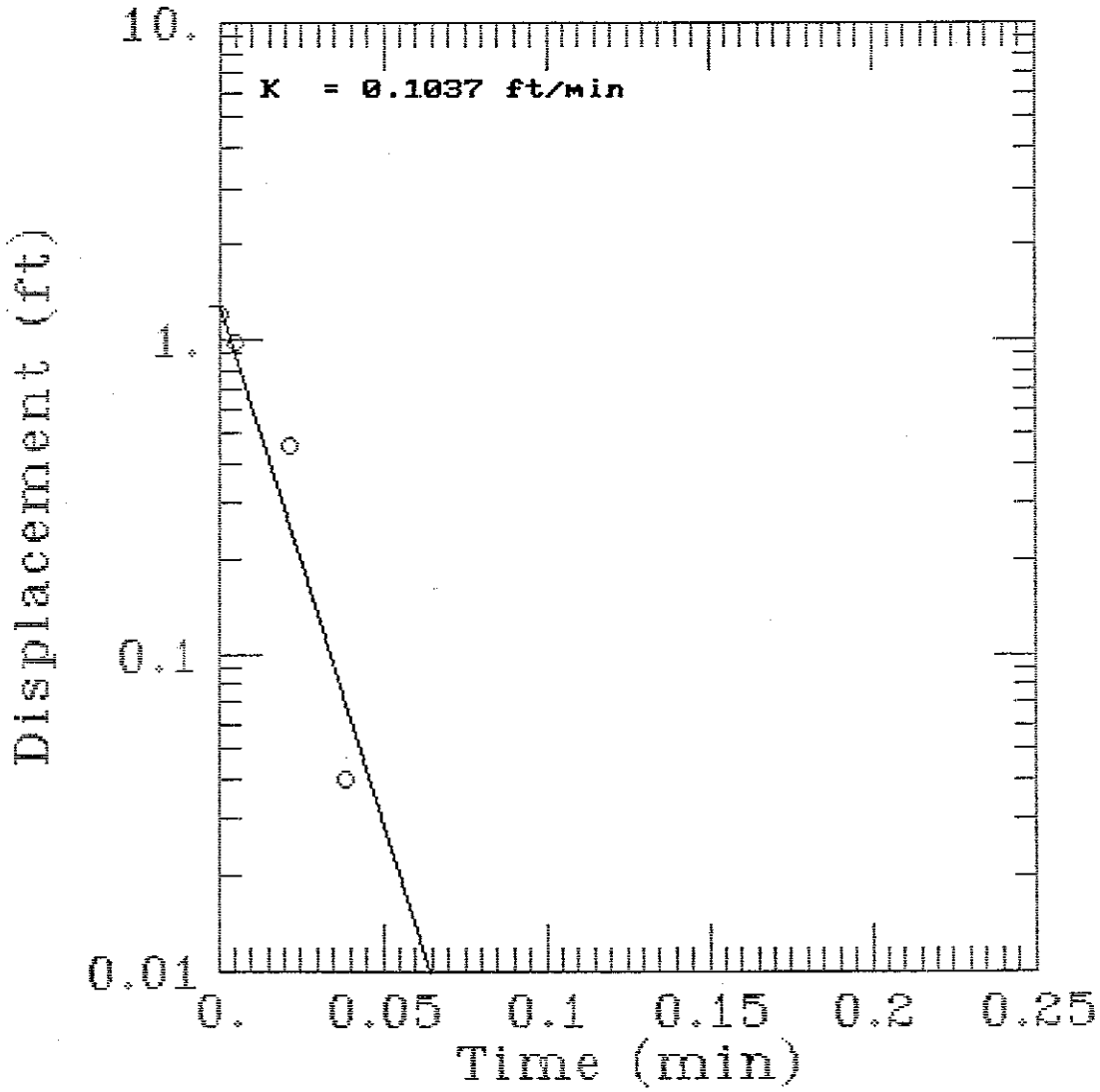
ARMCO MW-4 (Run No. 2, 04 Sep 91)



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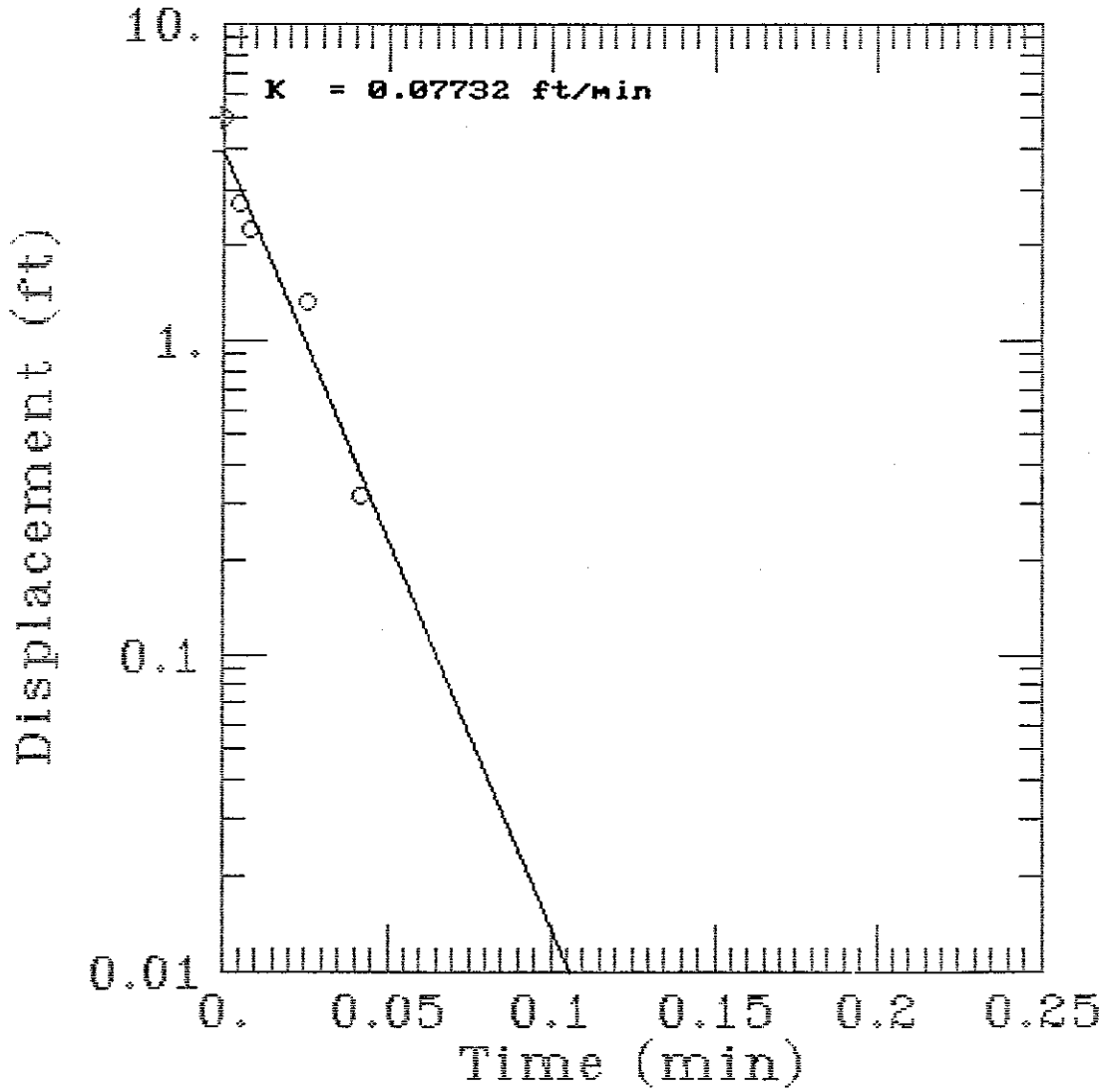
ARMCO MW-4 (Run No. 3, 04 Sep 91)



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NAIL MILL PHASE II INVESTIGATION REPORT

WORLDWIDE GRINDING SYSTEMS, ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

PROJECT NO. 50915113
NOVEMBER 18, 1991

Terracon

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NAIL MILL PHASE II INVESTIGATION REPORT

WORLDWIDE GRINDING SYSTEMS, ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

PROJECT NO. 50915113
NOVEMBER 18, 1991

EXECUTIVE SUMMARY[1]:

Summary

Previous site investigation work had identified the presence of halogenated volatile organics in soil samples taken in the vicinity of a degreasing unit within a former nail mill at the Worldwide Grinding Systems, ARMCO, Inc., facility in Kansas City, Missouri. This was also indicated by a subsequent soil vapor survey conducted in two phases during the spring of 1991.

At the completion of the soil vapor survey, it was recommended that additional work be undertaken to determine if halogenated volatile organics were also present in underlying ground water. During this Phase II investigation, two monitoring wells were installed near the degreasing unit and two additional wells were installed outside the nail mill to the east-northeast and northwest of the degreasing unit. The wells near the degreasing unit were screened in both the shallow and deeper saturated zones but the wells outside the nail mill were screened only in the deeper saturated zone. Soil samples were obtained from borings drilled for the installation of monitoring wells, ground water samples were obtained from each well, and aquifer tests were conducted in both the shallow and deeper saturated zones.

The Phase II investigation found halogenated volatile organics in both soil and ground water samples. The predominant compound detected was trichloroethylene (TCE). A shallow sand aquifer was also identified under the nail mill. The concentration of lead in ground water in this aquifer is apparently elevated. Aquifer testing indicated that hydraulic conductivity for the shallow and deeper aquifers was approximately 10^{-4} cm./sec. (allowing somewhat limited ground water movement) and 10^{-2} cm./sec. (allowing relatively rapid ground water movement), respectively. The data also indicate that both aquifers are confined by overlying and intervening fine grained materials. Testing of a sample from the overlying

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[1]This is a summary of the contents of this report. Please refer to the full text for a more complete explanation and supporting information.

unsaturated zone indicated a hydraulic conductivity in the range of 10^{-6} to 10^{-5} cm./sec. (allowing only very limited ground water movement).

The available information indicates limited concentrations of halogenated volatile organics in soil and ground water at this site and that their source is at least in part the nail mill degreasing unit. Concentrations of TCE in samples from monitoring wells MW-1 (31 ug/L) and MW-2 (a mean of 84 ug/L) and lead in the sample from MW-2 (270 ug/L) exceeded applicable ground water standards for those variables (5 ug/L for TCE and 50 ug/L for lead).

Future site use is a relevant factor in considering additional investigation activities and possible remedial measures. In part, this is because most of the contamination is presently covered by buildings and equipment that, according to information from ARMCO, will be removed circa spring 1992. Both site investigation work and possible remediation work are hampered by the presence of these facilities. If remediation is necessary, some alternatives may be precluded by their presence while ones that would still be feasible may be made more expensive.

Sufficient information appears to be available regarding the presence of halogenated volatile organics in unsaturated zone soil to allow decision making and selection and design of appropriate remedial alternatives, if remediation is necessary, once cleanup levels have been established. Design of an appropriate soil remediation system should be considered in concert with establishing soil cleanup levels and the removal of buildings and equipment. Physical removal of soil having the highest concentrations of halogenated volatile organics and further treatment or disposal of it or soil vapor extraction appear to be the leading candidates for soil remediation. However, additional investigation is necessary in order to provide adequate information on the level and extent of ground water contamination and site hydrogeology for decision making with regard to that media.

Recommendations

Terracon recommends that the following additional sampling and field measurement work be conducted at this time:

1. Additional sampling of all four monitoring wells with analysis for halogenated volatile organics and other selected variables (including lead); and

2. Additional measurement of ground water levels in all four monitoring wells.

Terracon recommends that the following drilling-related work be performed at this time or, if necessary, after removal of buildings covering parts of this site:

1. Drilling of a pattern of at least four shallow boreholes (i.e., on the order of 30 to 40 feet BGL) around MW-2 and MW-3 and to the east of MW-1, as indicated in Figure 5 (see page 45). Additional boreholes would be drilled as necessary, on the basis of initial results, to investigate the extent of the shallow sand aquifer;

2. Sampling of soil during drilling of borings to be analyzed for ambient temperature headspace, halogenated volatile organics, and physical properties;

3. Installation of a pattern of nested shallow and deep monitoring wells in selected boreholes around MW-2 and MW-3. The pattern would include the initial four sets of monitoring wells surrounding MW-2 and MW-3 and one to the east of MW-1. Further monitoring wells would be installed if field indications warrant;

4. Measurement of all monitoring well reference points (i.e., top of casing) by survey and water levels with respect to reference points;

5. Sampling of ground water from all monitoring wells (both new and existing) with analysis of all samples for halogenated volatile organics and analysis of a samples from a selection of wells for other selected variables (including lead).

The drilling-related phase of field work would be intended to develop the necessary additional information regarding ground water contamination and site hydrogeology.

Based on the information currently available, Terracon believes that this approach will be adequate to protect public health and the environment. There is a long history of industrial operations, which were suspended some time ago, at this site. Therefore, the constituents of concern have apparently been in place for a substantial period of time. Their nature and the presence of fine grained materials would be expected to substantially reduce the potential for migration.

Furthermore, the site location, within a highly urbanized area served by a major public water supply system with remote intakes, makes it unlikely that constituents from this site would impact any beneficial uses of ground water.

NAIL MILL PHASE II INVESTIGATION REPORT

WORLDWIDE GRINDING SYSTEMS, ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

PROJECT NO. 50915113
NOVEMBER 18, 1991

1.0 INTRODUCTION

Several halogenated volatile organics[1] were identified in soil samples taken in 1990 in the vicinity of a degreasing unit within a former nail mill at the Worldwide Grinding Systems (formerly Midwestern Steel Division), ARMCO, Inc., facility in Kansas City, Missouri (i.e., the Kansas City Works). A soil vapor survey performed by Terracon Environmental, Inc., during the first half of 1991 in the immediate vicinity of the degreasing unit and outside the nail mill building provided further information regarding the nature and extent of this contamination. In its report of the results of that work, Terracon recommended further site investigation for the purpose of obtaining additional information on contaminant concentrations in both soil and ground water, contaminant migration, and site hydrogeologic conditions.

A Terracon proposal for additional site investigation was submitted to ARMCO on July 15, 1991. The specific elements of that proposal were that:

1. A pair of monitoring wells be installed near the nail mill degreasing unit and three other wells be placed in

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[1]The term "halogenated volatile organics" applies to those compounds detected using U.S. Environmental Protection Agency (USEPA) method 8010. This method is for soil and water samples under USEPA's solid waste programs. Although other compounds may also be detected using this method, USEPA has published calibration, QC acceptance, accuracy, and precision data for 28 specific compounds. These are listed on the analytical data sheets in Appendix C where method 8010 was used. Method 8010 is essentially the same as USEPA method 601 for water samples in USEPA's water pollution control programs.

a pattern around those two. One of the paired wells was to be screened in the upper part of the aquifer. All other wells were to be screened in the lower part of the aquifer. These wells would provide initial information on possible ground water contamination, with emphasis on the identification of dense chlorinated solvents that might have migrated vertically downward.

2. Soil samples and soil ambient temperature headspace measurements be obtained during drilling for monitoring well installation. Soil samples were to be analyzed for physical characteristics and the presence of halogenated volatile organics.

3. Ground water samples be obtained from and aquifer tests conducted in monitoring wells. Ground water samples were to be analyzed for halogenated volatile organics and a selection of other water quality variables.

4. A report be prepared to present the data obtained from this investigation and an analysis/evaluation of that data. Additionally, the report was to include consideration of remedial alternatives and conceptual design information on the most cost-effective one.

Charles Fillinger of ARMCO notified Terracon in early-August that the Terracon proposal had been accepted. ARMCO's Purchase Order Number 2442450387 of August 6, 1991, identified the work to be performed as a Phase II investigation. This report presents background information pertinent to the Phase II investigation, describes methods used, presents the data obtained and results of data analysis, and presents recommendations based on the this information.

2.0 BACKGROUND INFORMATION

2.1 Regional Information

2.1.1 Location

The general vicinity of ARMCO's Kansas City Works is shown in Figure 1 (page 3), made by combining portions of the Kansas

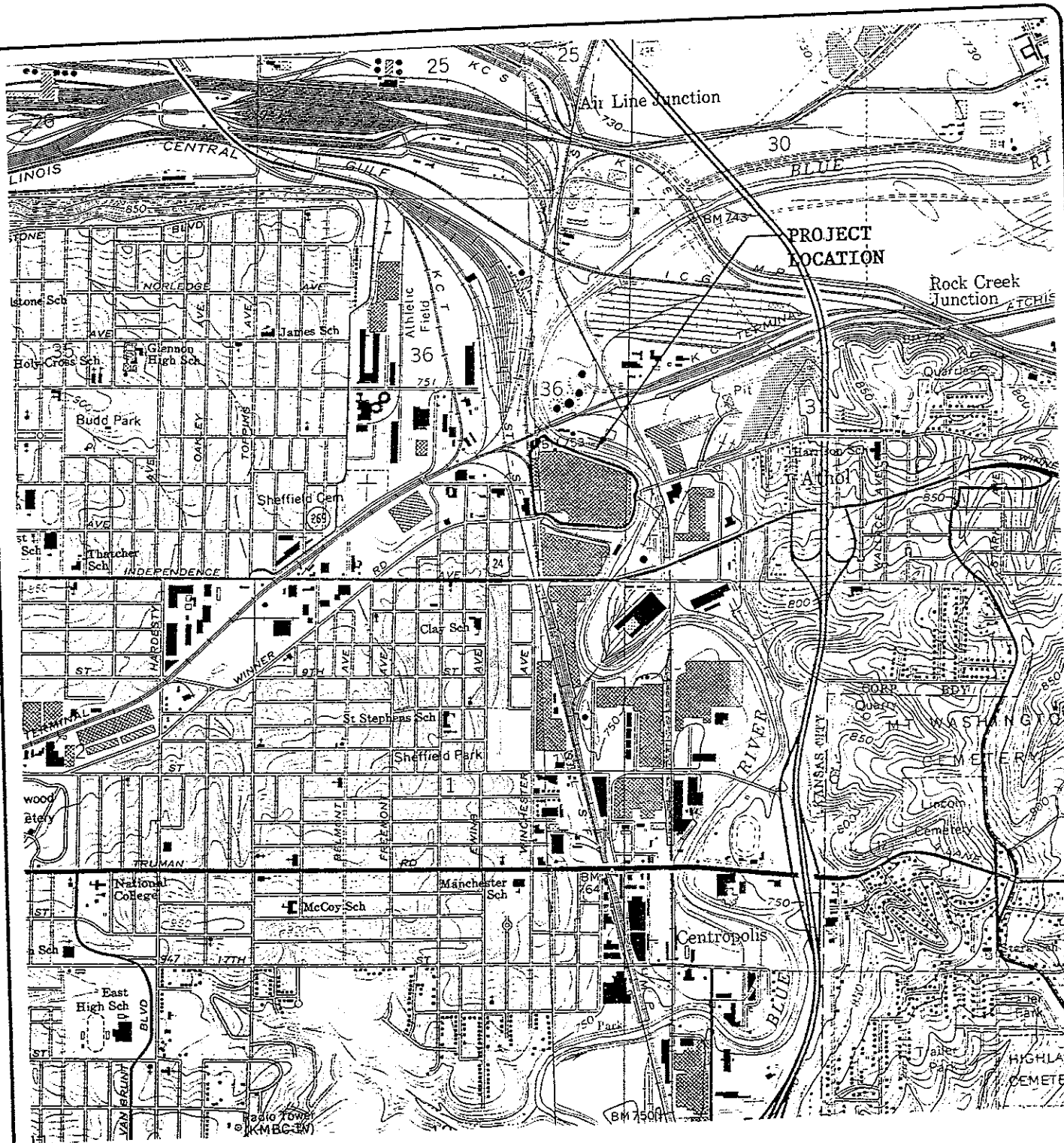

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FIGURE 1. VICINITY MAP
U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHICAL MAP
KANSAS CITY, MO–KS AND INDEPENDENCE, MO QUADS

ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

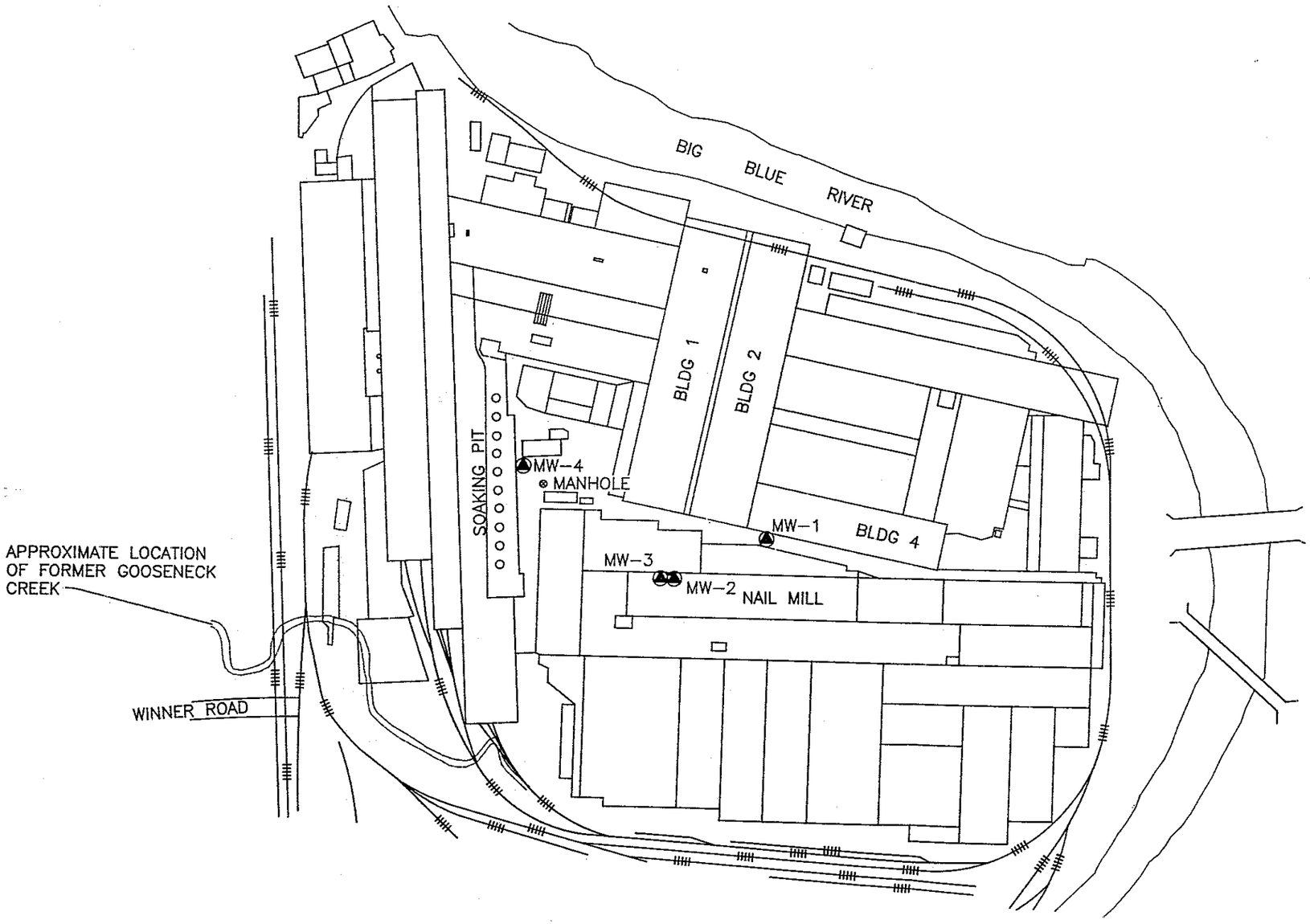
Terracon

City, MO-KS, and Independence, MO, U.S. Geological Survey (USGS) 7.5 minute series topographical quadrangles. It is approximately 4 miles east of downtown Kansas City, Missouri. The Kansas City Works is situated on both sides of the Blue River. Operations conducted at the Kansas City Works in the past have included steelmaking and a variety of related activities (e.g., nail production). The former nail mill site is located on the west side of a bend made by the Blue River as that stream enters the alluvial plain of the Missouri River. The Blue River forms the southeastern, eastern, and northern border of the site.

Figure 2 (page 5) is a more detailed diagram of the site. The approximate location of Gooseneck Creek, as indicated on Sanborn maps of the area from the 1909 time frame, is indicated in Figure 2 (page 5). This stream apparently used to meander across the site to the east and south before entering the Blue River somwhere to the southeast of the nail mill. This portion of its former channel was evidently buried by fill when facilities for the Kansas City Works were constructed. As much as 15 feet of fill, including steel slag, may exist to the south of the nail mill.

2.1.2 Regional Geology

Physiographically, Kansas City is located within the Osage Plains portion of the Central Lowlands Province. This area lies in the center of the Forest City Basin, made up of rocks from Cambrian to Permian age. Exposed bedrock units in the Kansas City area belong to the Pennsylvanian System. This System has a total thickness exceeding 900 feet in the area and a regional dip of about 1/4° (i.e., 10 feet per mile) to the northwest. It is believed to have been formed by cyclic sedimentation caused by marine transgression and regression and is composed of repetitive sequences of thin beds of limestone and shale, with or without



LEGEND

▲ MONITORING WELL

NOTES:

1. BASED ON ORIGINAL DRAWING BY REMCOR DATED 10/29/90

N

0 100' 200'

FIGURE 2. SITE DIAGRAM
ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

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DATE: OCTOBER 9, 1991	PAGE# 5

7810 NORTHWEST 100th
KANSAS CITY, MISSOURI 64153
PHONE: (816) 891-7717
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Terracon
ENVIRONMENTAL, INC.

sandstone. There are also unconsolidated deposits of alluvial, loessial, and glacial materials overlying bedrock. Alluvial deposits in the lower reaches of the Blue River typically consist of 70 to 75 feet of silty clay, silt, and fine sand with deeper sand and gravel[2].

The top layer of bedrock underlying alluvial deposits in the immediate vicinity of the ARMCO Kansas City Works site is apparently shale belonging to the Pleasanton Group. The Pleasanton Group is approximately 115 feet thick and is described as being comprised "mostly of silty gray shale"[3].

2.1.3 Nearby Site Data

Hydrogeologic data has been developed at two sites a short distance upstream of the Kansas City Works along the Blue River. These are ARMCO's Union Wire Rope site and another industrial facility a short distance south of it. This data was reviewed to provide background information for this project. Additional information from other sources that may exist was not reviewed.

2.1.3.1 Union Wire Rope[4]

Reportedly, borings at the Union Wire Rope site were drilled in Blue River alluvium. Typically, this consisted of:

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[2]Hasan, Syed E., Richard L. Moberly, and John A. Caoile. 1988. Geology of greater Kansas City, Missouri and Kansas, United States of America. Bulletin of the Association of Engineering Geologists, Vol. XXV, No. 3, pp. 281-341.

[3]Parizek, Eldon J., Wallace B. Howe, and James H. Williams. 1968. Geology of Independence quadrangle, Jackson County, Missouri. Geologic Quadrangle Map Series No. 3, MDNR, Rolla, MO.

[4]All information in this subsection of this report has been extracted from Remcor's draft report circa August 1991. Pages 3-6 through 3-10 of this report were made available for review.

1. Approximately 39 feet of moist to saturated brown interbedded clayey silt and silty clay with minor amounts of fine sand. The deeper approximately 20 feet of this material was referred to as a "shallow" aquifer.

2. Approximately 4 feet of thick damp, stiff silty clay having reduced permeability.

3. Approximately 20 feet of olive green silty gravel and poorly sorted silty sand. This material was referred to as a "deep zone".

4. Bedrock at a depth of approximately 63 feet below ground level (BGL). The first consolidated material encountered would typically be medium to dark claystone. This would grade into weathered shale and ultimately shale.

Data regarding ground water at the Union Wire Rope site indicated that water was typically encountered between 15 and 20 feet BGL and that overlying finer grained materials had a confining effect. Water levels in some wells reportedly rose to a depth of 7 feet BGL. The general direction of ground water flow in the shallow aquifer was to the north-northeast towards the Blue River at an "average hydraulic gradient" in the range of 0.01 to 0.02 feet/foot. Potentiometric heads in the deeper wells were higher than those in the shallow wells, indicating flow vertically upward at a gradient of 0.06 to 0.07 feet/foot.

The geometric mean hydraulic conductivity (K) of the shallow aquifer, determined through rising water level (i.e., slug-out) tests, was reportedly 7.25×10^{-4} centimeters/second (cm./sec.). The geometric mean hydraulic conductivity of the deep zone was similarly determined to be 1.81×10^{-3} cm./sec.

2.1.3.2 Other Industrial Facility

At another industrial facility a short distance south of Union Wire Rope, boring logs indicate that similar alluvial materials were encountered. In general, silty clay or clayey silt were reported over most of the boring, with occasional showings of sand (e.g., clayey and/or silty fine to very fine sand, clayey silt with a trace of very fine sand, or fine to medium sandy clay) and a gravelly clay with medium sand layer at the bottom of the boring. Bedrock underneath this material occurred at depths on the order of 50 to 60 feet BGL and was identified as weathered black shale.

2.2 Initial Remcor Investigation[5]

In 1989 and 1990, Remcor, Inc., of Pittsburgh, Pennsylvania, conducted an environmental investigation of idled facilities at ARMCO's Kansas City Works. Because it was known that dense chlorinated solvents, in particular trichloroethylene (TCE), had been used in a degreasing unit within the former nail mill, two soil samples were taken in the immediate vicinity of the degreasing unit in June 1990. Precise information on sampling methodology and location were not reported; however, it appears that these soil samples were taken immediately BGL. These samples were analyzed for volatile organic compounds (VOCs) by a laboratory in Pennsylvania using U.S. Environmental Protection Agency (USEPA) method 624. This is a gas chromatograph/mass spectrometer (GC/MS) method capable of identifying both halogenated volatile organics and purgeable aromatics.

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[5]All information in this subsection of this report has been extracted from Remcor's revised draft report titled "Idled Facilities Environmental Investigations" dated November 27, 1990 (Remcor Project No. 89316.15).

Table 4 of Remcor's report of that work (copy provided in Appendix A herein) contains analytical results for the two soil samples taken. No purgeable aromatics were detected; however, TCE was found in both samples at concentrations of 67 and 100 mg/kg. Three other halogenated volatile organics were found in one of the samples. These were 1,1-dichloroethylene (1,1-DCE), tetrachloroethylene (PCE or TeCE), and 1,1,1-trichloroethane (1,1,1-TCA) at concentrations of 22, 0.85, and 1.2 mg/kg, respectively.

At the conclusion of this work, Remcor recommended additional investigation of the extent of TCE soil contamination in the vicinity of the nail mill degreasing unit. It was specifically recommended by Remcor that a soil vapor survey be conducted and that a soil vapor extraction system or other alternative remedial approach be designed. Recommendations regarding the investigation of potential ground water contamination were to be made after the soil vapor survey.

2.3 Terracon Soil Vapor Survey

During the first part of 1991, Terracon conducted a soil vapor survey in the vicinity of the nail mill degreasing unit. This survey was carried out in two phases. The major portion of the work took place during mid-March. At that time, a soil gas van with a hydraulic ram was used to push 15 probes within the nail mill building. One inch outer diameter (OD) probes were used. In mid-May, an additional nine such probes were pushed at selected locations outside the nail mill building. Most of these were located in a roadway along its north side. Soil vapors were extracted from two depth ranges during this work. These were from 5 to 6 feet and 9 to 15 feet BGL inside the nail mill in March and from 9 to 15 feet BGL outside the nail mill in May. After extraction, soil vapors were analyzed using a field GC

(Shimadzu Corporation Model No. GC-14A) equipped with a 30 meter column and two detectors. The detectors used, an electron capture (ECD) and a 10.2 eV photoionization (PID), were capable of identifying both halogenated volatile organics and purgeable aromatics, respectively.

Results of the soil vapor survey were presented to ARMCO in a letter report dated July 3, 1991 (copy provided in Appendix A herein). VOCs detected during this work were reported as TCA, TCE, and total instrument response. Data were presented in terms of both tabulations and concentration contours. Since total instrument response exceeded the sum of TCA and TCE concentrations, additional compounds that were not specifically identified were apparently present. It was speculated that these may have included TeCE. Substantial concentrations were reported at both depth ranges near the degreasing unit. At a maximum, these exceeded 1,000 ug/L in the 5 to 6 foot depth range and were on the order of several hundred ug/L total instrument response in the 9 to 15 foot depth range. Much lower concentrations were found outside the building. These were on the order of a maximum of less than 50 ug/L.

This information indicates that the primary source of contamination was the degreasing unit. Concentrations were highest in the immediate vicinity of that unit and at the shallowest depth range. Concentrations generally decreased with depth and distance from that unit; however, there appears to be some elongation of the area of contamination along an east-west axis.

Four soil samples were taken from probes pushed at different locations during the soil vapor survey (i.e., P-1, P-2, P-9, and P-15). These were composited over the interval of 0 to 6 feet

BGL in clean 40 mL glass vials with Teflon septums, placed in an ice cooler to be cooled to and maintained at as close to 4 °C as possible, and sent to Continental Analytical Services, Inc. (CAS) in Salina, Kansas, as quality control (QC) check samples. They were analyzed only for 1,1,1-TCA and TCE, using USEPA method 8010 (GC). A data sheet showing results of analysis of these samples is provided in Appendix A. Substantial concentrations of TCE, were reported in all samples except P-9 (this location was relatively remote from the degreasing unit). The highest concentration of TCE (i.e., 130 mg/kg) was reported for sample P-1 (this location was the closest to the degreasing unit). TCE levels reported in samples P-2 and P-15 were 4.6 and 180 mg/kg, respectively. Sample P-1 was also the only one in which 1,1,1-TCA was reported to be present at a concentration exceeding the detection limit (the reported concentration was 0.100 mg/kg).

At the completion of the soil vapor survey, it was concluded that localized soil VOC contamination existed and that it was possible that ground water was also contaminated. Therefore, additional site investigation work was recommended (i.e., Phase II) for the purpose of obtaining information pertinent to contaminant concentrations in both soil and ground water, contaminant migration, and site hydrogeologic conditions. Such information is necessary for decision making regarding possible remedial action and, if necessary, design of remedial systems.

3.0 METHODS

Phase II field work was conducted between August 27 and September 5, 1991. Standard Terracon field procedures were utilized. These are generally based on and consistent with recommendations, guidelines, standards, or requirements of the Missouri Department of Natural Resources (MDNR), U.S.

Environmental Protection Agency (USEPA), American Society for Testing and Materials (ASTM), and professional practice.

3.1 Health and Safety

A site-specific health and safety plan was developed for intrusive activities. Because 1,1-DCE, 1,1,1-TCA and TCE had been detected in the past and the presence of other VOCs was possible[6], this plan was oriented towards personnel protection with regard to VOCs and, in particular, respiratory protection.

The health and safety plan specified general use of modified Level D personal protection equipment but required monitoring for organic vapors using a photoionization detector (PID) and delineated action levels for sustained (i.e., 5 minutes or longer) airborne contaminant concentrations. The use of vinyl chloride specific detector tubes was required for concentrations exceeding 5 parts/million (ppm) and upgrading to Level C respiratory protection with organic vapor filter cartridges was required for concentrations exceeding 10 ppm. Further discussion/evaluation with Terracon's Safety and Health Manager was required for concentrations exceeding 50 ppm.

During intrusive work, a Thermo Environmental Instruments, Inc., Model No. 580A organic vapor meter (OVM) with a 10.0 eV PID was used for health and safety monitoring. It was calibrated daily in accordance with manufacturer instructions using compressed zero and span gasses (air and isobutylene rated at less than 1 and 250 ppm, respectively).

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[6]It is noted that 1,1-DCE, two forms of 1,2-DCE, and vinyl chloride are sequential products of anaerobic degradation of TCE and that 1,1-DCA and chloroethane are sequential products of anaerobic degrdation of 1,1,1-TCA.

Drilling operations outside the nail mill building were conducted in modified Level D personal protection equipment. Concentrations measured during this work never exceeded background (i.e., less than 1 ppm). Drilling operations inside the nail mill building were conducted using Level C personal protection equipment. Concentrations measured near the degreasing unit during drilling operations reached a maximum of 58 ppm in the breathing zone and 393 ppm at the top of the borehole during work on MW-2 and 12 ppm in the breathing zone and 197 ppm at the top of the borehole during work on MW-3. However, concentrations in the breathing zone were of a transient nature and dissipated rapidly. Additionally, vinyl chloride was not detected.

3.2 Drilling/Soil Sampling/Well Installation

It was planned to drill five boreholes and install monitoring wells in each of them. Soil samples were to be obtained during drilling operations for observation, field measurements, and physical and chemical analysis. Due to its proximity to boring MW-2, samples would not be obtained from boring MW-3 for chemical analysis. Drilling and installation of the first four wells proceeded as planned. These were identified, in the order of drilling, as MW-1 through MW-4. Their locations are indicated in Figure 2 (page 5). However, the presence of slag fill, encountered during six attempts to drill at locations along the west and south sides of the nail mill building, precluded installation of MW-5 at a suitable location and, therefore, attempts to do so were aborted. Details regarding drilling, soil sampling, and monitoring well installation methods are provided below.

3.2.1 Drilling

Drilling operations were conducted during the period of August 27 through 30 and on September 3, 1991. A truck mounted

Central Mine Equipment (CME) Model No. 75 drill rig with 4.25 inch inner diameter (ID) hollow-stem augers and a continuous hollow-stem sampling (CHSS) system were utilized for drilling and soil sampling operations. This rig was operated by a two man crew under the supervision of an environmental geologist. The drill rig, all downhole equipment, and sample contacting equipment were cleaned in accordance with procedures delineated in ASTM Standard D 5088-90 prior to arrival onsite. Additionally, downhole and sample contacting equipment was similarly cleaned between boreholes and samples, respectively. Cuttings from MW-2 and MW-3 were considered potentially contaminated and were containerized for future disposal using 55 gallon drums. Cuttings from other borings and spent decontamination fluids were not so collected.

3.2.2 Soil Sampling

Soil samples were collected during the drilling of borings MW-1 through MW-4 during the period of August 27 through 30. Soil sampling was conducted in accordance with procedures delineated in ASTM Standard D 1586-84. Samples were generally obtained using the CHSS system. This enabled the environmental geologist logging boreholes to do so on the basis of a nearly complete visual examination of all materials encountered. Exceptions to this general case were the use of a 3 inch OD, 2 foot long thin-walled (i.e., Shelby) tube to collect samples for physical analysis from borings MW-2 (5 to 7 feet BGL) and MW-3 (29 to 31 feet BGL) and the initial 20 feet of boring MW-4. Because of the similarity of near-surface materials, it was decided to save time by logging the first 20 feet of boring MW-4 based on cuttings. Boring logs with a description of the materials encountered and delineating sample intervals, type of sample, and percent recovery are provided as Appendix B.

Composite samples were collected at intervals from all borings and placed in sealed one quart glass jars for ambient temperature headspace analysis. Ambient temperatures during drilling operations were in the 70 to 95 °F range. A minimum headspace development time of 15 minutes was allowed; after which the probe of the OVM used for health and safety monitoring was inserted through the seal of the jar to obtain a headspace measurement. The maximum reading thus obtained was recorded on the boring log.

Composite samples representing the interval involved were obtained from the CHSS system for chemical analysis. These were taken as rapidly as possible using clean stainless steel utensils and placed in clean, 4 ounce, wide mouth, glass jars with Teflon lined lids. After collection, these samples were placed in an ice cooler to cool to and maintain them at as close to 4 °C as possible. The first soil sample was taken on 27 and the last on 30 August. They were subsequently delivered to the PACE, Inc., laboratory in Lenexa, Kansas, on 30 August to be analyzed for VOCs. The sample from the 8 to 13 feet BGL depth interval of boring MW-2 was analyzed using USEPA method 8240 (VOCs by GC/MS). All other samples were analyzed using USEPA method 8010 (halogenated volatile organics by GC). Standard chain-of-custody procedures were followed. Copies of the chain-of-custody forms and laboratory data sheets are provided in Appendix C.

Samples for physical analysis were obtained in the thin-walled tubes mentioned above, in a manner consistent with ASTM Standard D 1587-83. After these samples were obtained, the ends of the tube were sealed and the tubes were delivered to Terracon's geotechnical laboratory in Lenexa, Kansas, to be analyzed. Analytical methods used were as follows:

1. Organic content was determined using American Association of State Highway and Transportation Officials (AASHTO) Method T 267-86[7].

2. Porosity was determined using Appendix II of the Corps of Engineers soils testing manual[8].

3. Particle size distribution was determined using ASTM Standard D 422-63 (reapproved 1972).

4. Hydraulic conductivity was determined using ASTM Standard D 5084-90.

Additionally, samples from MW-1 (28 to 30 feet BGL) and MW-4 (61 to 65 feet BGL) were analyzed for particle size distribution. Data sheets showing the results of these analysis are provided in Appendix D.

3.2.3 Monitoring Well Installation

Two inch nominal diameter monitoring wells were installed immediately after boreholes were drilled. Various parts of the installation process took place through the augers, as the augers were being pulled, or after augers were retracted. Design and installation of these wells was in accordance with procedures delineated in ASTM Standard D 5092-90.

Brainard-Kilman TriLoc, polyvinyl chloride (PVC), machine-slotted screens and riser casings with threaded connections and "O" ring seals were used. Screen slot size was 0.010 inches. A primary sand filter pack, composed of a medium (i.e., 12-20 size) silica sand, was installed around the screen by free-fall inside the auger to a depth of at least 3 feet above the top of the

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[7]This method is similar to ASTM Standard D 2974-87.

[8]Corps of Engineers. 1980. Laboratory soils testing. Engineer Manual No. EM 1110-2-1906 (published November 30, 1970, and updated May 1, 1980), U.S. Army, Washington, DC.

highest slot. A weighted line was also used in this process. Bentonite seals 2 to 3 feet thick were placed on top of the filter packs. Bentonite pellets were placed by free-fall for MW-1 and MW-3 and bentonite "doughnuts" were used for MW-2 and MW-4. To avoid potential bridging problems and, due to concern about borehole stability after auger retraction, the seal for MW-1 was placed just underneath the apparent water table. In all other cases, it was placed within 5 feet of the top slot of the screen. This was considerably below the static water level for MW-3 and MW-4. Bridging problems were encountered in the case of MW-3, but these were countered using a tamper and weighted line. It was possible, in the case of MW-4, to retract the augers and place a bentonite "doughnut" for a seal. Bentonite grout was placed over the seal to the bottom of the flush mount. The top of the well was finished with a lockable cap and a bolted flush mount.

After monitoring well installation, Terracon field staff obtained rough location and top of casing elevation data for all wells relative to the top of Manhole No. 2 (in the soaking pit sewer system to the northwest of the nail mill building). Location coordinates and elevations are listed in Table 1. The elevation of that manhole with relation to mean sea level (MSL) was available from ARMCO water pollution control Phase III drawing 45415. Locations were measured using tapes and elevations were measured using an engineer's level and rod.

Monitoring well development was accomplished by either mechanical surging with a bailer and bailing or over pumping. Due to the presence of a large fraction of fine grained materials, only marginal improvement in water clarity took place and it was arbitrarily decided that wells would be considered developed after removal of 5 well volumes. MW-2 and MW-3 were developed on

Table 1: Monitoring Well Location/Elevation

Well	Coordinates		Water Level Data				
				Drilled		Sampled	
	East	North	TOWC	Level	MSL	Level	MSL
MW-1	459.0	417.2	742.51	12.5	730.01	20.31	722.20
MW-2	306.5	350.0	744.90	21.5	723.40	7.98	736.92
MW-3	300.0	350.0	745.01	21.0	724.01	23.38	721.63
MW-4	54.0	527.6	744.66	12.5	743.16	26.91	717.75

August 30. Approximately 18.5 gallons (5.1 well volumes) and 43.5 gallons (6.8 well volumes) were removed from these wells by bailing and pumping, respectively. This water was containerized for future disposal using 55 gallon drums. MW-1 and MW-4 were developed by over pumping in conjunction with sampling activities on September 4. This involved the initial removal of 5 well volumes from each by over pumping, followed by additional purging.

3.3 Ground Water Sampling

Ground water sampling was conducted in accordance with procedures delineated in ASTM Standard D 4448-85a. Dedicated WaTerra Pumps Ltd. inertial pump systems consisting of a Model D-25 Delrin foot valve and 0.625 inch OD high density polyethylene (HDPE) tubing were installed in each well. For samples to be analyzed for elements, a Model FHT-700 in-line high capacity filter was also used.

Static water levels were measured prior to purging, during purging, and after sampling using a flat tape ORS electric interface probe. The procedures followed were in accordance with those delineated in ASTM Standard D 4750-87. This information was subsequently contoured in order to estimate the direction and gradient of ground water flow[9]. A minimum of three well volumes were purged prior to sampling, except in the case of MW-2. MW-2 was pumped dry after approximately 2 well volumes were removed. Purge variables (i.e., pH, temperature, and conductivity) were measured initially and after each well volume following

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[9]Contours were generated by the "Surfer" computer program (Version 4) produced by Golden Software, Inc., of Golden, Colorado. This program interpolates between data points to estimate contour line positions. Therefore, contour lines should not be considered exact except where they coincide with data points.

development. pH and temperature were measured using an Orion Model No. 230A meter. A two point calibration was performed daily using pH 7 and 10 buffer solutions. The electrode slope was 100.3 percent each time. Conductivity was measured using an Orion Model No. 120 meter. The meter was checked using YSI 3163 calibrator solution (standard conductivity of 1,000 µmhos/cm. at 25 °C). Purge data are listed in Table 2. Purge variables were stable prior to sampling (i.e., change between successive well volumes was less than 10 percent). During purging and sampling monitoring wells MW-3 and MW-4, a sewage-like odor was also noticed.

Samples were collected in pairs of clean 40 mL vials with Teflon septums from all four monitoring wells. MW-1, MW-3, and MW-4 were sampled on September 4 and MW-2 was sampled on September 5. In addition, a field replicate of the sample from MW-2 was obtained for QC purposes and labelled MW-5. After collection, these samples were placed in an ice cooler to cool them to and maintain them at as close to 4 °C as possible. They were subsequently delivered to the PACE, Inc., laboratory in Lenexa, Kansas, on 30 August to be analyzed for VOCs. The sample from MW-2 was analyzed using USEPA method 8240 (VOCs by GC/MS). All other samples were analyzed using USEPA method 8010 (halogenated volatile organics by GC). Standard chain-of-custody procedures were followed. Copies of the chain-of-custody forms and laboratory data sheets are provided in Appendix C.

In addition to samples to be analyzed for VOCs, samples were taken from MW-2 to be analyzed for major anions (i.e., alkalinity, chloride, nitrate, and sulfate), elements (the major elements calcium, iron, magnesium, manganese, potassium, and sodium and the trace elements arsenic, cadmium, chromium, copper, lead, nickel, selenium, and zinc), total suspended solids (TSS), and

Table 2: Monitoring Well Purge Variables[1]				
Well [Date]: Appearance	WV[2]	pH	T	COND
MW-1 [04 Sep 91]:				
Clear	0.0	7.26	21.2	928
Highly turbid (dark gray)	5.0	6.96	18.4	1,038
Moderately turbid (gray)	6.0	6.92	17.8	1,059
Moderately turbid (light gray)	7.0	6.93	17.6	1,068
MW-2 [05 Sep 91]:				
Clear	0.0	6.70	18.3	2,720
Moderately turbid (light gray)	1.0	6.67	16.9	2,830
Moderately turbid (light gray)	2.0	6.69	17.0	2,850
MW-3 [04 Sep 91]:				
Clear	0.0	6.74	20.8	864
Moderately turbid (light gray)	1.0	6.83	18.7	1,089
Moderately turbid (light gray)	2.0	6.83	18.6	1,101
Slightly turbid (v. lt. gray)	3.0	6.88	18.6	1,132
MW-4 [04 Sep 91]:				
Clear	0.0	6.93	23.1	1,124
Moderately turbid (light gray)	5.0	6.91	24.2	1,184
Moderately turbid (light gray)	6.0	6.96	24.0	1,186
Moderately turbid (light gray)	7.0	6.95	23.9	1,165

NOTES:

1. "WV" well volumes of water purged (see note two for value of each well volume), T is temperature in °C, pH is in units, and "COND" is conductivity in umhos/cm at 25 °C.

2. Approximate well volumes at time of sampling were: (1) 7.4 gallons for MW-1; (2) 4.8 gallons for MW-2; (3) 6.6 gallons for MW-3; and (4) 7.5 gallons for MW-4. MW-2 was pumped dry after approximately 2 well volumes were removed.

turbidity. After collection, these were handled in the same manner as VOC samples until analysis. Differences in collection, preservation, and analysis were as follows:

1. These samples were collected in clean 1 liter polyethylene containers.

2. USEPA method 310.1 was used for bicarbonate alkalinity.

3. Standard method 4500B was used for chloride.

4. The sample for nitrate analysis was preserved with sulfuric acid sufficient to lower pH to less than 2 units. USEPA method 353.3 was used for this analysis.

5. USEPA method 375.3 was used for sulfate.

6. USEPA method 160.2 was used for TSS.

7. USEPA method 180.1 was to be used for turbidity. Due to the amount and nature of solids in the sample, turbidity was not measured in it.

8. The sample to be analyzed for elements was field filtered and preserved with nitric acid sufficient to lower pH to less than 2 units. USEPA methods 206.2, 239.1, 258.1, and 270.2 were used for arsenic, lead, potassium, and selenium, respectively. USEPA method 200.7 was used for all other elements.

Copies of laboratory data sheets for samples analyzed for these variables are provided in Appendix C.

3.4 Aquifer Testing

Aquifer testing was conducted September 4 in MW-3 and MW-4 and September 5 in MW-2. These tests consisted of rising water level (i.e., slug-out) tests performed in accordance with Terracon Standard Field Method No. 9020-2. Test data are presented in Appendix E.

All test runs were conducted in an essentially similar manner with the exception of run number one in well MW-2. An In

Situ Inc. Model No. PTX-161D 20 psi pressure transducer was positioned near the bottom of each well and connected to a Model No. SE 1000B Hermit environmental data logger to record test data. Either 2 or 3 VOSS disposable bailers were then positioned under the static water level and, after the water level had returned to its previous mark, simultaneously pulled to produce an abrupt change in head and start the test. Effective displacement produced by each VOSS bailer is 0.292 gallons. This is equivalent to a head change in the well of approximately 1.68 feet. In the case of run number one in well MW-2, the initial change in head was produced by rapid pumping using the WaTerra inertial pump system.

Data from all test runs were analyzed using a computer program[10] to apply the Bouwer and Rice method[11]. This yields a direct estimate of hydraulic conductivity. Additionally, the data for both test runs in MW-2 and MW-3 were analyzed using the Cooper, Bredehoeft, and Papadopulos (CBP) method[12]. Data for test runs in MW-4 were insufficient for that method. The CBP method provides an estimate of transmissivity (T) and storage coefficient (S); however, the estimate of storage coefficient is not considered reliable. Hydraulic conductivity is calculated from CBP results by dividing transmissivity by the saturated

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[10]Duffield, Glenn M. and James O. Rumbaugh, III. 1991. Aquifer test solver (Version 1.1). Geraghty & Miller Modeling Group, Reston, Virginia.

[11]Bouwer, Herman and R.C. Rice. 1976. A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells. Water Resources Research, Vol. 12, No. 3, pp. 423-428.

[12]Cooper, Hilton H., Jr., John D. Bredehoeft, and Istavros S. Papadopulos. 1967. Response of a finite-diameter well to an instantaneous charge of water. Water Resources Research, Vol. 3, No. 1, pp. 262-269.

aquifer thickness. Assumptions used in data analysis and computer analytical outputs (consisting of graphical plots with numerical solutions printed on them) are presented in Appendix E.

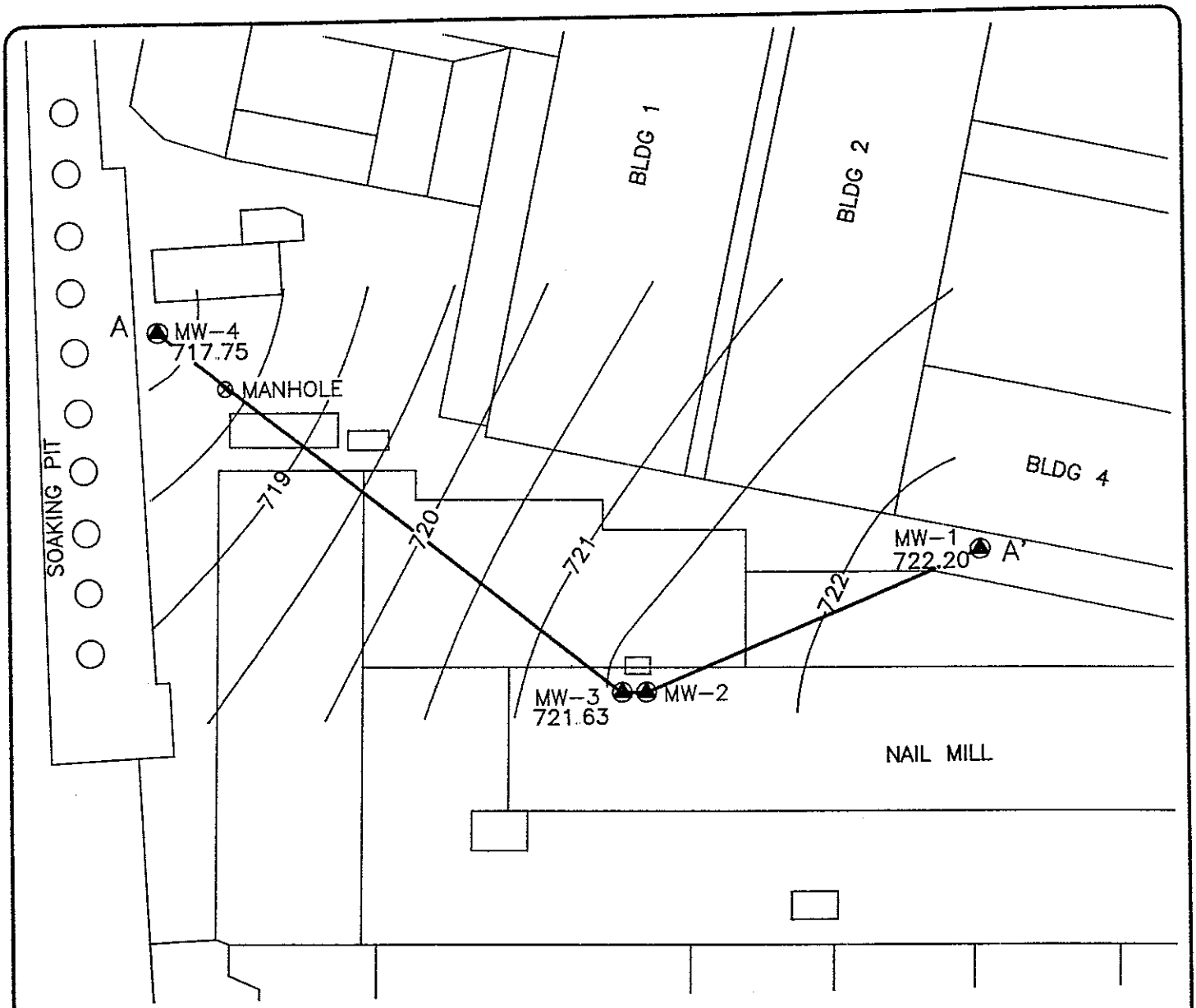
4.0 RESULTS

4.1 Soil/Aquifer

4.1.1 Physical Characteristics

Soil physical characteristics were described on boring logs after visual examination (see Appendix B). Materials encountered were alluvial in nature and generally consisted of clayey silt, silty clay, or clay with occasional sand or gravel seams overlying shale bedrock. A shallow aquifer sand layer was found between 28 and 41 feet BGL in borings MW-2 and MW-3 and sand, gravel, and/or cobbles were mixed with clay or silty clay to form a deeper aquifer at depths exceeding 56 feet BGL in the three deep borings. Figures 3 (page 25) and 4 (page 26) show the location of a lithologic cross-section (A-A') drawn through all four wells using this information and the cross-section itself, respectively. Since no indication of the shallow sand aquifer was found in borings MW-1 and MW-4, the extent of that material beyond the immediate vicinity of the nail mill degreasing unit is unknown. The nature of the fine grained materials overlying the shallow aquifer and separating the shallow and deep aquifers would indicate that both aquifers may effectively be confined.

Samples from all borings were analyzed for particle size distribution. The results of this analysis, presented in Appendix D, indicate the influence of fine grained materials in all cases. Ninety percent or more of the material from the saturated zone of MW-1 (28 to 30 feet BGL) and unsaturated zone of MW-2 (5 to 7 feet BGL) was in the silt or clay size range. These samples were classified as silty clay and clayey silt, respectively. The sample from the saturated sand layer of MW-3 (29 to 31 feet BGL)



N

0 40' 80'

LEGEND

● MONITORING WELL
PROPOSED INITIAL SOIL BORING
AND MONITORING WELL NEST

NOTES:

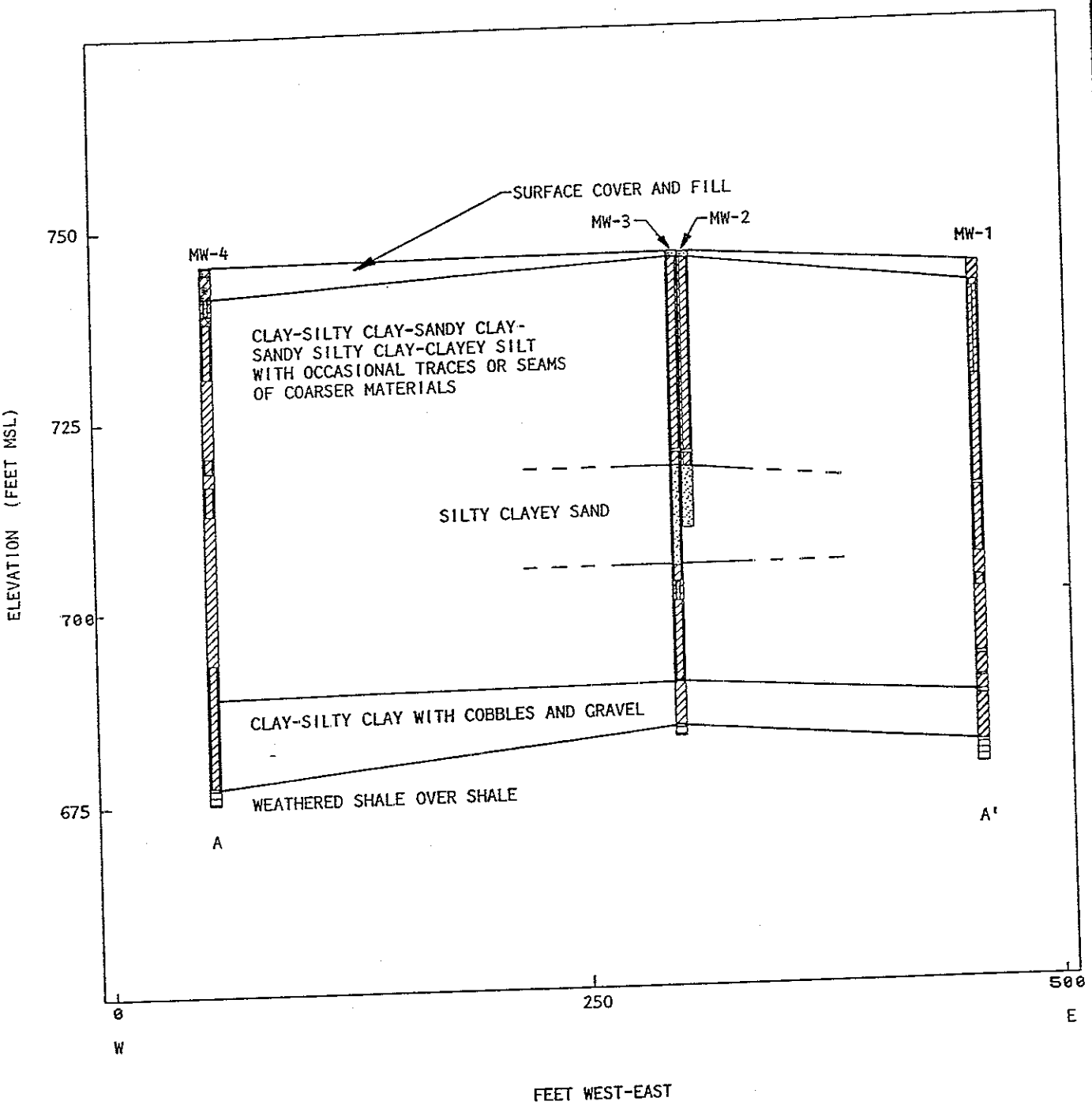
1. BASED ON ORIGINAL DRAWING BY REMCOR DATED 10/29/90
2. WATER ELEVATIONS IN FEET MSL IN PARENTHESIS

PROJ.# 50915113	PAGE# 25
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91113AF2.DWG	
DATE: OCTOBER 14, 1991	

FIGURE 3. DEEPER ZONE POTENTIOMETRIC CONTOURS

ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

Terracon



PROJ.# 50915113	PAGE# 26
SCALE: AS SHOWN	DRAWN BY:
FN: 50915113	
DATE: OCTOBER 18, 1991	

FIGURE 4. LITHOLOGIC CROSS-SECTION A-A'

ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

Terracon

was predominantly in the very fine sand size range but also contained approximately 40 percent silt (26 percent) or clay (14 percent) size material. This sample was classified as silty, clayey sand. Finally, although more than 30 percent of the material from the deep sample taken from MW-4 (61 to 65 feet BGL) was in the gravel size range, over 55 percent was silt (23 percent) or clay (35 percent) size material. This sample was classified as gravelly, silty clay.

In addition, samples from the unsaturated zone of MW-2 (5 to 7 feet BGL) and shallow saturated zone of MW-3 (29 to 31 feet BGL) were analyzed for organic content, porosity, and hydraulic conductivity by permeameter (see Appenidx D). Results for the latter will are included below in the discussion of aquifer testing results. Analysis for porosity also entails determination of particle specific gravity and dry bulk density. A substantial fraction of organic material and relatively high porosity were found in samples from both the unsaturated clayey silt (0.0282 and 0.443, respectively) and saturated silty, clayey sand (0.0220 and 0.429, respectively). Particle specific gravity and dry bulk density for these zones were also similar (i.e., specific gravities were 2.695 and 2.694 and dry bulk densities were 93.6 and 96.0 pounds/cubic foot for the silty clay and silty, clayey sand, respectively). Conversion of units results in dry bulk densities of approximately 1.50 and 1.54 grams/cubic centimeter, respectively.

Aquifer test results are summarized in Table 3 (copies of test data, assumptions used in analysis, and analytical outputs ›re provided in Appendix E). These indicate, based on a single p ›meameter test, relatively impermeable materials in the overly- ›r unsaturated zone (i.e., on the order of 10^{-6} to 10^{-5} cm./sec.) (, ›ased mainly on slug tests, substantially different values

Table 3: Aquifer Test Results[1,2,3]

Well	Type Test	Run	Data	Depth BGL	Hydraulic Conductivity
MW-2	Permeameter	-	-	05 -07	6.8×10^{-6} cm./sec.
	Slug-Out	1	B&R	26 -35	8.1×10^{-5} cm./sec.
	Slug-Out	1	CBP	26 -35	1.1×10^{-4} cm./sec.
	Slug-Out	2	B&R	26 -35	9.2×10^{-5} cm./sec.
	Slug-Out	2	CBP	26 -35	1.1×10^{-4} cm./sec.
	Geo. Mean	All	All	26 -35	9.7×10^{-5} cm./sec.
MW-3	Permeameter	-	-	29 -31	1.6×10^{-4} cm./sec.
	Slug-Out	1	B&R	52.9-61.9	3.2×10^{-3} cm./sec.
	Slug-Out	2	CBP	52.9-61.9	2.3×10^{-3} cm./sec.
	Slug-Out	1	B&R	52.9-61.9	3.2×10^{-3} cm./sec.
	Slug-Out	2	CBP	52.9-61.9	4.4×10^{-3} cm./sec.
	Geo. Mean	All	All	52.9-61.9	3.2×10^{-3} cm./sec.
MW-4	Slug-Out	1	B&R	60.9-69.9	5.9×10^{-2} cm./sec.
	Slug-Out	2	B&R	60.9-69.9	5.3×10^{-2} cm./sec.
	Slug-Out	3	B&R	60.9-69.9	3.9×10^{-2} cm./sec.
	Geo. Mean	All	All	60.9-69.9	5.0×10^{-2} cm./sec.

NOTES:

1. "Permeameter" in "Type Test" column indicates flexible wall, falling head laboratory permeameter test conducted in accordance with ASTM Standard No. D 5084-90. "Geo. Mean" in "Type Test" column indicates geometric mean.

2. "B&R" and "CBP" in "Data" column indicate use of Bouwer and Rice (1976) or Cooper, Bredehoeft, Papodopulos (1967) methods, respectively, for analysis of slug test data.

3. "Depth BGL" column presents depth range below ground level in feet sampled for laboratory test or tested in situ via slug test.

of hydraulic conductivity for materials in the shallow and deeper saturated zones tested.

Hydraulic conductivity results, as estimated from analysis of multiple slug test runs (using two different analytical methods for MW-2 and MW-3 and one for MW-4), were reasonably consistent. The geometric mean for the silty, clayey sand in the shallow zone of MW-2 was approximately 10^{-4} cm./sec. This was of a similar magnitude as the permeameter result for the same material, indicating roughly the same vertical and horizontal hydraulic conductivity for this aquifer. The geometric means for the deeper zones, consisting of silty clay to clay material with a sand seam and cobbles and gravel for MW-3 and gravelly, silty clay for MW-4, were considerably higher at approximately 3×10^{-3} and 5×10^{-2} cm./sec., respectively. The geometric mean of these values would be approximately 1×10^{-2} cm./sec.

Although CBP estimates of storage coefficient are not considered reliable, it was noted that all such estimates in this case were less than the 0.01 value used as a dividing line between unconfined and confined aquifers. Confined aquifer storage coefficients are less than that value. This information supports the indication from lithologic data that both aquifers are effectively confined.

4.1.2 Contaminant Concentrations

Results of analysis of Phase II soil samples for contaminants are summarized in Table 4 (copies of laboratory data sheets are provided in Appendix C). Table 4 also contains a listing of historic soil sample data for comparison. Small concentrations of chloroform, near the analytical detection limit, were reported in the cleanest samples from all three borings. No other compound was found in the sample from boring MW-4. Chloroform is

Table 4a: Soil Sample Analytical Results (ug/kg)		
Location[1]	Compound	Concentration[2]
MW-1: 03-08 Feet BGL	Chloroform	10 (10)
	TCE	69 (10)
MW-2: 08-13 Feet BGL	1,2-DCE (Total)	300 (10)
	1,1,1-TCA	11 (10)
	TCE	2,500 (1,000)
15-18 Feet BGL	1,2-DCE (Total)	120 (10)
	TCE	980 (10)
29-32 Feet BGL	Chloroform	10 (10)
	TCE	83 (10)
MW-4: 10-15 Feet BGL	Chloroform	20 (10)

Table 4b: Historic Soil Sample Results (ug/kg)[3]				
Sample	1,1-DCE	TeCE	1,1,1-TCA	TCE
REMCOR No. 1	850	1,200	22,000	100,000
No. 2	<625	<625	<625	67,000
SOIL VAPOR SURVEY				
Probe P-1	-	-	100	130,000
Probe P-2	-	-	<500	4,600
Probe P-9	-	-	<500	<500
Probe P-15	-	-	<5,000	18,000

NOTES:

1. Composite sample over depth range indicated.

2. Detection limits for respective compounds listed in parens. Other compounds not listed were not found above their respective detection limits. Shallow sample from MW-2 analyzed by USEPA method 8240. Others by USEPA method 8010.

3. From data presented in Appendix A. REMCOR sample number 1 was closer to the degreasing unit than 2.

commonly found in public water supplies and used in analytical laboratories. Its presence in these sample results may be due to trace contamination during field or laboratory work. It may also be a result of leakage from sewers in the vicinity. Therefore, the chloroform results are not considered significant.

The compound detected most frequently and at the highest concentrations in soil samples was TCE. However, 1,2-DCE and 1,1,1-TCA were also found in one or more samples from boring MW-2. The reported concentration of TCE was highest in the shallow sample from boring MW-2 (i.e., 2.5 mg/kg) and decreased with depth in that boring and with distance from it (the concentration of TCE in boring MW-1 was 0.069 mg/kg).

A similar pattern was noted in ambient temperature headspace measurements of samples taken during drilling. These are summarized in Table 5.

4.2 Ground Water

4.2.1 Flow Conditions

Static water level data, obtained from monitoring wells MW-1, MW-3, and MW-4 immediately prior to sampling, was used to estimate the direction and hydraulic gradient of ground water flow in the deeper aquifer. The data used are listed in Table 1. The contours obtained from this data are shown in Figure 3 (page 25), a portion of the site showing monitoring well locations. They indicate flow to the west-northwest (from MW-1 and MW-3 towards MW-4) at a gradient of approximately 0.011 feet/foot.

An estimate of ground water flow velocity can be calculated using the available information and Darcy's law, as follows:

Table 5: Ambient Temperature Headspace (ppm)				
Depth Range (Feet BGL)	MW-1	MW-2	MW-3	MW-4[2]
0 - 3	0.0	-	-	-
1 - 3	-	233	116	-
3 - 5	-	190	-	-
3 - 8	0.5	-	78	-
8 - 13	0.2	233	172	-
13 - 18	0.7	48	-	-
13 - 21	-	-	68	-
18 - 23	1.3	8	-	-
21 - 26	-	-	73	-
23 - 28	1.7	7	-	-
26 - 29	-	-	64	-
28 - 33	1.8	-	-	-
29 - 31	-	-	27	-
31 - 33	-	7	-	-
33 - 36	-	7[1]	-	-
33 - 38	0.2		10	-
38 - 43	0.1		0.0	-
>43	0.0		0.0	0.0

NOTES:

1. Bottom of boring MW-2 was 36 feet BGL.

2. Intervals used for measurements were every 5 feet from ground level to bottom of boring. All measurements were zero.

$$v = -\frac{K}{n_e}\left(\frac{dh}{dl}\right)$$

Where
- v = mean linear or pore velocity in same units as hydraulic conductivity;
- K = hydraulic conductivity;
- n_e = effective porosity; and
- $\frac{dh}{dl}$ = hydraulic gradient

Assuming hydraulic conductivity and gradient values of 1×10^{-2} cm./sec. and 0.011 feet/foot (based on site data), respectively, and an effective porosity of 0.1[13], calculated ground water flow velocity would be 1.1×10^{-3} cm./sec. (3.12 feet/day).

Static water level data indicates that both the shallow and deeper aquifer zones are confined. This data also indicates that the potentiometric surface in the shallow aquifer exceeds that in the deeper aquifer by approximately the thickness of the intervening silty clay-clay layer and that, therefore, there is a hydraulic gradient in the downward direction between them. The confined nature of these aquifers, as noted previously, is further indicated by lithologic data and CBP analysis of slug test data.

4.2.2 Quality

Results of analysis of ground water samples are summarized in Table 6 (copies of laboratory data sheets are provided in

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[13]Due to the predominance of fine-grained materials, effective porosity would be expected to be substantially less than total. The range of total porosity for silts and clays is similar and is on the order of 0.35 to 0.55; however, effective porosity of these materials is much lower than total (e.g., on the order of 0.01 to 0.10 for clay). This value, based primarily on judgment, takes into account the presence of a substantial fraction of gravel and some sand.

Table 6: Ground Water Sample Analytical Results

Well	Variable[1]	Concentration[2]	Typical[3]	MO WQS
MW-1	1,2-DCE (Total)	45	-	700
	TCE	31	-	5
MW-2	GENERAL			
	HCO_3 Alkalinity	490	-	-
	Chloride	804	70	-
	Nitrate	<0.01	20	10
	Sulfate	297	150	-
	TSS	38,300	-	-
	MAJOR ELEMENTS			
	Calcium	450	150	-
	Iron	46.0	10	0.3
	Magnesium	93.7	50	-
	Potassium	10.34	10	-
	Sodium	35.3	120	-
	TRACE ELEMENTS			
	Arsenic	21	30	50
	Cadmium	35	<1.0	10
	Chromium	<20	5	-
	Copper	<10	30	1,000
	Lead	270	<15	50
	Manganese	2,880	1,000	50
	Nickel	<50	50	-
	Selenium	<5	10	10
	Zinc	23	2,000	5,000
	VOCs			
	TCE (8240)	87	-	5
	TCE (8010)	81	-	5
MW-3	TCE	5	-	5
MW-4	HALOGENATED ORGANICS	<DL	-	-

NOTES:

1. MW-2 samples analyzed by 8010 (QC replicate identified as MW-5) and 8240. 8010 was used for all other wells. Organics less than detection limits not specifically listed.

2. HCO_3 alkalinity in mg/L as $CaCO_3$. All other general variables and major elements in mg/L. Trace elements and organic compounds in ug/L. "<DL" indicates all compounds were less than respective detection limits.

3. High end of typical range for natural background.

Appendix C). Analytical problems were encountered in the case of those metals determined using USEPA method 200.7 (these are discussed in the project narrative prepared by the analytical laboratory and included with the data sheets in Appendix C). Values of these listed have been corrected to reflect final data.

The last two columns in Table 6 also show the high end of the range typical of natural background for several general variables and elements in ground water[14] and Missouri water quality standards (WQS). Halogenated volatile organics would not naturally occur in ground water; however, anthropogenic contamination has resulted in these compounds becoming ubiquitous at low levels (on the order of <1 ug/L).

The highest concentrations of TCE were found in the sample from MW-2. Replicate samples were taken and analyzed by two different methods. Results for each were similar. The mean result was 84 ug/L and the relative percent difference (RPD) was 7.1 percent. Smaller concentrations of TCE and 1,2-DCE were reported in the sample from MW-1 (the position of the sand filter pack and bentonite seal in this well precludes localization of contamination to a particular depth level) and a still smaller concentration of TCE was reported in the sample from MW-3. No other compounds were reported in these samples. The reported concentrations in MW-1 and MW-2 exceed the Missouri WQS for TCE in ground water.

Total suspended solids (TSS), major anions, and total concentrations of selected major and trace elements were measured

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[14]Dragun, James. 1988. The Soil Chemistry of Hazardous Materials, Hazardous Materials Control Research Institute, Silver Springs, MD, p. 79.

in the sample from MW-2. Results for these variables are also shown in Table 6 (copies of laboratory data sheets are provided in Appendix C). The reported TSS level of 38,300 mg/L in an unfiltered sample confirmed visual observations at the time of sampling that substantial amounts of fine sediments were in the ground water being sampled. Although TSS was not measured in the sample filtered in the field for analysis of inorganic elements, visual appearance indicated that filtration effectively removed sediments from this sample and that the TSS concentration of filtrate was very low. The conductivity of ground water in MW-2 was nearly three times that of ground water in the other monitoring wells (see Table 2). The ions apparently responsible for this circumstance are bicarbonate, chloride, sulfate, calcium, iron, magnesium, managnese, potassium, and sodium. Concentrations of other ions present or possibly present were relatively low and would not substantially influence conductivity.

Comparison of the data for general variables and elements indicates that reported concentrations of chloride, sulfate, calcium, magnesium, cadmium, iron, lead, and manganese in the sample from MW-2 exceeded typical natural levels. There are no Missouri WQS applicable to ground water for the former four of these. However, there are in the case of the latter four (cadmium, iron, lead, and manganese). For these the Missouri WQS was exceeded.

An ion balance calculation for major ions is presented in Table 7. As can be seen from it, a small imbalance is indicated.

Table 7: MW-2 Ground Water Ion Balance

Ion	Weight[1] MW	Weight[1] EW	Concentration[2] mg/L	Concentration[2] meq/L
CATIONS				
Calcium (Ca^{+2})	40.1	20.0	450	22.50
Iron (Fe^{+2})	55.8	27.9	46.0	1.65
Magnesium (Mg^{+2})	24.3	12.2	93.7	7.68
Manganese (Mn^{+2})	54.9	27.4	2.88	0.11
Potassium (K^{+})	39.1	39.1	10.34	0.26
Sodium (Na^{+})	23.0	23.0	35.3	1.53
Total				33.73
ANIONS				
Bicarbonate (HCO_3^{-})	61.0	61.0	598	9.80
Chloride (Cl^{-})	35.4	35.4	804	22.71
Nitrate (NO_3^{-})	62.0	62.0	<0.01	0.00
Sulfate (SO_4^{-2})	96.1	48.0	297	6.19
Total				38.70

NOTES:

1. Gram molecular weight (MW) and equivalent weight (EW) for each species in first column listed in second and third columns, respectively, rounded off to three significant figures. MW of elements obtained from Appendix III of Drever (1988) [The Geochemistry of Natural Waters, 2nd Ed., Prentice Hall, Englewood Cliffs, NJ]. EW calculated by dividing MW by ion valence.

2. Measured concentration reported by analytical laboratory on a weight/unit volume basis (i.e., mg/L). Equivalent concentration, in milliequivalents/liter (meq/L) calculated by dividing measured concentration by equivalent weight and rounding to two decimal places. Cation concentration listed is based on the assumption that total element concentration reported in filtered samples is dissolved. This may result in an overestimate of actual concentrations. Concentration of bicarbonate calculated by conversion of reported value of bicarbonate alkalinity as $CaCO_3$ (i.e., 490 mg/L divided by 50 and multiplied by 61).

There is a reaction error of negative 6.9 percent[15]. This is within the 10 percent rule used as a guide in judging the acceptability of data quality under such circumstances[16].

5.0 DISCUSSION/RECOMMENDATIONS

5.1 Contamination and Contaminant Migration

5.1.1 Soil/Aquifer

TCE appears to be the primary soil contaminant. Other solvents may have been used (e.g., 1,1,1-TCA) or would be expected to be present because they are in TCE anaerobic degradation products (e.g., 1,2-DCE). However, although the soil vapor survey indicated widespread low concentrations of 1,1,1-TCA, it was not found in soil or ground water samples except at small concentrations in two shallow soil samples near the degreasing unit. Larger concentrations of total 1,2-DCE were reported to have reached deeper depths in the same area.

Soil contamination appears to be limited to the immediate vicinity of the degreasing unit. Data from the soil vapor survey (supported by data from air monitoring during drilling operations, field ambient temperature headspace measurements, and soil samples) indicate that the area of contaminated soil is roughly in the shape of an ellipse with the degreasing unit at its center and the major axis oriented east-west. The major and minor axes of the ellipse formed by the 100 ug/L contour were approximately 160 and 100 feet, respectively. This is shown in the figures provided with the report of soil vapor survey results (see

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[15]As defined by Mazor, Emanuel. 1991. Applied Chemical and Isotopic Groundwater Hydrology, John Wiley & Sons, New York, pp. 64-65.

[16]Clark, Lewis. 1988. The Field Guide to Water Wells and Boreholes, John Wiley & Sons, New York, p. 82.

Appendix A). Contamination in the unsaturated zone appears to decrease in all directions moving horizontally away from the immediate vicinity of the degreasing unit. Maximum soil vapor measurements occurred in the center of the ellipse and were higher at the shallower (5 to 6 feet BGL) than the deeper (9 to 15 feet BGL) depth range sampled. For example, at probe P-15 the shallower and deeper depth range TCE measurements were greater than 1,000 and 116.5 ug/L, respectively. However, by the 100 ug/L total VOC contour, the extent of contamination at both depth ranges, as indicated by soil vapor measurements, was similar.

The data also indicate that the elliptical pattern of contamination is elongated to the east for some distance beyond the 100 ug/L contour. For example, boring MW-1, located approximately 167 feet east-northeast of MW-2, was placed between the 10 and 20 ug/L total VOC contours indicated by the soil vapor survey. Ambient temperature headspace measurements in the unsaturated zone of MW-1 were in the range of 0.0 to 1.0 ppm and the soil sample taken from the 3 to 8 foot depth range BGL was reported to contain 69 ug/kg TCE.

Limited ambient temperature headspace measurements and soil sample data in both the unsaturated and saturated zones support findings from the soil vapor survey, particularly with regard to declining contaminant concentrations with depth. For example, the maximum ambient temperature headspace measurement reported in samples from depths less than 13 feet BGL in boring MW-2 was 233 ppm. This measurement was reported to have declined to 48 ppm in the 13 to 18 feet BGL depth range sample and 7 ppm in the saturated zone, where it was constant. Similarly, soil samples taken from the first 6 feet BGL of P-15 (near MW-2) and the 8 to 13, 15 to 18, and 29 to 32 feet BGL depth ranges of MW-2 were reported to contain 18,000, 2,500, 980, and 83 ug/kg TCE, respectively.

Application of theoretical transformations for TCE indicate that the soil vapor survey and soil sample data are consistent. For example, soil samples from the unsaturated zones of borings MW-1 and MW-2 were reported to contain 69 and 2,500 ug/kg TCE. These may be converted to associated equilibrium soil vapor concentrations of 12 and 439 ug/L, respectively. Such calculated concentrations would be reasonably consistent with measured soil vapor survey results presented in Appendix A. These show concentrations above the MW-1 sample between the 10 and 20 ug/L contours and in the vicinity of the MW-2 sample which vary but are on the order of several hundred ug/L[17].

It is likely that the existing soil contamination is not migrating at a substantial rate and that natural attenuation is slowly occurring. The unsaturated zone apparently has low intrinsic permeability and is protected from infiltration by the presence of buildings covering most of the contaminated area. Since the nail mill is no longer in operation, input sources of solvents have presumably been eliminated. Natural attenuation at this site will likely be slow due to this fact and apparent aerobic conditions (indicated in part by the absence of several important degradation products and the presence of only low concentrations of others). TCE would be expected to degrade more rapidly under anaerobic conditions.

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[17]The following are assumed in this calculation: (1) Log K_{ow} = 2.42; and (2) and K_{aw} = 0.3962. K_{oc} was calculated from the relationship Log K_{oc} = 0.72 Log_{ow} + 0.49. K_{om} was then calculated from the relationship K_{oc} = 1.724 K_{om}. K_d was then calculated from the relationship K_d = 0.58 K_{oc} x f_{om}, using 0.0282 for f_{om}. K_p was then calculated by dividing K_{aw} by K_d. Given either a soil or soil vapor concentration, this value of 0.1756, with media-appropriate unit conversion, can be used to calculate the associated equilibrium concentration in the media for which a value was not given.

5.1.2 Ground Water

TCE also appears to be the ground water contaminant of primary concern. A mean concentration of 84 ug/L was reported for monitoring well MW-2 and concentrations of 31 and 5 ug/L were reported in MW-1 and MW-3, respectively. The levels of TCE in MW-1 and MW-2 exceed the Missouri WQS for TCE in ground water of 5 ug/L. The only other halogenated volatile organic reported at a concentration greater than its detection limit was total 1,2-DCE. It was only reported in monitoring well MW-1, at a concentration of 45 ug/L. Additionally, cadmium, iron, lead, and manganese were found at apparently elevated concentrations (35, 46,000, 270, and 2,880 ug/L) that exceed their respective Missouri WQS (10, 300, 50, and 50 ug/L) in the sample from MW-2, the only sample analyzed for their presence.

TCE ground water contamination apparently extends from at least the immediate vicinity of the degreasing unit to the east-northeast in the direction of monitoring well MW-1. The horizontal pattern of contamination may be similar to that of the overlying soil; however, the data are too limited to provide adequate delineation.

Information regarding the ground water system is incomplete. This makes it difficult to reach conclusions regarding both contaminant migration and the extent of contamination. In particular, the extent of the shallow sand aquifer and the direction of ground water and contaminant movement in it are unknown. Ambient temperature headspace measurements support the hypothesis that TCE may have reached MW-1 via predominantly horizontal migration through ground water rather than by vertically downward migration from overlying soils. Measurements in samples from this boring were highest at the approximate elevation of the shallow aquifer. However, although a gravel seam was

found at a depth of 29 feet BGL in boring MW-1, there was no other indication of a possible connection to the shallow sand aquifer. Additionally, contaminant migration from the vicinity of MW-2 towards MW-1 would require a flow direction in the shallow zone opposite that in apparent from current data for the deeper underlying aquifer.

The vertical distribution of contamination in MW-1 is also uncertain. Although MW-1 is screened in the deeper zone, ambient temperature headspace measurements during the drilling of this borehole were zero at depths deeper than 43 feet BGL.

Application of theoretical transformations for TCE indicate that, for the only soil sample taken in the saturated zone, results for the aquifer and ground water samples from MW-2 are consistent. The aquifer sample was reported to contain 83 ug/kg TCE. This may be converted to an associated equilibrium ground water concentration of 47 ug/L[18]. Such a calculated concentration would be reasonably consistent with the measured ground water sample result of a mean of 84 ug/L.

As noted above, existing data are too limited to provide precise delineation of ground water contamination. Information is also lacking with regard to the extent of the very fine sand comprising the shallow aquifer, possible contaminant migration

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[18]The following are assumed in this calculation: (1) Log K_{ow} = 2.42; and (2) and K_{aw} = 0.3962. K_{oc} was calculated from the relationship Log K_{oc} = 0.72 Log_{ow} + 0.49. K_{om} was then calculated from the relationship K_{oc} = 1.724 K_{om}. K_d was then calculated from the relationship K_d = 0.58 K_{oc} x f_{om}, using 0.0220 for f_{om}. Given either a soil or ground water concentration, this value of 1.76, with media-appropriate unit conversion, can be used to calculate the associated equilibrium concentration in the media for which a value was not given.

routes through the shallow aquifer or from it to the deeper aquifer, or whether other possible nearby sources of contamination exist.

5.2 Recommendations

The available information indicates that limited contamination of soil and ground water has occurred at this site and that this contamination is at least partially, if not completely, related to the nail mill degreasing unit. It is also noted that the available information indicates that concentrations of TCE in samples from monitoring wells MW-1 (31 ug/L) and MW-2 (a mean of 84 ug/L) and lead in the sample from MW-2 (270 ug/L) substantially exceed applicable ground water standards for those variables (5 and 50 ug/L for TCE and lead, respectively).

Future site use is a relevant factor in considering additional investigation activities and potential remedial measures. In part, this is because most of the contamination is presently covered by buildings and equipment that, according to information from ARMCO, will be removed circa spring 1992. Both site investigation work and possible remediation work are hampered by the presence of these facilities. In the case of remediation, some alternatives may be precluded by their presence while ones that would still be feasible may be made more expensive.

Sufficient information regarding unsaturated zone soil contamination appears to be available to allow decision making and selection and design of appropriate remedial alternatives after cleanup levels have been established. Design of an appropriate soil remediation system should be considered in concert with establishing soil cleanup levels and the removal of buildings and equipment. Physical removal of the most contaminated soil and further treatment or disposal of it or soil

vapor extraction appear to be the leading candidates for soil remediation.

Additional site investigation is warranted prior to further action regarding ground water contamination at this site. Terracon recommends the following with regard to investigation of the ground water system:

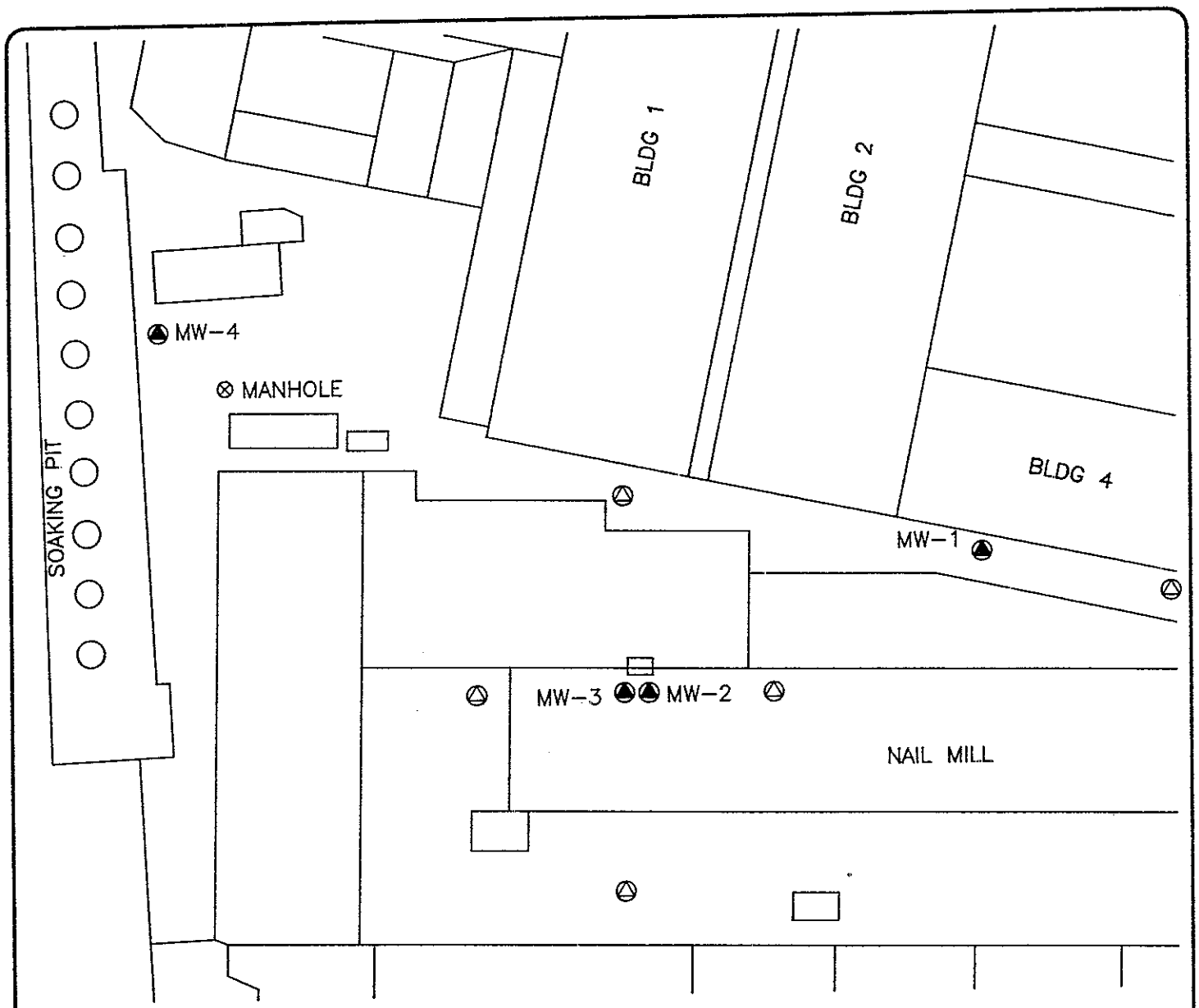
A. Sampling to be performed at this time:

1. Additional sampling of monitoring wells MW-1, MW-2, MW-3, and MW-4. The purpose of this sampling would be to confirm lead contamination in the shallow aquifer, to investigate lead contamination and other water quality variables in the deeper aquifer, and to confirm suspected halogenated volatile organic contamination in the deeper aquifer; and

2. Measurement of ground water levels in monitoring wells MW-1, MW-2, MW-3, and MW-4. The purpose of these measurements would be to provide additional information on water level variation and flow direction in the deeper aquifer.

B. Drilling-related work (to be performed at this time or, if necessary, after removal of buildings covering parts of this site):

1. Drilling of a pattern of shallow boreholes (i.e., on the order of 30 to 40 feet BGL) around MW-2 and MW-3 to investigate the extent of the shallow sand aquifer and contamination in it. The pattern would include four boreholes surrounding MW-2 and MW-3 and a borehole to the east of MW-1, as indicated in Figure 5 (page 45). The boreholes to the north of MW-2 and MW-3 and to the east of MW-1 would be outside the building (immediately north and approximately 100 feet east, respectively), but the others would be inside the nail mill building. Additional boreholes would be drilled as necessary, on the basis of initial results, to investigate the extent of the shallow sand aquifer. Soil samples and ambient temperature headspace measurements would be obtained from each borehole. Soil samples would be analyzed for



LEGEND

- EXISTING MONITORING WELL
- PROPOSED INITIAL SOIL BORING AND MONITORING WELL NEST

NOTES:

1. BASED ON ORIGINAL DRAWING BY REMCOR DATED 10/29/90

N

0 40' 80'

PROJ.# 50915113	PAGE# 45
SCALE: AS SHOWN	DRAWN BY: BSZ
FN: 91113AF2.DWG	
DATE: OCTOBER 14, 1991	

FIGURE 5. APPROXIMATE LOCATIONS OF PROPOSED SOIL BORINGS AND MONITORING WELL

ARMCO, INC.
7000 ROBERTS STREET
KANSAS CITY, MISSOURI

Terracon

halogenated volatile organics and selected soil samples would be analyzed for physical properties. Additional boreholes would be drilled as indicated by results from initial boreholes; and

2. Installation of a pattern of nested shallow and deep monitoring wells in selected boreholes around MW-2 and MW-3. The pattern would include the initial four sets of monitoring wells surrounding MW-2 and MW-3 and one to the east of MW-1. Further monitoring wells would be installed if field indications warrant. Monitoring well elevations would be determined by survey and water level measurements would be obtained from all monitoring wells. Additionally, all monitoring wells would be sampled for halogenated volatile organics. Selected monitoring wells, based on evaluation of previous sampling results, would be sampled for lead and possibly other variables. Aquifer testing would take place in selected monitoring wells.

The drilling-related phase of additional field work would be intended to develop adequate information about the ground water system and extent of contamination, so that rational consideration of remedial alternatives and design of the selected alternative could be accomplished after cleanup levels have been established.

Although it would be possible to begin remedial design for the shallow aquifer system at this time, additional investigation is advised to better define the extent of contamination and other aspects of the ground water system (including aquifer characteristics and the direction and gradient of ground water flow). Possible remedial alternatives include ground water extraction using a well field or trenches and subsequent disposal with or without treatment. Reinjection with nutrients as part of an in situ bioremediation approach should also be considered.

Disposal of extracted ground water would most likely have to be accomplished in accordance with the terms of either an industrial pretreatment permit, for discharge to the sanitary sewer system, or a National Pollutant Discharge Elimination System (NPDES) permit, for discharge directly to the Blue River. Removal of halogenated volatile organics could be accomplished by such treatment alternatives as air stripping, carbon adsorption, or ultraviolet (UV) photolysis. In order to prevent fouling of equipment, it would probably be necessary to precede any treatment process for organics removal by treatment to remove metals, particularly iron. Metals removal could be accomplished by a combination of processes designed to achieve oxidation and subsequent precipitation.

Based on the information currently available, Terracon believes that this approach will be adequate to protect public health and the environment. There is a long history of industrial operations, which were suspended some time ago, at this site. Therefore, the constituents of concern have apparently been in place for a substantial period of time. Their nature and the presence of fine grained materials would be expected to substantially reduce the potential for migration. Furthermore, the site location, within a highly urbanized area served by a major public water supply system with remote intakes, makes it unlikely that constituents from this site would impact any beneficial uses of ground water.

6.0 GENERAL COMMENTS

The analysis, comments, and recommendations in this report are based upon data obtained from soil borings and ground water monitoring wells installed at the indicated locations and samples taken or measurements made at the indicated times. Therefore, this report does not reflect possible spatial or temporal varia-

tions in subsurface lithology, environmental contamination, or other soil or aquifer properties which may occur between borings or monitoring wells. Actual subsurface conditions may vary. The extent of such variations may become evident if additional intrusive work is performed at this site. In that case, it may be necessary to reevaluate the analysis, comments, and/or recommendations contained in this report.

This report is prepared for the exclusive use of ARMCO for application to this project and has been prepared in accordance with generally accepted professional practice in the field of ground water science. No warranties, either express or implied, are intended or made.

APPENDIX C: PACE ANALYTICAL DATA/CHAIN-OF-CUSTODY SHEETS

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REPORT OF LABORATORY ANALYSIS

November 18, 1991

Mr. Gil Zemansky
Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510906.507
Client Reference: 50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received September 06, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

D.R. Boline

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

Enclosures

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

Attn: Mr. Gil Zemansky

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Parameter	Units	MDL	60 0123195 09/05/91 09/06/91 MW-5	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	81	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
2-Chloroethylvinyl ether	ug/L	5	ND	09/16/91
Dibromochloromethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123195	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
Page 3

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Alkalinity, Bicarbonate	mg/L	1	490	09/30/91
Arsenic	mg/L	0.006	0.021	09/24/91
Calcium	mg/L	0.10	450	09/24/91
Chloride, Total	mg/L	1.0	804	09/17/91
Iron	mg/L	0.020	46.0	09/24/91
Lead	mg/L	0.050	0.27	09/24/91
Magnesium	mg/L	0.10	93.7	09/24/91
Manganese	mg/L	0.010	2.88	09/24/91
Nitrogen, Nitrate by 353.3	mg/L	0.01	ND	09/13/91
Potassium	mg/L	0.10	10.34	09/24/91
Selenium	mg/L	0.005	ND	09/24/91
Sodium	mg/L	0.10	35.3	09/24/91
Solids, Total Suspended by 160.2	mg/L	1	38300	09/10/91
Sulfate, Total	mg/L	1.0	297	09/09/91
Turbidity			N/A	10/02/91
FIVE COMMON ICP METALS FOR ICP IN WATER				
Zinc	mg/L	0.020	0.023	09/24/91
Chromium	mg/L	0.020	ND	09/24/91
Cadmium	mg/L	0.002	0.035	09/24/91
Copper	mg/L	0.010	ND	09/24/91
Nickel	mg/L	0.050	ND	09/24/91
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Client Reference: 50915113

PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Methylene Chloride	ug/L	5	ND	09/16/91
Acetone	ug/L	10	ND	09/16/91
Carbon Disulfide	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
2-Butanone (MEK)	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
Vinyl Acetate	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	87	09/16/91
Chlorodibromomethane	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Benzene	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
4-Methyl-2-Pentanone (MIBK)	ug/L	5	ND	09/16/91
2-Hexanone	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Toluene	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
Ethylbenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
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PACE Project Number: 510906507

Client Reference: 50915113

Parameter	Units	MDL		DATE ANALYZED
PACE Sample Number:			60 0123209	
Date Collected:			09/05/91	
Date Received:			09/06/91	
Client Sample ID:			MW-2	
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 GC/MS				
Styrene	ug/L	5	ND	09/16/91
Xylenes (Total)	ug/L	5	ND	09/16/91
Dichlorodifluoromethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Acrolein	ug/L	100	ND	09/16/91
Acrylonitrile	ug/L	100	ND	09/16/91
Iodomethane	ug/L	5	ND	09/16/91
Dibromomethane	ug/L	5	ND	09/16/91
2-Chloroethylvinyl ether (mixed)	ug/L	5	ND	09/16/91
Ethylmethacrylate	ug/L	5	ND	09/16/91
1,2,3-Trichloropropane	ug/L	5	ND	09/16/91
1,4-Dichloro-2-butene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichloroethane-d4 (Surrogate)	%		81	09/16/91
Toluene-d8 (Surrogate)	%		98	09/16/91
4-Bromofluorobenzene (Surrogate)	%		93	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL

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November 18, 1991
PACE Project Number: 510906507

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These data have been reviewed and are approved for release.

D.R. Bolin for
Brian J. Smith
Manager, Inorganic Chemistry

Neal R. Hudson
Manager, Organic Chemistry

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QUALITY CONTROL DATA

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Alkalinity, Bicarbonate
Batch: 60 08058
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0128480	Duplicate of 60 0128480	RPD
Alkalinity, Bicarbonate	mg/L	1	316	311	2%

MDL Method Detection Limit
RPD Relative Percent Difference

REPORT OF LABORATORY ANALYSIS

Mr. Gil Zemansky
Page 8

QUALITY CONTROL DATA

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Chloride, Total
Batch: 60 07529
Samples: 60 0123209

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	60 0122172	Duplicate of 60 0122172	RPD
Chloride, Total	mg/L	1.0	ND	21.2	21.2	0%

MDL Method Detection Limit
RPD Relative Percent Difference

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REPORT OF LABORATORY ANALYSIS

Mr. Gil Zemansky
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QUALITY CONTROL DATA

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Nitrogen, Nitrate by 353.3
Batch: 60 07639
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0125511	Duplicate of 60 0125511	RPD
Nitrogen, Nitrate by 353.3	mg/L	0.01	0.47	0.48	2%

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Nitrogen, Nitrate by 353.3	mg/L	0.01	0.50	110%

MDL Method Detection Limit
RPD Relative Percent Difference

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Mr. Gil Zemansky
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QUALITY CONTROL DATA

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Solids, Total Suspended by 160.2
Batch: 60 07554
Samples: 60 0123209

SAMPLE DUPLICATE:

Parameter	Units	MDL	60 0123225 38	Duplicate of 60 0123225 38	RPD
Solids, Total Suspended by 160.2	mg/L	1			0%

MDL Method Detection Limit
RPD Relative Percent Difference

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Mr. Gil Zemansky
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QUALITY CONTROL DATA

November 18, 1991
PACE Project Number: 510906507

Client Reference: 50915113

Sulfate, Total
Batch: 60 07495
Samples: 60 0123209

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	60 0122180	Duplicate of 60 0122180	RPD
Sulfate, Total	mg/L	1.0	ND	198	204	3%

SPIKE:

Parameter	Units	MDL	60 0122300	Spike	Spike Recv
Sulfate, Total	mg/L	1.0	99	40	110%

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Sulfate, Total	mg/L	1.0	40	100%

MDL Method Detection Limit
RPD Relative Percent Difference

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REPORT OF LABORATORY ANALYSIS

Terracon
PACE Project No. 510906507

Project Narrative

Sample 60 012320.9 submitted for metals analysis on September 6, 1991 was analyzed and reported on September 24, 1991. Upon review of data, Gil Zemansky called PACE concerned that the Calcium and Magnesium results of ND seemed low for a ground water. Jody Velten and Brian Smith discussed this and agreed so the Calcium and Mg were rerun and results of 450 and 93.7 mg/L respectively were obtained. We felt this was clerical error only and a new report was submitted to Terracon.

Mr. Zemansky then called back later to question the Fe and Pb. Iron was reported ND and Pb at 0.27 mg/l and this did not seem correct. Brian Smith agreed and we went back to the original raw data for the ICP run of September 24, 1991. The data confirmed the ND on Fe, Ca, Mg, in fact, all metals were ND. The QC run was good and other samples on the run looked fine. It was determined that the Terracon sample never got to the Plasma torch on the ICP. This could be due to capillary tube clogging but not likely. The only other possibility would be if the sample test tube had a crack and the sample leaked out, when the probe got to the sample, it sampled air, reported ND and went on. This would not be easily detected from the results. This meant that the original report was incorrect for all ICP analytes: Zn, Cr, Cd, Cu, Ni, Ca, Mg, Fe, Mn. Sample was reanalyzed and the results are included.

PACE is very sorry for this problem and will monitor this type of sample delivery problem closely.

Brian J. Smith
Inorganic Manager
November 7, 1991

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

Attn: Mr. Gil Zemansky

November 15, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123160	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	45	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	31	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
2-Chloroethylvinyl ether	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Chlorodibromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. Gil Zemansky
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November 15, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123160	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL

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REPORT OF LABORATORY ANALYSIS

Mr. Gil Zemansky
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November 15, 1991
PACE Project Number: 510905503

Client Reference: 50915113

Parameter	Units	MDL		DATE ANALYZED
PACE Sample Number:			60 0123179	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-3	
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	5	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
2-Chloroethylvinyl ether	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
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November 15, 1991
PACE Project Number: 510905503

Client Reference: 50915113

PACE Sample Number:			60 0123187	
Date Collected:			09/05/91	
Date Received:			09/05/91	
Client Sample ID:			MW-4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/L	10	ND	09/16/91
Vinyl Chloride	ug/L	10	ND	09/16/91
Methyl bromide (Bromomethane)	ug/L	10	ND	09/16/91
Chloroethane	ug/L	10	ND	09/16/91
Trichlorofluoromethane	ug/L	5	ND	09/16/91
Methylene Chloride	ug/L	5	ND	09/16/91
1,1-Dichloroethylene	ug/L	5	ND	09/16/91
1,1-Dichloroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethylene (Total)	ug/L	5	ND	09/16/91
Chloroform	ug/L	5	ND	09/16/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/L	5	ND	09/16/91
1,2-Dichloroethane	ug/L	5	ND	09/16/91
Carbon Tetrachloride	ug/L	5	ND	09/16/91
1,1,1-Trichloroethane	ug/L	5	ND	09/16/91
Trichloroethylene	ug/L	5	ND	09/16/91
1,2-Dichloropropane	ug/L	5	ND	09/16/91
2-Chloroethylvinylether	ug/L	5	ND	09/16/91
Dichlorobromomethane	ug/L	5	ND	09/16/91
Trans-1,3-Dichloropropene	ug/L	5	ND	09/16/91
Chlorodibromomethane	ug/L	5	ND	09/16/91
Cis-1,3-Dichloropropene	ug/L	5	ND	09/16/91
1,1,2-Trichloroethane	ug/L	5	ND	09/16/91
Bromoform	ug/L	5	ND	09/16/91
Tetrachloroethylene	ug/L	5	ND	09/16/91
1,1,2,2-Tetrachloroethane	ug/L	5	ND	09/16/91
Chlorobenzene	ug/L	5	ND	09/16/91
1,2-Dichlorobenzene	ug/L	5	ND	09/16/91
1,3-Dichlorobenzene	ug/L	5	ND	09/16/91
1,4-Dichlorobenzene	ug/L	5	ND	09/16/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

November 15, 1991

Mr. Gil Zemansky
Terracon Environmental Inc.
7810 N.W. 100th St.
P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510905.503
Client Reference: 50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received September 05, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

D.R. Boline

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

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Mr. Gil Zemansky
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November 15, 1991
PACE Project Number: 510905503

Client Reference: 50915113

These data have been reviewed and are approved for release.

Neal R. Hudson
Manager, Organic Chemistry

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November 15, 1991

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Terracon Environmental Inc.
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P.O. Box 901541
Kansas City, MO 64190-1541

RE: PACE Project No. 510830.517
Client Reference: Proj. #50915113

Dear Mr. Zemansky:

Enclosed is the report of laboratory analyses for samples received August 30, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

D.R. Boline

Duane R. Boline, Ph.D.
Director, Sampling and Analytical Services

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REPORT OF LABORATORY ANALYSIS

Terracon Environmental Inc.
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Kansas City, MO 64190-1541

November 15, 1991
PACE Project Number: 510830517

Attn: Mr. Gil Zemansky

Client Reference: Proj. #50915113

PACE Sample Number:			60 0120536	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW2	
Parameter	Units	MDL	8-13'	DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 LOW				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/12/91
Methyl Bromide (Bromomethane)	ug/kg	10	ND	09/12/91
Vinyl Chloride	ug/kg	10	ND	09/12/91
Chloroethane	ug/kg	10	ND	09/12/91
Methylene Chloride	ug/kg	10	ND	09/12/91
Acetone	ug/kg	10	ND	09/12/91
Carbon Disulfide	ug/kg	10	ND	09/12/91
1,1-Dichloroethylene	ug/kg	10	ND	09/12/91
1,1-Dichloroethane	ug/kg	10	ND	09/12/91
1,2-Dichloroethylene (Total)	ug/kg	10	300	09/12/91
Chloroform	ug/kg	10	ND	09/12/91
1,2-Dichloroethane	ug/kg	10	ND	09/12/91
2-Butanone (MEK)	ug/kg	10	ND	09/12/91
1,1,1-Trichloroethane	ug/kg	10	11	09/12/91
Carbon Tetrachloride	ug/kg	10	ND	09/12/91
Vinyl Acetate	ug/kg	10	ND	09/12/91
Dichlorobromomethane	ug/kg	10	ND	09/12/91
1,2-Dichloropropane	ug/kg	10	ND	09/12/91
Cis-1,3-Dichloropropene	ug/kg	10	ND	09/12/91
Trichloroethylene	ug/kg	1000	2500	09/12/91
Chlorodibromomethane	ug/kg	10	ND	09/12/91
1,1,2-Trichloroethane	ug/kg	10	ND	09/12/91
Benzene	ug/kg	10	ND	09/12/91
Trans-1,3-Dichloropropene	ug/kg	10	ND	09/12/91
Bromoform	ug/kg	10	ND	09/12/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
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November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120536 08/29/91 08/30/91 MW2 8-13'	DATE ANALYZED
ORGANIC ANALYSIS				
VOLATILE ORGANICS, EPA METHOD 8240 LOW				
4-Methyl-2-Pentanone (MIBK)	ug/kg	10	ND	09/12/91
2-Hexanone	ug/kg	10	ND	09/12/91
Tetrachloroethylene	ug/kg	10	ND	09/12/91
1,1,2,2-Tetrachloroethane	ug/kg	10	ND	09/12/91
Toluene	ug/kg	10	ND	09/12/91
Chlorobenzene	ug/kg	10	ND	09/12/91
Ethylbenzene	ug/kg	10	ND	09/12/91
Styrene	ug/kg	10	ND	09/12/91
Xylenes (Total)	ug/kg	10	ND	09/12/91
Dichlorodifluoromethane	ug/kg	10	ND	09/12/91
Trichlorofluoromethane	ug/kg	5	ND	09/12/91
Acrolein	ug/kg	100	ND	09/12/91
Acrylonitrile	ug/kg	100	ND	09/12/91
Iodomethane	ug/kg	5	ND	09/12/91
Dibromomethane	ug/kg	5	ND	09/12/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/12/91
Ethylmethacrylate	ug/kg	5	ND	09/12/91
1,2,3-Trichloropropane	ug/kg	5	ND	09/12/91
1,4-Dichloro-2-butene	ug/kg	5	ND	09/12/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/12/91
1,2-Dichloroethane-d4 (Surrogate)	%		107	09/12/91
Toluene-d8 (Surrogate)	%		114	09/12/91
4-Bromofluorobenzene (Surrogate)	%		104	09/12/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120781 08/29/91 08/30/91 MW2 15-18'	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Methyl bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Methylene Chloride	ug/kg	5	ND	09/13/91
1,1-Dichloroethylene	ug/kg	5	ND	09/13/91
1,1-Dichloroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	5	120	09/13/91
Chloroform	ug/kg	5	ND	09/13/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	5	ND	09/13/91
Carbon Tetrachloride	ug/kg	5	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	5	ND	09/13/91
Trichloroethylene	ug/kg	5	980	09/13/91
1,2-Dichloropropane	ug/kg	5	ND	09/13/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/16/91
Dibromochloromethane	ug/kg	5	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
Dichlorobromomethane	ug/kg	5	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	5	ND	09/13/91
Bromoform	ug/kg	5	ND	09/13/91
Tetrachloroethylene	ug/kg	5	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	5	ND	09/13/91
Chlorobenzene	ug/kg	5	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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November 15, 1991
PACE Project Number: 510830517

Mr. Gil Zemansky
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Client Reference: Proj. #50915113

PACE Sample Number:			60 0120790	
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW1	
Parameter	Units	MDL	3-8'	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Methyl bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Methylene Chloride	ug/kg	5	ND	09/13/91
1,1-Dichloroethylene	ug/kg	5	ND	09/13/91
1,1-Dichloroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	5	ND	09/13/91
Chloroform	ug/kg	5	13	09/13/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	5	ND	09/13/91
Carbon Tetrachloride	ug/kg	5	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	5	ND	09/13/91
Trichloroethylene	ug/kg	5	69	09/13/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/16/91
1,2-Dichloropropane	ug/kg	5	ND	09/13/91
Dibromochloromethane	ug/kg	5	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
Dichlorobromomethane	ug/kg	5	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	5	ND	09/13/91
Bromoform	ug/kg	5	ND	09/13/91
Tetrachloroethylene	ug/kg	5	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	5	ND	09/13/91
Chlorobenzene	ug/kg	5	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
Page 5

November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120803	DATE ANALYZED
PACE Sample Number:				
Date Collected:			08/29/91	
Date Received:			08/30/91	
Client Sample ID:			MW4	
			10-15'	
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Methyl bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Methylene Chloride	ug/kg	5	ND	09/13/91
1,1-Dichloroethylene	ug/kg	5	ND	09/13/91
1,1-Dichloroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	5	ND	09/13/91
Chloroform	ug/kg	5	20	09/13/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	5	ND	09/13/91
Carbon Tetrachloride	ug/kg	5	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	5	ND	09/13/91
Trichloroethylene	ug/kg	5	ND	09/13/91
1,2-Dichloropropane	ug/kg	5	ND	09/13/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/16/91
Dibromochloromethane	ug/kg	5	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
Dichlorobromomethane	ug/kg	5	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	5	ND	09/13/91
Bromoform	ug/kg	5	ND	09/13/91
Tetrachloroethylene	ug/kg	5	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	5	ND	09/13/91
Chlorobenzene	ug/kg	5	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL

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REPORT OF LABORATORY ANALYSIS

Mr. Gil Zemansky
Page 6

November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

Parameter	Units	MDL	60 0120811 08/29/91 08/30/91 MW2 29-32'	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
Client Sample ID:				
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methyl chloride (Chloromethane)	ug/kg	10	ND	09/13/91
Vinyl Chloride	ug/kg	10	ND	09/13/91
Methyl bromide (Bromomethane)	ug/kg	10	ND	09/13/91
Chloroethane	ug/kg	10	ND	09/13/91
Trichlorofluoromethane	ug/kg	5	ND	09/13/91
Methylene Chloride	ug/kg	5	ND	09/13/91
1,1-Dichloroethylene	ug/kg	5	ND	09/13/91
1,1-Dichloroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethylene (Total)	ug/kg	5	ND	09/13/91
Chloroform	ug/kg	5	10	09/13/91
1,1,2-Trichloro 1,2,2-Trifluoroethane	ug/kg	5	ND	09/13/91
1,2-Dichloroethane	ug/kg	5	ND	09/13/91
Carbon Tetrachloride	ug/kg	5	ND	09/13/91
1,1,1-Trichloroethane	ug/kg	5	ND	09/13/91
Trichloroethylene	ug/kg	5	83	09/13/91
1,2-Dichloropropane	ug/kg	5	ND	09/13/91
2-Chloroethylvinyl ether	ug/kg	5	ND	09/16/91
Dibromochloromethane	ug/kg	5	ND	09/13/91
Trans-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
Dichlorobromomethane	ug/kg	5	ND	09/13/91
Cis-1,3-Dichloropropene	ug/kg	5	ND	09/13/91
1,1,2-Trichloroethane	ug/kg	5	ND	09/13/91
Bromoform	ug/kg	5	ND	09/13/91
Tetrachloroethylene	ug/kg	5	ND	09/13/91
1,1,2,2-Tetrachloroethane	ug/kg	5	ND	09/13/91
Chlorobenzene	ug/kg	5	ND	09/13/91
1,2-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,3-Dichlorobenzene	ug/kg	5	ND	09/13/91
1,4-Dichlorobenzene	ug/kg	5	ND	09/13/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Gil Zemansky
Page 7

November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

These data have been reviewed and are approved for release.

Neal R. Hudson
Manager, Organic Chemistry

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Page 8

QUALITY CONTROL DATA

November 15, 1991
PACE Project Number: 510830517

Client Reference: Proj. #50915113

VOLATILE ORGANIC COMPOUNDS/ALLIED LOW 91
Batch: 60 07769
Samples: 60 0120536

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	60 0116792	Spike	Spike Recv	Spike Dupl Recv	RPD
1,2-Dichloroethylene (Total)	ug/kg	10	ND	50	115%	110%	4%
Trichloroethylene	ug/kg	10	ND	50	78%	78%	0%
Benzene	ug/kg	10	ND	50	91%	94%	3%
Toluene	ug/kg	10	ND	50	91%	93%	2%
Chlorobenzene	ug/kg	10	ND	50	82%	83%	1%

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: Teracon
Address: Wright Pt 5091513
Phone: 816 891 7717

Report To: Gil Zemansky
Bill To:
P.O. # / Billing Reference: 5091513
Project Name / No.:

Pace Client No.:
Pace Project Manager:
Pace Project No.:
*Requested Due Date:

Sampled By (PRINT):
Sampler Signature:
Date Sampled: 27, 28, AND 30 AUG. 91

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	ANALYSES REQUEST: 8240 / 8010	REMARKS
1	MW 2 → 8'-13'									X	
2	MW 2 → 15'-18'										
3	MW1 → 3'-8'										
4	MW1 → 21'										
5	MW4 → 10'-15'										
6	MW2 → 29-32										
7											
8											

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

Additional Comments:

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ronald Wood	J. Green	8/30	1100

SEE REVERSE SIDE FOR INSTRUCTIONS

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: TERRACON ENVIRONMENTAL, INC.
Address: P.O. Box 901541
KC MO 64190-1541
Phone: 891-7717

Report To: G.M. ZEMANSKY
Bill To: "
P.O. # / Billing Reference
Project Name / No.: 50915113

Pace Client No.
Pace Project Manager
Pace Project No.
*Requested Due Date: Abnormal

Sampled By (PRINT): G.M. ZEMANSKY
Sampler Signature: G.M. Zemansky
Date Sampled: 5 SEP 91

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	4°C	ANALYSES REQUEST: VOC USEPA 8010	VOC USEPA 8240	NO$_3$ USEPA 353.1	HCO$_3$ SM A500-CO$_2$ ALKALINITY	Cl$^-$ USEPA 325.3	SO$_4^{=}$ USEPA 375.3	METALS USEPA 6010 & 200.7	TSS USEPA 160.2	THIRDUTY USEPA 180.1	REMARKS
1	MW-5		H_2O		2	✓				✓	✓									
2	MW-2				2	✓				✓		✓								
3					1		✓			✓			✓							
4					1	✓				✓				✓	✓	✓		✓	✓	
5					1			✓		✓							✓			Ca, Fe, Mg, Mn, K, Na, As, Cd, Cr, Cu, Pb, Ni, Se, Zn
6																				
7																				
8																				

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	SHIPMENT METHOD RETURNED / DATE

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	G.M. Zemansky, TERRACON		9/5	1700

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CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: TERRACON ENVIRONMENTAL, INC
Address: P.O. Box 201541
[illegible]
Phone: [illegible]

Report To: G. M. [illegible]
Bill To:
P.O. # / Billing Reference
Project Name / No. 5071

Pace Client No.
Pace Project Manager
Pace Project No. 510906.507
*Requested Due Date:

Sampled By (PRINT): [illegible]
Sampler Signature
Date Sampled: [illegible]

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	H_2SO_4	HNO_3	VOA	4°C	ANALYSES REQUEST									REMARKS
1	MW-5		H2O	012319-5	2	✓				✓	✓									
2	MW-2				2	✓				✓		✓								
3				012320.9	1		✓			✓										
4					1	✓				✓						✓		✓	✓	
5					1			✓		✓						✓				Ca, Fe, Mg, Mn, K, As, Cd, Cr, Cu, Pb, [illegible]
6																				
7																				
8																				

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	RETURNED / DATE

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	[illegible] Terracon	[illegible]	4/5	1700

Additional Comments

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Burns & McDonnell
SINCE 1898

March 30, 2001

Mr. Carl Batliner
AK Steel Asset Management
10945 Reed Hartman Highway, Suite 120
Cincinnati, OH 45242

Groundwater Monitoring Report – February 2001 Sampling Event
AK Steel, Kansas City Facility
Nail Mill Degreasing Area (SWMU 33)
EPA No MOD 007118029
BMcD Project No. 20230

Dear Mr. Batliner:

This letter presents the results of groundwater sampling performed during the week of January 29, 2001 at the Nail Mill Degreasing Area (Solid Waste Management Unit (SWMU) 33 Area). The sampling was conducted as outlined in the *Quality Assurance Project Plan for Groundwater Sampling at the Nail Mill Degreasing Area (SWMU 33) – AK Steel Kansas City Facility* (Burns & McDonnell, 2000) to comply with the Agreement to Resolve Dispute dated January 8, 2001. Background information regarding the SWMU 33 area was provided in *RCRA Facility Investigation Report – Armco Kansas City Facility* (Burns & McDonnell, 1999).

Field Activities and Sample Collection

Reynold Tomes and Bob Ralls of Burns & McDonnell (BMcD) conducted the field activities. Figure 1 presents the well locations. Prior to the collection of samples, barriers were removed from Wells 33MW10D/S, 33MW5D/I/S, and 33MW12D/S. In addition, Wells 33MW2 and 33MW4S were redeveloped due to screen occlusion in excess of 10%.

As indicated on Table 1, water-level measurements were taken from 23 wells and at two Blue River gauging points in the SWMU 33 area. Table 2 presents the water-level and total depth measurements for these wells. Groundwater contour maps for the shallow, unconfined saturated zone and the deep semi-confined saturated zone at SWMU 33 are presented in Figures 2 and 3. The direction of groundwater flow in the shallow zone is generally perpendicular toward the Blue River at gradients ranging from 5.3E-03 vertical (v.) feet (ft.)/horizontal (h.) ft. to 1.7E-02 v.ft./h.ft. Deep groundwater flow direction is generally northward toward the east-west trending part of the Blue River and across gradient to the north-south trending section of the river. The deep zone hydraulic gradient ranges from 6.3E-04 to 2.5E-03 v.ft./h ft. A re-entrant in the groundwater contours (shallow and deep) centered on the 48-inch Bristol Avenue storm sewer suggests that it may be exerting some hydraulic influence on groundwater levels. The apparent flattening of gradient adjacent to the river, especially in the deep zone, possibly reflects limited discharge through the paved channel walls.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
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Fax: 816 333-3690
www.burnsmcd.com

- The highest concentrations of chlorinated VOCs were detected in wells nearest the former degreaser. Total VOC concentrations significantly decreased or were non-detect in Wells radially outward from this location.

- As in previous rounds, chlorinated VOCs were detected in Well 33MW10D. The source of the detected VOC is unclear, as these detections do not appear to be part of the chlorinated VOC plume that is centered around the former degreaser.

If you have any questions or comments concerning this report, please call me at (816) 822-3168.

Sincerely,

Sharon Shelton

Sharon Shelton
Project Manager

Enclosures

Following the water-level measurements, groundwater samples were collected from 14 wells (See Table 1) on February 1 and 2, 2001. Samples were collected for analysis of volatile organic compounds (VOCs). A field duplicate sample was collected from Well 33MW10D. In addition, a split sample from Well 33MW10D was submitted to a secondary lab for analysis. Trip blanks were submitted with each cooler, and site-specific matrix spike and matrix spike duplicate samples were collected from Well 33MW13D. Pace Analytical of Lenexa, Kansas provided the laboratory services. Continental Analytical Services, Inc of Salina, Kansas served as the secondary lab for the split sample analysis.

Discussion of Sample Results

Copies of analytical data and chain-of-custody forms are enclosed. Table 3 presents the analytical results for the sampling event. Chlorinated compounds were the only detected VOCs. Trichloroethene (TCE) and related degradation products of cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride were the primary constituents detected. Total VOC results for samples collected from shallow Well 33MW2S [114,000 micrograms per liter (µg/L)], intermediate Well 33MW2 (3,565 µg/L), and deep Well 33MW3 (196.8 µg/L), which are located nearest the former degreaser, were significantly higher than other VOC samples. Total VOC concentrations in surrounding Wells 33MW4S/4, 33MW6D, and 33MW7S/7D were non-detect. With the exception of Well 33MW10D, Total VOC results for wells nearest the Blue River were either non-detect (33MW10S, 33MW11S, and 33MW13D) or below 2 µg/L (33MW11D and 33MW13S). Well 33MW10D contained 1,1-dichloroethane (1.6 µg/L), cis-1,2-DCE (14 µg/L), trans-1,2-dichloroethene (1.1 µg/L), and vinyl chloride (22 µg/L). These detections were confirmed in both the duplicate and split sample analyses. The source of VOC detections in deep Well 33MW10D is unknown. Based upon groundwater contour figures, it does not appear that the detections are part of the plume of chlorinated VOCs that surround the former degreaser.

Tables 4 through 17 provide a comparison of the analytical results for this sampling event to previous rounds in 1998 and 1997 (when available). Results for these events were comparable in the types and concentrations of detected constituents. Variations, when observed, are likely related to seasonal variations in water-level measurements and degradation of chlorinated VOCs.

Quality Control Results

Results of the quality assurance/quality control (QA/QC) review are provided as an attachment to this memo. The toluene and 1,1-dichloroethene results for Well 33MW13D were qualified as estimated (J*) due to potential precision problems with the analysis. No other problems were noted with the data, and the data are acceptable to use as reported by the laboratories.

Conclusions

Based upon the field and analytical data, the following conclusions can be made:

- Groundwater flow in both the shallow, unconfined and deep, semiconfined saturated zones is toward the Blue River. Hydraulic gradient in the deep zone adjacent to the river may be influenced by the paved sides of the Blue River Channel.

Groundwater Monitoring Report – February 2001 Sampling Event
AK Steel, Kansas City Facility
Nail Mill Degreasing Area (SWMU 33)
EPA No. MOD 007118029
Proj No 20230

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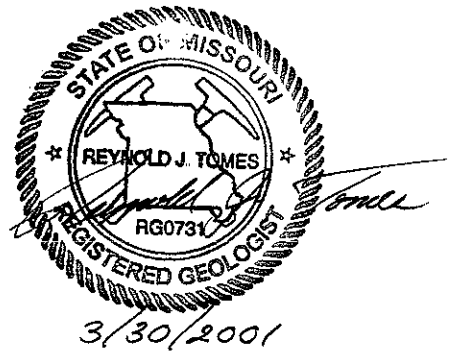
Figure 2	SWMU 33 Deep Groundwater Contour Map, Feb. 1, 2001	1
Figure 3	SWMU 33 Shallow Groundwater Contour Map, Feb. 1, 2001	1

CERTIFICATION



3/30/2001

TABLES

Table 1
Monitoring Well Summary
SWMU 33 - Nail Mill Degreasing Area
AK Steel Kansas City Facility

Well ID	Water Level[4]	VOC[5]
Shallow Wells[1]		
33MW2S	X	X
33MW4S	X	X
33MW5S	X	
33MW7S	X	X
33MW8S	X	
33MW9S	X	
33MW10S	X	X
33MW11S	X	X
33MW12S	X	
33MW13S	X	X
33MW14S	X	
Intermediate Wells[2]		
33MW2	X	X
33MW5I	X	
Deep Wells[3]		
33MW3	X	X
33MW4	X	X
33MW5D	X	
33MW6D	X	X
33MW7D	X	X
33MW10D	X	X
33MW11D	X	X
33MW12D	X	
33MW13D	X	X
33MW14D	X	

Notes:

1) Shallow wells were screened in the shallow unconfined saturated zone

2) Intermediate wells were screened directly over the semi-confining layer of the shallow saturated zone

3.) Deep wells were screened just above bedrock in the deep semi-confined saturated zone Field duplicate and split samples to a secondary lab were collected from Well 33MW10D.

4.) Groundwater level was measured at each of these wells prior to sample collection

5.) Sample was collected for VOC analysis

Table 2
February 1, 2001 Groundwater Levels
SWMU 33 - Nail Mill Degreasing Area
AK Steel Kansas City Facility

Well No	Date	Easting (corrected)	Northing (corrected)	Ground Elevation (FMSL)	TOC Elevation (FMSL)	Original Bottom Elevation (FMSL)	Depth to Water (FBTOC)	Water Level Elevation (FMSL)	Current Well Depth (FBTOC)	Current Bottom Elevation (FMSL)	Screen Length (ft)	% Screen Occlusion
33MW3	02/01/01	500595.93	1070791.82	747.26	746.96	685.16	29.31	717.65	62.30	684.66	10	0.0
33MW4	02/01/01	500354.98	1070983.66	748.12	747.86	677.86	31.59	716.27	70.24	677.62	10	0.0
33MW5D	02/01/01	501017.71	1070903.79	746.41	746.02	677.92	29.32	716.70	68.73	677.29	10	0.0
33MW6D	02/01/01	500601.87	1071190.10	749.30	751.95	680.30	35.61	716.34	71.32	680.63	10	3.3
33MW7D	02/01/01	500665.10	1070606.50	746.97	746.63	677.93	28.77	717.86	68.38	678.25	10	3.2
33MW10D	02/01/01	500243.24	1071542.85	746.31	745.87	678.97	29.48	716.39	67.45	678.42	10	0.0
33MW11D	02/01/01	501116.48	1071241.41	740.57	740.12	679.62	23.75	716.37	60.87	679.25	10	0.0
33MW12D	02/01/01	501227.00	1070566.52	746.87	746.56	678.26	28.44	718.12	68.72	677.84	10	0.0
33MW13D	02/01/01	501314.06	1070804.04	745.20	744.90	676.70	27.45	717.45	68.63	676.27	10	0.0
33MW14D	02/01/01	500093.56	1070733.07	748.75	748.42	679.82	31.42	717.00	68.82	679.60	10	0.0
33MW2	02/01/01	500602.14	1070791.72	747.22	746.96	710.36	8.32	738.64	36.19	710.77	10	4.1
33MW5I	02/01/01	501012.78	1070890.09	746.54	746.27	705.87	8.72	737.55	41.11	705.16	10	0.0
33MW2S	02/01/01	500590.11	1070792.07	747.20	746.98	729.18	7.72	739.26	18.37	728.61	10	0.0
33MW4S	02/01/01	500363.55	1070983.16	748.14	747.91	730.11	11.10	736.81	17.20	730.71	10	6.0
33MW5S	02/01/01	501016.28	1070896.49	746.59	746.38	728.58	8.83	737.55	18.40	727.98	10	0.0
33MW7S	02/01/01	500667.87	1070601.50	746.96	746.59	726.49	7.96	738.63	20.34	726.25	10	0.0
33MW8S	02/01/01	500364.47	1070807.40	747.27	747.08	729.28	9.58	737.50	16.80	730.28	10	10.0
33MW9S	02/01/01	500691.85	1071320.18	747.44	750.19	727.79	15.95	734.24	22.11	728.08	10	2.9
33MW10S	02/01/01	500243.09	1071545.53	746.28	745.93	729.13	10.50	735.43	17.17	728.76	10	0.0
33MW11S	02/01/01	501109.05	1071242.97	740.24	739.74	722.24	7.50	732.24	18.00	721.74	10	0.0
33MW12S	02/01/01	501218.66	1070667.18	746.84	746.24	729.34	9.98	736.26	17.10	729.14	10	0.0
33MW13S	02/01/01	501320.69	1070804.26	745.24	744.79	727.59	8.87	735.92	17.41	727.38	10	0.0
33MW14S	02/01/01	500093.51	1070738.25	748.87	748.52	730.72	8.27	740.25	18.18	730.34	10	0.0
BR-1	02/01/01	NA	NA	NA	717.90	NA	1.97	715.93	NA	NA	NA	NA
BR-2	02/01/01	NA	NA	NA	752.21	NA	37.35	714.86	NA	NA	NA	NA

FMSL - Feet above mean sea level
TOC - Top of casing
FBTOC - Feet below top of casing
NA - Not available or applicable
BR - Blue River surface water level monitoring points
Note: % screen occlusion calculated by equation ((CBE-OBE)/SL)(100) where:
CBE = Current bottom elevation
OBE = Original bottom elevation
SL = Screen length (feet)

Table 3
Groundwater Results
February 2001 Sampling Event
AK Steel Kansas City Facility

Sample Point:		33MW2S/GW3		33MW2/GW3		33MW3/GW3		33MW4S/GW3		33MW4/GW3		33MW6D/GW3		33MW7S/GW3	
Date Sampled:		02/02/2001		02/02/2001		02/02/2001		02/02/2001		02/02/2001		02/02/2001		02/02/2001	
Laboratory Number:		604136259		604136275		604136242		604136218		604136234		604136200		604136283	
				Intermediate		Deep				Deep					
Volatiles	UNITS														
1,1,1,2-Tetrachloroethane	ug/L	NA		NA		NA		NA		NA		NA		NA	
1,1,1-Trichloroethane	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	ug/L	500	U	***31***		1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	ug/L	500	U	***34***		1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Benzene	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Carbon tetrachloride	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Chloroform	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	ug/L	***62,000***		***2,800***		***130***		1	U	1	U	1	U	1	U
Ethylbenzene	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
m,p-Xylene	ug/L	650	U	6.5	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Methyl chloride	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Methylene chloride	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
o-Xylene	ug/L	550	U	5.5	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
Tetrachloroethene	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
Toluene	ug/L	500	U	5	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	ug/L	500	U	***180***		***3.8***		1	U	1	U	1	U	1	U
Trichloroethene	ug/L	***52,000***		***150***		***31***		1	U	1	U	1	U	1	U
Vinyl chloride	ug/L	500	U	***370***		***32***		1	U	1	U	1	U	1	U
Total Detected VOCs	UNITS														
Total Volatiles	ug/L	***114,000***		***3,565***		***196.8***		ND		ND		ND		ND	

Note: Due to miscommunication, CAS (split sample lab) provided 1,1,1,2-Tetrachloroethane results for 33MW10D/GWQA rather than 1,1,2,2-Tetrachloroethane results. Impact is minimal since Pace (primary lab) appropriately analyzed for 1,1,2,2-Tetrachloroethane.

LEGEND: J* - Qualified as estimated in the QC evaluation NA - Not Analyzed ND - Not Detected U - Compound was not detected

Table 3
Groundwater Results
February 2001 Sampling Event
AK Steel Kansas City Facility

Sample Point:		33MW7D/GW3		33MW10S/GW3		33MW10D/GW3		33MW10D/GW3D		33MW10D/GW3QA		33MW11S/GW3		33MW11D/GW3	
Date Sampled:		02/02/2001		02/01/2001		02/01/2001		02/01/2001		02/01/2001		02/01/2001		02/01/2001	
Laboratory Number:		604136226		604136127		604136135		604136184		01020184		604136101		604136119	
								Duplicate		Split to CAS					
Volatiles	UNITS														
1,1,1,2-Tetrachloroethane	ug/L	NA		NA		NA		NA		1	U	NA		NA	
1,1,1-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U	1	U	1	U	NA		1	U	1	U
1,1,2-Trichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	ug/L	1	U	1	U	***1.5***		***1.6***		***1.2***		1	U	***1.8***	
1,1-Dichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon tetrachloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	ug/L	1	U	1	U	1	U	1	U	5	U	1	U	1	U
Chloroform	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	ug/L	1	U	1	U	***14***		***14***		***11.3***		1	U	1	U
Ethylbenzene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
m,p-Xylene	ug/L	1.3	U	1.3	U	1.3	U	1.3	U	1	U	1.3	U	1.3	U
Methyl chloride	ug/L	1	U	1	U	1	U	1	U	5	U	1	U	1	U
Methylene chloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
o-Xylene	ug/L	1.1	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1.1	U
Tetrachloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	ug/L	1	U	1	U	***1.1***		***1***		1	U	1	U	1	U
Trichloroethene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl chloride	ug/L	1	U	1	U	***22***		***22***		***16.4***		1	U	1	U
Total Detected VOCs	UNITS														
Total Volatiles	ug/L	ND		ND		***38.6***		***38.6***		***28.9***		ND		***1.8***	

LEGEND: J* - Qualified as estimated in the QC evaluation NA - Not Analyzed ND - Not Detected U - Compound was not detected

Table 3
Groundwater Results
February 2001 Sampling Event
AK Steel Kansas City Facility

Sample Point:		33MW13S/GW3		33MW13D/GW3	
Date Sampled:		02/01/2001		02/01/2001	
Laboratory Number:		604136051		604136093	
Volatiles	UNITS				
1,1,1,2-Tetrachloroethane	ug/L	NA		NA	
1,1,1-Trichloroethane	ug/L	1	U	1	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U
1,1,2-Trichloroethane	ug/L	1	U	1	U
1,1-Dichloroethane	ug/L	1	U	1	U
1,1-Dichloroethene	ug/L	1	U	1	UJ*
1,2-Dichloroethane	ug/L	1	U	1	U
Benzene	ug/L	1	U	1	U
Carbon tetrachloride	ug/L	1	U	1	U
Chlorobenzene	ug/L	1	U	1	U
Chloroethane	ug/L	1	U	1	U
Chloroform	ug/L	1	U	1	U
cis-1,2-Dichloroethene	ug/L	*1.4*		1	U
Ethylbenzene	ug/L	1	U	1	U
m,p-Xylene	ug/L	1.3	U	1.3	U
Methyl chloride	ug/L	1	U	1	U
Methylene chloride	ug/L	1	U	1	U
o-Xylene	ug/L	1.1	U	1.1	U
Tetrachloroethene	ug/L	1	U	1	U
Toluene	ug/L	1	U	1	UJ*
trans-1,2-Dichloroethene	ug/L	1	U	1	U
Trichloroethene	ug/L	1	U	1	U
Vinyl chloride	ug/L	1	U	1	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	*1.4*		ND	

LEGEND: J* - Qualified as estimated in the QC evaluation NA - Not Analyzed ND - Not Detected U - Compound was not detected

Table 4
Well 33MW2S Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW2S/GW3		33MW2S/GW2		33MW2S/GW1	
Date Sampled:		02/02/2001		07/17/1998		05/12/1997	
Laboratory Number:		604136259		D98-4944-9		D97-5825-12	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	500	UD	***75***	***J****	***50.8***	
1,1,2,2-Tetrachloroethane	ug/L	500	UD	5	UJ*	5	U
1,1,2-Trichloroethane	ug/L	500	UD	***42.4***	***J****	***80.7***	
1,1-Dichloroethane	ug/L	500	UD	***126***	***J****	***103***	
1,1-Dichloroethene	ug/L	500	UD	2,500	DUJ*	***369***	***DJ***
1,2-Dichloroethane	ug/L	500	UD	***15.1***	***J****	***18.6***	
1,2-Dichloropropane	ug/L	NA		5	UJ*	5	U
2-Butanone	ug/L	NA		5	UJ*	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	UJ*	5	U
2-Hexanone	ug/L	NA		50	UJ*	50	U
4-Methyl-2-pentanone	ug/L	NA		100	UJ*	100	U
Acetone	ug/L	NA		100	UJ*	100	U
Benzene	ug/L	500	UD	***2.02***	***J***	5	U
Bromodichloromethane	ug/L	NA		5	UJ*	5	U
Bromoform	ug/L	NA		5	UJ*	5	U
Bromomethane	ug/L	NA		5	UJ*	5	U
Carbon disulfide	ug/L	NA		5	UJ*	5	U
Carbon tetrachloride	ug/L	500	UD	5	UJ*	5	U
Chlorobenzene	ug/L	500	UD	5	UJ*	5	U
Chloroethane	ug/L	500	UD	5	UJ*	5	U
Chloroform	ug/L	500	UD	***42.7***	***J****	***57.5***	
cis-1,2-Dichloroethene	ug/L	***62,000***	***D***	***58,700***	***DJ****	***8,400***	***D***
cis-1,3-Dichloropropene	ug/L	NA		5	UJ*	5	U
Dibromochloromethane	ug/L	NA		5	UJ*	5	U
Ethylbenzene	ug/L	500	UD	5	UJ*	5	U
m,p-Xylene	ug/L	650	UD	5	UJ*	5	U
Methyl chloride	ug/L	500	UD	5	UJ*	5	U
Methylene chloride	ug/L	500	UD	***5.93***	***J****	5	U
o-Xylene	ug/L	550	UD	5	UJ*	5	U
Styrene	ug/L	NA		5	UJ*	5	U
Tetrachloroethene	ug/L	500	UD	***23.1***	***J****	***10.1***	
Toluene	ug/L	500	UD	***14.8***	***J****	***15.4***	
trans-1,2-Dichloroethene	ug/L	500	UD	2,500	DUJ*	***106***	
trans-1,3-Dichloropropene	ug/L	NA		5	UJ*	5	U
Trichloroethene	ug/L	***52,000***	***D***	***67,700***	***DJ****	***132,000***	***D***
Vinyl acetate	ug/L	NA		50	UJ*	50	U
Vinyl chloride	ug/L	500	UD	***1,100***	***DJ****	***64.4***	
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	***114,000***		***127,847.05***		***141,275.5***	

LEGEND: Bold, italics - Compound was detected; NA - Not Analyzed; D - Diluted prior to analysis; U - Qualified as undetected by the laboratory; J - Qualified as estimated by the laboratory; J* - Qualified as estimated in the QC evaluation

Table 5
Well 33MW2 Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW2/GW3		33MW2/GW2		33MW2/GW1	
Date Sampled:		02/02/2001		07/17/1998		05/12/1997	
Laboratory Number:		604136275		D98-4944-8		D97-5825-11	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	5	UD	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	UD	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	UD	***2.7***	***J***	5	U
1,1-Dichloroethane	ug/L	***31***	***D***	***20.2***		5	U
1,1-Dichloroethene	ug/L	***34***	***D***	***90.8***		5	U
1,2-Dichloroethane	ug/L	5	UD	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	5	UD	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	5	UD	5	U	5	U
Chlorobenzene	ug/L	5	UD	5	U	5	U
Chloroethane	ug/L	5	UD	5	U	5	U
Chloroform	ug/L	5	UD	5	U	5	U
cis-1,2-Dichloroethene	ug/L	***2,800***	***D***	***3,100***	***D***	***963***	***D***
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	5	UD	5	U	5	U
m,p-Xylene	ug/L	6.5	UD	5	U	5	U
Methyl chloride	ug/L	5	UD	5	U	5	U
Methylene chloride	ug/L	5	UD	5	U	5	U
o-Xylene	ug/L	5.5	UD	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	5	UD	5	U	5	U
Toluene	ug/L	5	UD	5	U	5	U
trans-1,2-Dichloroethene	ug/L	***180***	***D***	***15.7***		***14.1***	
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	***150***	***D***	***5,230***	***D***	***21***	
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	***370***	***D***	***583***	***D***	***1,880***	***D***
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	***3,565***		***9,042.4***		***2,878.1***	

LEGEND: Bold, italics - Compound was detected; D - Diluted prior to analysis; J - Qualified as estimated by the laboratory; NA - Not Analyzed
U - Qualified as undetected by the laboratory

Table 6
Well 33MW3 Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW3/GW3		33MW3/GW2		33MW3/GW1		33MW3/GW1D	
Date Sampled:		02/02/2001		07/17/1998		05/12/1997		05/12/1997	
Laboratory Number:		604136242		D98-4944-7		D97-5825-9		D97-5825-10 Deep Duplicate	
Volatiles	UNITS								
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	***2.42***	***J***	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U	100	U
Acetone	ug/L	NA		100	U	100	U	100	U
Benzene	ug/L	1	U	5	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U	5	U
Bromoform	ug/L	NA		5	U	5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	***130***	***D***	***326***	***D***	***21.9***		***19.1***	
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	***3.8***		5	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U	5	U
Trichloroethene	ug/L	***31***		***35.1***		***32.1***		***26.3***	
Vinyl acetate	ug/L	NA		50	U	50	U	50	U
Vinyl chloride	ug/L	***32***		***148***		***19.1***		***17.6***	
Total Detected VOCs	UNITS								
Total Volatiles	ug/L	***196.8***		***511.52***		***73.1***		***63***	

LEGEND: Bold, italics - Compound was detected
U - Qualified as undetected by the laboratory
D - Diluted prior to analysis
J - Qualified as estimated by the laboratory
NA - Not Analyzed

Table 7
Well 33MW4S Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW4S/GW3		33MW4S/GW2		33MW4S/GW1	
Date Sampled:		02/02/2001		07/15/1998		05/12/1997	
Laboratory Number:		604136218		D98-4890-3		D97-5825-2	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	1	U	2	U	2	U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND		ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 8
Well 33MW4 Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW4/GW3		33MW4/GW2		33MW4/GW1	
Date Sampled:		02/02/2001		07/16/1998		05/12/1997	
Laboratory Number:		604136234		D98-4917-2		D97-5825-1	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	1	U	2	U	2	U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND		ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 9
Well 33MW6D Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW6D/GW3		33MW6D/GW2		33MW6D/GW1	
Date Sampled:		02/02/2001		07/15/1998		05/30/1997	
Laboratory Number:		604136200		D98-4890-2		D97-6645-2	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	1	U	2	U	2	U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND		ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 10
Well 33MW7S Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW7S/GW3		33MW7S/GW2		33MW7S/GW1	
Date Sampled:		02/02/2001		07/16/1998		05/12/1997	
Laboratory Number:		604136283		D98-4917-3		D97-5825-8	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	1	U	2	U	2	U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND		ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 11
Well 33MW7D Results
1997, 1998, and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW7D/GW3		33MW7D/GW2		33MW7D/GW1	
Date Sampled:		02/02/2001		07/16/1998		05/12/1997	
Laboratory Number:		604136226		D98-4917-4		D97-5825-7	
Volatiles	UNITS						
1,1,1-Trichloroethane	ug/L	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U	5	U
2-Butanone	ug/L	NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U	5	U
2-Hexanone	ug/L	NA		50	U	50	U
4-Methyl-2-pentanone	ug/L	NA		100	U	100	U
Acetone	ug/L	NA		100	U	100	U
Benzene	ug/L	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		5	U	5	U
Bromoform	ug/L	NA		5	U	5	U
Bromomethane	ug/L	NA		5	U	5	U
Carbon disulfide	ug/L	NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	5	U	5	U
Chloroethane	ug/L	1	U	5	U	5	U
Chloroform	ug/L	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Dibromochloromethane	ug/L	NA		5	U	5	U
Ethylbenzene	ug/L	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U	5	U
Methyl chloride	ug/L	1	U	5	U	5	U
Methylene chloride	ug/L	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	5	U	5	U
Styrene	ug/L	NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	5	U	5	U
Toluene	ug/L	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U	5	U
Trichloroethene	ug/L	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		50	U	50	U
Vinyl chloride	ug/L	1	U	2	U	2	U
Total Detected VOCs	UNITS						
Total Volatiles	ug/L	ND		ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 12
Well 33MW10S Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW10S/GW3		33MW10S/GW2	
Date Sampled:		02/01/2001		07/14/1998	
Laboratory Number:		604136127		D98-4875-4	
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U
2-Butanone	ug/L	NA		5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U
2-Hexanone	ug/L	NA		50	U
4-Methyl-2-pentanone	ug/L	NA		100	U
Acetone	ug/L	NA		100	U
Benzene	ug/L	1	U	5	U
Bromodichloromethane	ug/L	NA		5	U
Bromoform	ug/L	NA		5	U
Bromomethane	ug/L	NA		5	U
Carbon disulfide	ug/L	NA		5	U
Carbon tetrachloride	ug/L	1	U	5	U
Chlorobenzene	ug/L	1	U	5	U
Chloroethane	ug/L	1	U	5	U
Chloroform	ug/L	1	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U
Dibromochloromethane	ug/L	NA		5	U
Ethylbenzene	ug/L	1	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U
Methyl chloride	ug/L	1	U	5	U
Methylene chloride	ug/L	1	U	5	U
o-Xylene	ug/L	1.1	U	5	U
Styrene	ug/L	NA		5	U
Tetrachloroethene	ug/L	1	U	5	U
Toluene	ug/L	1	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U
Trichloroethene	ug/L	1	U	5	U
Vinyl acetate	ug/L	NA		50	U
Vinyl chloride	ug/L	1	U	2	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 13
Well 33MW10D Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point: / Date Sampled: / Laboratory Number:		33MW10D/GW3 02/01/2001 604136135		33MW10D/GW3D 02/01/2001 604136184 Duplicate		33MW10D/GW3QA 02/01/2001 01020184 Split to 2nd Lab		33MW10D/GW2 09/21/1998 366821		33MW10D/GW2 07/14/1998 D98-4875-5	
Volatiles	UNITS										
1,1,1,2-Tetrachloroethane	ug/L	NA		NA		1	U	NA		NA	
1,1,1-Trichloroethane	ug/L	1	U	1	U	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	1	U	NA		5	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	1	U	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	***1.5***		***1.6***		***1.2***		***2.9***	***J***	***4.32***	***J***
1,1-Dichloroethene	ug/L	1	U	1	U	1	U	***2.2***	***J***	5	U
1,2-Dichloroethane	ug/L	1	U	1	U	1	U	5	U	5	U
1,2-Dichloroethene	ug/L	NA		NA		NA		***65***		NA	
1,2-Dichloropropane	ug/L	NA		NA		NA		5	U	5	U
2-Butanone	ug/L	NA		NA		NA		5	U	5	U
2-Chloroethylvinyl ether	ug/L	NA		NA		NA		5	U	5	U
2-Hexanone	ug/L	NA		NA		NA		5	U	50	U
4-Methyl-2-pentanone	ug/L	NA		NA		NA		5	U	100	U
Acetone	ug/L	NA		NA		NA		5	U	100	U
Benzene	ug/L	1	U	1	U	1	U	5	U	5	U
Bromodichloromethane	ug/L	NA		NA		NA		5	U	5	U
Bromoform	ug/L	NA		NA		NA		5	U	5	U
Bromomethane	ug/L	NA		NA		NA		5	U	5	U
Carbon disulfide	ug/L	NA		NA		NA		5	U	5	U
Carbon tetrachloride	ug/L	1	U	1	U	1	U	5	U	5	U
Chlorobenzene	ug/L	1	U	1	U	1	U	5	U	5	U
Chloroethane	ug/L	1	U	1	U	5	U	5	U	5	U
Chloroform	ug/L	1	U	1	U	1	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	***14***		***14***		***11.3***		***63***		***74.4***	
cis-1,3-Dichloropropene	ug/L	NA		NA		NA		5	U	5	U
Dibromochloromethane	ug/L	NA		NA		NA		5	U	5	U
Ethylbenzene	ug/L	1	U	1	U	1	U	5	U	5	U
m,p-Xylene	ug/L	1.3	U	1.3	U	1	U	5	U	5	U
Methyl chloride	ug/L	1	U	1	U	5	U	5	U	5	U
Methylene chloride	ug/L	1	U	1	U	1	U	5	U	5	U
o-Xylene	ug/L	1.1	U	1.1	U	1	U	NA		5	U
Styrene	ug/L	NA		NA		NA		5	U	5	U
Tetrachloroethene	ug/L	1	U	1	U	1	U	5	U	5	U
Toluene	ug/L	1	U	1	U	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	***1.1***		***1***		1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		NA		NA		5	U	5	U
Trichloroethene	ug/L	1	U	1	U	1	U	5	U	5	U
Vinyl acetate	ug/L	NA		NA		NA		5	U	50	U
Vinyl chloride	ug/L	***22***		***22***		***16.4***		***4.1***		***9.05***	

LEGEND: Bold, italics - Compound was detected J - Qualified as estimated by the laboratory NA - Not Analyzed U - Qualified as undetected by the laboratory

Table 13
Well 33MW10D Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW10D/GW3	33MW10D/GW3D	33MW10D/GW3QA	33MW10D/GW2	33MW10D/GW2
Date Sampled:		02/01/2001	02/01/2001	02/01/2001	09/21/1998	07/14/1998
Laboratory Number:		604136135	604136184 Duplicate	01020184 Split to 2nd Lab	366821	D98-4875-5
Total Detected VOCs	UNITS					
Total Volatiles	ug/L	***38.6***	***38.6***	***28.9***	***137.2***	***87.77***

LEGEND: Bold, italics - Compound was detected J - Qualified as estimated by the laboratory NA - Not Analyzed U - Qualified as undetected by the laboratory

Table 14
Well 33MW11S Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW11S/GW3		33MW11S/GW2	
Date Sampled:		02/01/2001		07/14/1998	
Laboratory Number:		604136101		D98-4875-6	
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U
2-Butanone	ug/L	NA		5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U
2-Hexanone	ug/L	NA		50	U
4-Methyl-2-pentanone	ug/L	NA		100	U
Acetone	ug/L	NA		100	U
Benzene	ug/L	1	U	5	U
Bromodichloromethane	ug/L	NA		5	U
Bromoform	ug/L	NA		5	U
Bromomethane	ug/L	NA		5	U
Carbon disulfide	ug/L	NA		5	U
Carbon tetrachloride	ug/L	1	U	5	U
Chlorobenzene	ug/L	1	U	5	U
Chloroethane	ug/L	1	U	5	U
Chloroform	ug/L	1	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U
Dibromochloromethane	ug/L	NA		5	U
Ethylbenzene	ug/L	1	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U
Methyl chloride	ug/L	1	U	5	U
Methylene chloride	ug/L	1	U	5	U
o-Xylene	ug/L	1.1	U	5	U
Styrene	ug/L	NA		5	U
Tetrachloroethene	ug/L	1	U	5	U
Toluene	ug/L	1	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U
Trichloroethene	ug/L	1	U	5	U
Vinyl acetate	ug/L	NA		50	U
Vinyl chloride	ug/L	1	U	2	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	ND		ND	

LEGEND: NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

Table 15
Well 33MW11D Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW11D/GW3		33MW11D/GW2	
Date Sampled:		02/01/2001		07/14/1998	
Laboratory Number:		604136119		D98-4875-7	
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U
1,1-Dichloroethane	ug/L	***1.8***		***2.92***	***J***
1,1-Dichloroethene	ug/L	1	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U
2-Butanone	ug/L	NA		5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U
2-Hexanone	ug/L	NA		50	U
4-Methyl-2-pentanone	ug/L	NA		100	U
Acetone	ug/L	NA		100	U
Benzene	ug/L	1	U	5	U
Bromodichloromethane	ug/L	NA		5	U
Bromoform	ug/L	NA		5	U
Bromomethane	ug/L	NA		5	U
Carbon disulfide	ug/L	NA		5	U
Carbon tetrachloride	ug/L	1	U	5	U
Chlorobenzene	ug/L	1	U	5	U
Chloroethane	ug/L	1	U	5	U
Chloroform	ug/L	1	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U
Dibromochloromethane	ug/L	NA		5	U
Ethylbenzene	ug/L	1	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U
Methyl chloride	ug/L	1	U	5	U
Methylene chloride	ug/L	1	U	5	U
o-Xylene	ug/L	1.1	U	5	U
Styrene	ug/L	NA		5	U
Tetrachloroethene	ug/L	1	U	5	U
Toluene	ug/L	1	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U
Trichloroethene	ug/L	1	U	5	U
Vinyl acetate	ug/L	NA		50	U
Vinyl chloride	ug/L	1	U	2	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	***1.8***		***2.92***	

LEGEND: Bold, italics - Compound was detected J - Qualified as estimated by the laboratory NA - Not Analyzed U - Qualified as undetected by the laboratory

Table 16
Well 33MW13S Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW13S/GW3		33MW13S/GW2	
Date Sampled:		02/01/2001		07/17/1998	
Laboratory Number:		604136051		D98-4944-2	
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U
1,1-Dichloroethene	ug/L	1	U	5	U
1,2-Dichloroethane	ug/L	1	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U
2-Butanone	ug/L	NA		5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U
2-Hexanone	ug/L	NA		50	U
4-Methyl-2-pentanone	ug/L	NA		100	U
Acetone	ug/L	NA		100	U
Benzene	ug/L	1	U	5	U
Bromodichloromethane	ug/L	NA		5	U
Bromoform	ug/L	NA		5	U
Bromomethane	ug/L	NA		5	U
Carbon disulfide	ug/L	NA		5	U
Carbon tetrachloride	ug/L	1	U	5	U
Chlorobenzene	ug/L	1	U	5	U
Chloroethane	ug/L	1	U	5	U
Chloroform	ug/L	1	U	5	U
cis-1,2-Dichloroethene	ug/L	***1.4***		5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U
Dibromochloromethane	ug/L	NA		5	U
Ethylbenzene	ug/L	1	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U
Methyl chloride	ug/L	1	U	5	U
Methylene chloride	ug/L	1	U	5	U
o-Xylene	ug/L	1.1	U	5	U
Styrene	ug/L	NA		5	U
Tetrachloroethene	ug/L	1	U	5	U
Toluene	ug/L	1	U	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U
Trichloroethene	ug/L	1	U	3.79	JU*
Vinyl acetate	ug/L	NA		50	U
Vinyl chloride	ug/L	1	U	2	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	***1.4***		ND	

LEGEND: Bold, italics - Compound was detected; U - Qualified as undetected by the laboratory; J - Qualified as estimated by the laboratory; U* - Qualified as undetected in the QC evaluation; NA - Not Analyzed; ND - Not Detected

Table 17
Well 33MW13D Results
1998 and 2001 Sampling Events
AK Steel Kansas City Facility

Sample Point:		33MW13D/GW3		33MW13D/GW2	
Date Sampled:		02/01/2001		07/17/1998	
Laboratory Number:		604136093		D98-4944-3	
Volatiles	UNITS				
1,1,1-Trichloroethane	ug/L	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	1	U	5	U
1,1,2-Trichloroethane	ug/L	1	U	5	U
1,1-Dichloroethane	ug/L	1	U	5	U
1,1-Dichloroethene	ug/L	1	UJ*	5	U
1,2-Dichloroethane	ug/L	1	U	5	U
1,2-Dichloropropane	ug/L	NA		5	U
2-Butanone	ug/L	NA		5	U
2-Chloroethylvinyl ether	ug/L	NA		5	U
2-Hexanone	ug/L	NA		50	U
4-Methyl-2-pentanone	ug/L	NA		100	U
Acetone	ug/L	NA		100	U
Benzene	ug/L	1	U	5	U
Bromodichloromethane	ug/L	NA		5	U
Bromoform	ug/L	NA		5	U
Bromomethane	ug/L	NA		5	U
Carbon disulfide	ug/L	NA		5	U
Carbon tetrachloride	ug/L	1	U	5	U
Chlorobenzene	ug/L	1	U	5	U
Chloroethane	ug/L	1	U	5	U
Chloroform	ug/L	1	U	5	U
cis-1,2-Dichloroethene	ug/L	1	U	5	U
cis-1,3-Dichloropropene	ug/L	NA		5	U
Dibromochloromethane	ug/L	NA		5	U
Ethylbenzene	ug/L	1	U	5	U
m,p-Xylene	ug/L	1.3	U	5	U
Methyl chloride	ug/L	1	U	5	U
Methylene chloride	ug/L	1	U	5	U
o-Xylene	ug/L	1.1	U	5	U
Styrene	ug/L	NA		5	U
Tetrachloroethene	ug/L	1	U	5	U
Toluene	ug/L	1	UJ*	5	U
trans-1,2-Dichloroethene	ug/L	1	U	5	U
trans-1,3-Dichloropropene	ug/L	NA		5	U
Trichloroethene	ug/L	1	U	5	U
Vinyl acetate	ug/L	NA		50	U
Vinyl chloride	ug/L	1	U	2	U
Total Detected VOCs	UNITS				
Total Volatiles	ug/L	ND		ND	

LEGEND: J* - Qualified as estimated NA - Not Analyzed ND - Not Detected U - Qualified as undetected by the laboratory

FIGURES

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005WMU33.DGN/11-30-2000 10:36/SDS K:\ARMORF\USTN\ 2000\

33MW10S
33MW10D
33MW9S
33MW11S
33MW11D
33MW6D
METAL BUILDING
33MW4S
33MW4
33MW5D
33MW5S
33MW5I
33MW2S
33MW3
33MW2
33MW8S
SWMU 17
33MW13S
33MW13D
SWMU 13
33MW14S
33MW14D
SWMU 33
33MW12S
33MW12D
33MW7D
33MW7S
WIRE MILL BUILDING

LEGEND

- MONITORING WELL LOCATION
- SWMU BOUNDARY
- RAILROAD

N

100' 0' 100' 200'
SCALE IN FEET

Burns & McDonnell
SINCE 1898

Figure 1

MONITORING WELL LOCATIONS
SWMU 33 AREA

AK Steel Kansas City Facility
AK Steel Property

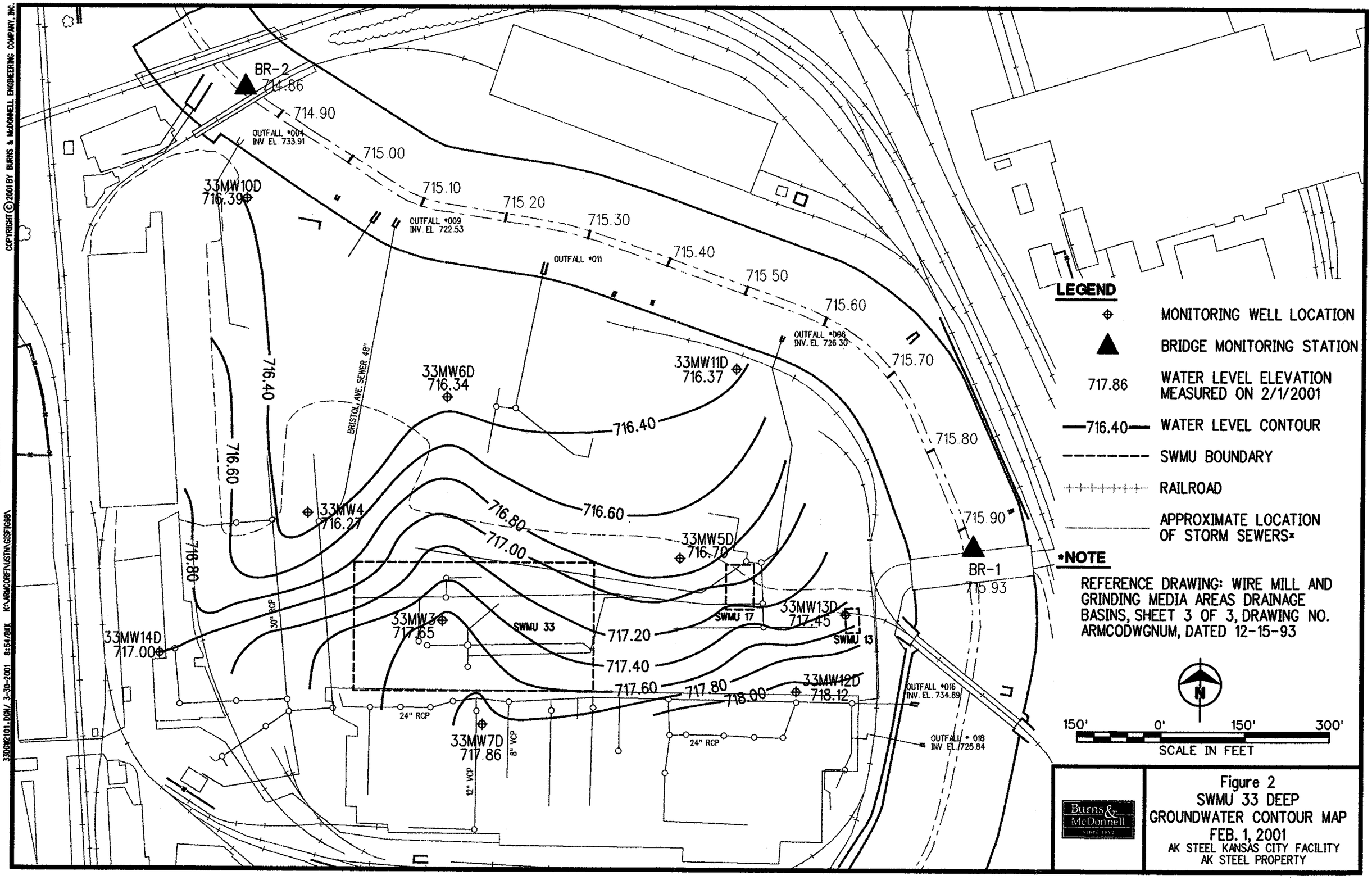

Figure 2
SWMU 33 DEEP
GROUNDWATER CONTOUR MAP
FEB. 1, 2001
AK STEEL KANSAS CITY FACILITY
AK STEEL PROPERTY

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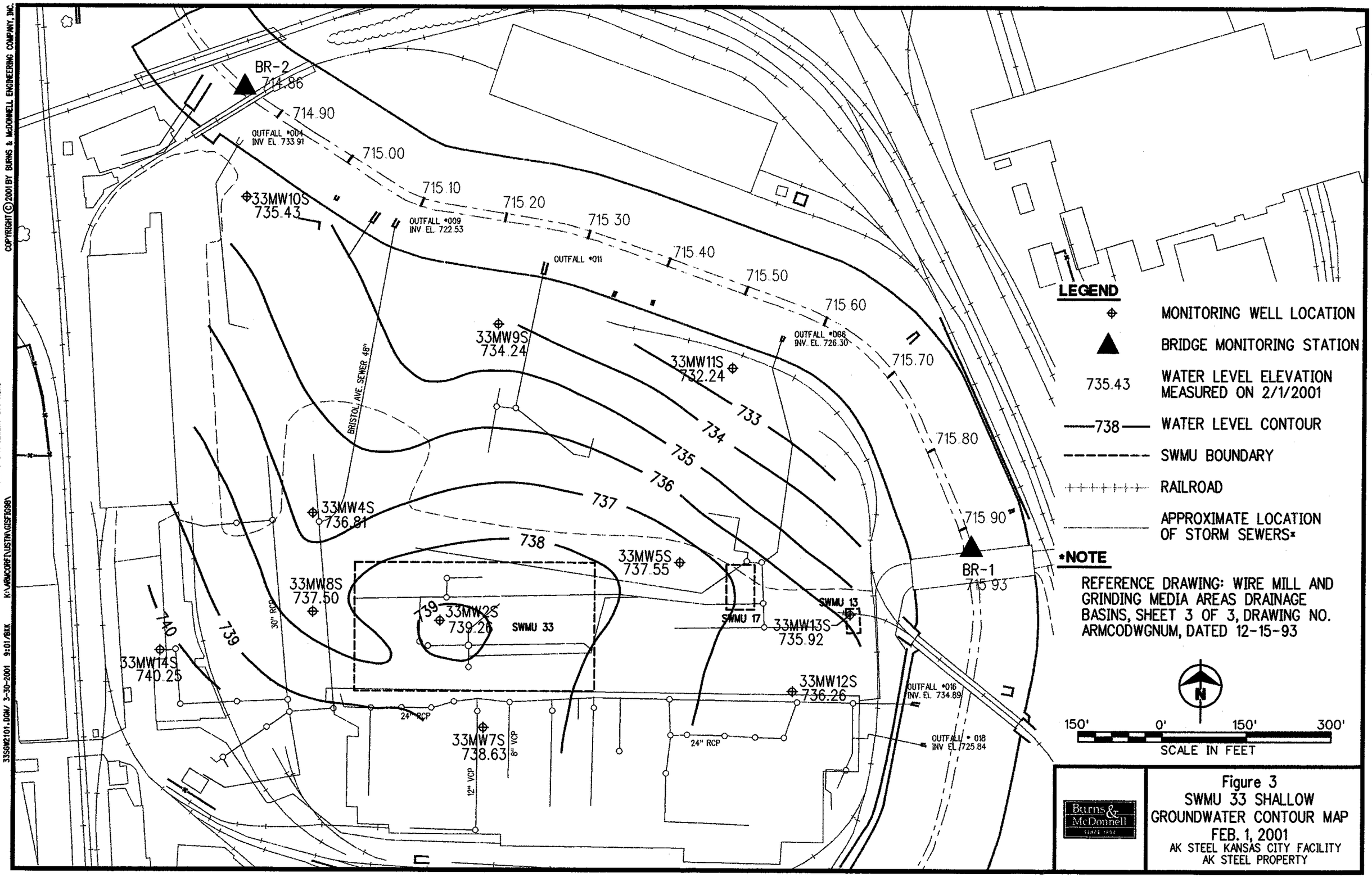

Figure 3
SWMU 33 SHALLOW GROUNDWATER CONTOUR MAP
FEB. 1, 2001
AK STEEL KANSAS CITY FACILITY
AK STEEL PROPERTY

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SITE Off=1 62-63
SWMU(GN) Off=1
STORMSWR.DGN(STORM SEWER) Off=none
K:\ARMCORFI\USTN\GISFIG98\
33SGW2101.DGN/ 3-30-2001 9:01/BKK

Table 2-4
Comparison of Historical Soil Data for Samples Nearest Former Degreaser at SWMU 33
AK Steel Kansas City Facility

Sample Name	Depth (ft)	Information Source	Units	1,1,1-TCA	1,1-DCE	Chloroform	PCE	TCE
33MW2S / CS1	1 - 5	ITS-Richardson	µg/kg	12.8	27.9	6.2 U	6.2 U	2600 D
33MW2S / CS2	7 - 7.5	ITS-Richardson	µg/kg	22.7	37.8	6.41 U	6.41 U	10800 D
33MW2S / CS3	14 - 15	ITS-Richardson	µg/kg	7.45 U	17.1	7.45 U	7.45 U	4950 D
33MW2S / CS4	19 - 20	ITS-Richardson	µg/kg	7.13 U	8	7.13 U	7.13 U	1210 D
MW-2	8 - 13	Terracon, 1991b	µg/kg	11	10 U	10 U	10 U	2500
MW-2	15 - 18	Terracon, 1991b	µg/kg	10 U	10 U	10 U	10 U	980
MW-2	29 - 32	Terracon, 1991b	µg/kg	10 U	10 U	10	10 U	83
Remcor No. 1 / Degreaser	Beneath Concrete	Remcor 1990	µg/kg	22000	850	625 U	1200	100000
Remcor No. 2 / Degreaser	Beneath Concrete	Remcor 1990	µg/kg	625 U	625 U	625 U	625 U	67000
Probe P-1 Approximately 5 ft west of degreaser	Unknown (5-15 ft)	Terracon, 1991a	µg/kg	100	NA	NA	NA	130000

D = Diluted
µg/kg = micrograms per kilogram
NA = Not Analyzed
U = Compound was not detected. Value is the reporting limit.
1,1-DCE = 1,1-Dichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
PCE = Tetrachloroethene
TCE = Trichloroethene
ft = feet
RFI = RCRA Facility Investigation

Remcor, 1990. *Draft Report, Idled Facilities Environmental Investigation, Kansas City Works, Kansas City, Missouri* . November 2.

Terracon, 1991a. *Armco Phase I and Phase II Soil Vapor Survey* . July 3.

Terracon, 1991b. *Nail Mill Phase II Investigation Report, Worldwide Grinding Systems, Armco, Inc. Kansas City, Missouri* . November 18.

ITS-Richardson data was collected during the RFI and presented in the RFI Report (BMWCI, 1999).

Table 2-5
Comparison of Historical Soil Data for Samples in Area Surrounding Former Degreaser at SWMU 33
AK Steel Kansas City Facility

Sample Name	Depth (ft)	Information Source	Units	1,1,1-TCA	1,1-DCE	Chloroform	PCE	TCE
33B05 / DP1	2.5 - 3.5	ITS-Richardson	µg/kg	6.22 U	7.14	7.7 U	6.22 U	2560 D
33B05 / DP2	7 - 8	ITS-Richardson	µg/kg	5.9 U	16.5	9.88	5.9 U	5860 D
Probe P-2	Unknown (5-15 ft)	Terracon, 1991a	µg/kg	500 U	NA	NA	NA	4600
Approximately 15 ft south and 24 ft west of degreaser								
33B15 / DP1	1.5 - 2.5	ITS-Richardson	µg/kg	6.55 U	6.55 U	6.55 U	6.55 U	577 D
33B15 / DP2	6.5 - 7.5	ITS-Richardson	µg/kg	6.17 U	6.17 U	6.17 U	6.17 U	1010 D
33B15 / DP3	9.5 - 11	ITS-Richardson	µg/kg	6.35 U	6.35 U	6.35 U	6.35 U	404 D
Probe P-9	Unknown (5-15 ft)	Terracon, 1991a	µg/kg	500 U	NA	NA	NA	500 U
Approximately 54 ft north and 26 ft west of degreaser								
Probe P-15	Unknown (5-15 ft)	Terracon, 1991a	µg/kg	5000 U	NA	NA	NA	18000
Approximately 16 ft south and 1 ft west of degreaser. No corresponding RFI boring.								

D = Diluted
µg/kg = micrograms per kilogram
NA = Not Analyzed
U = Compound was not detected. Value is the reporting limit.

1,1-DCE = 1,1-Dichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
PCE = Tetrachloroethene
TCE = Trichloroethene

ft = feet
RFI = RCRA Facility Investigation

Terracon, 1991a. *Armco Phase I and Phase II Soil Vapor Survey* . July 3.

ITS-Richardson data was collected during the RFI and presented in the RFI Report (BMWCI, 1999).

Armco file copy

PHASE II SITE ASSESSMENT REPORT, SOUTH RIVERFRONT EXPRESSWAY, ARMCO SITE KANSAS CITY, MISSOURI

Prepared for
Howard Needles
Tammen & Bergendoff
and Mid-America Regional Council
September 1994

Woodward-Clyde Consultants
10975 El Monte, Suite 100
Overland Park, Kansas 66211

Project Number 91KC083

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APPENDIX C	BORING LOGS
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4. All field documentation and chain-of-custody records for each sample was completed in the field each day during the time of sampling.

5. Following the drilling and sampling of the boring, all boreholes were grouted from the bottom, flush with surface, using a bentonite/cement grout.

2.3 SHALLOW SURFACE PIT BORING SOIL SAMPLING

Four shallow surface soil samples (maximum depth of 1 foot) were collected adjacent to Boring B-11, located within the area of the former clay pigeon shooting park. These sampling locations were numbered sequentially from P-1 through P-4. One composite sample (P-4D) was collected from each of the four locations. Analysis of the four samples was for total lead and TCLP lead (see Table 2-1).

In addition, two pits (P-1 and P-4) with the dimensions of 2 feet by 2 feet by 1 foot deep were hand dug for the purposes of visual inspection. The presence of shotgun pellets was not noted in either of these pits. The displaced soil was returned back to their respective pits.

The following procedures was used to collect the shallow surface soil samples:

1. All sampling equipment coming into contact with soil samples was decontaminated prior to sampling, between composite samples, and at the completion of work.

2. Decontaminated equipment was stored on clean polyethylene sheeting or wrapped in aluminum foil or plastic bags between uses.

3. The sample locations were located adjacent to Boring B-11.

4. All sticks, leaves, and other surface debris in vicinity of sampling location were removed.

5. Surface soil samples were collected using a trowel and spoon. The collected soil material was measured and placed in a decontaminated stainless steel bowl and transferred the soil to sample containers.

6. All field documentation and chain-of-custody records for each sample were completed in the field at the time of sampling.

7. The shallow surface pit borings were backfilled with native material upon completion of the borings.

2.4 GROUNDWATER SAMPLING

Groundwater samples were collected from Borings B-7 and B-11 using a stainless-steel bailer inside of the HSA. Two QA/QC samples were collected: GW-B-7F is a field blank using distilled water and GW-B11D is a field duplicate split from sample GW-B11. Analysis included dissolved metals (DM), TM, TPH, and total organic halides (TOX) (see Table 2-1).

The following procedures were used to collect the groundwater samples.

1. All sampling equipment coming into contact with groundwater was decontaminated prior to sampling, between sampling locations, and at the completion of work. The sampling equipment was wrapped in foil or plastic trash bags to prevent contamination prior to use.

2. The bailer was lowered through the HSA to collect a grab sample of the groundwater.

2.5 SURVEYING

The 12 boring locations, the 4 pit boring locations, and the geophysical survey grid were field staked on November 23, 1993. Because of continued high water conditions in the study area, borings B-6, B-7, B-8, and B-9 were relocated on March 24, 1994 (see Drawing 1). The approval to relocate these four borings was received in a March 11, 1994 letter from the MDNR.

4.0
CONCLUSIONS

The following section discusses the analytical findings detailed in the previous section relative to various guidelines set forth by both the United States Environmental Protection Agency (USEPA) and the Missouri Department of Natural Resources (MDNR).

4.1 GEOPHYSICAL SURVEY

The proposed center line of the SRE is located approximately 65 feet west of the estimated western limit of the RCRA Landfill (see Drawing 2). This is based upon the geophysical survey that was performed, superimposed upon a grid system that was measured from one known point (northeast fence post of the eastern cooling pond). It is apparent from the geophysical plot that there is abundant metal slag debris buried near the RCRA Landfill. It appears that this slag has been used as fill material to construct berms and other structures.

4.2 SUBSURFACE SOIL SAMPLES

One of the RCRA 8 Total Metals (chromium) detected in site soils exceeded Proposed Corrective Action Rules for Solid Waste Management (USEPA, 1990) standards (Table 3-1). The action criteria for chromium of 400 mg/kg was exceeded in four samples (SS-B1-0-7, SS-B1-7-14, SS-B2-0-10, and SS-B3-0-10) located adjacent to the RCRA Landfill and in areas where slag materials were used as fill. The fill material is a likely source for the high chromium levels. The standards are as follows:

- Arsenic 80 mg/kg
- Barium 4000 mg/kg
- Cadmium 40 mg/kg
- Chromium 400 mg/kg
- Lead 500 mg/kg
- Mercury 20 mg/kg
- Selenium (under review)
- Silver 200 mg/kg

None of the RCRA 8 Toxicity Characteristic Leaching Procedure (TCLP) Metals (Table 3-2) exceeded the Maximum Concentrations of Contaminants for the Toxicity Characteristics (RCRA, 1992). The standards are as follows:

- Arsenic 5.0 mg/l
- Barium 100.0 mg/l
- Cadmium 1.0 mg/l
- Chromium 5.0 mg/l
- Lead 5.0 mg/l
- Mercury 0.2 mg/l
- Selenium 1.0 mg/l
- Silver 5.0 mg/l

Results from three soil samples (SS-B1-0-7, SS-B2-0-10 and SS-B3-0-10) exceeded the MDNR Underground Storage Tank action criteria of 100 ppm for TPH in soil. All three of the samples are from the uppermost sample in each of their respective borings and are located in high traffic areas. The elevated TPH results could be a result of lubricating oils or leaking fuels from passing vehicles.

4.3 PIT BORING SAMPLES

The action criteria for lead of 500 mg/kg (USEPA, 1991) was exceeded in all of the five pit samples located in the former shooting park (see Drawing 1) each located approximately 20 feet away from Boring B-1. The detections of lead in the pit boring samples ranged from 1,050 mg/kg (P-4) to 9,750 mg/kg (P-3). The lead values can likely be attributed to the shooting activity and the associated lead shot.

4.4 GROUNDWATER

Six of the eight RCRA 8 metals exceeded the established Maximum Contaminant Levels (MCL) for drinking water standards (USEPA, 1993) (Table 3-3). The only RCRA 8 Metals that did not exceed the MCLs for Total Metals analysis were mercury and silver (under review). Four of the seven RCRA 8 Metals exceeded the MCLs by less than three times the MCL guideline (Barium, Cadmium, Chromium and Selenium); the remaining two RCRA

8 Metals: arsenic (approximately six times greater) and lead (approximately 50 times greater) were appreciably greater than the established MCLs. The established MCL standards are as follows:

- Arsenic 0.05 mg/l
- Barium 2 mg/l
- Cadmium 0.005 mg/l
- Chromium 0.1 mg/l
- Lead 0.015 mg/l
- Mercury 0.002 mg/l
- Selenium 0.05 mg/l
- Silver Under Review

Two RCRA 8 Metals exceeded the MCL for Dissolved Metals; arsenic exceeded the MCLs by a factor of approximately four times and lead by a factor of 18 times.

There were no groundwater samples that exceeded the MDNR guidance of 10 mg/L for TPH.

Total Organic Halogens (TOX) have no standard to compare against. The TOX results were compared against MCLs from two chlorinated hydrocarbons: Dichloromethane (0.005 mg/l) and 1,2 Dichloroethane (0.005 mg/l). The MCLs for these two hydrocarbons are conservative compared to other chlorinated hydrocarbons; based upon this, TOX was detected in all three ground water samples (0.01 mg/l) two times greater than the standards. In addition, the common lab contaminant, methylene chloride (a TOX) may be considered as a potential source of a portion the TOX detections.

TABLE 3-1

SOUTH RIVERFRONT EXPRESSWAY
ANALYTICAL SUMMARY OF PIT AND SOIL BORINGS
TOTAL RCRA METALS AND TOTAL PETROLEUM HYDROCARBONS (TPH)
(Units are mg/kg)

Sample No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	TPH
P-1	NA	NA	NA	NA	5500	NA	NA	NA	NA
P-2	NA	NA	NA	NA	6600	NA	NA	NA	NA
P-3	NA	NA	NA	NA	9750	NA	NA	NA	NA
P-4	NA	NA	NA	NA	1050	NA	NA	NA	NA
P-4D	NA	NA	NA	NA	4130	NA	NA	NA	NA
SS-B1-0-7	1.6	228	ND(1.2)	3050	64	ND(0.1)	ND(0.8)	22.2	628
SS-B1-7-14	ND(1.0)	194	ND(1.2)	1417	40.5	ND(0.1)	ND(0.5)	14.0	ND(10)
SS-B1-7-14D	7.2	206	ND(0.3)	49.3	25.1	ND(0.1)	ND(0.5)	19.1	44
SS-B2-0-10	3.2	224	2.2	878	114	ND(0.1)	ND(0.5)	8.0	130
SS-B2-10-20	2.6	138	1.5	372	33	ND(0.1)	ND(0.5)	7.0	ND(10)
SS-B3-0-10	ND(1.0)	241	1.8	1620	276	ND(0.1)	ND(0.5)	21	605
SS-B3-10-19	9.9	192	1.2	24.5	44.2	ND(0.1)	ND(0.5)	2.1	ND(10)
SS-B4-0-4	8.9	133	4.0	41.9	60.3	ND(0.1)	ND(0.5)	1.6	ND(10)
SS-B4-4-8	4.6	180	ND(0.3)	98.0	23.2	ND(0.1)	ND(0.5)	1.6	ND(10)
SS-5-0-5	13.3	259	1.3	39.6	36.3	ND(0.1)	8.8	ND(1.0)	ND(10)
SS-5-5-10	7.0	208	0.76	19.8	12.6	ND(0.1)	9.1	ND(1.0)	ND(10)
SS-6-0-5	9.5	252	1.1	28.8	21.2	ND(0.1)	8.9	ND(1.0)	ND(10)
SS-6-5-10	7.1	236	0.59	18.9	9.7	ND(0.1)	9.4	ND(1.0)	ND(10)
SS-7-0-7	6.3	225	1.0	23.3	12.8	ND(0.1)	9.0	ND(1.0)	ND(10)

TABLE 3-i
(CONTINUED)

SOUTH RIVERFRONT EXPRESSWAY
ANALYTICAL RESULTS FOR PIT AND SOIL BORINGS
TOTAL RCRA METALS AND TOTAL PETROLEUM HYDROCARBONS (Continued)
(Units are mg/kg)

Sample No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	TPH
SS-7-7-14	7.8	223	0.74	20.0	13.4	ND(0.1)	9.0	ND(1.0)	ND(10)
SS-8-0-5	7.5	263	0.88	28.9	19.1	ND(0.1)	7.8	ND(1.0)	12
SS-8-5-10	7.4	217	0.57	17.3	9.4	ND(0.1)	8.9	ND(1.0)	ND(10)
SS-9-0-7	4.4	179	0.40	12.8	7.0	ND(0.1)	8.7	ND(1.0)	ND(10)
SS-9-7-14	4.3	180	0.46	13.8	8.4	ND(0.1)	8.9	ND(1.0)	ND(10)
SS-B10-0-7	6.4	200	ND(0.3)	48.9	20.5	ND(0.1)	ND(0.5)	2.1	ND(10)
SS-B10-7-14	7.1	207	ND(0.3)	20.0	20.2	ND(0.1)	ND(0.5)	1.8	ND(10)
SS-B11-0-5	9.1	167	ND(0.3)	16.3	97.1	ND(0.1)	ND(0.5)	1.6	ND(10)
SS-B11-0-5D	7.5	179	ND(0.3)	10.8	15.8	ND(0.1)	ND(0.5)	1.2	ND(10)
SS-B11-5-10	4.8	167	ND(0.3)	8.5	10.6	ND(0.1)	ND(0.5)	ND(1.0)	ND(10)
SS-B12-0-7	6.8	201	ND(0.3)	16.6	21.9	ND(0.1)	ND(0.5)	1.6	ND(10)
SS-B12-7-14	4.1	144	ND(0.3)	8.9	8.5	ND(0.1)	ND(0.5)	ND(1.0)	ND(10)

Notes:

NA = Parameter not analyzed.
ND(0.3) = Parameter not detected above detection limit given in parentheses.

TABLE 3-2

SOUTH RIVERFRONT EXPRESSWAY
ANALYTICAL SUMMARY OF PIT AND SOIL BORINGS
TCLP RCRA METALS
(Units are mg/L)

Sample No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
SS-B1-0-7	ND(0.050)	0.30	ND(0.003)	0.30	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B1-7-14	ND(0.050)	1.6	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B1-7-14D	ND(0.050)	1.8	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B2-0-10	ND(0.050)	0.82	ND(0.003)	0.005	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B2-10-20	ND(0.050)	0.43	ND(0.003)	0.005	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B3-0-10	ND(0.050)	0.57	ND(0.003)	0.0027	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B3-10-19	ND(0.050)	0.96	ND(0.003)	0.006	0.050	ND(0.002)	ND(0.100)	ND(0.010)
SS-B4-0-4	ND(0.050)	1.3	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B4-4-8	ND(0.050)	1.2	0.009	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-5-0-5	ND(0.050)	1.1	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-5-5-10	ND(0.050)	1.3	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-6-0-5	ND(0.050)	1.1	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-6-5-10	ND(0.050)	1.4	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-7-0-7	ND(0.050)	1.2	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-7-7-14	ND(0.050)	1.3	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-8-0-5	ND(0.050)	1.2	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-8-5-10	ND(0.050)	1.4	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-9-0-7	ND(0.050)	1.0	ND(0.003)	0.005	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-9-7-14	ND(0.050)	1.0	ND(0.003)	ND(0.005)	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)

TABLE 3-2
(CONTINUED)

SOUTH RIVERFRONT EXPRESSWAY
ANALYTICAL SUMMARY OF PIT AND SOIL BORINGS
TCLP RCRA METALS
(Units are mg/L)

Sample No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
SS-B10-0-7	ND(0.050)	1.9	0.006	ND(0.005)	0.088	ND(0.002)	ND(0.1)	ND(0.01)
SS-B10-7-14	ND(0.050)	1.44	0.004	ND(0.005)	ND(0.050)	ND(0.002)	0.13	ND(0.01)
SS-B11-0-5	ND(0.050)	1.53	0.003	ND(0.005)	0.081	ND(0.002)	ND(0.100)	ND(0.010)
SS-B11-5-10D	0.05	1.7	0.005	ND(0.005)	0.900	ND(0.002)	ND(0.100)	ND(0.010)
SS-B11-5-10	0.050	1.5	0.004	0.007	0.17	ND(0.002)	ND(0.1)	ND(0.01)
SS-B12-0-7	ND(0.050)	1.3	ND(0.003)	0.006	ND(0.050)	ND(0.002)	ND(0.100)	ND(0.010)
SS-B12-7-14	ND(0.050)	1.5	ND(0.003)	0.010	ND(0.050)	0.005	ND(0.100)	ND(0.01)

Notes:

ND(0.3)= Parameter not detected above detection limit given in parenthesis.

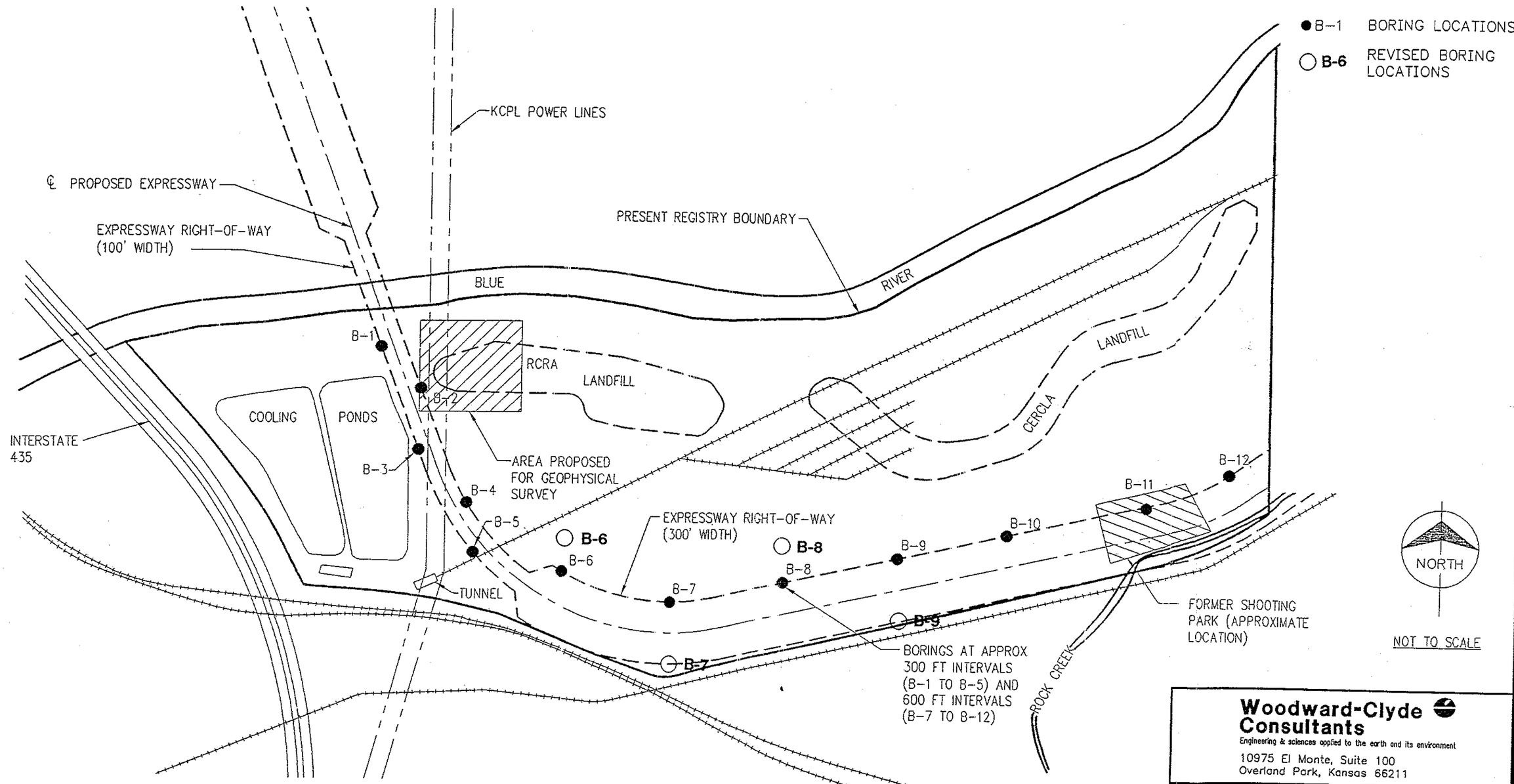
TABLE 3-3

SOUTH RIVERFRONT EXPRESSWAY
ANALYTICAL SUMMARY OF GROUNDWATER
TPH AND TOX, TOTAL METALS/(DISSOLVED METALS)

Sample No.	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[1]	Selenium[1]	Silver[1]	TPH[2]	TOX[2]
GW-B-11	295/(213)	5204/(1686)	6.7/(4.1)	165/(37.6)	728/(266)	ND(0.2)/(0.206)	11.9/(6.1)	18.2/(ND(10.0))	0.5	0.01
GW-B11D[3]	290/(193)	4240/(1401)	6.7/(ND(3.0))	136/(35.2)	563/(211)	ND(0.2)/ND(0.2)	11.1/(6.5)	25.5/(ND(10.0))	ND(0.5)	0.01
GW-7	59.2/(ND(10.0))	750/(502)	3.6/(ND(3.0))	28.7/(ND(50.0))	53.1/(ND(30.0))	ND(0.2)/ND(0.2)	68.4/(9.7)	13.4/ND(10.0)	1	0.01
GW-B-7F[5]	ND(10.0)	ND(5.0)	ND(3.0)	ND(5.0)	ND(30.0)	ND(0.2)	ND(5.0)	ND(10.0)	0.5	NA[6]

Notes:

[1]Units are in µg/L.
[2]Units are in mg/L.
[3]GW-B11D is a field duplicate of GW-B-11.
[4]ND(0.3) = Parameter not detected above detection limit given in parenthesis.
[5]GW-B-7F is a field blank.
[6]NA = Analysis not run on this sample.



LEGEND:

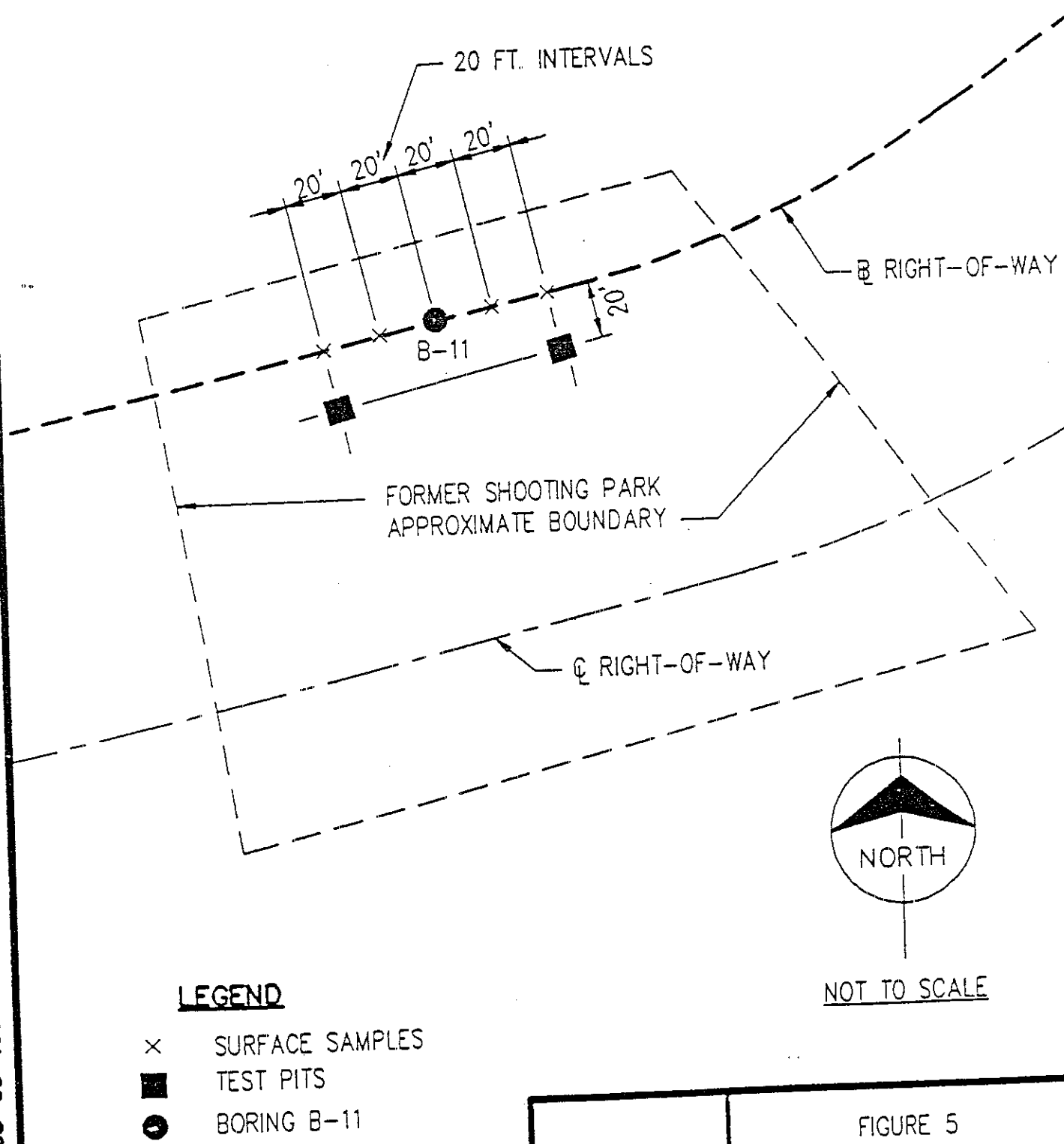
- ● B-1 BORING LOCATIONS
- ○ **B-6** REVISED BORING LOCATIONS

FROM BURNS & McDONNELL PHASE I ENVIRONMENTAL ASSESSMENT, OCTOBER 1991

Woodward-Clyde Consultants
Engineering & sciences applied to the earth and its environment
10975 El Monte, Suite 100
Overland Park, Kansas 66211

CLIENT: HNTB			
LOCATION: KANSAS CITY, MISSOURI			
TITLE: SITE LOCATION PLAN			
PROJ. NO. 91KC083	CHK'D. BY	DATE 06/15/94	DWG. NO. 1

ACAD FILE: 39
6/15/94
PL SC: 1=1



EMPLOYEE - OWNED
ENGINEERS - ARCHITECTS - CONSULTANTS
Kansas City, Missouri

FIGURE 5

SHOOTING PARK
SAMPLE LOCATIONS

Appendix O

List of Groundwater Chemical Analytical Results

Table Well 1-B: Groundwater Quality Parameters, Well No. 1
Table Well 1-C: Drinking Water Suitability Parameters, Well No. 1

Table Well 2-A: Groundwater Contamination Parameters, Well No. 2
Table Well 2-B: Groundwater Quality Parameters, Well and No. 2
Table Well 2-C: Drinking Water Suitability Parameters, Well and No. 2

Table Well 3-A: Groundwater Contamination Parameters, Well and No. 3 (3A)
Table Well 3-B: Groundwater Quality Parameters, Well and No. 3 (3A)
Table Well 3-C: Drinking Water Suitability Parameters, Well and No. 3 (3A)

Table Well 4-B: Groundwater Quality Parameters, Well and No. 4
Table Well 4-C: Drinking Water Suitability Parameters, Well and No. 4

Table Well 5-B: Groundwater Quality Parameters, Well and No. 5
Table Well 5-C: Drinking Water Suitability Parameters, Well and No. 5

Table Well 6-A: Groundwater Contamination Parameters, Well and No. 6
Table Well 6-B: Groundwater Quality Parameters, Well and No. 6
Table Well 6-C: Drinking Water Suitability Parameters, Well and No. 6

Table Well 7-A: Groundwater Contamination Parameters, Well and No. 7
Table Well 7-B: Groundwater Quality Parameters, Well and No. 7
Table Well 7-C: Drinking Water Suitability Parameters, Well and No. 7

Table Well 9-A: Groundwater Contamination Parameters, Well and No. 9
Table Well 9-B: Groundwater Quality Parameters, Well and No. 9
Table Well 9-C: Drinking Water Suitability Parameters, Well and No. 9

Table Well 10-A: Groundwater Contamination Parameters, Well and No. 10
Table Well 10-B: Groundwater Quality Parameters, Well and No. 10
Table Well 10-C: Drinking Water Suitability Parameters, Well and No. 10

The above tables are labeled as follows:

Well #-A: Groundwater Contamination Parameters
Well #-B: Groundwater Quality Parameters
Well #-C: Drinking Water Suitability Parameters

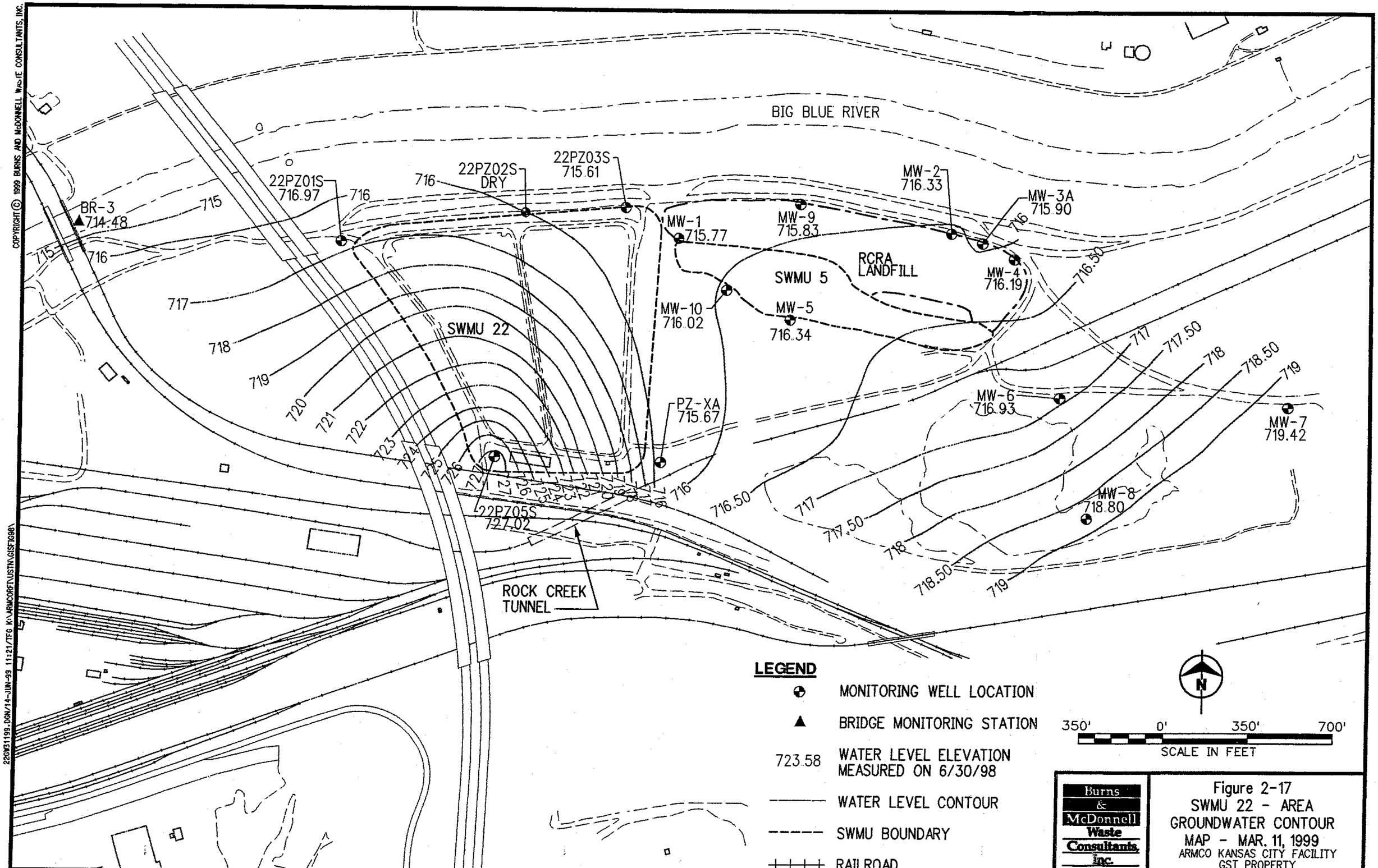


Figure 2-17
SWMU 22 - AREA
GROUNDWATER CONTOUR
MAP - MAR. 11, 1999
ARMCO KANSAS CITY FACILITY
GST PROPERTY

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Table Well 1-B
Groundwater Quality Parameters
Well No. 1

Date Sampled:		01/10/1983
Quarter Number:		Q1
Parameter	Units	
Chloride	mg/L	9
Iron	mg/L	0.03
Manganese	mg/L	0.07
Phenols	mg/L	0.001 U
Sodium	mg/L	11
Sulfate	mg/L	32.70

mg/L = milligrams per Liter
U = Compound was not detected

Table Well 1-C
Drinking Water Suitability Parameters
Well No. 1

Date Sampled:		01/10/1983
Quarter Number:		Q1
Parameter	**Units**	
Arsenic	µg/L	5 U
Barium	mg/L	0.05 U
Cadmium	mg/L	0.01 U
Chromium, Total	mg/L	0.01 U
Fluoride	mg/L	1.58
Lead	mg/L	0.025 U
Mercury	µg/L	0.2 U
Nitrate (as Nitrogen)	mg/L	0.55
Selenium	µg/L	5 U
Silver	mg/L	0.01 U
Endrin	µg/L	0.10 U
Lindane	mg/L	0.001 U
Methoxychlor	mg/L	0.001 U
Toxaphene	mg/L	0.001 U
2,4-D	mg/L	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U
Radium	pCi/L	2.00 U
Gross Alpha	pCi/L	2.00 U
Gross Beta	pCi/L	3
Coliform Bacteria	1/100mL	1 U

mg/L = milligrams per Liter
mL = milliLiter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		4/27/1983	4/27/1983	4/27/1983	4/27/1983
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.70	6.72	6.72	6.71
Specific Conductance	umhos/cm	1600	1700	1700	1700
Total Organic Carbon	mg/L	18	13	20	15
Total Organic Halogen	mg/L	0.282	0.284	0.283	0.287
Total Cadmium	mg/L	0.015	0.015	0.01	0.01
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/28/1983	7/28/1983	7/28/1983	7/28/1983
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.09	7.07	7.09	7.1
Specific Conductance	umhos/cm	1600	1700	1650	1650
Total Organic Carbon	mg/L	15	13	15	15
Total Organic Halogen	mg/L	0.14	0.15	0.15	0.15
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/27/1983	10/27/1983	10/27/1983	10/27/1983
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	6.8	7.0	7.0	7.0
Specific Conductance	umhos/cm	1280	1260	1270	1250
Total Organic Carbon	mg/L	12	13	12	13
Total Organic Halogen	mg/L	0.243	0.247	0.245	0.246
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/26/1984	1/26/1984	1/26/1984	1/26/1984
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.9	6.8	6.9	6.9
Specific Conductance	umhos/cm	970	980	1000	1000
Total Organic Carbon	mg/L	18	19	23	18
Total Organic Halogen	mg/L	0.232	0.240	0.235	0.23
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/05/1984[1]	04/05/1984[1]	04/05/1984[1]	04/05/1984[1]
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	11	10	8	8.3
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		8/15/1984	8/15/1984	8/15/1984	8/15/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.6	6.7	6.6	6.7
Specific Conductance	umhos/cm	1730	1730	1730	1720
Total Organic Carbon	mg/L	17	15	16	16
Total Organic Halogen	mg/L	0.035	0.046	0.048	0.040
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.08	0.05	0.08	0.05
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/23/84[2]	10/23/84[2]	10/23/84[2]	10/23/84[2]
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.1	7.2	7.2
Specific Conductance	umhos/cm	950	970	910	950
Total Organic Carbon	mg/L	11.5	11.8	12.0	11.9
Total Organic Halogen	mg/L	0.036	0.038	0.037	0.035
Total Cadmium	mg/L	0.0040	0.0033	0.0039	0.0047
Total Lead	mg/L	0.034	0.039	0.043	0.040
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.9	6.9	7	7
Specific Conductance	umhos/cm	890	880	890	890
Total Organic Carbon	mg/L	7.9	7.0	8.1	7.7
Total Organic Halogen	mg/L	0.146	0.136	0.142	0.163
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Date Sampled:		10/29/1985	10/29/1985	10/29/1985	10/29/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	6.7	6.7	6.7	6.7
Specific Conductance	umhos/cm	1300	1300	1300	1300
Total Organic Carbon	mg/L	10.8	12.0	12.5	12.8
Total Organic Halogen	mg/L	0.119	0.131	0.127	0.129
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.013	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	1000	1000	1000	1000
Total Organic Carbon	mg/L	6.7	6.3	6.9	6.9
Total Organic Halogen	mg/L	0.107	0.106	0.092	0.093
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.017	0.026	0.020	0.020
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.3	7.2	7.2	7.2
Specific Conductance	umhos/cm	1500	1500	1500	1500
Total Organic Carbon	mg/L	11.05	11.04	10.99	10.89
Total Organic Halogen	mg/L	0.111	0.106	0.102	0.100
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.021	0.020	0.019	0.018

Date Sampled:		1/27/1987	1/27/1987	1/27/1987	1/27/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.0	7.0	7.0
Specific Conductance	umhos/cm	1100	1125	1175	1175
Total Organic Carbon	mg/L	43.00	40.00	38.00	36.00
Total Organic Halogen	mg/L	0.087	0.085	0.079	0.076
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.026	0.024	0.022	0.019
Total Chromium	mg/L	0.010	0.010 U	0.010 U	0.010 U

Date Sampled:		7/31/1987	7/31/1987	7/31/1987	7/31/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7	7	7	7
Specific Conductance	umhos/cm	1200	1200	1200	1225
Total Organic Carbon	mg/L	9.71	9.66	9.71	9.60
Total Organic Halogen	mg/L	0.101	0.092	0.060	0.125
Total Cadmium	mg/L	0.001	0.001	0.001	0.001
Total Lead	mg/L	0.030	0.030	0.033	0.027
Total Chromium	mg/L	0.012	0.012	0.010 U	0.012
Dissolved Cadmium	mg/L	0.001	0.001	0.002	0.001
Dissolved Lead	mg/L	0.032	0.030	0.033	0.027
Dissolved Chromium	mg/L	0.010 U	0.012	0.010 U	0.012

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		4/7/1988	4/7/1988	4/7/1988	4/7/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	1450	1450	1450	1450
Total Organic Carbon	mg/L	9	9	9	9
Total Organic Halogen	mg/L	lost	lost	lost	lost
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.001	0.001	0.002	0.001
Dissolved Lead	mg/L	0.032	0.030	0.033	0.027
Dissolved Chromium	mg/L	0.010 U	0.012	0.010 U	0.012

Date Sampled:		10/3/1988	10/3/1988	10/3/1988	10/3/1988
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.014	N/A	N/A	N/A
Total Chromium	mg/L	0.03 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.03 U	0.03 U	0.03 U	0.03 U

Date Sampled:		3/22/1989	3/22/1989	3/22/1989	3/22/1989
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units	Duplicate	Duplicate	Duplicate	Duplicate
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/09/1990	04/09/1990	04/09/1990	04/09/1990
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		09/28/1990	03/26/1991	9/30/1991
Quarter Number:		Q3	Q1	Q3
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Total Lead	mg/L	0.0076	0.0291	0.005 U
Total Chromium	mg/L	0.01 U	0.063	0.020 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Dissolved Lead	mg/L	0.003 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.010 U	0.020 U

Date Sampled:		3/30/1992	3/30/1992	3/30/1992	3/30/1992
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	0.001 U
Total Lead	mg/L	N/A	N/A	N/A	0.003
Total Chromium	mg/L	N/A	N/A	N/A	0.04 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.002 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.04 U

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		3/31/1993
Quarter Number:		Q1
Parameter	Units	
pH	SU	N/A
Specific Conductance	umhos/cm	N/A
Total Organic Carbon	mg/L	N/A
Total Organic Halogen	mg/L	N/A
Total Cadmium	mg/L	0.005 U
Total Lead	mg/L	0.004
Total Chromium	mg/L	0.01 U
Dissolved Cadmium	mg/L	0.005 U
Dissolved Lead	mg/L	0.003 U
Dissolved Chromium	mg/L	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		10/11/1994	3/28/1995
Quarter Number:		Q4	Q1
Parameter	Units		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	N/A	N/A
Total Lead	mg/L	N/A	N/A
Total Chromium	mg/L	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U

Date Sampled:		10/25/2003	3/14/1996	3/14/1996
Quarter Number:		Q4	Q1	Q1 Duplicate
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U

Date Sampled:		10/1/1996	10/1/1996
Quarter Number:		Q4	Q4 Duplicate
Parameter	Units		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	N/A	N/A
Total Lead	mg/L	N/A	N/A
Total Chromium	mg/L	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U

Table Well 2-A
Groundwater Contamination Parameters
Well No. 2

Date Sampled:		3/11/1997	3/11/1997
Quarter Number:		Q1	Q1 Duplicate
Parameter	Units		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	N/A	N/A
Total Lead	mg/L	N/A	N/A
Total Chromium	mg/L	N/A	N/A
Dissolved Cadmium	mg/L	0.02 U	0.02 U
Dissolved Lead	mg/L	0.002 U	0.002 U
Dissolved Chromium	mg/L	0.02 U	0.02 U

Date Sampled:		10/24/1997	10/24/1997
Quarter Number:		Q4	Q4 Duplicate
Parameter	Units		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	N/A	N/A
Total Lead	mg/L	N/A	N/A
Total Chromium	mg/L	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.0050 U	0.0050 U

1 Retest of Certain 1/26/84 parameters
2 Restest of Certain 8/15/84 Parameters
mg/L = milligrams per Liter
N/A = Not Analyzed
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 2-B
Groundwater Quality Parameters
Well No. 2

Date Sampled:		1/10/1983	4/27/1983	7/28/1983	10/27/1983	1/26/1984	1/30/1985	4/29/1986
Quarter Number:		Q1	Q2	Q3	Q4	Q1	Q1	Q2
Parameter	Units							
Chloride	mg/L	56	98	113	72	60	29	41
Iron	mg/L	2.30	42.00	11.00	3.80	3.60	15.7	0.120
Manganese	mg/L	3.70	3.80	0.05	1.80	0.91	2.8	0.24
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.024
Sodium	mg/L	26	29	32	19	27	16.8	24
Sulfate	mg/L	9.00	0.80	2.20	1.50	3.50	41.00	2.40

Date Sampled:		01/27/1987	04/07/1988	3/22/1989	04/09/1990	03/26/1991	3/30/1992	3/31/1993
Quarter Number:		Q1	Q2	Q1	Q2	Q1	Q1	Q1
Parameter	Units							
Chloride	mg/L	44	80	69	63	61	65	54
Iron	mg/L	3.70	13.1	36.8	13.3	44.2	58	11
Manganese	mg/L	2.08	2.85	2.82	2.14	2.78	2.3	2.1
Phenols	mg/L	0.001 U	lost	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	17	25	21.9	25.2	14.2	26	27
Sulfate	mg/L	5.00	11	10	14	23	10 U	10 U
Dissolved Iron	mg/L	N/A	N/A	N/A	N/A	N/A	12	N/A
Dissolved Manganese	mg/L	N/A	N/A	N/A	N/A	N/A	1.83	N/A
Dissolved Sodium	mg/L	N/A	N/A	N/A	N/A	N/A	25	N/A

N/A = Not Analyzed
mg/L = milligrams per Liter
U = Compound was not detected

Table Well 2-C
Drinking Water Suitability Parameters
Well No. 2

Date Sampled		1/10/1983	4/27/1983	7/28/1983	10/27/1983	1/26/1984
Quarter Number		Q1	Q2	Q3	Q4	Q1
Parameter	Units					
Arsenic	µg/L	52	23	5 U	5 U	5 U
Barium	mg/L	0.10	0.05 U	0.05 U	0.05	0.05 U
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	1.58	0.96	1.66	0.57	0.74
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Mercury	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nitrate (as Nitrogen)	mg/L	0.7	0.03	0.02	0.02	0.79
Selenium	µg/L	5 U	12	5 U	5 U	5 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Lindane	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toxaphene	mg/L	0.001 U	0.001 U	0.001 U	0.001	0.001 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Radium	pCi/L	2.00 U	2.00	2.00	2.00 U	20.00
Gross Alpha	pCi/L	2 U	5	2 U	2 U	92
Gross Beta	pCi/L	4	10	6	6	43
Coliform Bacteria	1/100mL	1 U	1200	1 U	1 U	1 U

mg/L = milligrams per Liter
mL = milliliter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		4/27/1983	4/27/1983	4/27/1983	4/27/1983
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.90	6.96	6.94	6.92
Specific Conductance	umhos/cm	1700	1800	1800	1825
Total Organic Carbon	mg/L	20	9.8	10	8.2
Total Organic Halogen	mg/L	0.078	0.080	0.079	0.080
Total Cadmium	mg/L	0.01	0.01	0.01	0.015
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/28/1983	7/28/1983	7/28/1983	7/28/1983
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.85	6.93	7.00	7.00
Specific Conductance	umhos/cm	2000	2050	1950	2000
Total Organic Carbon	mg/L	14	10	13	11
Total Organic Halogen	mg/L	0.20	0.22	0.22	0.22
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/27/1983	10/27/1983	10/27/1983	10/27/1983
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	6.8	6.9	7.1	7.2
Specific Conductance	umhos/cm	1330	1340	1310	1290
Total Organic Carbon	mg/L	11	11	11	10
Total Organic Halogen	mg/L	0.202	0.191	0.180	0.200
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		01/26/1984	01/26/1984	01/26/1984	01/26/1984
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.7	6.7	6.7	6.7
Specific Conductance	umhos/cm	1000	1000	980	990
Total Organic Carbon	mg/L	18	16	17	14
Total Organic Halogen	mg/L	0.180	0.191	0.196	0.196
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		04/05/84[1]	04/05/84[1]	04/05/84[1]	04/05/84[1]
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	11	7.4	6.7	7.2
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A

Date Sampled:		8/15/1984	8/15/1984	8/15/1984	8/15/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.7	6.8	6.8	6.7
Specific Conductance	umhos/cm	1950	2000	2000	2000
Total Organic Carbon	mg/L	11	13	14	16
Total Organic Halogen	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.23	0.18	0.18	0.23
Total Chromium	mg/L	0.02	0.02	0.02	0.02

Date Sampled:		10/23/84[2]	10/23/84[2]	10/23/84[2]	10/23/84[2]
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.1	7.2	7.2
Specific Conductance	umhos/cm	1200	1200	1180	1190
Total Organic Carbon	mg/L	5.7	6.0	6	6
Total Organic Halogen	mg/L	0.052	0.054	0.05	0.057
Total Cadmium	mg/L	0.0077	0.0067	0.0068	0.0075
Total Lead	mg/L	0.062	0.059	0.062	0.065
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.8	6.8	6.8	6.8
Specific Conductance	umhos/cm	900	900	910	900
Total Organic Carbon	mg/L	4.1	4.5	4.5	4.7
Total Organic Halogen	mg/L	0.145	0.148	0.145	0.156
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Date Sampled:		10/29/1985	10/29/1985	10/29/1985	10/29/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	6.8	6.8	6.8	6.8
Specific Conductance	umhos/cm	1220	1220	1230	1220
Total Organic Carbon	mg/L	25.3	25.9	24.7	24.7
Total Organic Halogen	mg/L	0.131	0.135	0.127	0.131
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.015	0.018	0.018	0.021
Total Chromium	mg/L	0.011	0.010 U	0.010 U	0.010 U

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.8	6.8	6.9	6.9
Specific Conductance	umhos/cm	1010	1010	1000	1010
Total Organic Carbon	mg/L	5.7	5.0	5.0	5.3
Total Organic Halogen	mg/L	0.093	0.088	0.088	0.089
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.021	0.023	0.018	0.019
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.4	7.4	7.3	7.3
Specific Conductance	umhos/cm	1300	1300	1250	1250
Total Organic Carbon	mg/L	5.86	5.82	5.8	5.73
Total Organic Halogen	mg/L	0.091	0.088	0.085	0.081
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.019	0.017	0.015	0.014

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		1/27/1987	1/27/1987	1/27/1987	1/27/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1175	1175	1150	1150
Total Organic Carbon	mg/L	42.00	39.00	38.00	35.00
Total Organic Halogen	mg/L	0.104	0.103	0.098	0.091
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.029	0.028	0.026	0.020
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/31/1987	7/31/1987	7/31/1987	7/31/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1400	1375	1375	1375
Total Organic Carbon	mg/L	9.04	9.03	9.11	9.01
Total Organic Halogen	mg/L	0.104	0.087	0.067	0.095
Total Cadmium	mg/L	0.002	0.002	0.002	0.002
Total Lead	mg/L	0.041	0.044	0.045	0.046
Total Chromium	mg/L	0.016	0.012	0.012	0.013

Date Sampled:		4/6/1988	4/6/1988	4/6/1988	4/6/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	1470	1450	1470	1450
Total Organic Carbon	mg/L	14	3	3	3
Total Organic Halogen	mg/L	0.054	0.051	0.065	0.058
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.01 U

Date Sampled:		10/03/1988	10/03/1988	10/03/1988	10/03/1988
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.040	N/A	N/A	N/A
Total Chromium	mg/L	0.03 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.03 U	0.03 U	0.03 U	0.03 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		3/22/1989	3/22/1989	3/22/1989	3/22/1989
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.035	N/A	N/A	N/A
Total Chromium	mg/L	0.010 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.097	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/09/1990	04/09/1990	04/09/1990	04/09/1990
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.0494	N/A	N/A	N/A
Total Chromium	mg/L	0.01	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		9/28/1990	03/26/1991	09/30/1991
Quarter Number:		Q3	Q1	Q3
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Total Lead	mg/L	0.0281	0.0379	0.0236
Total Chromium	mg/L	0.01 U	0.010 U	0.020 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Dissolved Lead	mg/L	0.003 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.020 U

Date Sampled:		3/30/1992	3/30/1992	3/30/1992	3/30/1992
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	0.001 U
Total Lead	mg/L	N/A	N/A	N/A	0.035
Total Chromium	mg/L	N/A	N/A	N/A	0.04 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.002 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.04 U

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.013	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		3/31/1993
Quarter Number:		Q1
Parameter	Units	
pH	SU	N/A
Specific Conductance	umhos/cm	N/A
Total Organic Carbon	mg/L	N/A
Total Organic Halogen	mg/L	N/A
Total Cadmium	mg/L	0.005 U
Total Lead	mg/L	0.015
Total Chromium	mg/L	0.01 U
Dissolved Cadmium	mg/L	0.005 U
Dissolved Lead	mg/L	0.003 U
Dissolved Chromium	mg/L	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.017	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.004
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 3-A
Groundwater Contamination Parameters
Well No. 3 (3A)

Date Sampled:		10/11/1994	3/28/1995	10/25/1995[3]	3/14/1996
Quarter Number:		Q4	Q1	Q4	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/1/1996	3/11/1997	10/24/1997
Quarter Number:		Q4	Q1	Q4
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.02 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.002 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.02 U	0.005 U

1 Retest of Certain 1/26/84 Parameters
2 Retest of Certain 8/15/84 Parameters
3 Well 3A replaces Well 3 for all samplings after 10/23/95

mg/L = milligrams per Liter
N/A = Not Analyzed
pCi/L = picoCuries per Liter
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 3-B
Groundwater Quality Parameters
Well No. 3 (3A)

Date Sampled:		1/10/1983	4/27/1983	7/28/1983	10/27/1983	1/26/1984	1/30/1985	4/29/1986
Quarter Number:		Q1	Q2	Q3	Q4	Q1	Q1	Q2
Parameter	Units							
Chloride	mg/L	145	311	533	479	310	86	85
Iron	mg/L	0.15	7.50	0.48	0.25	0.08	11.3	0.028
Manganese	mg/L	2.8	7.30	11.00	1.60	0.80	2.6	0.13
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.042
Sodium	mg/L	70	66	101	48	42	47.0	28
Sulfate	mg/L	15.40	35.20	38.90	35.00	42.00	68.00	1.00 U

Date Sampled:		01/27/1987	04/06/1988	3/22/1989	04/09/1990	03/26/1991	3/30/1992	3/31/1993
Quarter Number:		Q1	Q2	Q1	Q2	Q1	Q1	Q1
Parameter	Units							
Chloride	mg/L	59	99	80	88	360	169	310
Iron	mg/L	3.30	7.4	18	13.9	25.2	31	26
Manganese	mg/L	0.89	1.06	1.74	1.57	1.83	2.5	2.2
Phenols	mg/L	0.001 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	21	17	18.3	12.8	14.5	18	34
Sulfate	mg/L	35.00	66	56	50	38	13	18
Dissolved Iron	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	32
Dissolved Sodium	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	18
Dissolved Manganese	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	2.3

N/A = Not Analyzed
mg/L = milligrams per Liter
U = Compound was not detected

Table Well 3-C
Drinking Water Suitability Parameters
Well No. 3 (3A)

Date Sampled		1/10/1983	4/27/1983	7/28/1983	10/27/1983	1/26/1984
Quarter Number		Q1	Q2	Q3	Q4	Q1
Parameter	**Units**					
Arsenic	µg/L	15	5 U	5 U	5 U	5 U
Barium	mg/L	0.40	0.05	0.30	0.05	0.05 U
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	1.26	1.24	1.66	1.42	1.1
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Mercury	µg/L	0.2 U	1.8	0.2 U	0.2 U	0.2 U
Nitrate (as Nitrogen)	mg/L	2.70	0.07	1.34	1.11	0.31
Selenium	µg/L	5 U	6	5 U	5 U	5 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Lindane	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Toxaphene	mg/L	0.001 U	0.001 U	0.001 U	0.001	0.001 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Radium	pCi/L	2.00 U	1.00 U	3.00	1.00 U	10.00
Gross Alpha	pCi/L	3	2 U	2 U	31	9
Gross Beta	pCi/L	8	7	5	13	31
Coliform Bacteria	1/100mL	1 U	3000	1 U	1 U	1 U

mg/L = milligrams per Liter
mL = milliliter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 4-B
Groundwater Quality Parameters
Well No. 4

Date Sampled:		1/10/1983
Quarter Number:		Q1
Parameter	Units	
Chloride	mg/L	117
Iron	mg/L	30
Manganese	mg/L	7.6
Phenols	mg/L	0.001 U
Sodium	mg/L	124
Sulfate	mg/L	14.00

mg/L = milligrams per Liter
U = Compound was not detected

Table Well 4-C
Drinking Water Suitability Parameters
Well No. 4

Date Sampled		1/10/1983
Quarter Number		Q1
Parameter	Units	
Arsenic	µg/L	40
Barium	mg/L	0.20
Cadmium	mg/L	0.01 U
Chromium, Total	mg/L	0.01 U
Fluoride	mg/L	0.90
Lead	mg/L	0.025 U
Mercury	µg/L	0.20 U
Nitrate (as Nitrogen)	mg/L	0.90
Selenium	µg/L	5
Silver	mg/L	0.01 U
Endrin	µg/L	0.10 U
Lindane	mg/L	0.001 U
Methoxychlor	mg/L	0.001 U
Toxaphene	mg/L	0.001 U
2,4-D	mg/L	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U
Radium	pCi/L	2.00 U
Gross Alpha	pCi/L	2 U
Gross Beta	pCi/L	3
Coliform Bacteria	1/100mL	12

mg/L = milligrams per Liter
mL = milliliter
pCi/L = picoCuries per Liter
U Compound was not detected
µg/L = micrograms per Liter

Table Well 5-B
Groundwater Quality Parameters
Well No. 5

Date Sampled:		4/27/1983	7/28/1983	10/27/1983	1/26/1984
Quarter Number:		Q2	Q3	Q4	Q1
Parameter	Units				
Chloride	mg/L	17	25	20	15
Iron	mg/L	9.90	0.25	5.60	2.50
Manganese	mg/L	2.00	1.40	1.3	1.70
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Sodium	mg/L	30	38	24	27
Sulfate	mg/L	44.80	42.60	38.00	43.00

mg/L = milligrams per Liter
U = Compound was not detected

Table Well 5-C
Drinking Water Suitability Parameters
Well No. 5

Date Sampled:		4/27/1983	7/28/1983	10/27/1983	1/26/1984
Quarter Number:		Q2	Q3	Q4	Q1
Parameter	Units				
Arsenic	µg/L	5 U	5 U	5 U	5 U
Barium	mg/L	0.10	0.05 U	0.05	0.05 U
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	1.16	1.40	1.22	0.96
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Mercury	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
Nitrate (as Nitrogen)	mg/L	0.01	0.71	0.54	0.16
Selenium	µg/L	5 U	5 U	5 U	5 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U
Lindane	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Toxaphene	mg/L	0.001 U	0.001 U	0.001	0.001 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Radium	pCi/L	1.00 U	1.40	1.00 U	1.00 U
Gross Alpha	pCi/L	2 U	2 U	9	9
Gross Beta	pCi/L	5	6	6	10
Coliform Bacteria	1/100mL	100	2	5	10

mg/L = milligrams per Liter
mL = milliliter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		7/28/1983	7/28/1983	7/28/1983	7/28/1983
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.97	6.98	7.02	7.06
Specific Conductance	umhos/cm	850	850	880	845
Total Organic Carbon	mg/L	5.6	6.6	9.0	6.4
Total Organic Halogen	mg/L	0.07	0.06	0.07	0.08
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/27/1983	10/27/1983	10/27/1983	10/27/1983
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	7	7.1	7.2	7.2
Specific Conductance	umhos/cm	891	877	881	899
Total Organic Carbon	mg/L	4.6	5.6	5.0	5.8
Total Organic Halogen	mg/L	0.065	0.075	0.070	0.075
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/26/1984	1/26/1984	1/26/1984	1/26/1984
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.7	6.8	6.8	6.8
Specific Conductance	umhos/cm	1000	1000	1000	1100
Total Organic Carbon	mg/L	8.0	7.0	6.9	6.6
Total Organic Halogen	mg/L	0.052	0.059	0.066	0.069
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/05/1984[1]	04/05/1984[1]	04/05/1984[1]	04/05/1984[1]
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1000	1000	1000	1000
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		8/15/1984	8/15/1984	8/15/1984	8/15/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.8	6.8	6.9	6.9
Specific Conductance	umhos/cm	1000	999	998	1002
Total Organic Carbon	mg/L	3.3	2.6	2.9	2.8
Total Organic Halogen	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.2	7.3	7.3	7.2
Specific Conductance	umhos/cm	850	840	850	840
Total Organic Carbon	mg/L	7.8	7.8	7.7	7.7
Total Organic Halogen	mg/L	0.066	0.07	0.068	0.065
Total Cadmium	mg/L	0.0053	0.0052	0.0057	0.0047
Total Lead	mg/L	0.051	0.053	0.05	0.049
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.0	7.0	7.0	7.0
Specific Conductance	umhos/cm	780	780	780	700
Total Organic Carbon	mg/L	3.8	4.0	3.7	4.1
Total Organic Halogen	mg/L	0.136	0.153	0.135	0.158
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Date Sampled:		10/29/1985	10/29/1985	10/29/1985	10/29/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	7.0	7.0	7.0	7.0
Specific Conductance	umhos/cm	850	850	850	850
Total Organic Carbon	mg/L	32.3	32.3	30.9	30.7
Total Organic Halogen	mg/L	0.105	0.113	0.109	0.116
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.019	0.014	0.017	0.017
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	950	900	910	910
Total Organic Carbon	mg/L	7.9	8.3	8.3	8.3
Total Organic Halogen	mg/L	0.109	0.093	0.100	0.097
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.012	0.011	0.014	0.010
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.4	7.3	7.3	7.3
Specific Conductance	umhos/cm	950	950	950	900
Total Organic Carbon	mg/L	6.15	6.12	6.04	5.96
Total Organic Halogen	mg/L	0.103	0.099	0.094	0.085
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.019	0.018	0.017	0.016

Date Sampled:		1/27/1987	1/27/1987	1/27/1987	1/27/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.2	7.2	7.2	7.2
Specific Conductance	umhos/cm	960	950	950	900
Total Organic Carbon	mg/L	46.0	45.0	42.0	41.0
Total Organic Halogen	mg/L	0.085	0.080	0.079	0.079
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.029	0.027	0.025	0.021
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/29/1987	7/29/1987	7/29/1987	7/29/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	925	925	925	900
Total Organic Carbon	mg/L	10.63	10.61	10.4	10.28
Total Organic Halogen	mg/L	0.120	0.100	0.092	0.087
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.033	0.032	0.032	0.024
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.011

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		4/8/1988	4/8/1988	4/8/1988	4/8/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	7.1	7.3	7.3	7.3
Specific Conductance	umhos/cm	982	989	989	986
Total Organic Carbon	mg/L	7	7	7	7
Total Organic Halogen	mg/L	0.008	0.009	0.006	0.008
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		4/8/1988	4/8/1988	4/8/1988	4/8/1988
Quarter Number:		Q2	Q2	Q2	Q2
		Duplicate	Duplicate	Duplicate	Duplicate
Parameter	Units				
pH	SU	7.1	7.3	7.3	7.3
Specific Conductance	umhos/cm	993	997	995	994
Total Organic Carbon	mg/L	7	7	7	7
Total Organic Halogen	mg/L	0.025	0.025	0.025	0.017
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		10/03/1988	10/03/1988	10/03/1988	10/03/1988
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.018	N/A	N/A	N/A
Total Chromium	mg/L	0.03 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.03 U	0.03 U	0.03 U	0.03 U

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		3/22/1989	3/22/1989	3/22/1989	3/22/1989
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.049	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.0267	0.0267	0.0267	0.0267
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/09/1990	04/09/1990	04/09/1990	04/09/1990
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.0083	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		9/28/1990	03/26/1991	9/30/1991
Quarter Number:		Q3	Q1	Q3
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Total Lead	mg/L	0.0058	0.109	0.005 U
Total Chromium	mg/L	0.01 U	0.01 U	0.020 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Dissolved Lead	mg/L	0.003 U	0.0156	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.010 U	0.020 U

Date Sampled:		3/30/1992	3/30/1992	3/30/1992	3/30/1992
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.001 U	N/A	N/A	0.001 U
Total Lead	mg/L	0.005	N/A	N/A	0.005
Total Chromium	mg/L	0.04 U	N/A	N/A	0.04 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.002 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.04 U

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.004	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		3/31/1993
Quarter Number:		Q1
Parameter	Units	
pH	SU	N/A
Specific Conductance	umhos/cm	N/A
Total Organic Carbon	mg/L	N/A
Total Organic Halogen	mg/L	N/A
Total Cadmium	mg/L	0.005 U
Total Lead	mg/L	0.009
Total Chromium	mg/L	0.01 U
Dissolved Cadmium	mg/L	0.005 U
Dissolved Lead	mg/L	0.003 U
Dissolved Chromium	mg/L	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 6-A
Groundwater Contamination Parameters
Well No. 6

Date Sampled:		10/11/1994	3/28/1995	10/25/1995	3/14/1996
Quarter Number:		Q4	Q1	Q4	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/1/1996	3/11/1997	10/24/1997
Quarter Number:		Q4	Q1	Q4
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.02 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.002 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.02 U	0.005 U

Not Sampled 04/27/1983
1 Retest of Certain 1/26/84 Parameters
mg/L = milligrams per Liter
N/A = Not Analyzed
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 6-B
Groundwater Quality Parameters
Well No. 6

Date Sampled:		7/28/1983	10/27/1983	1/26/1984	4/24/1984	1/30/1985	4/29/1986	01/27/1987	04/06/1988
Quarter Number:		Q3	Q4	Q1	Q2	Q1	Q2	Q1	Q2
Parameter	Units								
Chloride	mg/L	14	9	5	7	10	17	15	22
Iron	mg/L	0.05	0.35	0.15	0.01 U	21.4	17.00	6.70	4.6
Manganese	mg/L	0.42	1.90	3.40	0.01 U	2.0	0.08	0.73	0.70
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.028	0.019	0.001 U	0.005 U
Sodium	mg/L	25	15	15	13	15.6	19	27	23
Sulfate	mg/L	50.40	46	37	43	25	1 U	5	10 U

Date Sampled:		03/22/1989	04/09/1990	03/26/1991	03/30/1992	03/31/1993
Quarter Number:		Q1	Q2	Q1	Q1	Q1
Parameter	Units					
Chloride	mg/L	14	17	27	35	14
Iron	mg/L	47.6	29.8	33.3	22	21
Manganese	mg/L	1.13	1.08	0.677	0.79	0.85
Phenols	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	40.3	27.1	37.3	32	25
Sulfate	mg/L	10	38	24	10 U	48
Dissolved Iron	mg/L	N/A	N/A	N/A	16	N/A
Dissolved Manganese	mg/L	N/A	N/A	N/A	0.72	N/A
Dissolved Sodium	mg/L	N/A	N/A	N/A	31	N/A

mg/L = milligrams per Liter
N/A = Not Analyzed
U = Compound was not detected

Table Well 6-C
Drinking Water Suitability Parameters
Well No. 6

Date Sampled		7/28/1983	10/27/1983	1/26/1984	4/24/1984
Quarter Number		Q3	Q4	Q1	Q2
Parameter	Units				
Arsenic	µg/L	5 U	5 U	5 U	5 U
Barium	mg/L	0.05 U	0.05	0.05 U	0.05 U
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	1.36	1.41	1.09	0.73
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Mercury	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
Nitrate (as Nitrogen)	mg/L	1.70	1.52	1.10	0.34
Selenium	µg/L	5 U	5 U	5	5 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U
Lindane	µg/L	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Toxaphene	mg/L	0.001 U	0.001	0.001 U	0.001 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Radium	pCi/L	1.10	1.00 U	4.00	1.00 U
Gross Alpha	pCi/L	18	2 U	30	18
Gross Beta	pCi/L	14	7	11	12
Coliform Bacteria	1/100mL	500	650	320	1 U

mg/L = milligrams per Liter
mL = milliliter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 7-A
Groundwater Contamination Parameters
Well No. 7

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.9	6.9	7.0	7.0
Specific Conductance	umhos/cm	1300	1300	1400	1380
Total Organic Carbon	mg/L	20.9	21.5	21.7	21.7
Total Organic Halogen	mg/L	0.050	0.048	0.052	0.048
Total Cadmium	mg/L	0.0048	0.0051	0.0044	0.0048
Total Lead	mg/L	0.055	0.052	0.055	0.056
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		4/29/1985	4/29/1985	4/29/1985	4/29/1985
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.7	6.7	6.8	6.8
Specific Conductance	umhos/cm	1200	1200	1200	1230
Total Organic Carbon	mg/L	13.6	13.6	13.5	13.8
Total Organic Halogen	mg/L	0.082	0.086	0.087	0.091
Total Cadmium	mg/L	0.0043	0.0042	0.0044	0.0042
Total Lead	mg/L	0.019	0.020	0.029	0.019
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.8	6.8	6.8	6.9
Specific Conductance	umhos/cm	1300	1310	1300	1300
Total Organic Carbon	mg/L	10.1	10.3	10.6	10.8
Total Organic Halogen	mg/L	0.205	0.198	0.222	0.225
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Date Sampled:		10/29/1985	10/29/1985	10/29/1985	10/29/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	6.8	6.8	6.8	6.8
Specific Conductance	umhos/cm	1510	1500	1500	1510
Total Organic Carbon	mg/L	13.8	13.6	13.8	13.9
Total Organic Halogen	mg/L	0.169	0.170	0.168	0.170
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.011	0.017	0.011	0.010 U
Total Chromium	mg/L	0.010	0.010 U	0.010 U	0.010 U

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.7	6.8	6.8	6.8
Specific Conductance	umhos/cm	1550	1560	1550	1550
Total Organic Carbon	mg/L	14.8	12.6	14.0	14.6
Total Organic Halogen	mg/L	0.086	0.090	0.098	0.104
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.017	0.019	0.014	0.016
Total Chromium	mg/L	0.010 U	0.013	0.010	0.010 U

Table Well 7-A
Groundwater Contamination Parameters
Well No. 7

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.0
Specific Conductance	umhos/cm	1650	1650	1600	1600
Total Organic Carbon	mg/L	14.13	14.06	14.05	13.55
Total Organic Halogen	mg/L	0.1	0.092	0.091	0.087
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.029	0.028	0.028	0.023

Date Sampled:		1/27/1987	1/27/1987	1/27/1987	1/27/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1600	1575	1575	1550
Total Organic Carbon	mg/L	85.00	75.00	74.00	75.00
Total Organic Halogen	mg/L	0.090	0.077	0.077	0.075
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.034	0.033	0.033	0.030
Total Chromium	mg/L	0.011	0.011	0.010	0.010

Date Sampled:		7/31/1987	7/31/1987	7/31/1987	7/31/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1525	1525	1525	1550
Total Organic Carbon	mg/L	16.37	16.32	16.37	16.78
Total Organic Halogen	mg/L	0.336	0.329	0.332	0.329
Total Cadmium	mg/L	0.002	0.002	0.003	0.001
Total Lead	mg/L	0.042	0.046	0.054	0.032
Total Chromium	mg/L	0.012	0.012	0.014	0.010

Date Sampled:		4/6/1988	4/6/1988	4/6/1988	4/6/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	1830	1840	1840	1840
Total Organic Carbon	mg/L	18	18	18	18
Total Organic Halogen	mg/L	0.013	0.017	0.023	0.015
Total Cadmium	mg/L	NA	NA	NA	NA
Total Lead	mg/L	NA	NA	NA	NA
Total Chromium	mg/L	NA	NA	NA	NA
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

mg/L = milligrams per Liter
N/A = Not analyzed
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 7-B
Groundwater Quality Parameters
Well No. 7

Date Sampled:		1/30/1985	4/29/1985	7/31/1985	10/29/1985	1/20/1986	4/29/1986	01/27/1987	04/06/1988
Quarter Number:		Q1	Q2	Q3	Q4	Q1	Q2	Q1	Q2
Parameter	Units								
Chloride	mg/L	50	58	56	66	57	68	71	95
Iron	mg/L	56.3	45.00	0.079	0.370	0.022	3.90	17.90	29.1
Manganese	mg/L	2.3	0.69	0.49	0.23	0.10 U	0.11	0.89	1.4
Phenols	mg/L	0.001 U	0.002	0.005 U	0.001 U	0.001 U	0.005	0.001 U	0.005 U
Sodium	mg/L	52.0	50	47	21	43	50	50	42
Sulfate	mg/L	2.20	2.30	1.00	12.00	7.00	1.00 U	5.00	10

mg/L = milligrams per Liter

U = Compound was not detected

Table Well 7-C
Drinking Water Suitability Parameters
Well No. 7

Date Sampled:		1/30/1985	4/29/1985	7/31/1985	10/29/1985	1/20/1986	4/29/1986
Quarter Number:		Q1	Q2	Q3	Q4	Q1	Q2
Parameter	Units						Dissolved Metals
Arsenic	µg/L	180	5 U	3 U	1 U	2	1 U
Barium	mg/L	0.87	0.50	0.487	0.430	0.630	0.510
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.025 U	0.010 U	0.010 U	0.010
Fluoride	mg/L	0.21	0.19	0.21	0.17	0.28	N/A
Lead	mg/L	0.056	0.029	0.025 U	0.017	0.019	0.015
Mercury	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nitrate (as Nitrogen)	mg/L	0.05	0.11	0.01 U	0.04	0.02	N/A
Selenium	µg/L	1 U	1 U	2 U	1 U	1 U	1 U
Silver	mg/L	0.005 U	0.005 U	0.020 U	0.013	0.010 U	0.001 U
Endrin	µg/L	0.20 U	0.20 U	1.00 U	0.20 U	0.20 U	N/A
Lindane	mg/L	0.020 U	0.020 U	0.004 U	0.004 U	0.004 U	N/A
Methoxychlor	mg/L	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	N/A
Toxaphene	mg/L	0.050 U	0.050 U	0.005 U	0.005 U	0.005 U	N/A
2,4-D	mg/L	0.10 U	0.10 U	1.000 U	0.10 U	0.10 U	N/A
2,4,5-TP (Silvex)	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	N/A
Radium	pCi/L	1.00 U	1.00 U	1.00 U	1.00 U	N/A	N/A
Gross Alpha	pCi/L	2 U	2 U	2 U	2 U	N/A	N/A
Gross Beta	pCi/L	10	2	10	3 U	N/A	N/A
Coliform Bacteria	1/100mL	1 U	1 U	1 U	1 U	1 U	N/A

Construction date was 10/21/1982

mg/L = milligrams per Liter
N/A = Not Analyzed
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		4/27/1983	4/27/1983	4/27/1983	4/27/1983
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	7.32	7.34	7.35	7.32
Specific Conductance	umhos/cm	1100	1100	1100	1100
Total Organic Carbon	mg/L	24	16	16	14
Total Organic Halogen	mg/L	1.13	1.14	1.14	1.13
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/28/1983	7/28/1983	7/28/1983	7/28/1983
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.07	7.04	7.06	7.10
Specific Conductance	umhos/cm	1100	1100	1150	1100
Total Organic Carbon	mg/L	8.6	8.6	5.8	9.2
Total Organic Halogen	mg/L	0.14	0.12	0.14	0.13
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/27/1983	10/27/1983	10/27/1983	10/27/1983
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	7.0	7.2	7.1	7.1
Specific Conductance	umhos/cm	1100	1090	1100	1080
Total Organic Carbon	mg/L	8.8	8.3	6.6	7.2
Total Organic Halogen	mg/L	0.120	0.135	0.125	0.130
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/26/1984	1/26/1984	1/26/1984	1/26/1984
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	6.9	7.0	7.0	6.9
Specific Conductance	umhos/cm	1100	1000	1100	1100
Total Organic Carbon	mg/L	31	31	31	31
Total Organic Halogen	mg/L	0.110	0.101	0.115	0.120
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/05/1984[1]	04/05/1984[1]	04/05/1984[1]	04/05/1984[1]
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.8	6.9	7.0	7.0
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	6.4	7.2	5.9	6.4
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		8/15/1984	8/15/1984	8/15/1984	8/15/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	6.9	6.9	6.9	6.9
Specific Conductance	umhos/cm	1150	1160	1150	1160
Total Organic Carbon	mg/L	3.6	4.3	3.7	3.8
Total Organic Halogen	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.2	7.3	7.2	7.3
Specific Conductance	umhos/cm	880	870	880	860
Total Organic Carbon	mg/L	7.6	7.5	7.4	7.5
Total Organic Halogen	mg/L	0.046	0.047	0.044	0.049
Total Cadmium	mg/L	0.0034	0.0036	0.0030	0.0041
Total Lead	mg/L	0.033	0.035	0.034	0.034
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.0	7.0	7.0	7.0
Specific Conductance	umhos/cm	790	780	780	780
Total Organic Carbon	mg/L	5.7	5.8	5.7	5.9
Total Organic Halogen	mg/L	0.158	0.153	0.145	0.152
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Date Sampled:		10/29/1985	10/29/1985	10/29/1985	10/29/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	7.0	7.0	7.0	7.0
Specific Conductance	umhos/cm	890	890	890	880
Total Organic Carbon	mg/L	4.4	4.5	4.2	4.1
Total Organic Halogen	mg/L	0.149	0.151	0.152	0.142
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.0	7.0	7.0	7.0
Specific Conductance	umhos/cm	850	850	850	830
Total Organic Carbon	mg/L	4.6	5.5	5.4	4.6
Total Organic Halogen	mg/L	0.099	0.093	0.097	0.080
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.021	0.015	0.014	0.013
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.4	7.4	7.4	7.4
Specific Conductance	umhos/cm	1000	1000	1000	1000
Total Organic Carbon	mg/L	5.44	5.41	5.37	5.3
Total Organic Halogen	mg/L	0.102	0.094	0.093	0.088
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.021	0.019	0.019	0.019

Date Sampled:		1/27/1987	1/27/1987	1/27/1987	1/27/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	975	975	950	950
Total Organic Carbon	mg/L	31	29	27	27
Total Organic Halogen	mg/L	0.076	0.076	0.068	0.060
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		07/29/1987	07/29/1987	07/29/1987	07/29/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	900	900	900	870
Total Organic Carbon	mg/L	6.34	6.32	6.24	6.07
Total Organic Halogen	mg/L	0.119	0.108	0.097	0.122
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.036	0.028	0.023	0.018
Total Chromium	mg/L	0.013	0.012	0.010	0.010

Date Sampled:		4/7/1988	4/7/1988	4/7/1988	4/7/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	6.6	6.6	6.6	6.6
Specific Conductance	umhos/cm	1250	1250	1250	1250
Total Organic Carbon	mg/L	16	16	16	16
Total Organic Halogen	mg/L	0.018	0.019	0.019	0.014
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		10/03/1988	10/03/1988	10/03/1988	10/03/1988
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.014	N/A	N/A	N/A
Total Chromium	mg/L	0.03 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.03 U	0.03 U	0.03 U	0.03 U

Date Sampled:		3/22/1989	3/22/1989	3/22/1989	3/22/1989
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		04/09/1990	04/09/1990	04/09/1990	04/09/1990
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.0166	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		04/09/1990	04/09/1990	04/09/1990	04/09/1990
Quarter Number:		Q2	Q2	Q2	Q2
		Duplicate	Duplicate	Duplicate	Duplicate
Parameter	**Units**				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/28/1990	9/28/1990	03/26/1991	03/26/1991
Quarter Number:		Q3	Q3	Q1	Q1
			Duplicate		Duplicate
Parameter	**Units**	N/A	N/A	N/A	N/A
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.0031	0.0044	0.005 U	0.005 U
Total Chromium	mg/L	0.01 U	0.01 U	0.010 U	0.010 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.010 U	0.010 U

Date Sampled:		9/30/1991	9/30/1991
Quarter Number:		Q3	Q3
			Duplicate
Parameter	**Units**		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	0.020 U	0.020 U
Total Lead	mg/L	0.005 U	0.005 U
Total Chromium	mg/L	0.020 U	0.020 U
Dissolved Cadmium	mg/L	0.020 U	0.020 U
Dissolved Lead	mg/L	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.020 U	0.020 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		3/30/1992	3/30/1992	3/30/1992	3/30/1992
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.001 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.04 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.002 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.04 U	0.01 U	0.01 U	0.01 U

Date Sampled:		3/30/1992
Quarter Number:		Q1
		Duplicate
Parameter	Units	N/A
pH	SU	N/A
Specific Conductance	umhos/cm	N/A
Total Organic Carbon	mg/L	N/A
Total Organic Halogen	mg/L	N/A
Total Cadmium	mg/L	0.001 U
Total Lead	mg/L	0.003 U
Total Chromium	mg/L	0.04 U
Dissolved Cadmium	mg/L	0.002 U
Dissolved Lead	mg/L	0.003 U
Dissolved Chromium	mg/L	0.04 U

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
		Duplicate	Duplicate	Duplicate	Duplicate
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		3/31/1993	3/31/1993
Quarter Number:		Q1	Q1 Duplicate
Parameter	Units		
pH	SU	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U
Total Lead	mg/L	0.009	0.005
Total Chromium	mg/L	0.01 U	0.01 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4 Duplicate	Q4 Duplicate	Q4 Duplicate	Q4 Duplicate
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.004
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
		Duplicate	Duplicate	Duplicate	Duplicate
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/11/1994	10/11/1994	3/28/1995	3/28/1995
Quarter Number:		Q4	Q4	Q1	Q1
			Duplicate		Duplicate
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/25/1995	10/25/1995	3/14/1996	3/14/1996
Quarter Number:		Q4	Q4	Q1	Q1
			Duplicate		Duplicate
Parameter	Units				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 9-A
Groundwater Contamination Parameters
Well No. 9

Date Sampled:		10/1/1996	3/11/1997	10/24/1997
Quarter Number:		Q4	Q1	Q4
Parameter	Units			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.02 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.02 U	0.0050 U
Dissolved Chromium	mg/L	0.01 U	0.002 U	0.005 U

1 Retest of Certain 1/26/84 Parameters
mg/L = milligrams per Liter
N/A = Not Analyzed
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 9-B
Groundwater Quality Parameters
Well No. 9

Date Sampled:		4/27/1983	7/28/1983	10/27/1983	1/26/1984	1/30/1985	4/29/1986	01/27/1987
Quarter Number:		Q2	Q3	Q4	Q1	Q1	Q2	Q1
Parameter	Units							
Chloride	mg/L	133	92	81	60	44	34	48
Iron	mg/L	1.20	0.20	1.80	0.13	10.8	0.010	0.35
Manganese	mg/L	0.65	2.90	1.30	1.10	2.3	0.14	1.87
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.025	0.017	0.001 U
Sodium	mg/L	34	55	33	45	34.0	31	26
Sulfate	mg/L	15.80	77.80	69.00	63.00	24.00	1.00 U	11.00

Date Sampled:		04/07/1988	3/22/1989	04/09/1990	04/09/1990	03/26/1991	03/26/1991
Quarter Number:		Q2	Q1	Q2	Q2 Duplicate	Q1	Q1 Duplicate
Parameter	Units						
Chloride	mg/L	70	290	210	210	298	309
Iron	mg/L	8.3	22.4	23.8	22.5	20.2	19.9
Manganese	mg/L	2.05	1.72	1.94	1.93	1.7	1.68
Phenols	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	27	1160	23.2	22.4	31.1	29.4
Sulfate	mg/L	10 U	10 U	14	17	62	62

Date Sampled:		3/30/1992	3/30/1992	3/31/1993	3/31/1993
Quarter Number:		Q1	Q1 Duplicate	Q1	Q1 Duplicate
Parameter	Units				
Chloride	mg/L	171	177	47	50
Iron	mg/L	19	18	12	13
Manganese	mg/L	1.59	1.59	1.5	1.5
Phenols	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	40	40	21	21
Sulfate	mg/L	11	10 U	10 U	10 U
Dissolved Iron	mg/L	16	16	N/A	N/A
Dissolved Manganese	mg/L	1.64	1.65	N/A	N/A
Dissolved Sodium	mg/L	38	38	N/A	N/A

mg/L = milligrams per Liter
N/A = Not Analyzed
U = Compound was not detected

Table Well 9-C
Drinking Water Suitability Parameters
Well No. 9

Date Sampled		4/27/1983	7/28/1983	10/27/1983	1/26/1984
Quarter Number		Q2	Q3	Q4	Q1
Parameter	Units				
Arsenic	µg/L	5 U	5 U	5 U	5 U
Barium	mg/L	0.10	0.05 U	0.10	0.05 U
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	1.10	1.36	1.12	0.91
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Mercury	µg/L	0.2 U	0.2 U	0.2 U	0.2 U
Nitrate (as Nitrogen)	mg/L	0.04	0.15	0.10	0.02
Selenium	µg/L	5 U	5 U	5 U	5 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.10 U
Lindane	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Toxaphene	mg/L	0.001 U	0.001 U	0.001	0.001 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.001 U
Radium	pCi/L	1.00 U	3.00	1.00 U	15.00
Gross Alpha	pCi/L	2 U	2 U	2 U	17
Gross Beta	pCi/L	5	9	4	50
Coliform Bacteria	1/100mL	5200	1 U	1 U	1 U

mg/L = milligrams per Liter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		4/24/1984	4/24/1984	4/24/1984	4/24/1984
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Unit				
pH	SU	7.22	7.29	7.35	7.27
Specific Conductance	umhos/cm	460	460	460	460
Total Organic Carbon	mg/L	2.6	2.6	2.4	2.6
Total Organic Halogen	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		8/15/1984	8/15/1984	8/15/1984	8/15/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	7.1	7	7	7
Specific Conductance	umhos/cm	506	507	507	505
Total Organic Carbon	mg/L	3.8	4.8	4.6	4.2
Total Organic Halogen	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/23/1984	10/23/1984	10/23/1984	10/23/1984
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	7.6	7.7	7.8	7.9
Specific Conductance	umhos/cm	490	500	520	520
Total Organic Carbon	mg/L	5.2	5	4.6	4.5
Total Organic Halogen	mg/L	0.045	0.020	0.030	0.028
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		1/30/1985	1/30/1985	1/30/1985	1/30/1985
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Unit				
pH	SU	7.2	7.3	7.3	7.3
Specific Conductance	umhos/cm	440	445	445	445
Total Organic Carbon	mg/L	8.7	9	9	9.2
Total Organic Halogen	mg/L	0.037	0.038	0.036	0.031
Total Cadmium	mg/L	0.0021	0.0025	0.0024	0.0026
Total Lead	mg/L	0.026	0.032	0.032	0.029
Total Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		7/31/1985	7/31/1985	7/31/1985	7/31/1985
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	7	7	7	7
Specific Conductance	umhos/cm	490	490	490	500
Total Organic Carbon	mg/L	4.1	4	4.2	4.3
Total Organic Halogen	mg/L	0.173	0.156	0.179	0.162
Total Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Total Lead	mg/L	0.025 U	0.025 U	0.025 U	0.025 U
Total Chromium	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		10/30/1985	10/30/1985	10/30/1985	10/30/1985
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Unit				
pH	SU	7.1	7.1	7.1	7.2
Specific Conductance	umhos/cm	510	510	500	510
Total Organic Carbon	mg/L	14.7	15	14.1	14.6
Total Organic Halogen	mg/L	0.099	0.106	0.107	0.102
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		1/20/1986	1/20/1986	1/20/1986	1/20/1986
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Unit				
pH	SU	7.1	7.1	7.1	7.1
Specific Conductance	umhos/cm	400	405	400	405
Total Organic Carbon	mg/L	2.1	2	2	2.4
Total Organic Halogen	mg/L	0.080	0.072	0.093	0.092
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/25/1986	7/25/1986	7/25/1986	7/25/1986
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	7.7	7.6	7.6	7.6
Specific Conductance	umhos/cm	700	700	675	675
Total Organic Carbon	mg/L	3.79	3.78	3.74	3.72
Total Organic Halogen	mg/L	0.094	0.090	0.088	0.082
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.014	0.013	0.013	0.013

Date Sampled:		1/28/1987	1/28/1987	1/28/1987	1/28/1987
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Unit				
pH	SU	7.2	7.2	7.2	7.2
Specific Conductance	umhos/cm	450	450	440	410
Total Organic Carbon	mg/L	13.3	13.2	12.4	12.3
Total Organic Halogen	mg/L	0.100	0.094	0.085	0.079
Total Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Total Lead	mg/L	0.010 U	0.010 U	0.010 U	0.010 U
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		7/31/1987	7/31/1987	7/31/1987	7/31/1987
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	7.2	7.2	7.2	7.2
Specific Conductance	umhos/cm	500	500	575	600
Total Organic Carbon	mg/L	5.49	5.37	5.47	5.44
Total Organic Halogen	mg/L	0.020	0.028	0.013	0.019
Total Cadmium	mg/L	0.002	0.001	0.001	0.002
Total Lead	mg/L	0.028	0.024	0.026	0.037
Total Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.012

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		4/8/1988	4/8/1988	4/8/1988	4/8/1988
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Unit				
pH	SU	6.9	7.1	7.2	7.2
Specific Conductance	umhos/cm	1050	1040	1040	1040
Total Organic Carbon	mg/L	5	5	5	5
Total Organic Halogen	mg/L	0.007	0.005	0.008	0.005 U
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.010 U	0.010 U	0.010 U	0.010 U

Date Sampled:		10/3/1988	10/3/1988	10/3/1988	10/3/1988
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.03 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.03 U	0.03 U	0.03 U	0.03 U

Date Sampled:		3/22/1989	3/22/1989	3/22/1989	3/22/1989
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/18/1989	9/18/1989	9/18/1989	9/18/1989
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.005 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		04/10/1990	04/10/1990	04/10/1990	04/10/1990
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		9/28/1990	03/27/1991	09/30/1991
Quarter Number:		Q3	Q1	Q3
Parameter	Unit			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Total Lead	mg/L	0.0042	0.005 U	0.005 U
Total Chromium	mg/L	0.01 U	0.010 U	0.020 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.020 U
Dissolved Lead	mg/L	0.003 U	0.005 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.010 U	0.020 U

Date Sampled:		3/30/1992	3/30/1992	3/30/1992	3/30/1992
Quarter Number:		Q1	Q1	Q1	Q1
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	0.001 U
Total Lead	mg/L	N/A	N/A	N/A	0.003 U
Total Chromium	mg/L	N/A	N/A	N/A	0.04 U
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.002 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.04 U

Date Sampled:		09/28/1992	09/28/1992	09/28/1992	09/28/1992
Quarter Number:		Q3	Q3	Q3	Q3
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.003 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		3/31/1993
Quarter Number:		Q1
Parameter	Unit	
pH	SU	N/A
Specific Conductance	umhos/cm	N/A
Total Organic Carbon	mg/L	N/A
Total Organic Halogen	mg/L	N/A
Total Cadmium	mg/L	0.005 U
Total Lead	mg/L	0.003
Total Chromium	mg/L	0.01 U
Dissolved Cadmium	mg/L	0.005 U
Dissolved Lead	mg/L	0.003 U
Dissolved Chromium	mg/L	0.01 U

Date Sampled:		12/14/1993	12/14/1993	12/14/1993	12/14/1993
Quarter Number:		Q4	Q4	Q4	Q4
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	0.005 U	N/A	N/A	N/A
Total Lead	mg/L	0.01 U	N/A	N/A	N/A
Total Chromium	mg/L	0.01 U	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		6/8/1994	6/8/1994	6/8/1994	6/8/1994
Quarter Number:		Q2	Q2	Q2	Q2
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U

Date Sampled:		10/11/1994	3/28/1995	10/25/1995
Quarter Number:		Q4	Q1	Q4
Parameter	Unit			
pH	SU	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.003 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.01 U

Table Well 10-A
Groundwater Contamination Parameters
Well No. 10

Date Sampled:		3/14/1996	10/1/1996	3/11/1997	10/24/1997
Quarter Number:		Q1	Q4	Q1	Q4
Parameter	Unit				
pH	SU	N/A	N/A	N/A	N/A
Specific Conductance	umhos/cm	N/A	N/A	N/A	N/A
Total Organic Carbon	mg/L	N/A	N/A	N/A	N/A
Total Organic Halogen	mg/L	N/A	N/A	N/A	N/A
Total Cadmium	mg/L	N/A	N/A	N/A	N/A
Total Lead	mg/L	N/A	N/A	N/A	N/A
Total Chromium	mg/L	N/A	N/A	N/A	N/A
Dissolved Cadmium	mg/L	0.005 U	0.005 U	0.02 U	0.005 U
Dissolved Lead	mg/L	0.003 U	0.003 U	0.002 U	0.005 U
Dissolved Chromium	mg/L	0.01 U	0.01 U	0.02 U	0.005 U

mg/L = milligrams per Liter
N/A = Not Analyzed
SU = Standard Units
U = Compound was not detected
umhos/cm = microohms per centimeter

Table Well 10-B
Groundwater Quality Parameters
Well No. 10

Date Sampled:		4/24/1984	8/15/1984	10/23/1984	1/30/1985	4/29/1986
Quarter Number:		Q2	Q3	Q4	Q1	Q2
Parameter	Units					
Chloride	mg/L	14	46	47	30	6
Iron	mg/L	0.01 U	5.3	6.4	12.2	0.010 U
Manganese	mg/L	0.01 U	1.0	1.1	1.4	0.08
Phenols	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.005
Sodium	mg/L	6	11	6.7	5.3	8
Sulfate	mg/L	43.00	55.00	49.00	18.00	5.80

Date Sampled:		01/27/1987	04/16/1988	3/22/1989	4/10/1990	03/26/1991
Quarter Number:		Q1	Q2	Q1	Q2	Q1
Parameter	Units					
Chloride	mg/L	9	40	48	13	18
Iron	mg/L	1.60	15.2	22.5	22.2	19.7
Manganese	mg/L	0.81	1.2	1.33	1.49	1.16
Phenols	mg/L	0.001 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	mg/L	10	34	41.2	10.1	16.4
Sulfate	mg/L	3.00	12	11	53	30

Date Sampled:		3/30/1992	3/31/1993
Quarter Number:		Q1	Q1
Parameter	Units		
Chloride	mg/L	23	47
Iron	mg/L	22	21
Manganese	mg/L	1.5	1.5
Phenols	mg/L	0.005 U	0.005 U
Sodium	mg/L	27	50
Sulfate	mg/L	34	84
Dissolved Iron	mg/L	21	N/A
Dissolved Manganese	mg/L	1.47	N/A
Dissolved Sodium	mg/L	27	N/A

mg/L = milligrams per Liter
N/A = Not Analyzed
U = Compound was not detected

Table Well 10-C
Drinking Water Suitability Parameters
Well No. 10

Date Sampled:		4/24/1984	8/15/1984	10/23/1984	1/30/1985
Quarter Number:		Q2	Q3	Q4	Q1
Parameter	Units				
Arsenic	µg/L	5 U	38	38	42
Barium	mg/L	0.05 U	0.05 U	0.05 U	0.29
Cadmium	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Chromium, Total	mg/L	0.01 U	0.01 U	0.01 U	0.01 U
Fluoride	mg/L	0.62	0.32	0.23	0.16
Lead	mg/L	0.025 U	0.025 U	0.025 U	0.032
Mercury	µg/L	0.2 U	0.2 U	0.2 U	1.0 U
Nitrate (as Nitrogen)	mg/L	0.94	0.75	0.43	0.05
Selenium	µg/L	5 U	5 U	5 U	1 U
Silver	mg/L	0.01 U	0.01 U	0.01 U	0.005 U
Endrin	µg/L	0.10 U	0.10 U	0.10 U	0.20 U
Lindane	mg/L	0.001 U	0.001 U	0.001 U	0.020 U
Methoxychlor	mg/L	0.001 U	0.001 U	0.001 U	0.100 U
Toxaphene	mg/L	0.001 U	0.001 U	0.001 U	0.050 U
2,4-D	mg/L	0.001 U	0.001 U	0.001 U	0.10 U
2,4,5-TP (Silvex)	mg/L	0.001 U	0.001 U	0.001 U	0.01 U
Radium	pCi/L	1.00 U	1.00 U	1.00 U	1.00 U
Gross Alpha	pCi/L	2 U	2 U	2 U	2 U
Gross Beta	pCi/L	7	3 U	6	3 U
Coliform Bacteria	1/100mL	1 U	1 U	1 U	1 U

mg/L = milligrams per Liter
pCi/L = picoCuries per Liter
U = Compound was not detected
µg/L = micrograms per Liter

APPENDIX C
Comprehensive Analytical Result Data Tables

APPENDIX C - Comprehensive Analytical Result Tables

C-1 SWMU 2 Direct-Push Groundwater Results
C-2 SWMU 12 Soil Results
C-3 AOC 8 Soil Results
C-4 SWMU 3 Direct-Push Groundwater Results
C-5 SWMU 7 Soil Results
C-6 SWMU 9 Soil Results
C-7 SWMU 6 Soil Results
C-8 AOC 4 Soil Results
C-9 SWMU 24 Soil Results
C-10 SWMU 24 Groundwater Results
C-11 SWMU 13 Soil Results
C-12 SWMU 17 Soil Results
C-13 SWMU 33 Groundwater Results
C-14 33MW2 Groundwater Sample Results – Intermediate Well
C-15 33MW2S Groundwater Sample Results – Shallow Well
C-16 33MW3 Groundwater Sample Results – Deep Well
C-17 33MW4 Groundwater Sample Results – Deep Well
C-18 33MW4S Groundwater Sample Results – Shallow Well
C-19 33MW5D Groundwater Sample Results – Deep Well
C-20 33MW5I Groundwater Sample Results – Intermediate Well
C-21 33MW5S Groundwater Sample Results – Shallow Well
C-22 33MW6D Groundwater Sample Results – Deep Well
C-23 33MW7D Groundwater Sample Results – Deep Well
C-24 33MW7S Groundwater Sample Results – Shallow Well
C-25 33MW8S Groundwater Sample Results – Shallow Well
C-26 33MW9S Groundwater Sample Results – Shallow Well
C-27 33MW10D Groundwater Sample Results – Deep Well
C-28 33MW10S Groundwater Sample Results – Shallow Well
C-29 33MW11D Groundwater Sample Results – Deep Well
C-30 33MW11S Groundwater Sample Results – Shallow Well
C-31 33MW12D Groundwater Sample Results – Deep Well
C-32 33MW12S Groundwater Sample Results – Shallow Well
C-33 33MW13D Groundwater Sample Results – Deep Well
C-34 33MW13S Groundwater Sample Results – Shallow Well
C-35 33MW14D Groundwater Sample Results – Deep Well
C-36 33MW14S Groundwater Sample Results – Shallow Well
C-37 33MW15D Groundwater Sample Results – Deep Well
C-38 33MW15S Groundwater Sample Results – Shallow Well
C-39 33MW16D Groundwater Sample Results – Deep Well
C-40 33MW16S Groundwater Sample Results – Shallow Well

Table C-1
SWMU 2, Old Blue River "W" Landfill, Direct-Push Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		02B18 / DW1			02B19 / DW1			02B20 / DW1			02B21 / DW1			02B21 / DW1D		
Depth (ft):		24 - 28			14 - 18			22 - 26			16 - 20			16 - 20		
Date Collected:		9/12/2007			9/12/2007			9/12/2007			9/12/2007			9/12/2007		
Lab ID:		510-18114-2			510-18114-5			510-18114-6			510-18114-3			510-18114-4		
Comments:														Duplicate		
Parameter	**Units**															
Filtered Metals																
Cadmium, Dissolved	mg/L	0.001	U		0.001	U		0.001	U		0.001	U		0.001	U	
Lead, Dissolved	mg/L	0.0005	U		***0.012***			0.0005	U		***0.057***			***0.021***		
Volatile Organic Compounds																
1,1,1-Trichloroethane	ug/L	5	U		5	U		5	U		100	U		100	U	
1,1,2,2-Tetrachloroethane	ug/L	5	U		5	U		5	U		100	U		100	U	
1,1,2-Trichloroethane	ug/L	5	U		5	U		5	U		100	U		100	U	
1,1-Dichloroethane	ug/L	5	U		***1.4***	***J***		5	U		100	U		100	U	
1,1-Dichloroethene	ug/L	5	U		5	U		5	U		100	U		100	U	
1,2-Dichloroethane	ug/L	5	U		5	U		5	U		100	U		100	U	
1,2-Dichloropropane	ug/L	5	U		5	U		5	U		100	U		100	U	
2-Butanone (MEK)	ug/L	10	U		10	U		10	U		200	U		200	U	
2-Hexanone	ug/L	10	U		10	U		10	U		200	U		200	U	
4-Methyl-2-pentanone (MIBK)	ug/L	10	U		10	U		10	U		200	U		200	U	
Acetone	ug/L	10	U		***50***			10	U		200	U		200	U	
Benzene	ug/L	5	U		***1.2***	***J***		5	U		***7***	***J***		100	U	
Bromodichloromethane	ug/L	5	U		5	U		5	U		100	U		100	U	
Bromoform	ug/L	5	U		5	U		5	U		100	U		100	U	
Bromomethane	ug/L	10	U		10	U		10	U		200	U		200	U	
Carbon disulfide	ug/L	5	U		***1.7***	***J +***		***0.29***	***J +***		100	U		100	U	
Carbon tetrachloride	ug/L	5	U		5	U		5	U		100	U		100	U	
Chlorobenzene	ug/L	5	U		5	U		5	U		100	U		100	U	
Chloroethane	ug/L	10	U	J-	10	U	J-	10	U		200	U	J-	200	U	J-
Chloroform	ug/L	5	U		5	U		5	U		100	U		100	U	
Chloromethane	ug/L	10	U		10	U		10	U		200	U		200	U	
cis-1,2-Dichloroethene	ug/L	5	U		5	U		5	U		100	U		100	U	
cis-1,3-Dichloropropene	ug/L	5	U		5	U		5	U		100	U		100	U	
Dibromochloromethane	ug/L	5	U		5	U		5	U		100	U		100	U	
Ethylbenzene	ug/L	5	U		***28***			***0.55***	***J***		***830***			***880***		***J+***
Methylene Chloride	ug/L	5	U		***8.9***			5	U		100	U		100	U	
Styrene	ug/L	5	U		5	U		5	U		100	U		100	U	
Tetrachloroethene	ug/L	5	U		5	U		5	U		100	U		100	U	
Toluene	ug/L	5	U		***17***			***0.31***	***J***		***180***			***190***		***J+***
trans-1,2-Dichloroethene	ug/L	5	U		5	U		5	U		100	U		100	U	
trans-1,3-Dichloropropene	ug/L	5	U		5	U		5	U		100	U		100	U	

Table C-1
SWMU 2, Old Blue River "W" Landfill, Direct-Push Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	02B18 / DW1		02B19 / DW1		02B20 / DW1		02B21 / DW1		02B21 / DW1D	
	Depth (ft):	24 - 28		14 - 18		22 - 26		16 - 20		16 - 20	
	Date Collected:	9/12/2007		9/12/2007		9/12/2007		9/12/2007		9/12/2007	
	Lab ID:	510-18114-2		510-18114-5		510-18114-6		510-18114-3		510-18114-4	
	Comments:									Duplicate	
Parameter	**Units**										
Trichloroethene	ug/L	5	U	5	U	5	U	100	U	100	U
Vinyl acetate	ug/L	5	U	5	U	5	U	100	U	100	U
Vinyl chloride	ug/L	2	U	2	U	2	U	40	U	40	U
Xylenes, Total	ug/L	10	U	***180***		***2***	***J***	***3,200***		***3,300***	***J+***

Bold, italic = Detected
ug/L = micrograms per liter
mg/L = milligrams per liter
Table 2-3 provides definition of data flags.

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		12B01A / SB1		12B01A / SB2		12B01A / SB2D		12B01A / SB3		12B01A / SB4		12B03A / SB1		12B03A / SB2	
Depth (ft):		0 - 2		2 - 4		2 - 4		4 - 6		6 - 8		0 - 2		2 - 4	
Date Collected:		9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007	
Lab ID:		510-18045-1		510-18045-2		510-18045-3		510-18045-4		510-18045-5		510-18106-3		510-18106-4	
Comments:						Duplicate									
Parameter	**Units**														
Metals															
Chromium	mg/Kg	***1,100***		***52***		***22***		***16***		***7***		***860***		***12***	
Chromium, hexavalent	mg/Kg	1.1	U	1.2	U	1.4	U	1.1	U	1.1	U	1.1	U	1.2	U
Lead	mg/Kg	***4,400***		***250***		***74***		***22***		***10***		***3,700***		***17***	
Semivolatile Organic Compounds															
1,2,4-Trichlorobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
1,2-Dichlorobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
1,3-Dichlorobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
1,4-Dichlorobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2,2'-oxybis(2-chloropropane)	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2,4,5-Trichlorophenol	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U	2,200	U
2,4-Dichlorophenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2,4-Dimethylphenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2,4-Dinitrophenol	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U J*	2,200	U
2,4-Dinitrotoluene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2,6-Dinitrotoluene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2-Chloronaphthalene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2-Chlorophenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2-Methylnaphthalene	ug/Kg	***9,700***		470	U	***1,000***		390	U	390	U	***1,100***		430	U
2-Methylphenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2-Nitroaniline	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
2-Nitrophenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
3 & 4 Methylphenol	ug/Kg	4,000	U	940	U	920	U	780	U	780	U	770	U	870	U
3,3'-Dichlorobenzidine	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U	2,200	U
3-Nitroaniline	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4,6-Dinitro-2-methylphenol	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U J*	2,200	U
4-Bromophenyl phenyl ether	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4-Chloro-3-methylphenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4-Chloroaniline	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4-Chlorophenyl phenyl ether	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4-Nitroaniline	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
4-Nitrophenol	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U	2,200	U
Acenaphthene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Acenaphthylene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Anthracene	ug/Kg	***370***	***J***	470	U	460	U	390	U	390	U	***43***	***J***	430	U

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B01A / SB1		12B01A / SB2		12B01A / SB2D		12B01A / SB3		12B01A / SB4		12B03A / SB1		12B03A / SB2	
	Depth (ft):	0 - 2		2 - 4		2 - 4		4 - 6		6 - 8		0 - 2		2 - 4	
	Date Collected:	9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007	
	Lab ID:	510-18045-1		510-18045-2		510-18045-3		510-18045-4		510-18045-5		510-18106-3		510-18106-4	
	Comments:					Duplicate									
Parameter	**Units**														
Benzo[a]anthracene	ug/Kg	***3,700***		470	U	***210***	***J***	390	U	***81***	***J***	***450***		430	U
Benzo[a]pyrene	ug/Kg	***17,000***		470	U	***530***		390	U	***71***	***J***	***3,100***	***J****	***61***	***J***
Benzo[b]fluoranthene	ug/Kg	***15,000***	***J***	470	U	***530***		390	U	***75***	***J***	***2,700***	***J****	***62***	***J***
Benzo[g,h,i]perylene	ug/Kg	***7,800***		470	U	***1,100***		390	U	***54***	***J***	***2,900***	***J****	***180***	***J***
Benzo[k]fluoranthene	ug/Kg	***3,300***	***J***	470	U	***140***	***J***	390	U	390	U	***520***	***J*** *	430	U
Benzoic acid	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U J*	2,200	U
Benzyl alcohol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Bis(2-chloroethoxy)methane	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Bis(2-chloroethyl)ether	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Bis(2-ethylhexyl) phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Butyl benzyl phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Chrysene	ug/Kg	***17,000***		470	U	***500***		390	U	***76***	***J***	***990***	***J****	***71***	***J***
Dibenz(a,h)anthracene	ug/Kg	***7,300***		470	U	***550***		390	U	390	U	***2,100***		***63***	***J***
Dibenzofuran	ug/Kg	***510***	***J***	470	U	460	U	390	U	390	U	390	U	430	U
Diethyl phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Dimethyl phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Di-n-butyl phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Di-n-octyl phthalate	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Fluoranthene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Fluorene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Hexachlorobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Hexachlorobutadiene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Hexachlorocyclopentadiene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Hexachloroethane	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Indeno[1,2,3-cd]pyrene	ug/Kg	***2,700***		470	U	***270***	***J***	390	U	390	U	***1,100***	***J***	***45***	***J***
Isophorone	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Naphthalene	ug/Kg	***5,800***		470	U	***620***		390	U	390	U	***550***		430	U
Nitrobenzene	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
N-Nitrosodi-n-propylamine	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
N-Nitrosodiphenylamine	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U J*	430	U
Pentachlorophenol	ug/Kg	10,000	U	2,400	U	2,400	U	2,000	U	2,000	U	2,000	U	2,200	U
Phenanthrene	ug/Kg	***1,500***	***J***	470	U	460	U	390	U	390	U	***180***	***J***	430	U
Phenol	ug/Kg	2,000	U	470	U	460	U	390	U	390	U	390	U	430	U
Pyrene	ug/Kg	***4,500***		470	U	***240***	***J***	390	U	390	U	***580***	***J****	430	U

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		12B01A / SB1	12B01A / SB2	12B01A / SB2D	12B01A / SB3	12B01A / SB4	12B03A / SB1	12B03A / SB2
Depth (ft):		0 - 2	2 - 4	2 - 4	4 - 6	6 - 8	0 - 2	2 - 4
Date Collected:		9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007
Lab ID:		510-18045-1	510-18045-2	510-18045-3	510-18045-4	510-18045-5	510-18106-3	510-18106-4
Comments:				Duplicate				
Parameter	**Units**							
Total Petroleum Hydrocarbons								
Gasoline Range Organics (C6-C10)	ug/Kg	120 U	140 U	140 U	120 U	120 U	120 U J-	130 U
Diesel	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Fuel Oil	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Hydraulic Fluid	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Kerosene	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Mineral Spirits	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Motor Oil	mg/Kg	180 U	4.3 U	42 U	3.5 U	3.6 U	180 U	3.9 U
Unknown Hydrocarbons	mg/Kg	***13,000***	***26***	***1,100***	***22***	***18***	***10,000 J+***	***71***
Volatile Organic Compounds								
1,1,1-Trichloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,1,2,2-Tetrachloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,1,2-Trichloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,1-Dichloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,1-Dichloroethene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,2-Dichloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
1,2-Dichloropropane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
2-Butanone (MEK)	ug/Kg	15 U J*	16 U	***17***	14 U	13 U	***110 J****	16 U
2-Hexanone	ug/Kg	15 U J*	16 U	17 U	14 U	13 U	14 U J*	16 U
4-Methyl-2-pentanone (MIBK)	ug/Kg	15 U J*	16 U	17 U	14 U	13 U	14 U J*	16 U
Acetone	ug/Kg	12 HU J*	***54***	***63***	***34***	***28***	12 HU J-	***6.2 HJ -***
Benzene	ug/Kg	***5.3 J ****	***4.7 J +***	***3.5 J +***	7 U	6.6 U	***11 J****	***3.7 J +***
Bromodichloromethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Bromoform	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Bromomethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Carbon disulfide	ug/Kg	***7 J ****	***3.9 J***	***4.8 J***	***2 J***	6.6 U	29 U J*	6.6 U J*
Carbon tetrachloride	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Chlorobenzene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Chloroethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Chloroform	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Chloromethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
cis-1,2-Dichloroethene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
cis-1,3-Dichloropropene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Dibromochloromethane	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Ethylbenzene	ug/Kg	***9.9 J****	***10***	***9.1***	7 U	***7.5***	***9.3 J****	***8.9***

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B01A / SB1	12B01A / SB2	12B01A / SB2D	12B01A / SB3	12B01A / SB4	12B03A / SB1	12B03A / SB2
	Depth (ft):	0 - 2	2 - 4	2 - 4	4 - 6	6 - 8	0 - 2	2 - 4
	Date Collected:	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007	9/11/2007
	Lab ID:	510-18045-1	510-18045-2	510-18045-3	510-18045-4	510-18045-5	510-18106-3	510-18106-4
	Comments:			Duplicate				
Parameter	**Units**							
Methylene Chloride	ug/Kg	***4.7 J ****	11 B U*	14 B U*	13 B U*	12 B U*	***8.7 J****	***19***
Styrene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Tetrachloroethene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Toluene	ug/Kg	***7.3 J ****	***7.2 J +***	***2.1 J +***	***1.5 J +***	***2.6 J +***	29 U J*	***5 J +***
trans-1,2-Dichloroethene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
trans-1,3-Dichloropropene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Trichloroethene	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Vinyl acetate	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Vinyl chloride	ug/Kg	7.5 U J*	8.2 U	8.3 U	7 U	6.6 U	6.8 U J*	7.8 U
Xylenes, Total	ug/Kg	***14 J ****	***15 J***	17 U	14 U	***11 J***	***13 J ****	***13 J***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B03A / SB3		12B03A / SB4	
	Depth (ft):	4 - 6		6 - 8	
	Date Collected:	9/11/2007		9/11/2007	
	Lab ID:	510-18106-5		510-18106-6	
	Comments:				
Parameter	**Units**				
Metals					
Chromium	mg/Kg	***34***		***13***	
Chromium, hexavalent	mg/Kg	1.2	U	1.3	U
Lead	mg/Kg	***110***		***11***	
Semivolatile Organic Compounds					
1,2,4-Trichlorobenzene	ug/Kg	420	U	430	U
1,2-Dichlorobenzene	ug/Kg	420	U	430	U
1,3-Dichlorobenzene	ug/Kg	420	U	430	U
1,4-Dichlorobenzene	ug/Kg	420	U	430	U
2,2'-oxybis(2-chloropropane)	ug/Kg	420	U	430	U
2,4,5-Trichlorophenol	ug/Kg	2,200	U	2,200	U
2,4-Dichlorophenol	ug/Kg	420	U	430	U
2,4-Dimethylphenol	ug/Kg	420	U	430	U
2,4-Dinitrophenol	ug/Kg	2,200	U	2,200	U
2,4-Dinitrotoluene	ug/Kg	420	U	430	U
2,6-Dinitrotoluene	ug/Kg	420	U	430	U
2-Chloronaphthalene	ug/Kg	420	U	430	U
2-Chlorophenol	ug/Kg	420	U	430	U
2-Methylnaphthalene	ug/Kg	420	U	430	U
2-Methylphenol	ug/Kg	420	U	430	U
2-Nitroaniline	ug/Kg	420	U	430	U
2-Nitrophenol	ug/Kg	420	U	430	U
3 & 4 Methylphenol	ug/Kg	850	U	870	U
3,3'-Dichlorobenzidine	ug/Kg	2,200	U	2,200	U
3-Nitroaniline	ug/Kg	420	U	430	U
4,6-Dinitro-2-methylphenol	ug/Kg	2,200	U	2,200	U
4-Bromophenyl phenyl ether	ug/Kg	420	U	430	U
4-Chloro-3-methylphenol	ug/Kg	420	U	430	U
4-Chloroaniline	ug/Kg	420	U	430	U
4-Chlorophenyl phenyl ether	ug/Kg	420	U	430	U
4-Nitroaniline	ug/Kg	420	U	430	U
4-Nitrophenol	ug/Kg	2,200	U	2,200	U
Acenaphthene	ug/Kg	420	U	430	U
Acenaphthylene	ug/Kg	420	U	430	U
Anthracene	ug/Kg	420	U	430	U

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B03A / SB3	12B03A / SB4
	Depth (ft):	4 - 6	6 - 8
	Date Collected:	9/11/2007	9/11/2007
	Lab ID:	510-18106-5	510-18106-6
	Comments:		
Parameter	**Units**		
Benzo[a]anthracene	ug/Kg	420 U	430 U
Benzo[a]pyrene	ug/Kg	420 U	430 U
Benzo[b]fluoranthene	ug/Kg	420 U	430 U
Benzo[g,h,i]perylene	ug/Kg	420 U	430 U
Benzo[k]fluoranthene	ug/Kg	420 U	430 U
Benzoic acid	ug/Kg	2,200 U	2,200 U
Benzyl alcohol	ug/Kg	420 U	430 U
Bis(2-chloroethoxy)methane	ug/Kg	420 U	430 U
Bis(2-chloroethyl)ether	ug/Kg	420 U	430 U
Bis(2-ethylhexyl) phthalate	ug/Kg	420 U	430 U
Butyl benzyl phthalate	ug/Kg	420 U	430 U
Chrysene	ug/Kg	420 U	430 U
Dibenz(a,h)anthracene	ug/Kg	420 U	430 U
Dibenzofuran	ug/Kg	420 U	430 U
Diethyl phthalate	ug/Kg	420 U	430 U
Dimethyl phthalate	ug/Kg	420 U	430 U
Di-n-butyl phthalate	ug/Kg	420 U	430 U
Di-n-octyl phthalate	ug/Kg	420 U	430 U
Fluoranthene	ug/Kg	420 U	430 U
Fluorene	ug/Kg	420 U	430 U
Hexachlorobenzene	ug/Kg	420 U	430 U
Hexachlorobutadiene	ug/Kg	420 U	430 U
Hexachlorocyclopentadiene	ug/Kg	420 U	430 U
Hexachloroethane	ug/Kg	420 U	430 U
Indeno[1,2,3-cd]pyrene	ug/Kg	420 U	430 U
Isophorone	ug/Kg	420 U	430 U
Naphthalene	ug/Kg	420 U	430 U
Nitrobenzene	ug/Kg	420 U	430 U
N-Nitrosodi-n-propylamine	ug/Kg	420 U	430 U
N-Nitrosodiphenylamine	ug/Kg	420 U	430 U
Pentachlorophenol	ug/Kg	2,200 U	2,200 U
Phenanthrene	ug/Kg	420 U	430 U
Phenol	ug/Kg	420 U	430 U
Pyrene	ug/Kg	420 U	430 U

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B03A / SB3		12B03A / SB4	
	Depth (ft):	4 - 6		6 - 8	
	Date Collected:	9/11/2007		9/11/2007	
	Lab ID:	510-18106-5		510-18106-6	
	Comments:				
Parameter	**Units**				
Total Petroleum Hydrocarbons					
Gasoline Range Organics (C6-C10)	ug/Kg	130	U	130	U
Diesel	mg/Kg	3.9	U	4	U
Fuel Oil	mg/Kg	3.9	U	4	U
Hydraulic Fluid	mg/Kg	3.9	U	4	U
Kerosene	mg/Kg	3.9	U	4	U
Mineral Spirits	mg/Kg	3.9	U	4	U
Motor Oil	mg/Kg	3.9	U	4	U
Unknown Hydrocarbons	mg/Kg	***58***		***23***	
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/Kg	7.6	U	7.9	U
1,1,2,2-Tetrachloroethane	ug/Kg	7.6	U	7.9	U
1,1,2-Trichloroethane	ug/Kg	7.6	U	7.9	U
1,1-Dichloroethane	ug/Kg	7.6	U	7.9	U
1,1-Dichloroethene	ug/Kg	7.6	U	7.9	U
1,2-Dichloroethane	ug/Kg	7.6	U	7.9	U
1,2-Dichloropropane	ug/Kg	7.6	U	7.9	U
2-Butanone (MEK)	ug/Kg	15	U	16	U
2-Hexanone	ug/Kg	15	U	16	U
4-Methyl-2-pentanone (MIBK)	ug/Kg	15	U	16	U
Acetone	ug/Kg	***22***	***H J-***	***21***	***H J-***
Benzene	ug/Kg	***2.5***	***J +***	***2.3***	***J +***
Bromodichloromethane	ug/Kg	7.6	U	7.9	U
Bromoform	ug/Kg	7.6	U	7.9	U
Bromomethane	ug/Kg	7.6	U	7.9	U
Carbon disulfide	ug/Kg	7.6	U	7.9	U
Carbon tetrachloride	ug/Kg	7.6	U	7.9	U
Chlorobenzene	ug/Kg	7.6	U	7.9	U
Chloroethane	ug/Kg	7.6	U	7.9	U
Chloroform	ug/Kg	7.6	U	7.9	U
Chloromethane	ug/Kg	7.6	U	7.9	U
cis-1,2-Dichloroethene	ug/Kg	7.6	U	7.9	U
cis-1,3-Dichloropropene	ug/Kg	7.6	U	7.9	U
Dibromochloromethane	ug/Kg	7.6	U	7.9	U
Ethylbenzene	ug/Kg	7.6	U	7.9	U

Table C-2
SWMU 12, AMOCO Landfarm, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B03A / SB3		12B03A / SB4	
	Depth (ft):	4 - 6		6 - 8	
	Date Collected:	9/11/2007		9/11/2007	
	Lab ID:	510-18106-5		510-18106-6	
	Comments:				
Parameter	**Units**				
Methylene Chloride	ug/Kg	***12***	***J+***	***13***	***J+***
Styrene	ug/Kg	7.6	U	7.9	U
Tetrachloroethene	ug/Kg	7.6	U	7.9	U
Toluene	ug/Kg	***2.9***	***J +***	***3.2***	***J +***
trans-1,2-Dichloroethene	ug/Kg	7.6	U	7.9	U
trans-1,3-Dichloropropene	ug/Kg	7.6	U	7.9	U
Trichloroethene	ug/Kg	7.6	U	7.9	U
Vinyl acetate	ug/Kg	7.6	U	7.9	U
Vinyl chloride	ug/Kg	7.6	U	7.9	U
Xylenes, Total	ug/Kg	15	U	16	U

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-3
AOC 8, "Owl Gun Club" Shooting Park, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	A08B26A / SB1	A08B26A / SB2	A08B49 / SB1	A08B49 / SB2	A08B50 / SB1	A08B50 / SB2
	Depth (ft):	0 - 0.5	0.5 - 2	0 - 0.5	0.5 - 2	0 - 0.5	0.5 - 2
	Date Collected:	9/12/2007	9/12/2007	9/12/2007	9/12/2007	9/12/2007	9/12/2007
	Lab ID:	510-18114-9	510-18114-10	510-18114-7	510-18114-8	510-18114-11	510-18114-12
	Comments:						
Parameter	**Units**						
Metals							
Lead	mg/Kg	***150***	***200***	***53***	***76***	***31***	***43***

Bold, italic = Detected
mg/kg = milligrams per kilogram

Table 2-3 provides definition of data flags.

Table C-4
SWMU 3, South of Bar Fab Landfill, Direct-Push Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

		Sample:	03B08A / DW1	03B08A / DW1D
		Depth (ft):	23 - 27	23 - 27
		Date Collected:	9/13/2007	9/13/2007
		Lab ID:	510-18156-1	510-18156-2
		Comments:		Duplicate
Parameter	**Units**			
Filtered Metals				
Cadmium, Dissolved	mg/L		***0.001***	***0.0014***
Lead, Dissolved	mg/L		0.0005 U	0.0005 U

Bold, italic = Detected
mg/L = milligrams per liter

Table 2-3 provides definition of data flags.

Refusal & lack of water noted for planned locations:
03B01A, 03B02A, and 03B03A.

Table C-5
SWMU 7, No. 1 Melt Shop Baghouse Dust Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		**07B01A / SB1**	**07B01A / SB2**	**07B02A / SB1**	**07B02A / SB2**	**07B03A / SB1**	**07B03A / SB2**
Depth (ft):		**0 - 0.5**	**0.5 - 1**	**0 - 0.5**	**0.5 - 1**	**0 - 0.5**	**0.5 - 1**
Date Collected:		**9/10/2007**	**9/10/2007**	**9/10/2007**	**9/10/2007**	**9/10/2007**	**9/10/2007**
Lab ID:		**510-17978-12**	**510-17978-13**	**510-17978-10**	**510-17978-11**	**510-17978-8**	**510-17978-9**
Comments:							
Parameter	**Units**						
Metals							
Cadmium	mg/Kg	***5.3***	***8.6***	***9.8***	***40***	***19***	***35***
Lead	mg/Kg	***290 J+***	***290 J+***	***360 J+***	***1000 J+***	***630 J+***	***940 J+***

Bold, italic = Detected
mg/kg = milligrams per kilogram

Table 2-3 provides definition of data flags.

Table C-6
SWMU 9, No. 1 Melt Shop Baghouse Dust Conveyor, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	09B01 / SB1	09B01 / SB2	09G04 / SB1	09G04 / SB2
	Depth (ft):	0 - 0.5	0.5 - 1	0 - 0.5	0.5 - 1
	Date Collected:	9/10/2007	9/10/2007	9/10/2007	9/10/2007
	Lab ID:	510-17978-4	510-17978-5	510-17978-6	510-17978-7
	Comments:				
Parameter	**Units**				
Metals					
Cadmium	mg/Kg	***1.3***	***2.5***	***2.4***	***1.8***
Lead	mg/Kg	***43 J+***	***110 J+***	***150 J+***	***120 J+***

Bold, italic = Detected
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-7
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		06B15 / SB1	06B15 / SB2	06B16 / SB1	06B16 / SB2	06B17 / SB1	06B17 / SB2	06B17 / SB2D
Depth (ft):		0 - 2	4 - 8	0 - 2	4 - 8	0 - 2	4 - 8	4 - 8
Date Collected:		9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007
Lab ID:		510-18356-4	510-18356-5	510-18356-6	510-18356-7	510-18356-1	510-18356-2	510-18356-3
Comments:								Duplicate
Parameter	**Units**							
Metals								
Cadmium	mg/Kg	***2.5***	***2.1***	***5.4***	***0.67***	0.3 U	***0.42***	***4.5***
Lead	mg/Kg	***89***	***38***	***100***	***18***	0.15 U	***8.4***	***160***
Polynuclear Aromatic Hydrocarbons								
1-Methylnaphthalene	ug/Kg	350 U	***100 J***	370 U	400 U	420 U J*	***100 J***	***51 J***
2-Methylnaphthalene	ug/Kg	350 U	***120 J***	370 U	400 U	420 U J*	***140 J***	***55 J***
Acenaphthene	ug/Kg	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Acenaphthylene	ug/Kg	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Anthracene	ug/Kg	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Benzo[a]anthracene	ug/Kg	***96 J***	350 U	370 U	400 U	***70 J ****	370 U	***94 J***
Benzo[a]pyrene	ug/Kg	***90 J***	350 U	370 U	400 U	***70 J ****	370 U	***85 J***
Benzo[b]fluoranthene	ug/Kg	***130 J***	350 U	370 U	400 U	***99 J ****	370 U	***120 J***
Benzo[g,h,i]perylene	ug/Kg	***63 J***	350 U	370 U	400 U	***72 J ****	370 U	***75 J***
Benzo[k]fluoranthene	ug/Kg	***54 J***	350 U	370 U	400 U	***45 J ****	370 U	***56 J***
Chrysene	ug/Kg	***110 J***	350 U	370 U	400 U	***89 J ****	370 U	***98 J***
Dibenz(a,h)anthracene	ug/Kg	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Fluoranthene	ug/Kg	***160 J***	350 U	***53 J***	400 U	***110 J ****	370 U	***150 J***
Fluorene	ug/Kg	350 U	350 U	370 U	400 U	420 U J*	370 U	370 U
Indeno[1,2,3-cd]pyrene	ug/Kg	***49 J***	350 U	370 U	400 U	420 U J*	370 U	***48 J***
Naphthalene	ug/Kg	350 U	***54 J***	370 U	400 U	420 U J*	***65 J***	370 U
Phenanthrene	ug/Kg	***140 J***	***55 J***	370 U	***47 J +***	***84 J ****	***84 J***	***120 J***
Pyrene	ug/Kg	***170 J***	350 U	***58 J***	400 U	***130 J ****	370 U	***160 J***
Extractable Petroleum Hydrocarbons								
Diesel	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Fuel Oil	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Hydraulic Fluid	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Kerosene	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Mineral Spirits	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Motor Oil	mg/Kg	3.2 U	3.1 U	3.4 U	3.7 U	3.8 U	3.4 U	3.4 U
Unknown Hydrocarbons	mg/Kg	***89***	***44***	***170***	***31***	***150***	***48***	***150***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-7
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		06B18 / SB1		06B18 / SB2		06B19 / SB1		06B19 / SB2		06B20 / SB1		06B20 / SB2		06B21 / SB1		06B21 / SB2	
Depth (ft):		0 - 2		4 - 8		0 - 2		4 - 8		0 - 2		4 - 8		0 - 2		4 - 8	
Date Collected:		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007	
Lab ID:		510-18356-8		510-18356-9		510-18356-14		510-18356-15		510-18356-10		510-18356-11		510-18356-12		510-18356-13	
Comments:																	
Parameter	**Units**																
Metals																	
Cadmium	mg/Kg	***1.9***		***4.1***		***0.34***		***0.95***		***1.6***		***7.5***		***0.74***		***1.1***	
Lead	mg/Kg	***100***		***130***		***16***		***37***		***71***		***1300***		***75***		***97***	
Polynuclear Aromatic Hydrocarbons																	
1-Methylnaphthalene	ug/Kg	350	U	370	U	440	U	350	U	360	U	***620***		***170***	***J***	***420***	
2-Methylnaphthalene	ug/Kg	350	U	370	U	440	U	350	U	360	U	***720***		***180***	***J***	***510***	
Acenaphthene	ug/Kg	350	U	370	U	***45***	***J***	350	U	***83***	***J***	390	U	380	U	390	U
Acenaphthylene	ug/Kg	350	U	370	U	440	U	350	U	360	U	***56***	***J***	380	U	390	U
Anthracene	ug/Kg	***130***	***J***	***57***	***J***	***99***	***J***	***73***	***J***	***190***	***J***	***64***	***J***	***54***	***J***	***46***	***J***
Benzo[a]anthracene	ug/Kg	***810***		***350***	***J***	***420***	***J***	***280***	***J***	***640***		***280***	***J***	***330***	***J***	***230***	***J***
Benzo[a]pyrene	ug/Kg	***820***		***390***		***400***	***J***	***250***	***J***	***550***		***240***	***J***	***300***	***J***	***240***	***J***
Benzo[b]fluoranthene	ug/Kg	***1200***		***490***		***560***		***360***		***750***		***330***	***J***	***460***		***310***	***J***
Benzo[g,h,i]perylene	ug/Kg	***340***	***J***	***250***	***J***	***200***	***J***	***110***	***J***	***270***	***J***	***110***	***J***	***160***	***J***	***170***	***J***
Benzo[k]fluoranthene	ug/Kg	***480***		***230***	***J***	***220***	***J***	***130***	***J***	***320***	***J***	***150***	***J***	***210***	***J***	***130***	***J***
Chrysene	ug/Kg	***800***		***400***		***410***	***J***	***260***	***J***	***640***		***290***	***J***	***340***	***J***	***270***	***J***
Dibenz(a,h)anthracene	ug/Kg	***150***	***J***	370	U	440	U	350	U	360	U	***58***	***J***	380	U	***67***	***J***
Fluoranthene	ug/Kg	***1600***		***630***		***850***		***600***		***1400***		***470***		***540***		***390***	
Fluorene	ug/Kg	350	U	370	U	440	U	350	U	***61***	***J***	390	U	380	U	390	U
Indeno[1,2,3-cd]pyrene	ug/Kg	***340***	***J***	***170***	***J***	***180***	***J***	***98***	***J***	***260***	***J***	***94***	***J***	***140***	***J***	***110***	***J***
Naphthalene	ug/Kg	350	U	370	U	440	U	350	U	360	U	***340***	***J***	***83***	***J***	***280***	***J***
Phenanthrene	ug/Kg	***440***		***330***	***J***	***470***		***350***	***J***	***800***		***680***		***400***		***490***	
Pyrene	ug/Kg	***1500***		***720***		***750***		***510***		***1100***		***430***		***520***		***380***	***J***
Extractable Petroleum Hydrocarbons																	
Diesel	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Fuel Oil	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Hydraulic Fluid	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Kerosene	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Mineral Spirits	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Motor Oil	mg/Kg	160	U	170	U	40	U	32	U	160	U	35	U	35	U	35	U
Unknown Hydrocarbons	mg/Kg	***310***		***1100***		***81***		***150***		***210***		***350***		***230***		***240***	

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-7
SWMU 6, RCRA Permitted Baghouse Dust Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	06B22 / SB1		06B22 / SB2		06B23 / SB1		06B23 / SB2	
	Depth (ft):	0 - 2		4 - 8		0 - 2		4 - 8	
	Date Collected:	9/18/2007		9/18/2007		9/18/2007		9/18/2007	
	Lab ID:	510-18356-26		510-18356-27		510-18356-24		510-18356-25	
	Comments:								
Parameter	**Units**								
Metals									
Cadmium	mg/Kg	***23***		***0.27***	***J***	***1.4***		***5.5***	
Lead	mg/Kg	***830***		***57***		***75***		***310***	
Polynuclear Aromatic Hydrocarbons									
1-Methylnaphthalene	ug/Kg	3900	U	***130***	***J***	360	U	350	U
2-Methylnaphthalene	ug/Kg	3900	U	***130***	***J***	360	U	350	U
Acenaphthene	ug/Kg	3900	U	380	U	360	U	350	U
Acenaphthylene	ug/Kg	3900	U	380	U	360	U	350	U
Anthracene	ug/Kg	3900	U	***39***	***J***	360	U	350	U
Benzo[a]anthracene	ug/Kg	***650***	***J***	***41***	***J***	***150***	***J +***	***100***	***J***
Benzo[a]pyrene	ug/Kg	3900	U	380	U	360	U	350	U
Benzo[b]fluoranthene	ug/Kg	***640***	***J***	***82***	***J***	***210***	***J +***	***120***	***J***
Benzo[g,h,i]perylene	ug/Kg	3900	U	380	U	360	U	350	U
Benzo[k]fluoranthene	ug/Kg	3900	U	380	U	***80***	***J +***	***53***	***J***
Chrysene	ug/Kg	***570***	***J***	***61***	***J***	***250***	***J +***	***110***	***J***
Dibenz(a,h)anthracene	ug/Kg	3900	U	380	U	360	U	350	U
Fluoranthene	ug/Kg	***1100***	***J***	***100***	***J***	***330***	***J +***	***200***	***J***
Fluorene	ug/Kg	3900	U	380	U	360	U	350	U
Indeno[1,2,3-cd]pyrene	ug/Kg	3900	U	380	U	360	U	350	U
Naphthalene	ug/Kg	3900	U J-	***48***	***J -***	360	U J-	350	U J-
Phenanthrene	ug/Kg	***830***	***J***	***120***	***J***	***210***	***J +***	***140***	***J***
Pyrene	ug/Kg	***1100***	***J***	***150***	***J***	***430***	***J+***	***190***	***J***
Extractable Petroleum Hydrocarbons									
Diesel	mg/Kg	180	U J-	170	U	32	U	160	U
Fuel Oil	mg/Kg	180	U J-	170	U	32	U	160	U
Hydraulic Fluid	mg/Kg	180	U J-	170	U	32	U	160	U
Kerosene	mg/Kg	180	U J-	170	U	32	U	160	U
Mineral Spirits	mg/Kg	180	U J-	170	U	32	U	160	U
Motor Oil	mg/Kg	180	U J-	170	U	32	U	160	U
Unknown Hydrocarbons	mg/Kg	***8400***	***J-***	***2500***		***1200***		***1400***	

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-8
AOC 4, Boiler Furnace Area, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		A04B05 / SB1		A04B05 / SB2		A04B06 / SB1		A04B06 / SB2		A04B06 / SB2		A04B07 / SB1		A04B07 / SB2	
Depth (ft):		0 - 2		4 - 8		0 - 2		4 - 8		4 - 8		0 - 2		4 - 8	
Date Collected:		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007		9/18/2007	
Lab ID:		510-18356-18		510-18356-19		510-18356-22		510-18356-23		510-18356-23RA		510-18356-16		510-18356-17	
Comments:										Reanalysis					
Parameter	**Units**														
Metals															
Cadmium	mg/Kg	***0.16***		***1.5***		***0.14***		***0.69***		Not Analyzed		***2.3***		***1.2***	
Lead	mg/Kg	***7.5***		***260***		***5.5***		***190***		Not Analyzed		***130***		***71***	
Polynuclear Aromatic Hydrocarbons															
1-Methylnaphthalene	ug/Kg	***51***	***J***	***190***	***J***	360	U	360	U R	370	U	380	U	***1000***	***J***
2-Methylnaphthalene	ug/Kg	***52***	***J***	***200***	***J***	360	U	360	U R	***67***	***J***	380	U	***1000***	***J***
Acenaphthene	ug/Kg	360	U	***60***	***J***	360	U	360	U R	370	U	***120***	***J***	***5900***	
Acenaphthylene	ug/Kg	360	U	***330***	***J***	360	U	360	U R	370	U	380	U	3800	U
Anthracene	ug/Kg	360	U	***220***	***J***	360	U	360	U R	370	U	***280***	***J***	***11000***	
Benzo[a]anthracene	ug/Kg	***45***	***J***	***950***		360	U	360	U R	***40***	***J***	***1800***		***22000***	
Benzo[a]pyrene	ug/Kg	***38***	***J***	***1100***		360	U	360	U R	370	U	***1900***		***17000***	
Benzo[b]fluoranthene	ug/Kg	***61***	***J***	***1500***		360	U	360	U R	***47***	***J***	***2600***		***22000***	
Benzo[g,h,i]perylene	ug/Kg	360	U	***490***		360	U	360	U R	370	U	***860***		***8400***	
Benzo[k]fluoranthene	ug/Kg	360	U	***710***		360	U	360	U R	370	U	***1100***		***8600***	
Chrysene	ug/Kg	***41***	***J***	***1200***		360	U	***45***	***J R***	***59***	***J***	***1800***		***18000***	
Dibenz(a,h)anthracene	ug/Kg	360	U	390	U	360	U	360	U R	370	U	380	U	***3900***	
Fluoranthene	ug/Kg	***100***	***J***	***3000***		360	U	***55***	***J R***	***67***	***J***	***3500***		***50000***	
Fluorene	ug/Kg	360	U	***210***	***J***	360	U	360	U R	370	U	***82***	***J***	***5900***	
Indeno[1,2,3-cd]pyrene	ug/Kg	360	U	***450***		360	U	360	U R	370	U	***830***		***8400***	
Naphthalene	ug/Kg	360	U	***110***	***J***	360	U J-	360	U R	370	U	380	U	3800	U
Phenanthrene	ug/Kg	***160***	***J***	***2200***		***37***	***J***	***58***	***J R***	***66***	***J***	***1200***		***38000***	
Pyrene	ug/Kg	***81***	***J***	***2600***		360	U	***61***	***J R***	***78***	***J***	***2800***		***35000***	
Extractable Petroleum Hydrocarbons															
Diesel	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Fuel Oil	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Hydraulic Fluid	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Kerosene	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Mineral Spirits	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Motor Oil	mg/Kg	3.2	U	180	U	3.3	U	3.3	U	Not Analyzed		170	U	3.5	U
Unknown Hydrocarbons	mg/Kg	***53***		***620***		***90***		***170***		Not Analyzed		***280***		***190***	

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		24B11 / SB1		24B11 / SB2		24B11 / SB2D		24B11 / SB3		24B11 / SB4	
Depth (ft):		0 - 2		2 - 4		2 - 4		4 - 6		6 - 8	
Date Collected:		9/17/2007		9/17/2007		9/17/2007		9/17/2007		9/17/2007	
Lab ID:		510-18284-1		510-18284-2		510-18284-3		510-18284-4		510-18284-5	
Comments:						Duplicate					
Parameter	**Units**										
RCRA Metals											
Arsenic	mg/Kg	0.47	U J*	0.54	U J*	0.064	JB U*	0.51	U J*	0.5	U J*
Barium	mg/Kg	0.12	U J*	0.14	U J*	0.12	U J*	0.13	U J*	0.12	U J*
Cadmium	mg/Kg	0.24	U J*	0.27	U J*	0.23	U J*	0.26	U J*	0.25	U J*
Chromium	mg/Kg	***710***	***J****	***940***	***J****	***840***	***J****	***1300***	***J****	***11***	***J****
Lead	mg/Kg	0.12	U J*	0.14	U J*	0.12	U J*	0.13	U J*	0.12	U J*
Mercury	mg/Kg	***0.0078***	***J +***	***0.01***	***J +***	***0.021***	***J +***	***0.011***	***J +***	***0.14***	***J+***
Selenium	mg/Kg	***0.053***	***J ****	***0.064***	***J ****	***0.08***	***J ****	***0.12***	***J ****	***0.14***	***J ****
Silver	mg/Kg	***0.69***		***1.1***		***1.2***		***0.81***		***0.2***	***J***
Polynuclear Aromatic Hydrocarbons											
1-Methylnaphthalene	ug/Kg	350	U	360	U	360	U	370	U	***130***	***J***
2-Methylnaphthalene	ug/Kg	350	U	360	U	360	U	370	U	***170***	***J***
Acenaphthene	ug/Kg	350	U	360	U	360	U	370	U	390	U
Acenaphthylene	ug/Kg	350	U	360	U	360	U	370	U	390	U
Anthracene	ug/Kg	350	U	360	U	360	U	370	U	***58***	***J***
Benzo[a]anthracene	ug/Kg	350	U	360	U	360	U	***200***	***J***	***210***	***J***
Benzo[a]pyrene	ug/Kg	***78***	***J***	360	U	***52***	***J***	***180***	***J***	***160***	***J***
Benzo[b]fluoranthene	ug/Kg	***57***	***J***	360	U	***46***	***J***	***230***	***J***	***220***	***J***
Benzo[g,h,i]perylene	ug/Kg	***76***	***J***	360	U	***43***	***J***	***160***	***J***	***96***	***J***
Benzo[k]fluoranthene	ug/Kg	350	U	360	U	360	U	***100***	***J***	***94***	***J***
Chrysene	ug/Kg	***89***	***J***	360	U	***61***	***J***	***210***	***J***	***190***	***J***
Dibenz(a,h)anthracene	ug/Kg	350	U	360	U	360	U	370	U	390	U
Fluoranthene	ug/Kg	***78***	***J***	360	U	***52***	***J***	***340***	***J***	***400***	
Fluorene	ug/Kg	350	U	360	U	360	U	370	U	390	U
Indeno[1,2,3-cd]pyrene	ug/Kg	***39***	***J***	360	U	360	U	***110***	***J***	***79***	***J***
Naphthalene	ug/Kg	350	U	360	U	360	U	370	U	***78***	***J***
Phenanthrene	ug/Kg	350	U	360	U	360	U	***160***	***J***	***370***	***J***
Pyrene	ug/Kg	***160***	***J***	***43***	***J***	***73***	***J***	***290***	***J***	***320***	***J***
Extractable Petroleum Hydrocarbons											
Diesel	mg/Kg	16	U	3.3	U	***120***		3.3	U	180	U
Fuel Oil	mg/Kg	16	U	3.3	U	3.3	U	3.3	U	180	U
Hydraulic Fluid	mg/Kg	16	U	3.3	U	3.3	U	3.3	U	180	U
Kerosene	mg/Kg	16	U	3.3	U	3.3	U	3.3	U	180	U
Mineral Spirits	mg/Kg	16	U	3.3	U	3.3	U	3.3	U	180	U
Motor Oil	mg/Kg	16	U	3.3	U	3.3	U	3.3	U	180	U
Unknown Hydrocarbons	mg/Kg	***320***		***230***		***250***		***120***		***700***	

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		24B11 / SB1		24B11 / SB2		24B11 / SB2D		24B11 / SB3		24B11 / SB4	
Depth (ft):		0 - 2		2 - 4		2 - 4		4 - 6		6 - 8	
Date Collected:		9/17/2007		9/17/2007		9/17/2007		9/17/2007		9/17/2007	
Lab ID:		510-18284-1		510-18284-2		510-18284-3		510-18284-4		510-18284-5	
Comments:						Duplicate					
Parameter	**Units**										
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,1,2,2-Tetrachloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,1,2-Trichloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,1-Dichloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,1-Dichloroethene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,2-Dichloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
1,2-Dichloropropane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
2-Butanone (MEK)	ug/Kg	12	U	13	U	12	U	13	U	14	U
2-Hexanone	ug/Kg	12	U	13	U	12	U	13	U	14	U
4-Methyl-2-pentanone (MIBK)	ug/Kg	12	U	13	U	12	U	13	U	14	U
Acetone	ug/Kg	11	U	***38***		***7.2***	***J***	***13***		37	B U*
Benzene	ug/Kg	***1.7***	***J +***	6.3	U	6.2	U	***1.6***	***J +***	7	U
Bromodichloromethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Bromoform	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Bromomethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Carbon disulfide	ug/Kg	***3.9***	***J +***	***12***		***2.5***	***J +***	***3.7***	***J +***	7	U
Carbon tetrachloride	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Chlorobenzene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Chloroethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Chloroform	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Chloromethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
cis-1,2-Dichloroethene	ug/Kg	5.4	U	6.3	U	5.5	U	5.6	U	7	U
cis-1,3-Dichloropropene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Dibromochloromethane	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Ethylbenzene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Methylene Chloride	ug/Kg	***10***	***J+***	12	B U*	***13***	***J+***	***8.7***	***J+***	3.3	JB U*
Styrene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Tetrachloroethene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Toluene	ug/Kg	5.4	U	***1.3***	***J +***	5.5	U	***1.7***	***J +***	7	U
trans-1,2-Dichloroethene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
trans-1,3-Dichloropropene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Trichloroethene	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Vinyl acetate	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Vinyl chloride	ug/Kg	6.2	U	6.3	U	6.2	U	6.5	U	7	U
Xylenes, Total	ug/Kg	12	U	13	U	12	U	13	U	14	U

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	24B11 / SB1	24B11 / SB2	24B11 / SB2D	24B11 / SB3	24B11 / SB4
	Depth (ft):	0 - 2	2 - 4	2 - 4	4 - 6	6 - 8
	Date Collected:	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007
	Lab ID:	510-18284-1	510-18284-2	510-18284-3	510-18284-4	510-18284-5
	Comments:			Duplicate		
Parameter	**Units**					
Physical Parameters						
pH	S.U.	***11.3***	***11.8***	***11.9***	***12***	***9.02***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	24B12 / SB1		24B12 / SB2		24B12 / SB3		24B12 / SB4	
	Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
	Date Collected:	9/17/2007		9/17/2007		9/17/2007		9/17/2007	
	Lab ID:	510-18284-7		510-18284-8		510-18284-9		510-18284-10	
	Comments:								
Parameter	**Units**								
RCRA Metals									
Arsenic	mg/Kg	0.077	JB U*	0.08	JB U*	***11***	***B J****	0.5	U J*
Barium	mg/Kg	0.14	U J*	0.12	U J*	***110***	***J****	0.13	U J*
Cadmium	mg/Kg	0.27	U J*	0.25	U J*	***1.7***	***J****	0.25	U J*
Chromium	mg/Kg	***27***	***J****	***23***	***J****	***31***	***J****	***21***	***J****
Lead	mg/Kg	0.14	U J*	0.12	U J*	***110***	***J****	0.13	U J*
Mercury	mg/Kg	***0.054***	***J+***	***0.039***	***J+***	***0.08***	***J+***	***0.02***	***J+***
Selenium	mg/Kg	***0.12***	***J **	***0.18***	***J **	***0.68***	***J****	***0.13***	***J **
Silver	mg/Kg	***0.084***	***J***	***0.088***	***J***	***0.15***	***J***	***0.23***	***J***
Polynuclear Aromatic Hydrocarbons									
1-Methylnaphthalene	ug/Kg	***46***	***J***	350	U	***310***	***J***	***250***	***J***
2-Methylnaphthalene	ug/Kg	***50***	***J***	350	U	***380***		***270***	***J***
Acenaphthene	ug/Kg	360	U	350	U	360	U	370	U
Acenaphthylene	ug/Kg	360	U	350	U	360	U	370	U
Anthracene	ug/Kg	360	U	***94***	***J***	***82***	***J***	370	U
Benzo[a]anthracene	ug/Kg	360	U	***240***	***J***	***290***	***J***	***57***	***J***
Benzo[a]pyrene	ug/Kg	360	U	***170***	***J***	***210***	***J***	370	U
Benzo[b]fluoranthene	ug/Kg	360	U	***230***	***J***	***300***	***J***	***48***	***J***
Benzo[g,h,i]perylene	ug/Kg	360	U	***100***	***J***	***120***	***J***	370	U
Benzo[k]fluoranthene	ug/Kg	360	U	***110***	***J***	***120***	***J***	370	U
Chrysene	ug/Kg	360	U	***200***	***J***	***270***	***J***	***65***	***J***
Dibenz(a,h)anthracene	ug/Kg	360	U	350	U	360	U	370	U
Fluoranthene	ug/Kg	360	U	***630***		***680***	***J-***	***100***	***J***
Fluorene	ug/Kg	360	U	***36***	***J***	360	U	370	U
Indeno[1,2,3-cd]pyrene	ug/Kg	360	U	***88***	***J***	***96***	***J -***	370	U
Naphthalene	ug/Kg	360	U	350	U	***180***	***J***	***120***	***J***
Phenanthrene	ug/Kg	***72***	***J***	***500***		***620***	***J-***	***290***	***J***
Pyrene	ug/Kg	360	U	***480***		***520***		***84***	***J***
Extractable Petroleum Hydrocarbons									
Diesel	mg/Kg	***10***		***8.6***		3.3	U	3.4	U
Fuel Oil	mg/Kg	3.3	U	3.2	U	3.3	U	3.4	U
Hydraulic Fluid	mg/Kg	3.3	U	3.2	U	3.3	U	3.4	U
Kerosene	mg/Kg	3.3	U	3.2	U	3.3	U	3.4	U
Mineral Spirits	mg/Kg	3.3	U	3.2	U	3.3	U	3.4	U
Motor Oil	mg/Kg	3.3	U	3.2	U	3.3	U	3.4	U
Unknown Hydrocarbons	mg/Kg	***29***		***21***		***130***		***99***	

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	24B12 / SB1		24B12 / SB2		24B12 / SB3		24B12 / SB4	
	Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
	Date Collected:	9/17/2007		9/17/2007		9/17/2007		9/17/2007	
	Lab ID:	510-18284-7		510-18284-8		510-18284-9		510-18284-10	
	Comments:								
Parameter	**Units**								
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,1,2,2-Tetrachloroethane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,1,2-Trichloroethane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,1-Dichloroethane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,1-Dichloroethene	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,2-Dichloroethane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
1,2-Dichloropropane	ug/Kg	5.9	U	5.7	U	6.1	U	6.6	U
2-Butanone (MEK)	ug/Kg	12	U	11	U	12	U	13	U
2-Hexanone	ug/Kg	12	U	11	U	12	U	13	U
4-Methyl-2-pentanone (MIBK)	ug/Kg	12	U	11	U	12	U	13	U
Acetone	ug/Kg	22	B U*	21	B U*	18	B U*	18	B U*
Benzene	ug/Kg	***2.4***	***J +***	***1.9***	***J +***	***5.8***	***J ****	***2.2***	***J***
Bromodichloromethane	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Bromoform	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Bromomethane	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Carbon disulfide	ug/Kg	5.9	U	***2.5***	***J +***	***2.5***	***J ****	***5***	***J***
Carbon tetrachloride	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Chlorobenzene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Chloroethane	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Chloroform	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Chloromethane	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
cis-1,2-Dichloroethene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
cis-1,3-Dichloropropene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Dibromochloromethane	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Ethylbenzene	ug/Kg	5.9	U	5.7	U	***1.4***	***J ****	6.6	U
Methylene Chloride	ug/Kg	5.4	JB U*	2.8	JB U*	1.8	JB U*	3.6	JB U*
Styrene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Tetrachloroethene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Toluene	ug/Kg	***1.7***	***J +***	***1.6***	***J +***	***5***	***J ****	***1.5***	***J***
trans-1,2-Dichloroethene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
trans-1,3-Dichloropropene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Trichloroethene	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Vinyl acetate	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Vinyl chloride	ug/Kg	5.9	U	5.7	U	6.1	U J*	6.6	U
Xylenes, Total	ug/Kg	12	U	11	U	12	U J*	13	U

Table C-9
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		**24B12 / SB1**	**24B12 / SB2**	**24B12 / SB3**	**24B12 / SB4**
Depth (ft):		**0 - 2**	**2 - 4**	**4 - 6**	**6 - 8**
Date Collected:		**9/17/2007**	**9/17/2007**	**9/17/2007**	**9/17/2007**
Lab ID:		**510-18284-7**	**510-18284-8**	**510-18284-9**	**510-18284-10**
Comments:					
Parameter	**Units**				
Physical Parameters					
pH	S.U.	***8.84***	***8.37***	***8.21***	***7.91***

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-10
SWMU 24, Waste Hydraulic Lubricating Oil Storage Tanks, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		24B11 / DW1		24B12 / DW1	
Depth (ft):		30 - 35		30 - 35	
Date Collected:		9/17/2007		9/17/2007	
Lab ID:		510-18284-6		510-18284-11	
Comments:					
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U
2-Butanone (MEK)	ug/L	10	U	10	U
2-Hexanone	ug/L	10	U	10	U
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	10	U
Acetone	ug/L	10	U	10	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Bromomethane	ug/L	10	U	10	U
Carbon disulfide	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
Chloroethane	ug/L	10	U	10	U
Chloroform	ug/L	5	U	5	U
Chloromethane	ug/L	10	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
Methylene Chloride	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U
Toluene	ug/L	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U
Vinyl acetate	ug/L	5	U	5	U
Vinyl chloride	ug/L	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U

ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-11
SWMU 13, Pickle Liquor Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	13B09A / SB1		13B09A / SB2		13B09A / SB3		13B09A / SB4	
	Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
	Date Collected:	9/10/2007		9/10/2007		9/10/2007		9/10/2007	
	Lab ID:	510-17977-1		510-17977-2		510-17977-3		510-17977-4	
	Comments:								
Parameter	**Units**								
Metals									
Arsenic	mg/Kg	***2.3***		***5.8***		***6.7***		***19***	
Barium	mg/Kg	***330***		***270***		***240***		***310***	
Cadmium	mg/Kg	***1.6***		***0.96***		***1.9***		***7.5***	
Chromium	mg/Kg	***1600***		***300***		***17***		***25***	
Lead	mg/Kg	***34***		***210***		***91***		***280***	
Mercury	mg/Kg	***0.048***		***0.67***		***0.22***		***0.45***	
Selenium	mg/Kg	0.26	U	0.3	U	0.33	U	0.33	U
Silver	mg/Kg	0.21	JB U*	0.32	B U*	0.24	JB U*	***0.68***	***B J+***
Inorganics									
pH	SU	***10.4***		***10.7***		***8.96***		***8.58***	
Semivolatile Organic Compounds									
1,2,4-Trichlorobenzene	ug/Kg	720	U	400	U	440	U	440	U
1,2-Dichlorobenzene	ug/Kg	720	U	400	U	440	U	440	U
1,3-Dichlorobenzene	ug/Kg	720	U	400	U	440	U	440	U
1,4-Dichlorobenzene	ug/Kg	720	U	400	U	440	U	440	U
2,2'-oxybis(2-chloropropane)	ug/Kg	720	U	400	U	440	U	440	U
2,4,5-Trichlorophenol	ug/Kg	3700	U	2000	U	2300	U	2300	U
2,4-Dichlorophenol	ug/Kg	720	U	400	U	440	U	440	U
2,4-Dimethylphenol	ug/Kg	720	U	400	U	440	U	440	U
2,4-Dinitrophenol	ug/Kg	3700	U	2000	U	2300	U	2300	U
2,4-Dinitrotoluene	ug/Kg	720	U	400	U	440	U	440	U
2,6-Dinitrotoluene	ug/Kg	720	U	400	U	440	U	440	U
2-Chloronaphthalene	ug/Kg	720	U	400	U	440	U	440	U
2-Chlorophenol	ug/Kg	720	U	400	U	440	U	440	U
2-Methylnaphthalene	ug/Kg	720	U	***390***	***J***	***100***	***J***	***370***	***J***
2-Methylphenol	ug/Kg	720	U	400	U	440	U	440	U
2-Nitroaniline	ug/Kg	720	U	400	U	440	U	440	U
2-Nitrophenol	ug/Kg	720	U	400	U	440	U	440	U
3 & 4 Methylphenol	ug/Kg	1400	U	790	U	880	U	890	U
3,3'-Dichlorobenzidine	ug/Kg	3700	U	2000	U	2300	U	2300	U
3-Nitroaniline	ug/Kg	720	U	400	U	440	U	440	U
4,6-Dinitro-2-methylphenol	ug/Kg	3700	U J-	2000	U J-	2300	U J-	2300	U J-
4-Bromophenyl phenyl ether	ug/Kg	720	U	400	U	440	U	440	U

Table C-11
SWMU 13, Pickle Liquor Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		13B09A / SB1		13B09A / SB2		13B09A / SB3		13B09A / SB4	
Depth (ft):		0 - 2		2 - 4		4 - 6		6 - 8	
Date Collected:		9/10/2007		9/10/2007		9/10/2007		9/10/2007	
Lab ID:		510-17977-1		510-17977-2		510-17977-3		510-17977-4	
Comments:									
Parameter	**Units**								
4-Chloro-3-methylphenol	ug/Kg	720	U	400	U	440	U	440	U
4-Chloroaniline	ug/Kg	720	U	400	U	440	U	440	U
4-Chlorophenyl phenyl ether	ug/Kg	720	U	400	U	440	U	440	U
4-Nitroaniline	ug/Kg	720	U	400	U	440	U	440	U
4-Nitrophenol	ug/Kg	3700	U	2000	U	2300	U	2300	U
Acenaphthene	ug/Kg	720	U	400	U	440	U	***190***	***J***
Acenaphthylene	ug/Kg	***150***	***J***	***64***	***J***	440	U	440	U
Anthracene	ug/Kg	720	U	***45***	***J***	440	U	***110***	***J***
Benzo[a]anthracene	ug/Kg	***580***	***J***	***290***	***J***	***45***	***J***	***160***	***J***
Benzo[a]pyrene	ug/Kg	***570***	***J***	***250***	***J***	***56***	***J***	***140***	***J***
Benzo[b]fluoranthene	ug/Kg	***790***		***470***		***64***	***J***	***190***	***J***
Benzo[g,h,i]perylene	ug/Kg	***250***	***J***	***210***	***J***	***64***	***J***	***74***	***J***
Benzo[k]fluoranthene	ug/Kg	***400***	***J***	***160***	***J***	440	U	***79***	***J***
Benzoic acid	ug/Kg	3700	U	2000	U	2300	U	2300	U
Benzyl alcohol	ug/Kg	720	U	400	U	440	U	440	U
Bis(2-chloroethoxy)methane	ug/Kg	720	U	400	U	440	U	440	U
Bis(2-chloroethyl)ether	ug/Kg	720	U	400	U	440	U	440	U
Bis(2-ethylhexyl) phthalate	ug/Kg	720	U	400	U	440	U	440	U
Butyl benzyl phthalate	ug/Kg	720	U	400	U	440	U	440	U
Chrysene	ug/Kg	***470***	***J***	***330***	***J***	***48***	***J***	***160***	***J***
Dibenz(a,h)anthracene	ug/Kg	720	U	400	U	440	U	440	U
Dibenzofuran	ug/Kg	720	U	***53***	***J***	440	U	440	U
Diethyl phthalate	ug/Kg	720	U	400	U	440	U	440	U
Dimethyl phthalate	ug/Kg	***630***	***J***	400	U	440	U	440	U
Di-n-butyl phthalate	ug/Kg	720	U	***110***	***J***	440	U	440	U
Di-n-octyl phthalate	ug/Kg	720	U	400	U	440	U	440	U
Fluoranthene	ug/Kg	***690***	***J***	***580***		***82***	***J***	***380***	***J***
Fluorene	ug/Kg	720	U	400	U	440	U	***110***	***J***
Hexachlorobenzene	ug/Kg	720	U	400	U	440	U	440	U
Hexachlorobutadiene	ug/Kg	720	U	400	U	440	U	440	U
Hexachlorocyclopentadiene	ug/Kg	720	U	400	U	440	U	440	U
Hexachloroethane	ug/Kg	720	U	400	U	440	U	440	U
Indeno[1,2,3-cd]pyrene	ug/Kg	***250***	***J***	***180***	***J***	440	U	***65***	***J***
Isophorone	ug/Kg	720	U	400	U	440	U	440	U

Table C-11
SWMU 13, Pickle Liquor Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	13B09A / SB1		13B09A / SB2		13B09A / SB3		13B09A / SB4	
	Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
	Date Collected:	9/10/2007		9/10/2007		9/10/2007		9/10/2007	
	Lab ID:	510-17977-1		510-17977-2		510-17977-3		510-17977-4	
	Comments:								
Parameter	**Units**								
Naphthalene	ug/Kg	720	U	***120***	***J***	440	U	***190***	***J***
Nitrobenzene	ug/Kg	720	U	400	U	440	U	440	U
N-Nitrosodi-n-propylamine	ug/Kg	720	U	400	U	440	U	440	U
N-Nitrosodiphenylamine	ug/Kg	720	U	400	U	440	U	440	U
Pentachlorophenol	ug/Kg	3700	U	2000	U	2300	U	2300	U
Phenanthrene	ug/Kg	***87***	***J***	***230***	***J***	440	U	***240***	***J***
Phenol	ug/Kg	720	U	400	U	440	U	440	U
Pyrene	ug/Kg	***820***		***400***		***75***	***J***	***310***	***J***
Total Petroleum Hydrocarbons									
Gasoline Range Organics (C6-C10)	ug/Kg	110	U	***1100***		***3300***		***30000***	
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,1,2,2-Tetrachloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,1,2-Trichloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,1-Dichloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,1-Dichloroethene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,2-Dichloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
1,2-Dichloropropane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
2-Butanone (MEK)	ug/Kg	12	U J*	15	U	15	U	16	U
2-Hexanone	ug/Kg	12	U J*	15	U	15	U	16	U
4-Methyl-2-pentanone (MIBK)	ug/Kg	12	U J*	15	U	15	U	16	U
Acetone	ug/Kg	12	U J*	***15***	***H J-***	***29***		***330***	***HB J****
Benzene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Bromodichloromethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Bromoform	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Bromomethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Carbon disulfide	ug/Kg	6.2	U J*	***2.7***	***HJ -***	***15***		***6.7***	***HJ -***
Carbon tetrachloride	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Chlorobenzene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Chloroethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Chloroform	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Chloromethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
cis-1,2-Dichloroethene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
cis-1,3-Dichloropropene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U

Table C-11
SWMU 13, Pickle Liquor Tanks, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	13B09A / SB1		13B09A / SB2		13B09A / SB3		13B09A / SB4	
	Depth (ft):	0 - 2		2 - 4		4 - 6		6 - 8	
	Date Collected:	9/10/2007		9/10/2007		9/10/2007		9/10/2007	
	Lab ID:	510-17977-1		510-17977-2		510-17977-3		510-17977-4	
	Comments:								
Parameter	**Units**								
Dibromochloromethane	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Ethylbenzene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Methylene Chloride	ug/Kg	6.2	U J*	7.3	U	1.9	JB U*	***2.8***	***J +***
Styrene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Tetrachloroethene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Toluene	ug/Kg	6.2	U J*	7.3	U	***2.2***	***J +***	***2.0***	***J +***
trans-1,2-Dichloroethene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
trans-1,3-Dichloropropene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Trichloroethene	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Vinyl acetate	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Vinyl chloride	ug/Kg	6.2	U J*	7.3	U	7.5	U	7.9	U
Xylenes, Total	ug/Kg	12	U J*	15	U	15	U	16	U

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 2-3 provides definition of data flags.

Table C-12
SWMU 17, Wire Mill Rinsewater Neutralization Tank, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	17B08B / SB1	17B08B / SB2	17B08B / SB3	17B08B / SB3D	17B08B / SB4
	Depth (ft):	0 - 2	2 - 4	4 - 6	4 - 6	6 - 8
	Date Collected:	9/10/2007	9/10/2007	9/10/2007	9/11/2007	9/11/2007
	Lab ID:	510-17978-1	510-17978-2	510-17978-3	510-18106-1	510-18106-2
	Comments:				Offset Boring	Offset Boring
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
1,1,2,2-Tetrachloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
1,1,2-Trichloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
1,1-Dichloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
1,1-Dichloroethene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	***1.6 J +***
1,2-Dichloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
1,2-Dichloropropane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
2-Butanone (MEK)	ug/Kg	14 U	11 U	11 U	57 HU J-	17 U
2-Hexanone	ug/Kg	14 U	11 U	11 U	57 HU J-	17 U
4-Methyl-2-pentanone (MIBK)	ug/Kg	14 U	11 U	11 U	57 HU J-	17 U
Acetone	ug/Kg	***40***	***52 J+***	***35***	***52 HJ -***	***17 H J-***
Benzene	ug/Kg	***2.3 J +***	***1.3 J +***	5.6 U	28 HU J-	8.5 U
Bromodichloromethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Bromoform	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Bromomethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Carbon disulfide	ug/Kg	***3.5 J***	***3.4 J +***	***3.2 J***	28 HU J-	***1.9 J +***
Carbon tetrachloride	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Chlorobenzene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Chloroethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Chloroform	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Chloromethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
cis-1,2-Dichloroethene	ug/Kg	***14***	***21 J+***	***8.8***	***27 HJ -***	***52 H J-***
cis-1,3-Dichloropropene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Dibromochloromethane	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Ethylbenzene	ug/Kg	***8.2***	5.6 U	***6.8***	28 HU J-	8.5 U
Methylene Chloride	ug/Kg	12 B U*	6.7 U*	5.9 B U*	***310 H J-***	8.5 U
Styrene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Tetrachloroethene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Toluene	ug/Kg	***2.4 J +***	***0.92 J +***	***1.6 J +***	28 HU J-	8.5 U
trans-1,2-Dichloroethene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	***3.3 J +***
trans-1,3-Dichloropropene	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Trichloroethene	ug/Kg	***140***	***130 J+***	***82***	***650 H J-***	***180 J+***

Table C-12
SWMU 17, Wire Mill Rinsewater Neutralization Tank, Soil Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	17B08B / SB1	17B08B / SB2	17B08B / SB3	17B08B / SB3D	17B08B / SB4
	Depth (ft):	0 - 2	2 - 4	4 - 6	4 - 6	6 - 8
	Date Collected:	9/10/2007	9/10/2007	9/10/2007	9/11/2007	9/11/2007
	Lab ID:	510-17978-1	510-17978-2	510-17978-3	510-18106-1	510-18106-2
	Comments:				Offset Boring	Offset Boring
Parameter	**Units**					
Vinyl acetate	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	8.5 U
Vinyl chloride	ug/Kg	6.8 U	5.6 U	5.6 U	28 HU J-	***4.4 J +***
Xylenes, Total	ug/Kg	***21***	11 U	***16***	57 HU J-	17 U

Bold, italic = Detected
ug/kg = micrograms per kilogram
Table 2-3 provides definition of data flags.

Due to refusal encountered in the 6-8 ft bgs interval, a sample from the 6-8 ft bgs interval could not be collected on 9/10/2007. Different sampling equipment was used on 9/11/2007 to advance a slightly offset boring and collect the 4-6 and 6-8 ft bgs interval.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW2S / GW4		33MW2 / GW4		33MW3 / GW4		33MW4S / GW4		33MW4 / GW4		
Depth:		Shallow		Intermediate		Deep		Shallow		Deep		
Date Collected:		10/5/2007		10/5/2007		10/4/2007		10/1/2007		9/26/2007		
Lab ID:		510-19072-2		510-19072-3		510-19035-11		510-18936-5		510-18739-1		
Comments:												
Parameter	**Units**											
Volatile Organic Compounds												
1,1,1-Trichloroethane	ug/L	50	U	50	U	10	U	5	U	5	U	
1,1,2,2-Tetrachloroethane	ug/L	50	U	50	U	10	U	5	U	5	U	
1,1,2-Trichloroethane	ug/L	50	U	50	U	10	U	5	U	5	U	
1,1-Dichloroethane	ug/L	50	U	***11***	***J***	***1.8***	***J***	5	U	5	U	
1,1-Dichloroethene	ug/L	***11***	***J***	***5.1***	***J***	***8.8***	***J***	5	U	5	U	
1,2-Dichloroethane	ug/L	50	U	50	U	10	U	5	U	5	U	
1,2-Dichloropropane	ug/L	50	U	50	U	10	U	5	U	5	U	
2-Butanone (MEK)	ug/L	250	U	250	U	50	U	10	U	10	U	
2-Hexanone	ug/L	250	U	250	U	50	U	10	U	10	U	
4-Methyl-2-pentanone (MIBK)	ug/L	250	U	250	U	50	U	10	U	10	U	
Acetone	ug/L	250	U	250	U	50	U	10	U	10	U	
Benzene	ug/L	10	U	10	U	2	U	5	U	5	U	
Bromodichloromethane	ug/L	50	U	50	U	10	U	5	U	5	U	
Bromoform	ug/L	50	U	50	U	10	U	5	U	5	HU	J-
Bromomethane	ug/L	50	U	50	U	10	U	10	U	10	U	
Carbon disulfide	ug/L	50	U	50	U	10	U	5	U	5	U	
Carbon tetrachloride	ug/L	50	U	50	U	10	U	5	U	5	U	
Chlorobenzene	ug/L	50	U	50	U	10	U	5	U	5	U	
Chloroethane	ug/L	50	U	50	U	10	U	10	U	10	U	
Chloroform	ug/L	50	U	50	U	10	U	5	U	5	U	
Chloromethane	ug/L	50	U	50	U	10	U	10	U	10	U	
cis-1,2-Dichloroethene	ug/L	***1800***		***630***		***940***		5	U	5	U	
cis-1,3-Dichloropropene	ug/L	50	U	50	U	10	U	5	U	5	U	
Dibromochloromethane	ug/L	50	U	50	U	10	U	5	U	5	U	
Ethylbenzene	ug/L	50	U	50	U	10	U	5	U	5	U	
Methylene Chloride	ug/L	50	U	50	U	10	U	5	U	5	U	
Styrene	ug/L	50	U	50	U	10	U	5	U	5	U	
Tetrachloroethene	ug/L	50	U	50	U	10	U	5	U	5	U	
Toluene	ug/L	50	U	50	U	10	U	5	U	5	U	
trans-1,2-Dichloroethene	ug/L	50	U	50	U	***3.5***	***J***	5	U	5	U	
trans-1,3-Dichloropropene	ug/L	50	U	50	U	10	U	5	U	5	U	
Trichloroethene	ug/L	***1100***		***270***		***480***		5	U	5	U	
Vinyl acetate	ug/L	250	U	250	U	50	U	5	U	5	U	
Vinyl chloride	ug/L	***150***		***1500***		***60***		2	U	2	U	
Xylenes, Total	ug/L	150	U	150	U	30	U	10	U	10	U	

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
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	Sample:	33MW2S / GW4	33MW2 / GW4	33MW3 / GW4	33MW4S / GW4	33MW4 / GW4
	Depth:	Shallow	Intermediate	Deep	Shallow	Deep
	Date Collected:	10/5/2007	10/5/2007	10/4/2007	10/1/2007	9/26/2007
	Lab ID:	510-19072-2	510-19072-3	510-19035-11	510-18936-5	510-18739-1
	Comments:					
Parameter	**Units**					
Total Metals						
Arsenic	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Filtered Metals						
Arsenic, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW5S / GW4		33MW5S / GW4D		33MW5I / GW4		33MW5D / GW4		33MW6D / GW4	
Depth:		Shallow		Shallow		Intermediate		Deep		Deep	
Date Collected:		10/4/2007		10/4/2007		10/4/2007		9/26/2007		10/1/2007	
Lab ID:		510-19035-12		510-19035-13		510-19035-14		510-18739-2		510-18936-2	
Comments:				Duplicate							
Parameter	**Units**										
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/L	5	U	5	U	25	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	25	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	25	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	25	U	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	25	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	25	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	25	U	5	U	5	U
2-Butanone (MEK)	ug/L	25	U	25	U	130	U	10	U	10	U
2-Hexanone	ug/L	25	U	25	U	130	U	10	U	10	U
4-Methyl-2-pentanone (MIBK)	ug/L	25	U	25	U	130	U	10	U	10	U
Acetone	ug/L	25	U	25	U	130	U	10	U	10	U
Benzene	ug/L	***0.26***	***J***	***0.27***	***J***	5	U	***0.3***	***J***	5	U
Bromodichloromethane	ug/L	5	U	5	U	25	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	25	U	5	HU J-	5	U
Bromomethane	ug/L	5	U	5	U	25	U	10	U	10	U
Carbon disulfide	ug/L	5	U	5	U	25	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	25	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	25	U	5	U	5	U
Chloroethane	ug/L	5	U	5	U	25	U	10	U	10	U
Chloroform	ug/L	5	U	5	U	25	U	5	U	5	U
Chloromethane	ug/L	5	U	5	U	25	U	10	U	10	U
cis-1,2-Dichloroethene	ug/L	***53***		***55***		***560***		5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	25	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	25	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	25	U	***0.61***	***J***	5	U
Methylene Chloride	ug/L	5	U	5	U	25	U	5	U	5	U
Styrene	ug/L	5	U	5	U	25	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	25	U	5	U	5	U
Toluene	ug/L	5	U	5	U	25	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	***0.51***	***J***	***3.7***	***J***	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	25	U	5	U	5	U
Trichloroethene	ug/L	***2.4***	***J***	***3.2***	***J***	***77***		5	U	5	U
Vinyl acetate	ug/L	25	U	25	U	130	U	5	U	5	U
Vinyl chloride	ug/L	***4.1***	***J***	***4.2***	***J***	***66***		2	U	2	U
Xylenes, Total	ug/L	15	U	15	U	75	U	***0.81***	***J***	10	U

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
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	Sample:	33MW5S / GW4		33MW5S / GW4D		33MW5I / GW4		33MW5D / GW4		33MW6D / GW4
	Depth:	Shallow		Shallow		Intermediate		Deep		Deep
	Date Collected:	10/4/2007		10/4/2007		10/4/2007		9/26/2007		10/1/2007
	Lab ID:	510-19035-12		510-19035-13		510-19035-14		510-18739-2		510-18936-2
	Comments:			Duplicate						
Parameter	**Units**									
Total Metals										
Arsenic	mg/L	***0.0092***		***0.0093***		***0.012***		***0.014***		Not Analyzed
Barium	mg/L	***0.25***		***0.25***		***0.22***		***1.3***		Not Analyzed
Cadmium	mg/L	***0.0003***	***J***	***0.00032***	***J***	***0.000084***	***J***	0.001	U	Not Analyzed
Chromium	mg/L	***0.0013***		***0.00073***	***J***	0.001	U	***0.0011***		Not Analyzed
Lead	mg/L	***0.0023***		***0.0018***		***0.0015***		***0.0024***		Not Analyzed
Mercury	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	Not Analyzed
Selenium	mg/L	0.0017	B U*	0.0014	B U*	0.001	U	***0.00061***	***J***	Not Analyzed
Silver	mg/L	0.001	U	0.001	U	0.001	U	0.00073	JB U*	Not Analyzed
Filtered Metals										
Arsenic, Dissolved	mg/L	***0.0085***		**0.0088**		***0.013***		***0.011***		Not Analyzed
Barium, Dissolved	mg/L	***0.22***		**0.22**		***0.22***		***1.3***		Not Analyzed
Cadmium, Dissolved	mg/L	0.001	U	0.001	U	0.001	U	0.001	U	Not Analyzed
Chromium, Dissolved	mg/L	0.001	U	***0.00023***	***J***	***0.00021***	***J***	0.001	U	Not Analyzed
Lead, Dissolved	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	U	Not Analyzed
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	Not Analyzed
Selenium, Dissolved	mg/L	0.001	U	0.001	U	0.001	U	***0.00047***	***J***	Not Analyzed
Silver, Dissolved	mg/L	0.001	U	0.001	U	0.001	U	0.00066	JB U*	Not Analyzed

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW7S / GW4		33MW7D / GW4		33MW8S / GW4		33MW9S / GW4		33MW10S / GW4		33MW10S / GW4QA	
Depth:		Shallow		Deep		Shallow		Shallow		Shallow		Shallow	
Date Collected:		10/1/2007		10/1/2007		10/4/2007		10/4/2007		10/3/2007		10/3/2007	
Lab ID:		510-18936-4		510-18936-3		510-19035-10		510-19035-9		510-19035-3		07100529	
Comments:												QA Lab Sample	
Parameter	**Units**												
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
1,1-Dichloroethane	ug/L	5	U	5	U	***4.4***	***J***	***1.3***	***J***	5	U	1	U
1,1-Dichloroethene	ug/L	5	U	5	U	***1.7***	***J***	5	U	5	U	1	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
2-Butanone (MEK)	ug/L	10	U	10	U	25	U	25	U	10	U	25	U
2-Hexanone	ug/L	10	U	10	U	25	U	25	U	10	U	25	U
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	10	U	25	U	25	U	10	U	25	U
Acetone	ug/L	10	U	10	U	25	U	25	U	10	U	25	U
Benzene	ug/L	5	U	5	U	1	U	1	U	5	U	1	U
Bromodichloromethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Bromoform	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Bromomethane	ug/L	10	U	10	U	5	U	5	U	10	U	1	U
Carbon disulfide	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Chlorobenzene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Chloroethane	ug/L	10	U	10	U	5	U	5	U	10	U	1	U
Chloroform	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Chloromethane	ug/L	10	U	10	U	5	U	5	U	10	U	1	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	***33***		***1.9***	***J***	5	U	1	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Dibromochloromethane	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Ethylbenzene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Methylene Chloride	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Styrene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Tetrachloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Toluene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U	5	U	1	U
Trichloroethene	ug/L	5	U	5	U	***130***		***1.4***	***J***	5	U	1	U
Vinyl acetate	ug/L	5	U	5	U	25	U	25	U	5	U	25	U
Vinyl chloride	ug/L	2	U	2	U	***0.89***	***J***	5	U	2	U	1	U
Xylenes, Total	ug/L	10	U	10	U	15	U	15	U	10	U	3	U

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
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	Sample:	33MW7S / GW4	33MW7D / GW4	33MW8S / GW4	33MW9S / GW4	33MW10S / GW4	33MW10S / GW4QA
	Depth:	Shallow	Deep	Shallow	Shallow	Shallow	Shallow
	Date Collected:	10/1/2007	10/1/2007	10/4/2007	10/4/2007	10/3/2007	10/3/2007
	Lab ID:	510-18936-4	510-18936-3	510-19035-10	510-19035-9	510-19035-3	07100529
	Comments:						QA Lab Sample
Parameter	**Units**						
Total Metals							
Arsenic	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Filtered Metals							
Arsenic, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
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Sample:		33MW10D / GW4		33MW10D / GW4D		33MW10D / GW4QA		33MW11S / GW4		33MW11D / GW4	
Depth:		Deep		Deep		Deep		Shallow		Deep	
Date Collected:		10/3/2007		10/3/2007		10/3/2007		9/27/2007		10/4/2007	
Lab ID:		510-19035-4		510-19035-5		07100530		510-18739-3		510-19035-8	
Comments:				Duplicate		QA Lab Sample					
Parameter	**Units**										
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/L	5	U	5	U	1	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	1	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	1	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	1	U	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	1	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	1	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	1	U	5	U	5	U
2-Butanone (MEK)	ug/L	10	U	10	U	25	U	10	U	25	U
2-Hexanone	ug/L	10	U	10	U	25	U	10	U	25	U
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	10	U	25	U	10	U	25	U
Acetone	ug/L	10	U	10	U	25	U	10	U	25	U
Benzene	ug/L	5	U	5	U	1	U	***0.46***	***J***	1	U
Bromodichloromethane	ug/L	5	U	5	U	1	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	1	U	5	U	5	U
Bromomethane	ug/L	10	U	10	U	1	U	10	U	5	U
Carbon disulfide	ug/L	5	U	5	U	1	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	1	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	1	U	5	U	5	U
Chloroethane	ug/L	10	U	10	U	1	U	10	U	5	U
Chloroform	ug/L	5	U	5	U	1	U	5	U	5	U
Chloromethane	ug/L	10	U	10	U	1	U	10	U	5	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	***2.3***	***J***	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	1	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	1	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	1	U	***0.65***	***J***	5	U
Methylene Chloride	ug/L	5	U	5	U	1	U	5	U	5	U
Styrene	ug/L	5	U	5	U	1	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	1	U	5	U	5	U
Toluene	ug/L	5	U	5	U	1	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	1	U	5	U	5	U
Trichloroethene	ug/L	5	U	5	U	1	U	***1.8***	***J***	5	U
Vinyl acetate	ug/L	5	U	5	U	25	U	5	U	25	U
Vinyl chloride	ug/L	2	U	***0.88***	***J***	***0.8***	***J***	2	U	5	U
Xylenes, Total	ug/L	10	U	10	U	3	U	***0.86***	***J***	15	U

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10D / GW4	33MW10D / GW4D	33MW10D / GW4QA	33MW11S / GW4	33MW11D / GW4
	Depth:	Deep	Deep	Deep	Shallow	Deep
	Date Collected:	10/3/2007	10/3/2007	10/3/2007	9/27/2007	10/4/2007
	Lab ID:	510-19035-4	510-19035-5	07100530	510-18739-3	510-19035-8
	Comments:		Duplicate	QA Lab Sample		
Parameter	**Units**					
Total Metals						
Arsenic	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.0095***	***0.0019 J***
Barium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.51***	***1.2 B***
Cadmium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.001 U	***0.00049 J***
Chromium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.001 U	***0.0022***
Lead	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.0005 U	***0.003***
Mercury	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.0002 U	0.0002 U
Selenium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.00036 J***	0.001 U
Silver	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.00047 JB U*	0.001 U
Filtered Metals						
Arsenic, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.0083***	***0.00092 J***
Barium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.53***	***1.2***
Cadmium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.001 U	0.001 U
Chromium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.001 U	***0.00028 J***
Lead, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.0005 U	0.0005 U
Mercury, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.0002 U	0.0002 U
Selenium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	***0.00041 J***	***0.0021***
Silver, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	0.00076 JB U*	0.001 U

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW12S / GW4		33MW12D / GW4		33MW13S / GW4		33MW13D / GW4		33MW14S / GW4		33MW14D / GW4	
Depth:		Shallow		Deep		Shallow		Deep		Shallow		Deep	
Date Collected:		9/27/2007		9/27/2007		10/2/2007		10/1/2007		10/3/2007		10/3/2007	
Lab ID:		510-18739-5		510-18739-4		510-18936-9		510-18936-1		510-19035-6		510-19035-7	
Comments:													
Parameter	**Units**												
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	***0.59***	***J***	5	U	5	U	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
2-Butanone (MEK)	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Acetone	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Bromomethane	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Carbon disulfide	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Chloroethane	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
Chloroform	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Chloromethane	ug/L	10	U	10	U	10	U	10	U	10	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Methylene Chloride	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Styrene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Toluene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Trichloroethene	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Vinyl acetate	ug/L	5	U	5	U	5	U	5	U	5	U	5	U
Vinyl chloride	ug/L	2	U	2	U	***0.73***	***J***	2	U	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U	10	U	10	U	10	U	10	U

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW12S / GW4		33MW12D / GW4		33MW13S / GW4		33MW13D / GW4		33MW14S / GW4	33MW14D / GW4
	Depth:	Shallow		Deep		Shallow		Deep		Shallow	Deep
	Date Collected:	9/27/2007		9/27/2007		10/2/2007		10/1/2007		10/3/2007	10/3/2007
	Lab ID:	510-18739-5		510-18739-4		510-18936-9		510-18936-1		510-19035-6	510-19035-7
	Comments:										
Parameter	**Units**										
Total Metals											
Arsenic	mg/L	0.002	U	***0.0012***	***J***	***0.0045***		***0.0018***	***J***	Not Analyzed	Not Analyzed
Barium	mg/L	***0.039***		***1.5***		***0.038***		***0.72***		Not Analyzed	Not Analyzed
Cadmium	mg/L	***0.00046***	***J***	***0.00029***	***J***	***0.00026***	***J***	***0.00042***	***J***	Not Analyzed	Not Analyzed
Chromium	mg/L	0.001	U	0.001	U	***0.0011***	***B***	***0.0049***	***B***	Not Analyzed	Not Analyzed
Lead	mg/L	***0.0018***		***0.00069***		***0.0014***		***0.0033***		Not Analyzed	Not Analyzed
Mercury	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	Not Analyzed	Not Analyzed
Selenium	mg/L	***0.014***		***0.00056***	***J***	***0.00032***	***J***	0.001	U	Not Analyzed	Not Analyzed
Silver	mg/L	0.00039	JB U*	0.00044	JB U*	0.001	U	0.001	U	Not Analyzed	Not Analyzed
Filtered Metals											
Arsenic, Dissolved	mg/L	***0.00021***	***J***	0.002	U	***0.0022***		***0.00028***	***J***	Not Analyzed	Not Analyzed
Barium, Dissolved	mg/L	***0.031***		***0.66***		***0.035***		***0.63***		Not Analyzed	Not Analyzed
Cadmium, Dissolved	mg/L	***0.00056***	***J***	0.001	U	0.001	U	0.001	U	Not Analyzed	Not Analyzed
Chromium, Dissolved	mg/L	0.001	U	0.001	U	0.00048	J U*	0.001	U	Not Analyzed	Not Analyzed
Lead, Dissolved	mg/L	0.0005	U	0.0005	U	0.0005	U	0.0005	U	Not Analyzed	Not Analyzed
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U	0.0002	U	0.0002	U	Not Analyzed	Not Analyzed
Selenium, Dissolved	mg/L	***0.01***		***0.00038***	***J***	***0.00046***	***J***	***0.00042***	***J***	Not Analyzed	Not Analyzed
Silver, Dissolved	mg/L	0.00043	JB U*	0.00047	JB U*	0.001	U	0.001	U	Not Analyzed	Not Analyzed

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW15S / GW4		33MW15D / GW4		33MW16S / GW4		33MW16D / GW4	
	Depth:	Shallow		Deep		Shallow		Deep	
	Date Collected:	10/2/2007		10/2/2007		10/2/2007		10/3/2007	
	Lab ID:	510-18936-7		510-18936-6		510-18936-8		510-19035-2	
	Comments:								
Parameter	**Units**								
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	5	U
2-Butanone (MEK)	ug/L	10	U	10	U	10	U	10	U
2-Hexanone	ug/L	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	10	U	10	U	10	U
Acetone	ug/L	10	U	10	U	10	U	10	U
Benzene	ug/L	5	U	5	U	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	5	U	5	U
Bromomethane	ug/L	10	U	10	U	10	U	10	U
Carbon disulfide	ug/L	5	U	5	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	5	U	5	U
Chloroethane	ug/L	10	U	10	U	10	U	10	U
Chloroform	ug/L	5	U	5	U	5	U	5	U
Chloromethane	ug/L	10	U	10	U	10	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	5	U	5	U
Methylene Chloride	ug/L	5	U	5	U	5	U	5	U
Styrene	ug/L	5	U	5	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	5	U	5	U
Toluene	ug/L	5	U	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	5	U
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U
Trichloroethene	ug/L	5	U	5	U	5	U	5	U
Vinyl acetate	ug/L	5	U	5	U	5	U	5	U
Vinyl chloride	ug/L	2	U	2	U	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U	10	U	10	U

Table C-13
SWMU 33, Nail Mill Degreasing Area, Groundwater Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW15S / GW4	33MW15D / GW4	33MW16S / GW4	33MW16D / GW4
	Depth:	Shallow	Deep	Shallow	Deep
	Date Collected:	10/2/2007	10/2/2007	10/2/2007	10/3/2007
	Lab ID:	510-18936-7	510-18936-6	510-18936-8	510-19035-2
	Comments:				
Parameter	**Units**				
Total Metals					
Arsenic	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Filtered Metals					
Arsenic, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Barium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Cadmium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Chromium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Lead, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Mercury, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Selenium, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Silver, Dissolved	mg/L	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 2-3 provides definition of data flags.

Table C-14
33MW2 Groundwater Sample Results - Intermediate Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW2 / GW1		33MW2 / GW2		33MW2 / GW3		33MW2 / GW4	
	Date Collected:	5/12/1997		7/17/1998		2/2/2001		10/5/2007	
	Lab:	ITS-Richardson		ITS-Richardson		Pace		ITS - Valparaiso	
	Lab ID:	D97-5825-11		D98-4944-8		604136275		510-19072-3	
	Comments:								
Parameter	**Units**								
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U D	50	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U D	50	U
1,1,2-Trichloroethane	ug/L	5	U	***2.7***	***J***	5	U D	50	U
1,1-Dichloroethane	ug/L	5	U	***20.2***		***31***	***D***	***11***	***J***
1,1-Dichloroethene	ug/L	5	U	***90.8***		***34***	***D***	***5.1***	***J***
1,2-Dichloroethane	ug/L	5	U	5	U	5	U D	50	U
1,2-Dichloropropane	ug/L	5	U	5	U	Not Analyzed		50	U
2-Butanone	ug/L	5	U	5	U	Not Analyzed		250	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	50	U	Not Analyzed		250	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	Not Analyzed		250	U
Acetone	ug/L	100	U	100	U	Not Analyzed		250	U
Benzene	ug/L	5	U	5	U	5	U D	10	U
Bromodichloromethane	ug/L	5	U	5	U	Not Analyzed		50	U
Bromoform	ug/L	5	U	5	U	Not Analyzed		50	U
Bromomethane	ug/L	5	U	5	U	Not Analyzed		50	U
Carbon disulfide	ug/L	5	U	5	U	Not Analyzed		50	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U D	50	U
Chlorobenzene	ug/L	5	U	5	U	5	U D	50	U
Chloroethane	ug/L	5	U	5	U	5	U D	50	U
Chloroform	ug/L	5	U	5	U	5	U D	50	U
Chloromethane	ug/L	5	U	5	U	5	U D	50	U
cis-1,2-Dichloroethene	ug/L	***963***	***D***	***3100***	***D***	***2800***	***D***	***630***	
cis-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		50	U
Dibromochloromethane	ug/L	5	U	5	U	Not Analyzed		50	U
Ethylbenzene	ug/L	5	U	5	U	5	U D	50	U
Methylene chloride	ug/L	5	U	5	U	5	U D	50	U
Styrene	ug/L	5	U	5	U	Not Analyzed		50	U
Tetrachloroethene	ug/L	5	U	5	U	5	U D	50	U
Toluene	ug/L	5	U	5	U	5	U D	50	U
trans-1,2-Dichloroethene	ug/L	***14.1***		***15.7***		***180***	***D***	50	U

Table C-14
33MW2 Groundwater Sample Results - Intermediate Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW2 / GW1		33MW2 / GW2		33MW2 / GW3		33MW2 / GW4	
	Date Collected:	5/12/1997		7/17/1998		2/2/2001		10/5/2007	
	Lab:	ITS-Richardson		ITS-Richardson		Pace		ITS - Valparaiso	
	Lab ID:	D97-5825-11		D98-4944-8		604136275		510-19072-3	
	Comments:								
Parameter	**Units**								
trans-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		50	U
Trichloroethene	ug/L	***21***		***5230***	***D***	***150***	***D***	***270***	
Vinyl acetate	ug/L	50	U	50	U	Not Analyzed		250	U
Vinyl chloride	ug/L	***1880***	***D***	***583***	***D***	***370***	***D***	***1500***	
Xylenes, Total	ug/L	10	U	10	U	12	U	150	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Intermediate wells were screened directly over the semi-confining layer of the shallow saturated zone.

Table C-15
33MW2S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW2S / GW1		33MW2S / GW2		33MW2S / GW3		33MW2S / GW4	
	Date Collected:	5/12/1997		7/17/1998		2/2/2001		10/5/2007	
	Lab:	ITS-Richardson		ITS-Richardson		Pace		STL - Valparaiso	
	Lab ID:	D97-5825-12		D98-4944-9		604136259		510-19072-2	
	Comments:								
Parameter	**Units**								
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/L	***50.8***		***75***	***J****	500	U D	50	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U J*	500	U D	50	U
1,1,2-Trichloroethane	ug/L	***80.7***		***42.4***	***J****	500	U D	50	U
1,1-Dichloroethane	ug/L	***103***		***126***	***J****	500	U D	50	U
1,1-Dichloroethene	ug/L	***369***	***DJ***	2500	DU J*	500	U D	***11***	***J***
1,2-Dichloroethane	ug/L	***18.6***		***15.1***	***J****	500	U D	50	U
1,2-Dichloropropane	ug/L	5	U	5	U J*	Not Analyzed		50	U
2-Butanone	ug/L	5	U	5	U J*	Not Analyzed		250	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U J*	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	50	U J*	Not Analyzed		250	U
4-Methyl-2-pentanone	ug/L	100	U	100	U J*	Not Analyzed		250	U
Acetone	ug/L	100	U	100	U J*	Not Analyzed		250	U
Benzene	ug/L	5	U	***2.02***	***J***	500	U D	10	U
Bromodichloromethane	ug/L	5	U	5	U J*	Not Analyzed		50	U
Bromoform	ug/L	5	U	5	U J*	Not Analyzed		50	U
Bromomethane	ug/L	5	U	5	U J*	Not Analyzed		50	U
Carbon disulfide	ug/L	5	U	5	U J*	Not Analyzed		50	U
Carbon tetrachloride	ug/L	5	U	5	U J*	500	U D	50	U
Chlorobenzene	ug/L	5	U	5	U J*	500	U D	50	U
Chloroethane	ug/L	5	U	5	U J*	500	U D	50	U
Chloroform	ug/L	***57.5***		***42.7***	***J****	500	U D	50	U
Chloromethane	ug/L	5	U	5	U J*	500	U D	50	U
cis-1,2-Dichloroethene	ug/L	***8400***	***D***	***58700***	***D J****	***62000***	***D***	***1800***	
cis-1,3-Dichloropropene	ug/L	5	U	5	U J*	Not Analyzed		50	U
Dibromochloromethane	ug/L	5	U	5	U J*	Not Analyzed		50	U
Ethylbenzene	ug/L	5	U	5	U J*	500	U D	50	U
Methylene chloride	ug/L	5	U	***5.93***	***J****	500	U D	50	U
Styrene	ug/L	5	U	5	U J*	Not Analyzed		50	U
Tetrachloroethene	ug/L	***10.1***		***23.1***	***J****	500	U D	50	U
Toluene	ug/L	***15.4***		***14.8***	***J****	500	U D	50	U
trans-1,2-Dichloroethene	ug/L	***106***		2500	DU J*	500	U D	50	U

Table C-15
33MW2S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW2S / GW1		33MW2S / GW2			33MW2S / GW3			33MW2S / GW4	
	Date Collected:	5/12/1997		7/17/1998			2/2/2001			10/5/2007	
	Lab:	ITS-Richardson		ITS-Richardson			Pace			STL - Valparaiso	
	Lab ID:	D97-5825-12		D98-4944-9			604136259			510-19072-2	
	Comments:										
Parameter	**Units**										
trans-1,3-Dichloropropene	ug/L	5	U	5	U	J*	Not Analyzed			50	U
Trichloroethene	ug/L	***132000***	***D***	***67700***	***D***	***J****	***52000***	***D***		***1100***	
Vinyl acetate	ug/L	50	U	50	U	J*	Not Analyzed			250	U
Vinyl chloride	ug/L	***64.4***		***1100***	***D***	***J****	500	U	D	***150***	
Xylenes, Total	ug/L	10	U	10	U		1200	U		150	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-16
33MW3 Groundwater Sample Results - Deep Well
Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW3 / GW1		33MW3 / GW1D		33MW3 / GW2		33MW3 / GW3		33MW3 / GW4	
	Date Collected:	5/12/1997		5/12/1997		7/17/1998		2/2/2001		10/4/2007	
	Lab:	ITS Richardson		ITS Richardson		ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D97-5825-9		D97-5825-10		D98-4944-7		604136242		510-19035-11	
	Comments:			Duplicate							
Parameter	**Units**										
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U	1	U	10	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U	1	U	10	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U	1	U	10	U
1,1-Dichloroethane	ug/L	5	U	5	U	5	U	1	U	***1.8***	***J***
1,1-Dichloroethene	ug/L	5	U	5	U	***2.42***	***J***	1	U	***8.8***	***J***
1,2-Dichloroethane	ug/L	5	U	5	U	5	U	1	U	10	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
2-Butanone	ug/L	5	U	5	U	5	U	Not Analyzed		50	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	50	U	50	U	Not Analyzed		50	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	100	U	Not Analyzed		50	U
Acetone	ug/L	100	U	100	U	100	U	Not Analyzed		50	U
Benzene	ug/L	5	U	5	U	5	U	1	U	2	U
Bromodichloromethane	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Bromoform	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Bromomethane	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Carbon disulfide	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U	1	U	10	U
Chlorobenzene	ug/L	5	U	5	U	5	U	1	U	10	U
Chloroethane	ug/L	5	U	5	U	5	U	1	U	10	U
Chloroform	ug/L	5	U	5	U	5	U	1	U	10	U
Chloromethane	ug/L	5	U	5	U	5	U	1	U	10	U
cis-1,2-Dichloroethene	ug/L	***21.9***		***19.1***		***326***	***D***	***130***	***D***	***940***	
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Dibromochloromethane	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Ethylbenzene	ug/L	5	U	5	U	5	U	1	U	10	U
Methylene chloride	ug/L	5	U	5	U	5	U	1	U	10	U
Styrene	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Tetrachloroethene	ug/L	5	U	5	U	5	U	1	U	10	U
Toluene	ug/L	5	U	5	U	5	U	1	U	10	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U	***3.8***		***3.5***	***J***

Table C-16
33MW3 Groundwater Sample Results - Deep Well
Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW3 / GW1		33MW3 / GW1D		33MW3 / GW2		33MW3 / GW3		33MW3 / GW4	
	Date Collected:	5/12/1997		5/12/1997		7/17/1998		2/2/2001		10/4/2007	
	Lab:	ITS Richardson		ITS Richardson		ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D97-5825-9		D97-5825-10		D98-4944-7		604136242		510-19035-11	
	Comments:			Duplicate							
Parameter	**Units**										
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	Not Analyzed		10	U
Trichloroethene	ug/L	***32.1***		***26.3***		***35.1***		***31***		***480***	
Vinyl acetate	ug/L	50	U	50	U	50	U	Not Analyzed		50	U
Vinyl chloride	ug/L	***19.1***		***17.6***		***148***		***32***		***60***	
Xylenes, Total	ug/L	10	U	10	U	10	U	2.4	U	30	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-17
33MW4 Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW4 / GW1		33MW4 / GW2		33MW4 / GW3		33MW4 / GW4		
	Date Collected:	5/12/1997		7/16/1998		2/2/2001		9/26/2007		
	Lab:	ITS Richardson		ITS Richardson		Pace		STL Valparaiso		
	Lab ID:	D97-5825-1		D98-4917-2		604136234		510-18739-1		
	Comments:									
Parameter	**Units**									
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/L	5	U	5	U	1	U	5	U	
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	1	U	5	U	
1,1,2-Trichloroethane	ug/L	5	U	5	U	1	U	5	U	
1,1-Dichloroethane	ug/L	5	U	5	U	1	U	5	U	
1,1-Dichloroethene	ug/L	5	U	5	U	1	U	5	U	
1,2-Dichloroethane	ug/L	5	U	5	U	1	U	5	U	
1,2-Dichloropropane	ug/L	5	U	5	U	Not Analyzed		5	U	
2-Butanone	ug/L	5	U	5	U	Not Analyzed		10	U	
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		
2-Hexanone	ug/L	50	U	50	U	Not Analyzed		10	U	
4-Methyl-2-pentanone	ug/L	100	U	100	U	Not Analyzed		10	U	
Acetone	ug/L	100	U	100	U	Not Analyzed		10	U	
Benzene	ug/L	5	U	5	U	1	U	5	U	
Bromodichloromethane	ug/L	5	U	5	U	Not Analyzed		5	U	
Bromoform	ug/L	5	U	5	U	Not Analyzed		5	HU	J-
Bromomethane	ug/L	5	U	5	U	Not Analyzed		10	U	
Carbon disulfide	ug/L	5	U	5	U	Not Analyzed		5	U	
Carbon tetrachloride	ug/L	5	U	5	U	1	U	5	U	
Chlorobenzene	ug/L	5	U	5	U	1	U	5	U	
Chloroethane	ug/L	5	U	5	U	1	U	10	U	
Chloroform	ug/L	5	U	5	U	1	U	5	U	
Chloromethane	ug/L	5	U	5	U	1	U	10	U	
cis-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	5	U	
cis-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		5	U	
Dibromochloromethane	ug/L	5	U	5	U	Not Analyzed		5	U	
Ethylbenzene	ug/L	5	U	5	U	1	U	5	U	
Methylene chloride	ug/L	5	U	5	U	1	U	5	U	
Styrene	ug/L	5	U	5	U	Not Analyzed		5	U	
Tetrachloroethene	ug/L	5	U	5	U	1	U	5	U	
Toluene	ug/L	5	U	5	U	1	U	5	U	
trans-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	5	U	

Table C-17
33MW4 Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW4 / GW1		33MW4 / GW2		33MW4 / GW3		33MW4 / GW4	
	Date Collected:	5/12/1997		7/16/1998		2/2/2001		9/26/2007	
	Lab:	ITS Richardson		ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D97-5825-1		D98-4917-2		604136234		510-18739-1	
	Comments:								
Parameter	**Units**								
trans-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	5	U	5	U	1	U	5	U
Vinyl acetate	ug/L	50	U	50	U	Not Analyzed		5	U
Vinyl chloride	ug/L	2	U	2	U	1	U	2	U
Xylenes, Total	ug/L	10	U	10	U	2.4	U	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-18
33MW4S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW4S / GW1	33MW4S / GW2	33MW4S / GW3	33MW4S / GW4
	Date Collected:	5/12/1997	7/15/1998	2/2/2001	10/1/2007
	Lab:	ITS Richardson	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D97-5825-2	D98-4890-3	604136218	510-18936-5
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloropropane	ug/L	5 U	5 U	Not Analyzed	5 U
2-Butanone	ug/L	5 U	5 U	Not Analyzed	10 U
2-Chloroethylvinyl ether	ug/L	5 U	5 U	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	50 U	Not Analyzed	10 U
4-Methyl-2-pentanone	ug/L	100 U	100 U	Not Analyzed	10 U
Acetone	ug/L	100 U	100 U	Not Analyzed	10 U
Benzene	ug/L	5 U	5 U	1 U	5 U
Bromodichloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Bromoform	ug/L	5 U	5 U	Not Analyzed	5 U
Bromomethane	ug/L	5 U	5 U	Not Analyzed	10 U
Carbon disulfide	ug/L	5 U	5 U	Not Analyzed	5 U
Carbon tetrachloride	ug/L	5 U	5 U	1 U	5 U
Chlorobenzene	ug/L	5 U	5 U	1 U	5 U
Chloroethane	ug/L	5 U	5 U	1 U	10 U
Chloroform	ug/L	5 U	5 U	1 U	5 U
Chloromethane	ug/L	5 U	5 U	1 U	10 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
cis-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Dibromochloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Ethylbenzene	ug/L	5 U	5 U	1 U	5 U
Methylene chloride	ug/L	5 U	5 U	1 U	5 U
Styrene	ug/L	5 U	5 U	Not Analyzed	5 U
Tetrachloroethene	ug/L	5 U	5 U	1 U	5 U
Toluene	ug/L	5 U	5 U	1 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U

Table C-18
33MW4S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW4S / GW1	33MW4S / GW2	33MW4S / GW3	33MW4S / GW4
	Date Collected:	5/12/1997	7/15/1998	2/2/2001	10/1/2007
	Lab:	ITS Richardson	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D97-5825-2	D98-4890-3	604136218	510-18936-5
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Trichloroethene	ug/L	5 U	5 U	1 U	5 U
Vinyl acetate	ug/L	50 U	50 U	Not Analyzed	5 U
Vinyl chloride	ug/L	2 U	2 U	1 U	2 U
Xylenes, Total	ug/L	10 U	10 U	2.4 U	10 U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-19
33MW5D Groundwater Sample Results
Deep Well

Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW5D / GW1		33MW5D / GW2		33MW5D / GW4	
	Date Collected:	5/30/1997		7/16/1998		9/26/2007	
	Lab:	ITS Richardson		ITS Richardson		STL Valparaiso	
	Lab ID:	D97-6645-1		D98-4917-5		510-18739-2	
	Comments:						
Parameter	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U
2-Butanone	ug/L	5	U	5	U	10	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	50	U	10	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	10	U
Acetone	ug/L	100	U	100	U	10	U
Benzene	ug/L	5	U	5	U	***0.3***	***J***
Bromodichloromethane	ug/L	5	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	5	HU J-
Bromomethane	ug/L	5	U	5	U	10	U
Carbon disulfide	ug/L	5	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	5	U
Chloroethane	ug/L	5	U	5	U	10	U
Chloroform	ug/L	5	U	5	U	5	U
Chloromethane	ug/L	5	U	5	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	***0.61***	***J***
Methylene chloride	ug/L	5	U	5	U	5	U
Styrene	ug/L	5	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	5	U
Toluene	ug/L	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U

Table C-19
33MW5D Groundwater Sample Results
Deep Well

Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW5D / GW1		33MW5D / GW2		33MW5D / GW4	
	Date Collected:	5/30/1997		7/16/1998		9/26/2007	
	Lab:	ITS Richardson		ITS Richardson		STL Valparaiso	
	Lab ID:	D97-6645-1		D98-4917-5		510-18739-2	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U
Trichloroethene	ug/L	5	U	5	U	5	U
Vinyl acetate	ug/L	50	U	50	U	5	U
Vinyl chloride	ug/L	2	U	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U	***0.81***	***J***
Total RCRA Metals							
Arsenic	mg/L	Not Analyzed		Not Analyzed		***0.014***	
Barium	mg/L	Not Analyzed		Not Analyzed		***1.3***	
Cadmium	mg/L	Not Analyzed		Not Analyzed		0.001	U
Chromium	mg/L	Not Analyzed		Not Analyzed		***0.0011***	
Lead	mg/L	Not Analyzed		Not Analyzed		***0.0024***	
Mercury	mg/L	Not Analyzed		Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		***0.00061***	***J***
Silver	mg/L	Not Analyzed		Not Analyzed		0.00073	JB U*
Filtered RCRA Metals							
Arsenic, Dissolved	mg/L	Not Analyzed		***0.021***		***0.011***	
Barium, Dissolved	mg/L	Not Analyzed		***1.31***		***1.3***	
Cadmium, Dissolved	mg/L	Not Analyzed		0.005	U	0.001	U
Chromium, Dissolved	mg/L	Not Analyzed		***0.0023***	***J***	0.001	U
Lead, Dissolved	mg/L	Not Analyzed		0.003	U	0.0005	U
Mercury, Dissolved	mg/L	Not Analyzed		0.0002	U	0.0002	U
Selenium, Dissolved	mg/L	Not Analyzed		0.01	U	***0.00047***	***J***
Silver, Dissolved	mg/L	Not Analyzed		0.005	U	0.00066	JB U*

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-20
33MW5I Groundwater Sample Results - Intermediate Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW5I / GW2		33MW5I / GW4	
	Date Collected:	7/17/1998		10/4/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4944-6		510-19035-14	
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	25	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	25	U
1,1,2-Trichloroethane	ug/L	5	U	25	U
1,1-Dichloroethane	ug/L	***5.49***		25	U
1,1-Dichloroethene	ug/L	***10.5***		25	U
1,2-Dichloroethane	ug/L	5	U	25	U
1,2-Dichloropropane	ug/L	5	U	25	U
2-Butanone	ug/L	5	U	130	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	130	U
4-Methyl-2-pentanone	ug/L	100	U	130	U
Acetone	ug/L	100	U	130	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	25	U
Bromoform	ug/L	5	U	25	U
Bromomethane	ug/L	5	U	25	U
Carbon disulfide	ug/L	5	U	25	U
Carbon tetrachloride	ug/L	5	U	25	U
Chlorobenzene	ug/L	5	U	25	U
Chloroethane	ug/L	5	U	25	U
Chloroform	ug/L	5	U	25	U
Chloromethane	ug/L	5	U	25	U
cis-1,2-Dichloroethene	ug/L	***1150***	***D***	***560***	
cis-1,3-Dichloropropene	ug/L	5	U	25	U
Dibromochloromethane	ug/L	5	U	25	U
Ethylbenzene	ug/L	5	U	25	U
Methylene chloride	ug/L	5	U	25	U
Styrene	ug/L	5	U	25	U
Tetrachloroethene	ug/L	5	U	25	U
Toluene	ug/L	5	U	25	U
trans-1,2-Dichloroethene	ug/L	***6.19***		***3.7***	***J***

Table C-20
33MW5I Groundwater Sample Results - Intermediate Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW5I / GW2		33MW5I / GW4	
	Date Collected:	7/17/1998		10/4/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4944-6		510-19035-14	
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5	U	25	U
Trichloroethene	ug/L	***806***	***D***	***77***	
Vinyl acetate	ug/L	50	U	130	U
Vinyl chloride	ug/L	***12.4***		***66***	
Xylenes, Total	ug/L	10	U	75	U
Total RCRA Metals					
Arsenic	mg/L	Not Analyzed		***0.012***	
Barium	mg/L	Not Analyzed		***0.22***	
Cadmium	mg/L	Not Analyzed		***0.000084***	***J***
Chromium	mg/L	Not Analyzed		0.001	U
Lead	mg/L	Not Analyzed		***0.0015***	
Mercury	mg/L	Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		0.001	U
Silver	mg/L	Not Analyzed		0.001	U
Filtered RCRA Metals					
Arsenic, Dissolved	mg/L	***0.0148***		***0.013***	
Barium, Dissolved	mg/L	***0.315***		***0.22***	
Cadmium, Dissolved	mg/L	0.005	U	0.001	U
Chromium, Dissolved	mg/L	***0.0026***	***J***	***0.00021***	***J***
Lead, Dissolved	mg/L	0.003	U	0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U
Selenium, Dissolved	mg/L	0.01	U	0.001	U
Silver, Dissolved	mg/L	0.005	U	0.001	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Intermediate wells were screened directly over the semi-confining layer of the shallow saturated zone.

Table C-21
33MW5S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW5S / GW1	33MW5S / GW2	33MW5S / GW2D	33MW5S / GW4	33MW5S / GW4D
	Date Collected:	5/12/1997	7/17/1998	7/17/1998	10/4/2007	10/4/2007
	Lab:	ITS Richardson	ITS Richardson	ITS Richardson	STL Valparaiso	STL Valparaiso
	Lab ID:	D97-5825-13	D98-4944-4	D98-4944-5	510-19035-12	510-19035-12
	Comments:			Duplicate		Duplicate
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	ug/L	5 U	5 U	5 U	5 U	5 U
2-Butanone	ug/L	5 U	5 U	5 U	25 U	25 U
2-Chloroethylvinyl ether	ug/L	5 U	5 U	5 U	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	50 U	50 U	25 U	25 U
4-Methyl-2-pentanone	ug/L	100 U	100 U	100 U	25 U	25 U
Acetone	ug/L	100 U	100 U	100 U	25 U	25 U
Benzene	ug/L	5 U	5 U	5 U	***0.26 J***	***0.27 J***
Bromodichloromethane	ug/L	5 U	5 U	5 U	5 U	5 U
Bromoform	ug/L	5 U	5 U	5 U	5 U	5 U
Bromomethane	ug/L	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	ug/L	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	ug/L	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	ug/L	5 U	5 U	5 U	5 U	5 U
Chloroethane	ug/L	5 U	5 U	5 U	5 U	5 U
Chloroform	ug/L	5 U	5 U	5 U	5 U	5 U
Chloromethane	ug/L	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	ug/L	***403 D***	***386 D***	***350 D***	***53***	***55***
cis-1,3-Dichloropropene	ug/L	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	ug/L	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	ug/L	5 U	5 U	5 U	5 U	5 U
Methylene chloride	ug/L	5 U	5 U	5 U	5 U	5 U
Styrene	ug/L	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U	5 U
Toluene	ug/L	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	***2.96 J***	5 U	***0.51 J***

Table C-21
33MW5S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW5S / GW1		33MW5S / GW2		33MW5S / GW2D		33MW5S / GW4		33MW5S / GW4D	
Date Collected:		5/12/1997		7/17/1998		7/17/1998		10/4/2007		10/4/2007	
Lab:		ITS Richardson		ITS Richardson		ITS Richardson		STL Valparaiso		STL Valparaiso	
Lab ID:		D97-5825-13		D98-4944-4		D98-4944-5		510-19035-12		510-19035-12	
Comments:						Duplicate				Duplicate	
Parameter	**Units**										
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U	5	U	5	U
Trichloroethene	ug/L	***279***		***19.2***		***19.6***		***2.4***	***J***	***3.2***	***J***
Vinyl acetate	ug/L	50	U	50	U	50	U	25	U	25	U
Vinyl chloride	ug/L	***30.6***		***26.6***		***24.3***		***4.1***	***J***	***4.2***	***J***
Xylenes, Total	ug/L	10	U	10	U	10	U	15	U	15	U
Total RCRA Metals											
Arsenic	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		***0.0092***		***0.0093***	
Barium	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		***0.25***		***0.25***	
Cadmium	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		***0.0003***	***J***	***0.00032***	***J***
Chromium	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		***0.0013***		***0.00073***	***J***
Lead	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		***0.0023***		***0.0018***	
Mercury	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		0.0002	U	0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		0.0017	B U*	0.0014	B U*
Silver	mg/L	Not Analyzed		Not Analyzed		Not Analyzed		0.001	U	0.001	U
Filtered RCRA Metals											
Arsenic, Dissolved	mg/L	Not Analyzed		0.01	U	0.01	U	***0.0085***		***0.0088***	
Barium, Dissolved	mg/L	Not Analyzed		***0.235***		***0.225***		***0.22***		***0.22***	
Cadmium, Dissolved	mg/L	Not Analyzed		0.005	U	0.005	U	0.001	U	0.001	U
Chromium, Dissolved	mg/L	Not Analyzed		***0.0023***	***J***	***0.0025***	***J***	0.001	U	***0.00023***	***J***
Lead, Dissolved	mg/L	Not Analyzed		0.003	U	0.003	U	0.0005	U	0.0005	U
Mercury, Dissolved	mg/L	Not Analyzed		0.0002	U	0.0002	U	0.0002	U	0.0002	U
Selenium, Dissolved	mg/L	Not Analyzed		0.01	U	0.01	U	0.001	U	0.001	U
Silver, Dissolved	mg/L	Not Analyzed		0.005	U	0.005	U	0.001	U	0.001	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-22
33MW6D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW6D / GW1	33MW6D / GW2	33MW6D / GW3	33MW6D / GW4
Date Collected:		5/30/1997	7/15/1998	2/2/2001	10/1/2007
Lab:		ITS Richardson	ITS Richardson	Pace	STL Valparaiso
Lab ID:		D97-6645-2	D98-4890-2	604136200	510-18936-2
Comments:					
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloropropane	ug/L	5 U	5 U	Not Analyzed	5 U
2-Butanone	ug/L	5 U	5 U	Not Analyzed	10 U
2-Chloroethylvinyl ether	ug/L	5 U	5 U	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	50 U	Not Analyzed	10 U
4-Methyl-2-pentanone	ug/L	100 U	100 U	Not Analyzed	10 U
Acetone	ug/L	100 U	100 U	Not Analyzed	10 U
Benzene	ug/L	5 U	5 U	1 U	5 U
Bromodichloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Bromoform	ug/L	5 U	5 U	Not Analyzed	5 U
Bromomethane	ug/L	5 U	5 U	Not Analyzed	10 U
Carbon disulfide	ug/L	5 U	5 U	Not Analyzed	5 U
Carbon tetrachloride	ug/L	5 U	5 U	1 U	5 U
Chlorobenzene	ug/L	5 U	5 U	1 U	5 U
Chloroethane	ug/L	5 U	5 U	1 U	10 U
Chloroform	ug/L	5 U	5 U	1 U	5 U
Chloromethane	ug/L	5 U	5 U	1 U	10 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
cis-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Dibromochloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Ethylbenzene	ug/L	5 U	5 U	1 U	5 U
Methylene chloride	ug/L	5 U	5 U	1 U	5 U
Styrene	ug/L	5 U	5 U	Not Analyzed	5 U
Tetrachloroethene	ug/L	5 U	5 U	1 U	5 U
Toluene	ug/L	5 U	5 U	1 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U

Table C-22
33MW6D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW6D / GW1	33MW6D / GW2	33MW6D / GW3	33MW6D / GW4
	Date Collected:	5/30/1997	7/15/1998	2/2/2001	10/1/2007
	Lab:	ITS Richardson	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D97-6645-2	D98-4890-2	604136200	510-18936-2
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Trichloroethene	ug/L	5 U	5 U	1 U	5 U
Vinyl acetate	ug/L	50 U	50 U	Not Analyzed	5 U
Vinyl chloride	ug/L	2 U	2 U	1 U	2 U
Xylenes, Total	ug/L	10 U	10 U	2.4 U	10 U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-23
33MW7D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW7D / GW1		33MW7D / GW2		33MW7D / GW3		33MW7D / GW4	
Date Collected:		5/12/1997		7/16/1998		2/2/2001		10/1/2007	
Lab:		ITS Richardson		ITS Richardson		Pace		STL Valparaiso	
Lab ID:		D97-5825-7		D98-4917-4		604136226		510-18936-3	
Comments:									
Parameter	**Units**								
Volatile Organic Compounds									
1,1,1-Trichloroethane	ug/L	5	U	5	U	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	1	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	1	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U	1	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U	1	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U	1	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	Not Analyzed		5	U
2-Butanone	ug/L	5	U	5	U	Not Analyzed		10	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	50	U	Not Analyzed		10	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	Not Analyzed		10	U
Acetone	ug/L	100	U	100	U	Not Analyzed		10	U
Benzene	ug/L	5	U	5	U	1	U	5	U
Bromodichloromethane	ug/L	5	U	5	U	Not Analyzed		5	U
Bromoform	ug/L	5	U	5	U	Not Analyzed		5	U
Bromomethane	ug/L	5	U	5	U	Not Analyzed		10	U
Carbon disulfide	ug/L	5	U	5	U	Not Analyzed		5	U
Carbon tetrachloride	ug/L	5	U	5	U	1	U	5	U
Chlorobenzene	ug/L	5	U	5	U	1	U	5	U
Chloroethane	ug/L	5	U	5	U	1	U	10	U
Chloroform	ug/L	5	U	5	U	1	U	5	U
Chloromethane	ug/L	5	U	5	U	1	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		5	U
Dibromochloromethane	ug/L	5	U	5	U	Not Analyzed		5	U
Ethylbenzene	ug/L	5	U	5	U	1	U	5	U
Methylene chloride	ug/L	5	U	5	U	1	U	5	U
Styrene	ug/L	5	U	5	U	Not Analyzed		5	U
Tetrachloroethene	ug/L	5	U	5	U	1	U	5	U
Toluene	ug/L	5	U	5	U	1	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	1	U	5	U

Table C-23
33MW7D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW7D / GW1	33MW7D / GW2	33MW7D / GW3	33MW7D / GW4
	Date Collected:	5/12/1997	7/16/1998	2/2/2001	10/1/2007
	Lab:	ITS Richardson	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D97-5825-7	D98-4917-4	604136226	510-18936-3
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Trichloroethene	ug/L	5 U	5 U	1 U	5 U
Vinyl acetate	ug/L	50 U	50 U	Not Analyzed	5 U
Vinyl chloride	ug/L	2 U	2 U	1 U	2 U
Xylenes, Total	ug/L	10 U	10 U	2.4 U	10 U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-24
33MW7S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW7S / GW1	33MW7S / GW2	33MW7S / GW3	33MW7S / GW4
	Date Collected:	5/12/1997	7/16/1998	2/2/2001	10/1/2007
	Lab:	ITS Richardson	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D97-5825-8	D98-4917-3	604136283	510-18936-4
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	1 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	1 U	5 U
1,2-Dichloropropane	ug/L	5 U	5 U	Not Analyzed	5 U
2-Butanone	ug/L	5 U	5 U	Not Analyzed	10 U
2-Chloroethylvinyl ether	ug/L	5 U	5 U	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	50 U	Not Analyzed	10 U
4-Methyl-2-pentanone	ug/L	100 U	100 U	Not Analyzed	10 U
Acetone	ug/L	100 U	100 U	Not Analyzed	10 U
Benzene	ug/L	5 U	5 U	1 U	5 U
Bromodichloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Bromoform	ug/L	5 U	5 U	Not Analyzed	5 U
Bromomethane	ug/L	5 U	5 U	Not Analyzed	10 U
Carbon disulfide	ug/L	5 U	5 U	Not Analyzed	5 U
Carbon tetrachloride	ug/L	5 U	5 U	1 U	5 U
Chlorobenzene	ug/L	5 U	5 U	1 U	5 U
Chloroethane	ug/L	5 U	5 U	1 U	10 U
Chloroform	ug/L	5 U	5 U	1 U	5 U
Chloromethane	ug/L	5 U	5 U	1 U	10 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U
cis-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	5 U
Dibromochloromethane	ug/L	5 U	5 U	Not Analyzed	5 U
Ethylbenzene	ug/L	5 U	5 U	1 U	5 U
Methylene chloride	ug/L	5 U	5 U	1 U	5 U
Styrene	ug/L	5 U	5 U	Not Analyzed	5 U
Tetrachloroethene	ug/L	5 U	5 U	1 U	5 U
Toluene	ug/L	5 U	5 U	1 U	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	5 U

Table C-24
33MW7S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW7S / GW1		33MW7S / GW2		33MW7S / GW3		33MW7S / GW4	
	Date Collected:	5/12/1997		7/16/1998		2/2/2001		10/1/2007	
	Lab:	ITS Richardson		ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D97-5825-8		D98-4917-3		604136283		510-18936-4	
	Comments:								
trans-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	5	U	5	U	1	U	5	U
Vinyl acetate	ug/L	50	U	50	U	Not Analyzed		5	U
Vinyl chloride	ug/L	2	U	2	U	1	U	2	U
Xylenes, Total	ug/L	10	U	10	U	2.4	U	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-25
33MW8S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW8S / GW1		33MW8S / GW2		33MW8S / GW4	
	Date Collected:	5/12/1997		7/16/1998		10/4/2007	
	Lab:	ITS Richardson		ITS Richardson		STL Valparaiso	
	Lab ID:	D97-5825-3		D98-4917-8		510-19035-10	
	Comments:						
Parameter	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	***4.63***	***J***	***4.4***	***J***
1,1-Dichloroethene	ug/L	5	U	***3.14***	***J***	***1.7***	***J***
1,2-Dichloroethane	ug/L	5	U	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U	5	U
2-Butanone	ug/L	5	U	5	U	25	U
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	50	U	25	U
4-Methyl-2-pentanone	ug/L	100	U	100	U	25	U
Acetone	ug/L	100	U	100	U	25	U
Benzene	ug/L	5	U	5	U	1	U
Bromodichloromethane	ug/L	5	U	5	U	5	U
Bromoform	ug/L	5	U	5	U	5	U
Bromomethane	ug/L	5	U	5	U	5	U
Carbon disulfide	ug/L	5	U	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U	5	U
Chloroethane	ug/L	5	U	5	U	5	U
Chloroform	ug/L	5	U	5	U	5	U
Chloromethane	ug/L	5	U	5	U	5	U
cis-1,2-Dichloroethene	ug/L	***10.5***		***12.2***		***33***	
cis-1,3-Dichloropropene	ug/L	5	U	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U	5	U
Methylene chloride	ug/L	5	U	5	U	5	U
Styrene	ug/L	5	U	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U	5	U
Toluene	ug/L	5	U	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	5	U

Table C-25
33MW8S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW8S / GW1		33MW8S / GW2		33MW8S / GW4	
	Date Collected:	5/12/1997		7/16/1998		10/4/2007	
	Lab:	ITS Richardson		ITS Richardson		STL Valparaiso	
	Lab ID:	D97-5825-3		D98-4917-8		510-19035-10	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	5	U	5	U
Trichloroethene	ug/L	***26***		***51.7***		***130***	
Vinyl acetate	ug/L	50	U	50	U	25	U
Vinyl chloride	ug/L	2	U	2	U	***0.89***	***J***
Xylenes, Total	ug/L	10	U	10	U	15	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-26
33MW9S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW9S / GW1	33MW9S / GW2	33MW9S / GW4
	Date Collected:	5/12/1997	7/14/1998	10/4/2007
	Lab:	ITS Richardson	ITS Richardson	STL Valparaiso
	Lab ID:	D97-5825-4	D98-4875-10	510-19035-9
	Comments:			
Parameter	**Units**			
Volatile Organic Compounds				
1,1,1-Trichloroethane	ug/L	5 U	5 U J*	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U J*	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U J*	5 U
1,1-Dichloroethane	ug/L	5 U	5 U J*	***1.3 J***
1,1-Dichloroethene	ug/L	5 U	5 U J*	5 U
1,2-Dichloroethane	ug/L	5 U	5 U J*	5 U
1,2-Dichloropropane	ug/L	5 U	5 U J*	5 U
2-Butanone	ug/L	5 U	5 U J*	25 U
2-Chloroethylvinyl ether	ug/L	5 U	5 U J*	Not Analyzed
2-Hexanone	ug/L	50 U	50 U J*	25 U
4-Methyl-2-pentanone	ug/L	100 U	100 U J*	25 U
Acetone	ug/L	100 U	100 U J*	25 U
Benzene	ug/L	5 U	5 U J*	1 U
Bromodichloromethane	ug/L	5 U	5 U J*	5 U
Bromoform	ug/L	5 U	5 U J*	5 U
Bromomethane	ug/L	5 U	5 U J*	5 U
Carbon disulfide	ug/L	5 U	5 U J*	5 U
Carbon tetrachloride	ug/L	5 U	5 U J*	5 U
Chlorobenzene	ug/L	5 U	5 U J*	5 U
Chloroethane	ug/L	5 U	5 U J*	5 U
Chloroform	ug/L	5 U	5 U J*	5 U
Chloromethane	ug/L	5 U	5 U J*	5 U
cis-1,2-Dichloroethene	ug/L	5 U	***7.15 J****	***1.9 J***
cis-1,3-Dichloropropene	ug/L	5 U	5 U J*	5 U
Dibromochloromethane	ug/L	5 U	5 U J*	5 U
Ethylbenzene	ug/L	5 U	5 U J*	5 U
Methylene chloride	ug/L	5 U	5 U J*	5 U
Styrene	ug/L	5 U	5 U J*	5 U
Tetrachloroethene	ug/L	5 U	5 U J*	5 U
Toluene	ug/L	5 U	5 U J*	5 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U J*	5 U

Table C-26
33MW9S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW9S / GW1		33MW9S / GW2		33MW9S / GW4	
	Date Collected:	5/12/1997		7/14/1998		10/4/2007	
	Lab:	ITS Richardson		ITS Richardson		STL Valparaiso	
	Lab ID:	D97-5825-4		D98-4875-10		510-19035-9	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	5	U J*	5	U
Trichloroethene	ug/L	5	U	5	U J*	***1.4***	***J***
Vinyl acetate	ug/L	50	U	50	U J*	25	U
Vinyl chloride	ug/L	2	U	2	U J*	5	U
Xylenes, Total	ug/L	10	U	10	U J*	15	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-27
33MW10D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW10D / GW2		33MW10D / GW2A		33MW10D / GW3		33MW10D / GW3D		33MW10D / GW3QA	
Date Collected:		7/14/1998		9/21/1998		2/1/2001		2/1/2001		2/1/2001	
Lab:		ITS Richardson		SW Labs		Pace		Pace		Continental	
Lab ID:		D98-4875-5		366821		604136135		604136184		01020184	
Comments:								Duplicate		QA Lab Split	
Parameter	**Units**										
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/L	5	U	5	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	1	U	1	U	1	U
1,1,2-Trichloroethane	ug/L	5	U	5	U	1	U	1	U	1	U
1,1-Dichloroethane	ug/L	***4.32***	***J***	***2.9***	***J***	***1.5***		***1.6***		***1.2***	
1,1-Dichloroethene	ug/L	5	U	***2.2***	***J***	1	U	1	U	1	U
1,2-Dichloroethane	ug/L	5	U	5	U	1	U	1	U	1	U
1,2-Dichloropropane	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
2-Butanone	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
2-Chloroethylvinyl ether	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
4-Methyl-2-pentanone	ug/L	100	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Acetone	ug/L	100	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Benzene	ug/L	5	U	5	U	1	U	1	U	1	U
Bromodichloromethane	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Bromoform	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Bromomethane	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Carbon disulfide	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Carbon tetrachloride	ug/L	5	U	5	U	1	U	1	U	1	U
Chlorobenzene	ug/L	5	U	5	U	1	U	1	U	1	U
Chloroethane	ug/L	5	U	5	U	1	U	1	U	5	U
Chloroform	ug/L	5	U	5	U	1	U	1	U	1	U
Chloromethane	ug/L	5	U	5	U	1	U	1	U	5	U
cis-1,2-Dichloroethene	ug/L	***74.4***		***63***		***14***		***14***		***11.3***	
cis-1,3-Dichloropropene	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Dibromochloromethane	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Ethylbenzene	ug/L	5	U	5	U	1	U	1	U	1	U
Methylene chloride	ug/L	5	U	5	U	1	U	1	U	1	U
Styrene	ug/L	5	U	5	U	Not Analyzed		Not Analyzed		Not Analyzed	
Tetrachloroethene	ug/L	5	U	5	U	1	U	1	U	1	U
Toluene	ug/L	5	U	5	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U	***1.1***		***1***		1	U

Table C-27
33MW10D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10D / GW2	33MW10D / GW2A	33MW10D / GW3	33MW10D / GW3D	33MW10D / GW3QA
	Date Collected:	7/14/1998	9/21/1998	2/1/2001	2/1/2001	2/1/2001
	Lab:	ITS Richardson	SW Labs	Pace	Pace	Continental
	Lab ID:	D98-4875-5	366821	604136135	604136184	01020184
	Comments:				Duplicate	QA Lab Split
Parameter	**Units**					
trans-1,3-Dichloropropene	ug/L	5 U	5 U	Not Analyzed	Not Analyzed	Not Analyzed
Trichloroethene	ug/L	5 U	5 U	1 U	1 U	1 U
Vinyl acetate	ug/L	50 U	5 U	Not Analyzed	Not Analyzed	Not Analyzed
Vinyl chloride	ug/L	***9.05***	***4.1***	***22***	***22***	***16.4***
Xylenes, Total	ug/L	10 U	10 U	2.4 U	2.4 U	3 U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-27
33MW10D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10D / GW4	33MW10D / GW4D	33MW10D / GW4QA
	Date Collected:	10/3/2007	10/3/2007	10/3/2007
	Lab:	STL Valparaiso	STL Valparaiso	Continental
	Lab ID:	510-19035-4	510-19035-5	07100530
	Comments:		Duplicate	QA Lab Split
Parameter	**Units**			
Volatile Organic Compounds				
1,1,1-Trichloroethane	ug/L	5 U	5 U	1 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	1 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	1 U
1,1-Dichloroethane	ug/L	5 U	5 U	1 U
1,1-Dichloroethene	ug/L	5 U	5 U	1 U
1,2-Dichloroethane	ug/L	5 U	5 U	1 U
1,2-Dichloropropane	ug/L	5 U	5 U	1 U
2-Butanone	ug/L	10 U	10 U	25 U
2-Chloroethylvinyl ether	ug/L	Not Analyzed	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	10 U	10 U	25 U
4-Methyl-2-pentanone	ug/L	10 U	10 U	25 U
Acetone	ug/L	10 U	10 U	25 U
Benzene	ug/L	5 U	5 U	1 U
Bromodichloromethane	ug/L	5 U	5 U	1 U
Bromoform	ug/L	5 U	5 U	1 U
Bromomethane	ug/L	10 U	10 U	1 U
Carbon disulfide	ug/L	5 U	5 U	1 U
Carbon tetrachloride	ug/L	5 U	5 U	1 U
Chlorobenzene	ug/L	5 U	5 U	1 U
Chloroethane	ug/L	10 U	10 U	1 U
Chloroform	ug/L	5 U	5 U	1 U
Chloromethane	ug/L	10 U	10 U	1 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	1 U
cis-1,3-Dichloropropene	ug/L	5 U	5 U	1 U
Dibromochloromethane	ug/L	5 U	5 U	1 U
Ethylbenzene	ug/L	5 U	5 U	1 U
Methylene chloride	ug/L	5 U	5 U	1 U
Styrene	ug/L	5 U	5 U	1 U
Tetrachloroethene	ug/L	5 U	5 U	1 U
Toluene	ug/L	5 U	5 U	1 U
trans-1,2-Dichloroethene	ug/L	5 U	5 U	1 U

Table C-27
33MW10D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10D / GW4		33MW10D / GW4D		33MW10D / GW4QA	
	Date Collected:	10/3/2007		10/3/2007		10/3/2007	
	Lab:	STL Valparaiso		STL Valparaiso		Continental	
	Lab ID:	510-19035-4		510-19035-5		07100530	
	Comments:			Duplicate		QA Lab Split	
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	5	U	1	U
Trichloroethene	ug/L	5	U	5	U	1	U
Vinyl acetate	ug/L	5	U	5	U	25	U
Vinyl chloride	ug/L	2	U	***0.88***	***J***	***0.8***	***J***
Xylenes, Total	ug/L	10	U	10	U	3	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-28
33MW10S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10S / GW2	33MW10S / GW3	33MW10S / GW4	33MW10S / GW4QA
	Date Collected:	7/14/1998	2/1/2001	10/3/2007	10/3/2007
	Lab:	ITS Richardson	Pace	STL Valparaiso	Continental
	Lab ID:	D98-4875-4	604136127	510-19035-3	07100529
	Comments:				QA Lab Split
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5 U	1 U	5 U	1 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	1 U	5 U	1 U
1,1,2-Trichloroethane	ug/L	5 U	1 U	5 U	1 U
1,1-Dichloroethane	ug/L	5 U	1 U	5 U	1 U
1,1-Dichloroethene	ug/L	5 U	1 U	5 U	1 U
1,2-Dichloroethane	ug/L	5 U	1 U	5 U	1 U
1,2-Dichloropropane	ug/L	5 U	Not Analyzed	5 U	1 U
2-Butanone	ug/L	5 U	Not Analyzed	10 U	25 U
2-Chloroethylvinyl ether	ug/L	5 U	Not Analyzed	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	Not Analyzed	10 U	25 U
4-Methyl-2-pentanone	ug/L	100 U	Not Analyzed	10 U	25 U
Acetone	ug/L	100 U	Not Analyzed	10 U	25 U
Benzene	ug/L	5 U	1 U	5 U	1 U
Bromodichloromethane	ug/L	5 U	Not Analyzed	5 U	1 U
Bromoform	ug/L	5 U	Not Analyzed	5 U	1 U
Bromomethane	ug/L	5 U	Not Analyzed	10 U	1 U
Carbon disulfide	ug/L	5 U	Not Analyzed	5 U	1 U
Carbon tetrachloride	ug/L	5 U	1 U	5 U	1 U
Chlorobenzene	ug/L	5 U	1 U	5 U	1 U
Chloroethane	ug/L	5 U	1 U	10 U	1 U
Chloroform	ug/L	5 U	1 U	5 U	1 U
Chloromethane	ug/L	5 U	1 U	10 U	1 U
cis-1,2-Dichloroethene	ug/L	5 U	1 U	5 U	1 U
cis-1,3-Dichloropropene	ug/L	5 U	Not Analyzed	5 U	1 U
Dibromochloromethane	ug/L	5 U	Not Analyzed	5 U	1 U
Ethylbenzene	ug/L	5 U	1 U	5 U	1 U
Methylene chloride	ug/L	5 U	1 U	5 U	1 U
Styrene	ug/L	5 U	Not Analyzed	5 U	1 U
Tetrachloroethene	ug/L	5 U	1 U	5 U	1 U
Toluene	ug/L	5 U	1 U	5 U	1 U
trans-1,2-Dichloroethene	ug/L	5 U	1 U	5 U	1 U

Table C-28
33MW10S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10S / GW2	33MW10S / GW3	33MW10S / GW4	33MW10S / GW4QA
	Date Collected:	7/14/1998	2/1/2001	10/3/2007	10/3/2007
	Lab:	ITS Richardson	Pace	STL Valparaiso	Continental
	Lab ID:	D98-4875-4	604136127	510-19035-3	07100529
	Comments:				QA Lab Split
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5 U	Not Analyzed	5 U	1 U
Trichloroethene	ug/L	5 U	1 U	5 U	1 U
Vinyl acetate	ug/L	50 U	Not Analyzed	5 U	25 U
Vinyl chloride	ug/L	2 U	1 U	2 U	1 U
Xylenes, Total	ug/L	10 U	2.4 U	10 U	3 U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-29
33MW11D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW11D / GW2		33MW11D / GW3		33MW11D / GW4	
	Date Collected:	7/14/1998		2/1/2001		10/4/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4875-7		604136119		510-19035-8	
	Comments:						
Parameter	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	5	U	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	1	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	1	U	5	U
1,1-Dichloroethane	ug/L	***2.92***	***J***	***1.8***		5	U
1,1-Dichloroethene	ug/L	5	U	1	U	5	U
1,2-Dichloroethane	ug/L	5	U	1	U	5	U
1,2-Dichloropropane	ug/L	5	U	Not Analyzed		5	U
2-Butanone	ug/L	5	U	Not Analyzed		25	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	Not Analyzed		25	U
4-Methyl-2-pentanone	ug/L	100	U	Not Analyzed		25	U
Acetone	ug/L	100	U	Not Analyzed		25	U
Benzene	ug/L	5	U	1	U	1	U
Bromodichloromethane	ug/L	5	U	Not Analyzed		5	U
Bromoform	ug/L	5	U	Not Analyzed		5	U
Bromomethane	ug/L	5	U	Not Analyzed		5	U
Carbon disulfide	ug/L	5	U	Not Analyzed		5	U
Carbon tetrachloride	ug/L	5	U	1	U	5	U
Chlorobenzene	ug/L	5	U	1	U	5	U
Chloroethane	ug/L	5	U	1	U	5	U
Chloroform	ug/L	5	U	1	U	5	U
Chloromethane	ug/L	5	U	1	U	5	U
cis-1,2-Dichloroethene	ug/L	5	U	1	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Dibromochloromethane	ug/L	5	U	Not Analyzed		5	U
Ethylbenzene	ug/L	5	U	1	U	5	U
Methylene chloride	ug/L	5	U	1	U	5	U
Styrene	ug/L	5	U	Not Analyzed		5	U
Tetrachloroethene	ug/L	5	U	1	U	5	U
Toluene	ug/L	5	U	1	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	1	U	5	U

Table C-29
33MW11D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW11D / GW2		33MW11D / GW3		33MW11D / GW4	
	Date Collected:	7/14/1998		2/1/2001		10/4/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4875-7		604136119		510-19035-8	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	5	U	1	U	5	U
Vinyl acetate	ug/L	50	U	Not Analyzed		25	U
Vinyl chloride	ug/L	2	U	1	U	5	U
Xylenes, Total	ug/L	10	U	2.4	U	15	U
Total RCRA Metals							
Arsenic	mg/L	Not Analyzed		Not Analyzed		***0.0019***	***J***
Barium	mg/L	Not Analyzed		Not Analyzed		***1.2***	***B***
Cadmium	mg/L	Not Analyzed		Not Analyzed		***0.00049***	***J***
Chromium	mg/L	Not Analyzed		Not Analyzed		***0.0022***	
Lead	mg/L	Not Analyzed		Not Analyzed		***0.003***	
Mercury	mg/L	Not Analyzed		Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		0.001	U
Silver	mg/L	Not Analyzed		Not Analyzed		0.001	U
Filtered RCRA Metals							
Arsenic, Dissolved	mg/L	0.01	U	Not Analyzed		***0.00092***	***J***
Barium, Dissolved	mg/L	***0.858***		Not Analyzed		***1.2***	
Cadmium, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U
Chromium, Dissolved	mg/L	***0.0023***	***J***	Not Analyzed		***0.00028***	***J***
Lead, Dissolved	mg/L	0.003	U	Not Analyzed		0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	Not Analyzed		0.0002	U
Selenium, Dissolved	mg/L	0.01	U	Not Analyzed		***0.0021***	
Silver, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-30
33MW11S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW11S / GW2		33MW11S / GW3		33MW11S / GW4	
	Date Collected:	7/14/1998		2/1/2001		9/27/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4875-6		604136101		510-18739-3	
	Comments:						
Parameter	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	5	U	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	1	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	1	U	5	U
1,1-Dichloroethane	ug/L	5	U	1	U	5	U
1,1-Dichloroethene	ug/L	5	U	1	U	5	U
1,2-Dichloroethane	ug/L	5	U	1	U	5	U
1,2-Dichloropropane	ug/L	5	U	Not Analyzed		5	U
2-Butanone	ug/L	5	U	Not Analyzed		10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	Not Analyzed		10	U
4-Methyl-2-pentanone	ug/L	100	U	Not Analyzed		10	U
Acetone	ug/L	100	U	Not Analyzed		10	U
Benzene	ug/L	5	U	1	U	***0.46***	***J***
Bromodichloromethane	ug/L	5	U	Not Analyzed		5	U
Bromoform	ug/L	5	U	Not Analyzed		5	U
Bromomethane	ug/L	5	U	Not Analyzed		10	U
Carbon disulfide	ug/L	5	U	Not Analyzed		5	U
Carbon tetrachloride	ug/L	5	U	1	U	5	U
Chlorobenzene	ug/L	5	U	1	U	5	U
Chloroethane	ug/L	5	U	1	U	10	U
Chloroform	ug/L	5	U	1	U	5	U
Chloromethane	ug/L	5	U	1	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	1	U	***2.3***	***J***
cis-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Dibromochloromethane	ug/L	5	U	Not Analyzed		5	U
Ethylbenzene	ug/L	5	U	1	U	***0.65***	***J***
Methylene chloride	ug/L	5	U	1	U	5	U
Styrene	ug/L	5	U	Not Analyzed		5	U
Tetrachloroethene	ug/L	5	U	1	U	5	U
Toluene	ug/L	5	U	1	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	1	U	5	U

Table C-30
33MW11S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW11S / GW2		33MW11S / GW3		33MW11S / GW4	
	Date Collected:	7/14/1998		2/1/2001		9/27/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4875-6		604136101		510-18739-3	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	5	U	1	U	***1.8***	***J***
Vinyl acetate	ug/L	50	U	Not Analyzed		5	U
Vinyl chloride	ug/L	2	U	1	U	2	U
Xylenes, Total	ug/L	10	U	2.4	U	***0.86***	***J***
Total RCRA Metals							
Arsenic	mg/L	Not Analyzed		Not Analyzed		***0.0095***	
Barium	mg/L	Not Analyzed		Not Analyzed		***0.51***	
Cadmium	mg/L	Not Analyzed		Not Analyzed		0.001	U
Chromium	mg/L	Not Analyzed		Not Analyzed		0.001	U
Lead	mg/L	Not Analyzed		Not Analyzed		0.0005	U
Mercury	mg/L	Not Analyzed		Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		***0.00036***	***J***
Silver	mg/L	Not Analyzed		Not Analyzed		0.00047	JB U*
Filtered RCRA Metals							
Arsenic, Dissolved	mg/L	0.01	U	Not Analyzed		***0.0083***	
Barium, Dissolved	mg/L	***0.47***		Not Analyzed		***0.53***	
Cadmium, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U
Chromium, Dissolved	mg/L	***0.0029***	***J***	Not Analyzed		0.001	U
Lead, Dissolved	mg/L	0.003	U	Not Analyzed		0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	Not Analyzed		0.0002	U
Selenium, Dissolved	mg/L	0.01	U	Not Analyzed		***0.00041***	***J***
Silver, Dissolved	mg/L	***0.0024***	***J***	Not Analyzed		0.00076	JB U*

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-31
33MW12D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW12D / GW2		33MW12D / GW4	
	Date Collected:	7/16/1998		9/27/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4917-6		510-18739-4	
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	***0.59***	***J***
1,1-Dichloroethene	ug/L	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U
2-Butanone	ug/L	5	U	10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	10	U
4-Methyl-2-pentanone	ug/L	100	U	10	U
Acetone	ug/L	100	U	10	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Bromomethane	ug/L	5	U	10	U
Carbon disulfide	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
Chloroethane	ug/L	5	U	10	U
Chloroform	ug/L	5	U	5	U
Chloromethane	ug/L	5	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
Methylene chloride	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U
Toluene	ug/L	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U

Table C-31
33MW12D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW12D / GW2		33MW12D / GW4	
	Date Collected:	7/16/1998		9/27/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4917-6		510-18739-4	
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U
Vinyl acetate	ug/L	50	U	5	U
Vinyl chloride	ug/L	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U
Total RCRA Metals					
Arsenic	mg/L	Not Analyzed		***0.0012***	***J***
Barium	mg/L	Not Analyzed		***1.5***	
Cadmium	mg/L	Not Analyzed		***0.00029***	***J***
Chromium	mg/L	Not Analyzed		0.001	U
Lead	mg/L	Not Analyzed		***0.00069***	
Mercury	mg/L	Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		***0.00056***	***J***
Silver	mg/L	Not Analyzed		0.00044	JB U*
Filtered RCRA Metals					
Arsenic, Dissolved	mg/L	0.01	U	0.002	U
Barium, Dissolved	mg/L	***0.677***		***0.66***	
Cadmium, Dissolved	mg/L	***0.0013***	***J***	0.001	U
Chromium, Dissolved	mg/L	0.005	U	0.001	U
Lead, Dissolved	mg/L	***0.0146***		0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U
Selenium, Dissolved	mg/L	0.01	U	***0.00038***	***J***
Silver, Dissolved	mg/L	***0.0108***		0.00047	JB U*

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-32
33MW12S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW12S / GW2		33MW12S / GW4	
	Date Collected:	7/16/1998		9/27/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4917-7		510-18739-5	
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U
2-Butanone	ug/L	5	U	10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	10	U
4-Methyl-2-pentanone	ug/L	100	U	10	U
Acetone	ug/L	100	U	10	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Bromomethane	ug/L	5	U	10	U
Carbon disulfide	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
Chloroethane	ug/L	5	U	10	U
Chloroform	ug/L	5	U	5	U
Chloromethane	ug/L	5	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
Methylene chloride	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U
Toluene	ug/L	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U

Table C-32
33MW12S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW12S / GW2		33MW12S / GW4	
	Date Collected:	7/16/1998		9/27/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4917-7		510-18739-5	
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U
Vinyl acetate	ug/L	50	U	5	U
Vinyl chloride	ug/L	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U
Total RCRA Metals					
Arsenic	mg/L	Not Analyzed		0.002	U
Barium	mg/L	Not Analyzed		***0.039***	
Cadmium	mg/L	Not Analyzed		***0.00046***	***J***
Chromium	mg/L	Not Analyzed		0.001	U
Lead	mg/L	Not Analyzed		***0.0018***	
Mercury	mg/L	Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		***0.014***	
Silver	mg/L	Not Analyzed		0.00039	JB U*
Filtered RCRA Metals					
Arsenic, Dissolved	mg/L	0.01	U	***0.00021***	***J***
Barium, Dissolved	mg/L	***0.0837***		***0.031***	
Cadmium, Dissolved	mg/L	***0.0035***	***J***	***0.00056***	***J***
Chromium, Dissolved	mg/L	***0.0035***	***J***	0.001	U
Lead, Dissolved	mg/L	***0.0026***	***J***	0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U
Selenium, Dissolved	mg/L	0.01	U	***0.01***	
Silver, Dissolved	mg/L	***0.0046***	***J***	0.00043	JB U*

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-33
33MW13D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW13D / GW2	33MW13D / GW3	33MW13D / GW4
	Date Collected:	7/17/1998	2/1/2001	10/1/2007
	Lab:	ITS Richardson	Pace	STL Valparaiso
	Lab ID:	D98-4944-3	604136093	510-18936-1
	Comments:			
Parameter	**Units**			
Volatile Organic Compounds				
1,1,1-Trichloroethane	ug/L	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	1 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	1 U	5 U
1,1-Dichloroethane	ug/L	5 U	1 U	5 U
1,1-Dichloroethene	ug/L	5 U	1 U J*	5 U
1,2-Dichloroethane	ug/L	5 U	1 U	5 U
1,2-Dichloropropane	ug/L	5 U	Not Analyzed	5 U
2-Butanone	ug/L	5 U	Not Analyzed	10 U
2-Chloroethylvinyl ether	ug/L	5 U	Not Analyzed	Not Analyzed
2-Hexanone	ug/L	50 U	Not Analyzed	10 U
4-Methyl-2-pentanone	ug/L	100 U	Not Analyzed	10 U
Acetone	ug/L	100 U	Not Analyzed	10 U
Benzene	ug/L	5 U	1 U	5 U
Bromodichloromethane	ug/L	5 U	Not Analyzed	5 U
Bromoform	ug/L	5 U	Not Analyzed	5 U
Bromomethane	ug/L	5 U	Not Analyzed	10 U
Carbon disulfide	ug/L	5 U	Not Analyzed	5 U
Carbon tetrachloride	ug/L	5 U	1 U	5 U
Chlorobenzene	ug/L	5 U	1 U	5 U
Chloroethane	ug/L	5 U	1 U	10 U
Chloroform	ug/L	5 U	1 U	5 U
Chloromethane	ug/L	5 U	1 U	10 U
cis-1,2-Dichloroethene	ug/L	5 U	1 U	5 U
cis-1,3-Dichloropropene	ug/L	5 U	Not Analyzed	5 U
Dibromochloromethane	ug/L	5 U	Not Analyzed	5 U
Ethylbenzene	ug/L	5 U	1 U	5 U
Methylene chloride	ug/L	5 U	1 U	5 U
Styrene	ug/L	5 U	Not Analyzed	5 U
Tetrachloroethene	ug/L	5 U	1 U	5 U
Toluene	ug/L	5 U	1 U J*	5 U
trans-1,2-Dichloroethene	ug/L	5 U	1 U	5 U

Table C-33
33MW13D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW13D / GW2		33MW13D / GW3		33MW13D / GW4	
Date Collected:		7/17/1998		2/1/2001		10/1/2007	
Lab:		ITS Richardson		Pace		STL Valparaiso	
Lab ID:		D98-4944-3		604136093		510-18936-1	
Comments:							
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	5	U	1	U	5	U
Vinyl acetate	ug/L	50	U	Not Analyzed		5	U
Vinyl chloride	ug/L	2	U	1	U	2	U
Xylenes, Total	ug/L	10	U	2.4	U	10	U
Total RCRA Metals							
Arsenic	mg/L	Not Analyzed		Not Analyzed		***0.0018***	***J***
Barium	mg/L	Not Analyzed		Not Analyzed		***0.72***	
Cadmium	mg/L	Not Analyzed		Not Analyzed		***0.00042***	***J***
Chromium	mg/L	Not Analyzed		Not Analyzed		***0.0049***	***B***
Lead	mg/L	Not Analyzed		Not Analyzed		***0.0033***	
Mercury	mg/L	Not Analyzed		Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		0.001	U
Silver	mg/L	Not Analyzed		Not Analyzed		0.001	U
Filtered RCRA Metals							
Arsenic, Dissolved	mg/L	0.01	U	Not Analyzed		***0.00028***	***J***
Barium, Dissolved	mg/L	***0.61***		Not Analyzed		***0.63***	
Cadmium, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U
Chromium, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U
Lead, Dissolved	mg/L	0.003	U	Not Analyzed		0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	Not Analyzed		0.0002	U
Selenium, Dissolved	mg/L	0.01	U	Not Analyzed		***0.00042***	***J***
Silver, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-34
33MW13S Groundwater Sample Results
Shallow Well

Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW13S / GW2		33MW13S / GW3		33MW13S / GW4	
	Date Collected:	7/17/1998		2/1/2001		10/2/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4944-2		604136051		510-18936-9	
	Comments:						
Parameter	**Units**						
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	5	U	1	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	1	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	1	U	5	U
1,1-Dichloroethane	ug/L	5	U	1	U	5	U
1,1-Dichloroethene	ug/L	5	U	1	U	5	U
1,2-Dichloroethane	ug/L	5	U	1	U	5	U
1,2-Dichloropropane	ug/L	5	U	Not Analyzed		5	U
2-Butanone	ug/L	5	U	Not Analyzed		10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed		Not Analyzed	
2-Hexanone	ug/L	50	U	Not Analyzed		10	U
4-Methyl-2-pentanone	ug/L	100	U	Not Analyzed		10	U
Acetone	ug/L	100	U	Not Analyzed		10	U
Benzene	ug/L	5	U	1	U	5	U
Bromodichloromethane	ug/L	5	U	Not Analyzed		5	U
Bromoform	ug/L	5	U	Not Analyzed		5	U
Bromomethane	ug/L	5	U	Not Analyzed		10	U
Carbon disulfide	ug/L	5	U	Not Analyzed		5	U
Carbon tetrachloride	ug/L	5	U	1	U	5	U
Chlorobenzene	ug/L	5	U	1	U	5	U
Chloroethane	ug/L	5	U	1	U	10	U
Chloroform	ug/L	5	U	1	U	5	U
Chloromethane	ug/L	5	U	1	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	***1.4***		5	U
cis-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Dibromochloromethane	ug/L	5	U	Not Analyzed		5	U
Ethylbenzene	ug/L	5	U	1	U	5	U
Methylene chloride	ug/L	5	U	1	U	5	U
Styrene	ug/L	5	U	Not Analyzed		5	U
Tetrachloroethene	ug/L	5	U	1	U	5	U
Toluene	ug/L	5	U	1	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	1	U	5	U

Table C-34
33MW13S Groundwater Sample Results
Shallow Well

Supplemental Investigation Report
AK Steel Kansas City Facility

	Sample:	33MW13S / GW2		33MW13S / GW3		33MW13S / GW4	
	Date Collected:	7/17/1998		2/1/2001		10/2/2007	
	Lab:	ITS Richardson		Pace		STL Valparaiso	
	Lab ID:	D98-4944-2		604136051		510-18936-9	
	Comments:						
Parameter	**Units**						
trans-1,3-Dichloropropene	ug/L	5	U	Not Analyzed		5	U
Trichloroethene	ug/L	3.79	J U*	1	U	5	U
Vinyl acetate	ug/L	50	U	Not Analyzed		5	U
Vinyl chloride	ug/L	2	U	1	U	***0.73***	***J***
Xylenes, Total	ug/L	10	U	2.4	U	10	U
Total RCRA Metals							
Arsenic	mg/L	Not Analyzed		Not Analyzed		***0.0045***	
Barium	mg/L	Not Analyzed		Not Analyzed		***0.038***	
Cadmium	mg/L	Not Analyzed		Not Analyzed		***0.00026***	***J***
Chromium	mg/L	Not Analyzed		Not Analyzed		***0.0011***	***B***
Lead	mg/L	Not Analyzed		Not Analyzed		***0.0014***	
Mercury	mg/L	Not Analyzed		Not Analyzed		0.0002	U
Selenium	mg/L	Not Analyzed		Not Analyzed		***0.00032***	***J***
Silver	mg/L	Not Analyzed		Not Analyzed		0.001	U
Filtered RCRA Metals							
Arsenic, Dissolved	mg/L	0.01	U	Not Analyzed		***0.0022***	
Barium, Dissolved	mg/L	***0.047***		Not Analyzed		***0.035***	
Cadmium, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U
Chromium, Dissolved	mg/L	***0.004***	***J***	Not Analyzed		0.00048	J U*
Lead, Dissolved	mg/L	0.003	U	Not Analyzed		0.0005	U
Mercury, Dissolved	mg/L	0.0002	U	Not Analyzed		0.0002	U
Selenium, Dissolved	mg/L	0.01	U	Not Analyzed		***0.00046***	***J***
Silver, Dissolved	mg/L	0.005	U	Not Analyzed		0.001	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-35
33MW14D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW14D / GW2		33MW14D / GW4	
	Date Collected:	7/14/1998		10/3/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4875-1		510-19035-7	
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U
2-Butanone	ug/L	5	U	10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	10	U
4-Methyl-2-pentanone	ug/L	100	U	10	U
Acetone	ug/L	100	U	10	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Bromomethane	ug/L	5	U	10	U
Carbon disulfide	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
Chloroethane	ug/L	5	U	10	U
Chloroform	ug/L	5	U	5	U
Chloromethane	ug/L	5	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
Methylene chloride	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U
Toluene	ug/L	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U

Table C-35
33MW14D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW14D / GW2		33MW14D / GW4	
	Date Collected:	7/14/1998		10/3/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4875-1		510-19035-7	
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U
Vinyl acetate	ug/L	50	U	5	U
Vinyl chloride	ug/L	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-36
33MW14S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW14S / GW2		33MW14S / GW4	
	Date Collected:	7/14/1998		10/3/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4875-2		510-19035-6	
	Comments:				
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5	U	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U
1,1,2-Trichloroethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U
1,1-Dichloroethene	ug/L	5	U	5	U
1,2-Dichloroethane	ug/L	5	U	5	U
1,2-Dichloropropane	ug/L	5	U	5	U
2-Butanone	ug/L	5	U	10	U
2-Chloroethylvinyl ether	ug/L	5	U	Not Analyzed	
2-Hexanone	ug/L	50	U	10	U
4-Methyl-2-pentanone	ug/L	100	U	10	U
Acetone	ug/L	100	U	10	U
Benzene	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Bromomethane	ug/L	5	U	10	U
Carbon disulfide	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
Chloroethane	ug/L	5	U	10	U
Chloroform	ug/L	5	U	5	U
Chloromethane	ug/L	5	U	10	U
cis-1,2-Dichloroethene	ug/L	5	U	5	U
cis-1,3-Dichloropropene	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
Methylene chloride	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Tetrachloroethene	ug/L	5	U	5	U
Toluene	ug/L	5	U	5	U
trans-1,2-Dichloroethene	ug/L	5	U	5	U

Table C-36
33MW14S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW14S / GW2		33MW14S / GW4	
	Date Collected:	7/14/1998		10/3/2007	
	Lab:	ITS Richardson		STL Valparaiso	
	Lab ID:	D98-4875-2		510-19035-6	
	Comments:				
Parameter	**Units**				
trans-1,3-Dichloropropene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U
Vinyl acetate	ug/L	50	U	5	U
Vinyl chloride	ug/L	2	U	2	U
Xylenes, Total	ug/L	10	U	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-37
33MW15D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW15D / GW4	
	Date Collected:	10/2/2007	
	Lab:	STL Valparaiso	
	Lab ID:	510-18936-6	
	Comments:		
Parameter	**Units**		
Volatile Organic Compounds			
1,1,1-Trichloroethane	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
1,1-Dichloroethene	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
1,2-Dichloropropane	ug/L	5	U
2-Butanone	ug/L	10	U
2-Chloroethylvinyl ether	ug/L	Not Analyzed	
2-Hexanone	ug/L	10	U
4-Methyl-2-pentanone	ug/L	10	U
Acetone	ug/L	10	U
Benzene	ug/L	5	U
Bromodichloromethane	ug/L	5	U
Bromoform	ug/L	5	U
Bromomethane	ug/L	10	U
Carbon disulfide	ug/L	5	U
Carbon tetrachloride	ug/L	5	U
Chlorobenzene	ug/L	5	U
Chloroethane	ug/L	10	U
Chloroform	ug/L	5	U
Chloromethane	ug/L	10	U
cis-1,2-Dichloroethene	ug/L	5	U
cis-1,3-Dichloropropene	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Ethylbenzene	ug/L	5	U
Methylene Chloride	ug/L	5	U
Styrene	ug/L	5	U
Tetrachloroethene	ug/L	5	U
Toluene	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U

Table C-37
33MW15D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	**33MW15D / GW4**	
	Date Collected:	**10/2/2007**	
	Lab:	**STL Valparaiso**	
	Lab ID:	**510-18936-6**	
	Comments:		
Parameter	**Units**		
trans-1,3-Dichloropropene	ug/L	5	U
Trichloroethene	ug/L	5	U
Vinyl acetate	ug/L	5	U
Vinyl chloride	ug/L	2	U
Xylenes, Total	ug/L	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-38
33MW15S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW15S / GW4	
	Date Collected:	10/2/2007	
	Lab:	STL Valparaiso	
	Lab ID:	510-18936-7	
	Comments:		
Parameter	**Units**		
Volatile Organic Compounds			
1,1,1-Trichloroethane	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
1,1-Dichloroethene	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
1,2-Dichloropropane	ug/L	5	U
2-Butanone	ug/L	10	U
2-Chloroethylvinyl ether	ug/L	Not Analyzed	
2-Hexanone	ug/L	10	U
4-Methyl-2-pentanone	ug/L	10	U
Acetone	ug/L	10	U
Benzene	ug/L	5	U
Bromodichloromethane	ug/L	5	U
Bromoform	ug/L	5	U
Bromomethane	ug/L	10	U
Carbon disulfide	ug/L	5	U
Carbon tetrachloride	ug/L	5	U
Chlorobenzene	ug/L	5	U
Chloroethane	ug/L	10	U
Chloroform	ug/L	5	U
Chloromethane	ug/L	10	U
cis-1,2-Dichloroethene	ug/L	5	U
cis-1,3-Dichloropropene	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Ethylbenzene	ug/L	5	U
Methylene Chloride	ug/L	5	U
Styrene	ug/L	5	U
Tetrachloroethene	ug/L	5	U
Toluene	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U

Table C-38
33MW15S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	**33MW15S / GW4**	
	Date Collected:	**10/2/2007**	
	Lab:	**STL Valparaiso**	
	Lab ID:	**510-18936-7**	
	Comments:		
Parameter	**Units**		
trans-1,3-Dichloropropene	ug/L	5	U
Trichloroethene	ug/L	5	U
Vinyl acetate	ug/L	5	U
Vinyl chloride	ug/L	2	U
Xylenes, Total	ug/L	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

Table C-39
33MW16D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW16D / GW4	
	Date Collected:	10/3/2007	
	Lab:	STL Valparaiso	
	Lab ID:	510-19035-2	
	Comments:		
Parameter	**Units**		
Volatile Organic Compounds			
1,1,1-Trichloroethane	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
1,1-Dichloroethene	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
1,2-Dichloropropane	ug/L	5	U
2-Butanone	ug/L	10	U
2-Chloroethylvinyl ether	ug/L	Not Analyzed	
2-Hexanone	ug/L	10	U
4-Methyl-2-pentanone	ug/L	10	U
Acetone	ug/L	10	U
Benzene	ug/L	5	U
Bromodichloromethane	ug/L	5	U
Bromoform	ug/L	5	U
Bromomethane	ug/L	10	U
Carbon disulfide	ug/L	5	U
Carbon tetrachloride	ug/L	5	U
Chlorobenzene	ug/L	5	U
Chloroethane	ug/L	10	U
Chloroform	ug/L	5	U
Chloromethane	ug/L	10	U
cis-1,2-Dichloroethene	ug/L	5	U
cis-1,3-Dichloropropene	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Ethylbenzene	ug/L	5	U
Methylene Chloride	ug/L	5	U
Styrene	ug/L	5	U
Tetrachloroethene	ug/L	5	U
Toluene	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U

Table C-39
33MW16D Groundwater Sample Results - Deep Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	**33MW16D / GW4**		
	Date Collected:	**10/3/2007**		
	Lab:	**STL Valparaiso**		
	Lab ID:	**510-19035-2**		
	Comments:			
Parameter	**Units**			
trans-1,3-Dichloropropene	ug/L	5	U	
Trichloroethene	ug/L	5	U	
Vinyl acetate	ug/L	5	U	
Vinyl chloride	ug/L	2	U	
Xylenes, Total	ug/L	10	U	

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Deep wells were screened just above bedrock in the deep semi-confined saturated zone.

Table C-40
33MW16S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW16S / GW4	
	Date Collected:	10/2/2007	
	Lab:	STL Valparaiso	
	Lab ID:	510-18936-8	
	Comments:		
Parameter	**Units**		
Volatile Organic Compounds			
1,1,1-Trichloroethane	ug/L	5	U
1,1,2,2-Tetrachloroethane	ug/L	5	U
1,1,2-Trichloroethane	ug/L	5	U
1,1-Dichloroethane	ug/L	5	U
1,1-Dichloroethene	ug/L	5	U
1,2-Dichloroethane	ug/L	5	U
1,2-Dichloropropane	ug/L	5	U
2-Butanone	ug/L	10	U
2-Chloroethylvinyl ether	ug/L	Not Analyzed	
2-Hexanone	ug/L	10	U
4-Methyl-2-pentanone	ug/L	10	U
Acetone	ug/L	10	U
Benzene	ug/L	5	U
Bromodichloromethane	ug/L	5	U
Bromoform	ug/L	5	U
Bromomethane	ug/L	10	U
Carbon disulfide	ug/L	5	U
Carbon tetrachloride	ug/L	5	U
Chlorobenzene	ug/L	5	U
Chloroethane	ug/L	10	U
Chloroform	ug/L	5	U
Chloromethane	ug/L	10	U
cis-1,2-Dichloroethene	ug/L	5	U
cis-1,3-Dichloropropene	ug/L	5	U
Dibromochloromethane	ug/L	5	U
Ethylbenzene	ug/L	5	U
Methylene Chloride	ug/L	5	U
Styrene	ug/L	5	U
Tetrachloroethene	ug/L	5	U
Toluene	ug/L	5	U
trans-1,2-Dichloroethene	ug/L	5	U

Table C-40
33MW16S Groundwater Sample Results - Shallow Well
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	**33MW16S / GW4**	
	Date Collected:	**10/2/2007**	
	Lab:	**STL Valparaiso**	
	Lab ID:	**510-18936-8**	
	Comments:		
trans-1,3-Dichloropropene	ug/L	5	U
Trichloroethene	ug/L	5	U
Vinyl acetate	ug/L	5	U
Vinyl chloride	ug/L	2	U
Xylenes, Total	ug/L	10	U

Bold, italic = Compound was detected.
Description of data flags is provided on Table 2-3.

Shallow wells were screened in the
shallow unconfined saturated zone.

APPENDIX D
QA/QC Review of Analytical Data

Date: December 1, 2007

To: File

From: Sharon Shelton

Re: QA/QC Review of Analytical Data
Supplemental Investigation
AK Steel Kansas City, Missouri Facility (EPA ID # MOD 007118029)
BMcD Project No. 46619

Soil and groundwater samples were collected in September and October 2007 from the AK Steel Kansas City, Missouri Facility (EPA ID # MOD 007118029) as part of a Supplemental Investigation. The samples were collected following the sample collection plan and procedures outlined in the *Quality Assurance Sampling and Analysis Plan, Supplemental Investigation, AK Steel Kansas City, Missouri* ([QA SAP] Burns & McDonnell, 2007). A sample collection and analysis summary is presented Table 1. Samples were analyzed by TestAmerica of Valparaiso, Indiana. Continental Analytical Services, Inc. of Salina, Kansas (CAS) provided analysis for quality assurance (QA) split groundwater samples collected from Solid Waste Management Unit (SWMU) 33 – Nail Mill Degreasing Area.

QA/quality control (QC) items were evaluated in accordance with procedures presented in QA SAP. The QA/QC results are discussed in the following sections. Summary tables of the analytical results and the laboratory analytical reports are provided as appendices to the Supplemental Investigation Report (Burns & McDonnell, 2008). Data qualifiers added during the course of this QA/QC review are presented on Table 2. A description of the assigned data flags is provided in Table 3.

1. Field/Sampling Information – The sample collection summary is presented on Table 1. With the exceptions noted in the following paragraphs, samples were collected as outlined in the QA SAP.

   - SWMU 3 – South of Bar Fab Landfill: Refusal and lack of water were noted at planned sampling locations 03B01A, 03B02A, and 03B03A. Multiple offsets were attempted. Following consultation with the United States Environmental Protection Agency (USEPA) Region 7 and Missouri Department of Natural Resources (MDNR) project managers, additional efforts for groundwater sample collection were abandoned.

   - SWMU 13 – Pickle Liquor Tanks: Extractable total petroleum hydrocarbon (TPH) was planned for soil samples collected from Boring 13B09A. The chain-of-custody (COC) was unclear regarding this requirement. Extractable TPH was requested from TestAmerica Valparaiso via phone and email; however, this analysis was not performed.

   - SWMU 17 – Wire Mill Rinsewater Neutralization Tank: Due to refusal encountered in the 6 – 8 foot below ground surface (ft bgs) interval, a sample could not be collected at this depth on September 10, 2007. More powerful sampling equipment

was used on September 11, 2007 to advance a slightly offset boring for re-collection of a sample from the 4-6 ft bgs interval and collection of a sample from the 6-8 ft bgs interval.

2. Chain-of-Custody – The COCs were reviewed for any errors or omissions. The relinquished and received signatures, times, and dates on the COC forms were present and properly signed.

   The following errors were noted:
   - SWMU 12 – AMOCO Landfarm: The field sampling team requested pH analysis, which was not part of the sampling plan. This analysis was cancelled by the Burns & McDonnell project manager.

   - AOC 8 – "Owl Gun Club" Shooting Park: The field sampling team inadvertently mislabeled location A08B26A as A08B26 on the COC. The lab was advised of the error and provided the correct name in the analytical report.

3. Requested Analyses Completed – The sample plan is presented on Table 1. The analytical methods used by the laboratories were consistent with requirements established in the QA SAP. Deviances from the sample analyses requested on the COCs are noted in the following paragraphs:

   - SWMU 13 – Pickle Liquor Tanks: See discussion in Section 1 regarding extractable TPH analyses.

   - AOC 4 – Boiler Furnace Area: Sample A04B05/SB2 was marked on the COC to be used for the site-specific matrix spike/matrix spike duplicate (MS/MSD) analysis. TestAmerica Valparaiso did not use this sample as the MS/MSD as requested.

4. Sample Preservation Acceptable – No problems were noted with sample preservation.

5. Holding Times Met – Certain VOC parameters required corrective action reanalyses due to failure of method QC criteria. Table 4 presents a summary of samples and VOC parameters that were analyzed outside of holding time for these corrective action reanalyses. All samples were reanalyzed within two times of the holding time and were qualified as estimated, potential low bias (i.e., J- flag for detections and UJ- flag for non-detect results).

6. Method Requirements – The laboratories flagged any detections between the method detection limit (MDL) and the reporting limit (RL) with a "J" to indicate the reported value was estimated. Any detections reported with this "J" qualifier should be used as reported by the lab, unless otherwise noted during the course of this QA/QC evaluation.

   The laboratories assigned other data qualifiers, as needed, during sample analysis. A summary of these data qualifiers and their meaning is provided on Table 3.

7. Laboratory Method Blanks – A summary of the laboratory method blank detections is provided on Table 5. This table includes detections of target analytes noted in the method blanks and any data qualifiers added based on these detections. The following paragraphs discuss the method blank detections:

   - VOC – Acetone was detected in two method blanks, and methylene chloride was detected in three method blanks. Both acetone and methylene chloride are common lab contaminants. Any acetone or methylene chloride detection in the associated field samples that was less than 10 times the blank concentration was disregarded as false positive and qualified as undetected (U*).

   - Extractable TPH – Diesel was detected in one method blank. Since diesel was not detected in the associated field samples, cross-contamination was not a concern. No data required qualification.

   - Total Metals – Silver was detected in two method blanks. In addition, arsenic, barium, chromium, and selenium were each detected in one method blank. Any detection of arsenic, barium, chromium, selenium, or silver in the associated field samples that was less than five times the blank concentration was disregarded as false positive and qualified as undetected (U*).

   - Dissolved Metals – Dissolved chromium and dissolved silver were each detected in one method blank. Any dissolved chromium or dissolved silver detection in the associated field samples that was less than five times the blank concentration was disregarded as false positive and qualified as undetected (U*).

8. Trip Blanks – Trip blanks are supplied by the laboratory and sent to the field with the sample containers to evaluate potential cross-contamination of aqueous VOC samples during sample shipment. Table 6 presents a summary of trip blank results. Sporadic detections of 4-methyl-2-pentanone, acetone, ethylbenzene, toluene, and xylenes were noted. Since these parameters were not detected in the corresponding field samples, cross-contamination was not a concern. No data required qualification due to the trip blank detections.

9. Equipment Rinsate Blank – An equipment rinsate blank was collected from the sampling equipment used to homogenize composite samples from location 09G04. The equipment rinsate blank was used to evaluate potential cross-contamination between samples caused by residual contamination on sampling equipment. As indicated on Table 7, lead was detected in this rinsate blank. Since lead was detected in the associated samples from location 09G04 at concentrations greater than five times the blank value, the field sample results could not be disregarded as false positive. No qualifiers were required due to the rinsate blank detection.

10. Surrogates – Surrogates are added for organic analyses. Surrogates are compounds not normally found in the environment that are added (spiked) into samples and analyzed for the percent recovery (REC) to monitor analytical accuracy. Table 8 presents a summary

of surrogate results that were outside of QC limits and any data qualification that was required.

- VOCs – In general, elevated VOC surrogate RECs were noted for certain samples collected from SWMU 2, SWMU 13, SWMU 17, SWMU 12, SWMU 24, and SWMU 33. The elevated RECS suggest potential high bias in the results, and any VOC detections in the impacted samples were flagged as estimated, potential high bias (J+ flag).

  In some instances, VOC samples exhibited both high REC for one surrogate compound and low surrogate REC for a different surrogate compound. Since the direction of bias is unclear in these instance, results for samples exhibiting both high and low surrogate RECs were qualified as estimated, no specific bias (J* flag).

- Extractable TPH – Certain extractable TPH samples from SWMU 12 and SWMU 6/AOC 4 were diluted by a factor of 50 to bring concentrations of extractable TPH within the instrument calibration range. Due to the dilution, the surrogate spikes could not be recovered by the lab. In these instances, accuracy of the extractable TPH analyses was evaluated using the laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and MS/MSD.

- PAHs – Two soil samples from SWMU 6 exhibited elevated PAH surrogate REC. The elevated RECS suggest potential high bias in the results, and any PAH detections in the impacted samples were flagged as estimated, potential high bias (J+ flag). In addition, one PAH surrogate REC less than 10 percent was noted for Sample A04B06/SB2. The lab reanalyzed the sample, and PAH surrogate results were within QC limits. Results of the initial analysis were rejected (R).

11. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – A LCS is a matrix similar to that of the field sample that has been spiked with known concentrations of analytes. The LCS is prepared and analyzed by the same method as the field samples. The LCS REC is a measure of the accuracy of the preparation and analysis method. The LCSD is a duplicate of the LCS. The relative percent difference (RPD) between the LCS/LCSD pair is calculated to determine precision. Table 9 presents a summary of the LCS/LCSD results that were outside of QC limits and any data qualification that was required.

    - VOC – Elevated LCS and/or LCSD RECs were noted. The elevated RECs suggest potential high bias in the results, and any detections of the impacted constituents were flagged as estimated, potential high bias (J+ flag).

    - SVOC – Low LCS REC was noted for 4,6-dinitro-2-methylphenol. The low LCS REC indicates the potential for low bias. Since 4,6-dinitro-2-methylphenol was not detected it the associated soil samples from SWMU 13, the reporting limit was qualified as estimated, potential low bias (UJ- flag).

- PAH – Low LCS REC was noted for naphthalene in one QC Batch associated with samples from SWMU 6/AOC 4. The low REC indicates the potential for low bias. Naphthalene results for the associated samples were qualified as estimated, potential low bias (J- for detections and UJ- for non-detect results).

12. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – MS/MSDs are run for organic and inorganic analyses. A sample is split into three portions (original, MS, and MSD), and a known amount of an analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion for REC of the spike.

    Samples were collected from the AK Steel Kansas City Facility and submitted to the lab for analysis. A summary of these site-specific MS/MSD samples and their analysis batches is provided in Table 10. A summary of the MS/MSD results and any data qualification that was assigned is presented in Table 11.

13. Reporting Limits – Table 12 presents the samples that required dilution to bring concentrations of target analytes within the calibration range and/or to account for matrix interference(s). These dilutions resulted in elevated reporting limits for any non-detect analytes.

14. Field Duplicate and QA Split Sample Results – Field duplicates provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. In contrast, QA split samples are collected and sent to a laboratory that is independent from the primary analysis lab to provide information on the accuracy and precision of the primary analysis results. Duplicate and QA Split Sample results for the samples were evaluated in accordance with guidelines presented in the QA SAP.

    The field duplicates and QA splits that were collected during this sampling event are listed below:

    - 02B21/DW1 and 02B21/DW1D (Table 13)
    - 03B08A/DW1 and 03B08A/DW1D (Table 14)
    - 06B17/SB2 and 06B17/SB2D (Table 15)
    - 12B01A/SB2 and 12B01A/SB2D (Table 16)
    - 24B11/SB2 and 24B11/SB2D (Table 17)
    - 33MW5S/GW4 and 33MW5S/GW4D (Table 18)
    - 33MW10D/GW4, 33MW10D/GW4D, and 33MW10D/GW4QA (Table 19)
    - 33MW10S/GW4 and 33MW10S/GW4QA (Table 20)

    Limited discrepancies were noted. Overall, the field duplicate comparison was quantitative in nature and no significant problems were discovered.

15. Field Completeness – Field completeness was assessed by comparing the number of samples properly collected to the number of samples planned for collection. A summary of any sample collection difficulties was presented in Section 1, Field/Sampling Information. Minimal problems were encountered during the field activities, and field completeness exceeded the 90 percent goal established in the QA SAP (Table 21).

16. Laboratory Completeness – Laboratory completeness is assessed by comparing the number of valid sample results to the total number of sample results. The only data qualified as rejected (R) was the initial PAH analysis for Sample A04B06/SB2 (Lab ID 510-18356-23). Since the laboratory provided reanalysis results with acceptable QC data, there was no data gap. Since corrective actions addressed the problem and suitable replacement data exists, laboratory completeness was 100 percent.

17. Conclusion – Field and laboratory QA/QC procedures were adhered to as described in the QA SAP. Overall, laboratory data completeness was 100 percent. Table 2 indicates the data qualifiers that were added to the data during the course of this review, and the appropriate result to use in the event that more that one set of results is provided for a sample. Data are considered valid to use in reporting the results of the Supplemental Investigation. Summary tables of the analytical results and the laboratory analytical reports are provided as Appendices C and J to the Supplemental Investigation Report (Burns & McDonnell, 2008).

    Tables
    Table 1 – Sample Collection Summary
    Table 2 – Qualifiers Assigned During Data Review
    Table 3 – Description of Data Flags
    Table 4 – Holding Time Exceedences
    Table 5 – Method Blank Detections
    Table 6 – Trip Blank Results
    Table 7 – Rinsate Blank Results
    Table 8 – Surrogate Results Outside of QC Limits
    Table 9 – LCS/LCSD Results Outside of QC Limits
    Table 10 – Site-Specific MS/MSD Batches
    Table 11 – MS/MSD Results Outside of QC Limits
    Table 12 – Dilution Factors
    Table 13 – Field Duplicate Results – 02B21/DW1 and 02B21/DW1D
    Table 14 – Field Duplicate Results – 03B08A/DW1 and 03B08A/DW1D
    Table 15 – Field Duplicate Results – 06B17/SB2 and 06B17/SB2D
    Table 16 – Field Duplicate Results – 12B01A/SB2 and 12B01A/SB2D
    Table 17 – Field Duplicate Results – 24B11/SB2 and 24B11/SB2D
    Table 18 – Field Duplicate Results – 33MW5S/GW4 and 33MW5S/GW4D
    Table 19 – Field Duplicate and QA Split Results – 33MW10D/GW4, 33MW10D/GW4D, and 33MW10D/GWQA
    Table 20 – QA Split Lab Results – 33MW10S/GW4 and 33MW10S/GW4D
    Table 21 – Field Completeness

Table 1
Sample Collection Summary
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Sample Depth (ft bgs)	Sample Date	Comment	Lab Report	Lab ID	Matrix	VOC	SVOC	PAHs	Volatile TPH	Extractable TPH	pH	Total Cadmium	Total Lead	Total Chromium	Hexavalent Chromium	Total RCRA Metals	Filtered RCRA Metals	Filtered Cadmium	Filtered Lead
SWMU 2 - Old Blue River "W" Landfill																				
02B18 / DW1	24 - 28	9/12/2007		510-18114-1	510-18114-2	Groundwater	X												X	X
02B19 / DW1	14 - 18	9/12/2007		510-18114-1	510-18114-5	Groundwater	X												X	X
02B20 / DW1	22 - 26	9/12/2007		510-18114-1	510-18114-6	Groundwater	X												X	X
02B21 / DW1	16 - 20	9/12/2007		510-18114-1	510-18114-3	Groundwater	X												X	X
02B21 / DW1D	16 - 20	9/12/2007	Duplicate of 02B21/DW1	510-18114-1	510-18114-4	Groundwater	X												X	X
SWMU 3 - South of Bar Fab Landfill																				
03B01A / DW1			No Sample																(1)	(1)
03B02A / DW1			No Sample																(1)	(1)
03B03A / DW1			No Sample																(1)	(1)
03B08A / DW1	23 - 27	9/13/2007		510-18156-1	510-18156-1	Groundwater													X	X
03B08A / DW1D	23 - 27	9/13/2007	Duplicate of 03B08/DW1	510-18156-1	510-18156-2	Groundwater													X	X
SWMU 7 - No. 1 Melt Shop Baghouse Dust Tanks																				
07B01A / SB1	0 - 0.5	9/10/2007		510-17978-1	510-17978-12	Soil							X	X						
07B01A / SB2	0.5 - 1	9/10/2007		510-17978-1	510-17978-13	Soil							X	X						
07B02A / SB1	0 - 0.5	9/10/2007		510-17978-1	510-17978-10	Soil							X	X						
07B02A / SB2	0.5 - 1	9/10/2007		510-17978-1	510-17978-11	Soil							X	X						
07B03A / SB1	0 - 0.5	9/10/2007		510-17978-1	510-17978-8	Soil							X	X						
07B03A / SB2	0.5 - 1	9/10/2007		510-17978-1	510-17978-9	Soil							X	X						
SWMU 9 - No. 1 Melt Shop Baghouse Dust Conveyor																				
09B01 / SB1	0 - 0.5	9/10/2007		510-17978-1	510-17978-4	Soil							X	X						
09B01 / SB2	0.5 - 1	9/10/2007		510-17978-1	510-17978-5	Soil							X	X						
09G04 / SB1	0 - 0.5	9/10/2007		510-17978-1	510-17978-6	Soil							X	X						
09G04 / SB2	0.5 - 1	9/10/2007		510-17978-1	510-17978-7	Soil							X	X						
SWMU 12 - AMOCO Landfarm																				
12B01A / SB1	0 - 2	9/11/2007		510-18045-1	510-18045-1	Soil	X	X		X	X			X	X	X				
12B01A / SB2	2 - 4	9/11/2007		510-18045-1	510-18045-2	Soil	X	X		X	X			X	X	X				
12B01A / SB2D	2 - 4	9/11/2007	Duplicate of 12B01A/SB2	510-18045-1	510-18045-3	Soil	X	X		X	X			X	X	X				
12B01A / SB3	4 - 6	9/11/2007		510-18045-1	510-18045-4	Soil	X	X		X	X			X	X	X				
12B01A / SB4	6 - 8	9/11/2007		510-18045-1	510-18045-5	Soil	X	X		X	X			X	X	X				
12B03A / SB1	0 - 2	9/11/2007		510-18106-1	510-18106-3	Soil	X	X		X	X			X	X	X				
12B03A / SB2	2 - 4	9/11/2007		510-18106-1	510-18106-4	Soil	X	X		X	X			X	X	X				
12B03A / SB3	4 - 6	9/11/2007		510-18106-1	510-18106-5	Soil	X	X		X	X			X	X	X				
12B03A / SB4	6 - 8	9/11/2007		510-18106-1	510-18106-6	Soil	X	X		X	X			X	X	X				
SWMU 13 - Pickle Liquor Tanks																				
13B09A / SB1	0 - 2	9/10/2007		510-17977-1	510-17977-1	Soil	X	X		X	(2)	X					X			
13B09A / SB2	2 - 4	9/10/2007		510-17977-1	510-17977-2	Soil	X	X		X	(2)	X					X			
13B09A / SB3	4 - 6	9/10/2007		510-17977-1	510-17977-3	Soil	X	X		X	(2)	X					X			
13B09A / SB4	6 - 8	9/10/2007		510-17977-1	510-17977-4	Soil	X	X		X	(2)	X					X			
SWMU 17 - Wire Mill Rinsewater Neutralization Tank																				
17B08B / SB1	0 - 2	9/10/2007		510-17978-1	510-17978-1	Soil	X													
17B08B / SB2	2 - 4	9/10/2007		510-17978-1	510-17978-2	Soil	X													
17B08B / SB3	4 - 6	9/10/2007		510-17978-1	510-17978-3	Soil	X													
17B08B / SB3D	4 - 6	9/11/2007	(3)	510-18106-1	510-18106-1	Soil	X													
17B08B / SB4	6 - 8	9/11/2007	(3)	510-18106-1	510-18106-2	Soil	X													
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks																				
06B15 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-4	Soil			X		X		X	X						
06B15 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-5	Soil			X		X		X	X						
06B16 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-6	Soil			X		X		X	X						
06B16 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-7	Soil			X		X		X	X						
06B17 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-1	Soil			X		X		X	X						
06B17 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-2	Soil			X		X		X	X						
06B17 / SB2D	4 - 8	9/18/2007	Duplicate of 06B17/SB2	510-18356-1	510-18356-3	Soil			X		X		X	X						

Table 1
Sample Collection Summary
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Sample Depth (ft bgs)	Sample Date	Comment	Lab Report	Lab ID	Matrix	VOC	SVOC	PAHs	Volatile TPH	Extractable TPH	pH	Total Cadmium	Total Lead	Total Chromium	Hexavalent Chromium	Total RCRA Metals	Filtered RCRA Metals	Filtered Cadmium	Filtered Lead
06B18 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-8	Soil			X		X		X	X						
06B18 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-9	Soil			X		X		X	X						
06B19 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-14	Soil			X		X		X	X						
06B19 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-15	Soil			X		X		X	X						
06B20 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-10	Soil			X		X		X	X						
06B20 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-11	Soil			X		X		X	X						
06B21 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-12	Soil			X		X		X	X						
06B21 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-13	Soil			X		X		X	X						
06B22 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-26	Soil			X		X		X	X						
06B22 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-27	Soil			X		X		X	X						
06B23 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-24	Soil			X		X		X	X						
06B23 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-25	Soil			X		X		X	X						
AOC 4 - Boiler Furnace Area																				
A04B05 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-18	Soil			X		X		X	X						
A04B05 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-19	Soil			X		X		X	X						
A04B06 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-22	Soil			X		X		X	X						
A04B06 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-23	Soil			X		X		X	X						
A04B06 / SB2	4 - 8	9/18/2007	Reanalysis	510-18356-1	510-18356-23RA	Soil			X											
A04B07 / SB1	0 - 2	9/18/2007		510-18356-1	510-18356-16	Soil			X		X		X	X						
A04B07 / SB2	4 - 8	9/18/2007		510-18356-1	510-18356-17	Soil			X		X		X	X						
SWMU 24 - Waste Hydraulic Lubricating Oil Storage Tanks																				
24B11 / SB1	0 - 2	9/17/2007		510-18284-1	510-18284-1	Soil	X		X		X	X					X			
24B11 / SB2	2 - 4	9/17/2007		510-18284-1	510-18284-2	Soil	X		X		X	X					X			
24B11 / SB2D	2 - 4	9/17/2007	Duplicate of 24B11/SB2	510-18284-1	510-18284-3	Soil	X		X		X	X					X			
24B11 / SB3	4 - 6	9/17/2007		510-18284-1	510-18284-4	Soil	X		X		X	X					X			
24B11 / SB4	6 - 8	9/17/2007		510-18284-1	510-18284-5	Soil	X		X		X	X					X			
24B11 / DW1	30 - 35	9/17/2007		510-18284-1	510-18284-6	Groundwater	X													
24B12 / SB1	0 - 2	9/17/2007		510-18284-1	510-18284-7	Soil	X		X		X	X					X			
24B12 / SB2	2 - 4	9/17/2007		510-18284-1	510-18284-8	Soil	X		X		X	X					X			
24B12 / SB3	4 - 6	9/17/2007		510-18284-1	510-18284-9	Soil	X		X		X	X					X			
24B12 / SB4	6 - 8	9/17/2007		510-18284-1	510-18284-10	Soil	X		X		X	X					X			
24B12 / DW1	30 - 35	9/17/2007		510-18284-1	510-18284-11	Groundwater	X													
SWMU 33 - Nail Mill Degreasing Area																				
33MW2S / GW4		10/5/2007		510-19072-1	510-19072-2	Groundwater	X													
33MW2 / GW4		10/5/2007		510-19072-1	510-19072-3	Groundwater	X													
33MW3 / GW4		10/4/2007		510-19035-1	510-19035-11	Groundwater	X													
33MW4 / GW4		9/26/2007		510-18739-1	510-18739-1	Groundwater	X													
33MW4S / GW4		10/1/2007		510-18936-1	510-18936-5	Groundwater	X													
33MW5S / GW4		10/4/2007		510-19035-1	510-19035-12	Groundwater	X										X	X		
33MW5S / GW4D		10/4/2007	Duplicate of 33MW5S/GW4	510-19035-1	510-19035-13	Groundwater	X										X	X		
33MW5I / GW4		10/4/2007		510-19035-1	510-19035-14	Groundwater	X										X	X		
33MW5D / GW4		9/26/2007		510-18739-1	510-18739-2	Groundwater	X										X	X		
33MW6D / GW4		10/1/2007		510-18936-1	510-18936-2	Groundwater	X													
33MW7S / GW4		10/1/2007		510-18936-1	510-18936-4	Groundwater	X													
33MW7D / GW4		10/1/2007		510-18936-1	510-18936-3	Groundwater	X													
33MW8S / GW4		10/4/2007		510-19035-1	510-19035-10	Groundwater	X													
33MW9S / GW4		10/4/2007		510-19035-1	510-19035-9	Groundwater	X													
33MW10S / GW4		10/3/2007		510-19035-1	510-19035-3	Groundwater	X													
33MW10S / GW4QA		10/3/2007	QA Split of 33MW10S/GW4	28707	07100529	Groundwater	X													
33MW10D / GW4		10/3/2007		510-19035-1	510-19035-4	Groundwater	X													
33MW10D / GW4D		10/3/2007	Duplicate of 33MW10D/GW4	510-19035-1	510-19035-5	Groundwater	X													
33MW10D / GW4QA		10/3/2007	QA Split of 33MW10D/GW4	28707	07100530	Groundwater	X													

Table 1
Sample Collection Summary
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Sample Depth (ft bgs)	Sample Date	Comment	Lab Report	Lab ID	Matrix	VOC	SVOC	PAHs	Volatile TPH	Extractable TPH	pH	Total Cadmium	Total Lead	Total Chromium	Hexavalent Chromium	Total RCRA Metals	Filtered RCRA Metals	Filtered Cadmium	Filtered Lead
33MW11S / GW4		9/27/2007		510-18739-1	510-18739-3	Groundwater	X										X	X		
33MW11D / GW4		10/4/2007		510-19035-1	510-19035-8	Groundwater	X										X	X		
33MW12S / GW4		9/27/2007		510-18739-1	510-18739-5	Groundwater	X										X	X		
33MW12D / GW4		9/27/2007		510-18739-1	510-18739-4	Groundwater	X										X	X		
33MW13S / GW4		10/2/2007		510-18936-1	510-18936-9	Groundwater	X										X	X		
33MW13D / GW4		10/1/2007		510-18936-1	510-18936-1	Groundwater	X										X	X		
33MW14S / GW4		10/3/2007		510-19035-1	510-19035-6	Groundwater	X													
33MW14D / GW4		10/3/2007		510-19035-1	510-19035-7	Groundwater	X													
33MW15S / GW4		10/2/2007		510-18936-1	510-18936-7	Groundwater	X													
33MW15D / GW4		10/2/2007		510-18936-1	510-18936-6	Groundwater	X													
33MW16S / GW4		10/2/2007		510-18936-1	510-18936-8	Groundwater	X													
33MW16D / GW4		10/3/2007		510-19035-1	510-19035-2	Groundwater	X													
AOC 8 - "Owl Gun Club" Shooting Park																				
A08B26A / SB1	0 - 0.5	9/12/2007		510-18114-1	510-18114-9	Soil								X						
A08B26A / SB2	0.5 - 2	9/12/2007		510-18114-1	510-18114-10	Soil								X						
A08B49 / SB1	0 - 0.5	9/12/2007		510-18114-1	510-18114-7	Soil								X						
A08B49 / SB2	0.5 - 2	9/12/2007		510-18114-1	510-18114-8	Soil								X						
A08B50 / SB1	0 - 0.5	9/12/2007		510-18114-1	510-18114-11	Soil								X						
A08B50 / SB2	0.5 - 2	9/12/2007		510-18114-1	510-18114-12	Soil								X						
Trip Blanks																				
TB / 091207		9/12/2007		510-18114-1	510-18114-1	Water	X													
TB / 091707		9/17/2007		510-18284-1	510-18284-12	Water	X													
TB092707 / GW4		9/27/2007		510-18739-1	510-18739-6	Water	X													
TB / 100207		10/2/2007		510-18936-1	510-18936-10	Water	X													
TB / 100307		10/3/2007		510-19035-1	510-19035-1	Water	X													
TB / 100307QA		10/3/2007		28707	07100531	Water	X													
TB / 100507		10/5/2007		510-19072-1	510-19072-1	Water	X													
Equipment Rinsate Blank																				
09G04 / RINSATE		9/10/2007		510-17978-1	510-17978-14	Water							X	X						

AOC = Area of Concern
ft bgs = feet below ground surface
ID = Identification
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds
SVOC = Semivolatile Organic Compounds
PAH = Polynuclear Aromatic Hydrocarbons
QA = Quality Assurance sample submitted to Continental Analytical Services, Inc. of Salina, Kansas for comparative analysis
RCRA = Resource Conservation and Recovery Act
RCRA Metals = RCRA metals include: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver
SWMU = Solid Waste Management Unit
(1) = Refusal and lack of water were noted at planned locations 03B01A, 03B02A, and 03B03A. No samples could be collected.
(2) = Extractable TPH was planned for samples collected from location 13B09A. The chain-of-custody was unclear regarding this requirement. Extractable TPH analysis was requested via phone and email to the laboratory; however, this analysis was not performed.
(3) = Due to refusal encountered in the 6-8 ft bgs interval, a sample could not be collected from this interval on 9/10/07. More powerful sampling equipment was used on 9/11/07 to advance a slightly offset boring and collect samples from the 4-6 and 6-8 ft bgs intervals.

Table 2
Qualifiers Assigned During Data Review
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports	
									HT	MB	Surr	LCS/D	MS/D			
SWMU 2 - Old Blue River "W" Landfill																
02B18 / DW1	9/12/2007	510-18114-2	VOC	Chloroethane	ug/L	10	U	J-				X			10	U J-
02B19 / DW1	9/12/2007	510-18114-5	VOC	Carbon disulfide	ug/L	1.7	J	J+				X			1.7	J +
02B19 / DW1	9/12/2007	510-18114-5	VOC	Chloroethane	ug/L	10	U	J-				X			10	U J-
02B20 / DW1	9/12/2007	510-18114-6	VOC	Carbon disulfide	ug/L	0.29	J	J+				X	X		0.29	J +
02B21 / DW1	9/12/2007	510-18114-3	VOC	Chloroethane	ug/L	200	U	J-				X			200	U J-
02B21 / DW1D	9/12/2007	510-18114-4	VOC	Chloroethane	ug/L	200	U	J-				X			200	U J-
02B21 / DW1D	9/12/2007	510-18114-4	VOC	Ethylbenzene	ug/L	880		J+			X				880	J+
02B21 / DW1D	9/12/2007	510-18114-4	VOC	Toluene	ug/L	190		J+			X				190	J+
02B21 / DW1D	9/12/2007	510-18114-4	VOC	Xylenes, Total	ug/L	3300		J+			X				3300	J+
SWMU 7 - No. 1 Melt Shop Baghouse Dust Storage Tanks																
07B01A / SB1	9/10/2007	510-17978-12	METAL	Lead	mg/Kg	290		J+					X		290	J+
07B01A / SB2	9/10/2007	510-17978-13	METAL	Lead	mg/Kg	290		J+					X		290	J+
07B02A / SB1	9/10/2007	510-17978-10	METAL	Lead	mg/Kg	360		J+					X		360	J+
07B02A / SB2	9/10/2007	510-17978-11	METAL	Lead	mg/Kg	1000		J+					X		1000	J+
07B03A / SB1	9/10/2007	510-17978-8	METAL	Lead	mg/Kg	630		J+					X		630	J+
07B03A / SB2	9/10/2007	510-17978-9	METAL	Lead	mg/Kg	940		J+					X		940	J+
SWMU 9 - No. 1 Melt Shop Baghouse Dust Conveyor																
09B01 / SB1	9/10/2007	510-17978-4	METAL	Lead	mg/Kg	43		J+					X		43	J+
09B01 / SB2	9/10/2007	510-17978-5	METAL	Lead	mg/Kg	110		J+					X		110	J+
09G04 / SB1	9/10/2007	510-17978-6	METAL	Lead	mg/Kg	150		J+					X		150	J+
09G04 / SB2	9/10/2007	510-17978-7	METAL	Lead	mg/Kg	120		J+					X		120	J+

Table 2
Qualifiers Assigned During Data Review
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports	
									HT	MB	Surr	LCS/D	MS/D			
SWMU 12 - AMOCO Landfarm																
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,1,1-Trichloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,1,2,2-Tetrachloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,1,2-Trichloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,1-Dichloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,1-Dichloroethene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,2-Dichloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	1,2-Dichloropropane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	2-Butanone (MEK)	ug/Kg	15	U	J*			X				15	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	2-Hexanone	ug/Kg	15	U	J*			X				15	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	4-Methyl-2-pentanone (MIBK)	ug/Kg	15	U	J*			X				15	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Acetone	ug/Kg	12	HU	J-	X		X			Reanalysis	12	HU J-
12B01A / SB1	9/11/2007	510-18045-1	VOC	Benzene	ug/Kg	5.3	J	J*			X	X			5.3	J *
12B01A / SB1	9/11/2007	510-18045-1	VOC	Bromodichloromethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Bromoform	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Bromomethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Carbon disulfide	ug/Kg	7	J	J*			X	X			7	J *
12B01A / SB1	9/11/2007	510-18045-1	VOC	Carbon tetrachloride	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Chlorobenzene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Chloroethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Chloroform	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Chloromethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	cis-1,2-Dichloroethene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	cis-1,3-Dichloropropene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Dibromochloromethane	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Ethylbenzene	ug/Kg	9.9		J*			X				9.9	J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Methylene Chloride	ug/Kg	4.7	J	J*			X				4.7	J *
12B01A / SB1	9/11/2007	510-18045-1	VOC	Styrene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Tetrachloroethene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Toluene	ug/Kg	7.3	J	J*			X	X			7.3	J *
12B01A / SB1	9/11/2007	510-18045-1	VOC	trans-1,2-Dichloroethene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	trans-1,3-Dichloropropene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Trichloroethene	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Vinyl acetate	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Vinyl chloride	ug/Kg	7.5	U	J*			X				7.5	U J*
12B01A / SB1	9/11/2007	510-18045-1	VOC	Xylenes, Total	ug/Kg	14	J	J*			X				14	J *
12B01A / SB2	9/11/2007	510-18045-2	VOC	Benzene	ug/Kg	4.7	J	J+				X			4.7	J +
12B01A / SB2	9/11/2007	510-18045-2	VOC	Methylene Chloride	ug/Kg	11	B	U*		X					11	B U*
12B01A / SB2	9/11/2007	510-18045-2	VOC	Toluene	ug/Kg	7.2	J	J+				X			7.2	J +

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Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports		
									HT	MB	Surr	LCS/D	MS/D				
12B01A / SB2D	9/11/2007	510-18045-3	VOC	Benzene	ug/Kg	3.5	J	J+				X			3.5	J	+
12B01A / SB2D	9/11/2007	510-18045-3	VOC	Methylene Chloride	ug/Kg	14	B	U*		X					14	B	U*
12B01A / SB2D	9/11/2007	510-18045-3	VOC	Toluene	ug/Kg	2.1	J	J+				X			2.1	J	+
12B01A / SB3	9/11/2007	510-18045-4	VOC	Methylene Chloride	ug/Kg	13	B	U*		X					13	B	U*
12B01A / SB3	9/11/2007	510-18045-4	VOC	Toluene	ug/Kg	1.5	J	J+				X			1.5	J	+
12B01A / SB4	9/11/2007	510-18045-5	VOC	Methylene Chloride	ug/Kg	12	B	U*		X					12	B	U*
12B01A / SB4	9/11/2007	510-18045-5	VOC	Toluene	ug/Kg	2.6	J	J+				X			2.6	J	+
12B03A / SB1	9/11/2007	510-18106-3	SVOC	2,4-Dinitrophenol	ug/Kg	2000	U	J*					X		2000	U	J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	4,6-Dinitro-2-methylphenol	ug/Kg	2000	U	J*					X		2000	U	J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Benzo[a]pyrene	ug/Kg	3100		J*					X		3100		J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Benzo[b]fluoranthene	ug/Kg	2700		J*					X		2700		J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Benzo[g,h,i]perylene	ug/Kg	2900		J*					X		2900		J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Benzo[k]fluoranthene	ug/Kg	520	J	J*					X		520	J	*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Benzoic acid	ug/Kg	2000	U	J*					X		2000	U	J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Chrysene	ug/Kg	990		J*					X		990		J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	N-Nitrosodiphenylamine	ug/Kg	390	U	J*					X		390	U	J*
12B03A / SB1	9/11/2007	510-18106-3	SVOC	Pyrene	ug/Kg	580		J*					X		580		J*
12B03A / SB1	9/11/2007	510-18106-3	TPH	Gasoline Range (C6-C10)	ug/Kg	120	U	J-					X		120	U	J-
12B03A / SB1	9/11/2007	510-18106-3	TPH	Unknown Hydrocarbons	mg/kg	10000		J+					X		10000		J+
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,1,1-Trichloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,1,2,2-Tetrachloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,1,2-Trichloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,1-Dichloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,1-Dichloroethene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,2-Dichloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	1,2-Dichloropropane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	2-Butanone (MEK)	ug/Kg	110		J*			X				110		J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	2-Hexanone	ug/Kg	14	U	J*			X				14	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	4-Methyl-2-pentanone (MIBK)	ug/Kg	14	U	J*			X				14	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Acetone	ug/Kg	12	HU	J-	X		X			Reanalysis	12	HU	J-
12B03A / SB1	9/11/2007	510-18106-3	VOC	Benzene	ug/Kg	11		J*			X	X			11		J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Bromodichloromethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Bromoform	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Bromomethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Carbon disulfide	ug/Kg	29	U	J*			X	X		Reanalysis	29	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Carbon tetrachloride	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Chlorobenzene	ug/Kg	6.8	U	J*			X				6.8	U	J*

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									HT	MB	Surr	LCS/D	MS/D				
12B03A / SB1	9/11/2007	510-18106-3	VOC	Chloroethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Chloroform	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Chloromethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	cis-1,2-Dichloroethene	ug/Kg	6.8	U	J*			X			Reanalysis	6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	cis-1,3-Dichloropropene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Dibromochloromethane	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Ethylbenzene	ug/Kg	9.3		J*			X				9.3		J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Methylene Chloride	ug/Kg	8.7		J*			X				8.7		J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Styrene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Tetrachloroethene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Toluene	ug/Kg	29	U	J*			X	X		Reanalysis	29	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	trans-1,2-Dichloroethene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	trans-1,3-Dichloropropene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Trichloroethene	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Vinyl acetate	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Vinyl chloride	ug/Kg	6.8	U	J*			X				6.8	U	J*
12B03A / SB1	9/11/2007	510-18106-3	VOC	Xylenes, Total	ug/Kg	13	J	J*			X				13	J	*
12B03A / SB2	9/11/2007	510-18106-4	VOC	Acetone	ug/Kg	6.2	HJ	J-	X						6.2	HJ	-
12B03A / SB2	9/11/2007	510-18106-4	VOC	Benzene	ug/Kg	3.7	J	J+				X			3.7	J	+
12B03A / SB2	9/11/2007	510-18106-4	VOC	Carbon disulfide	ug/Kg	6.6	U	J*			X	X		Reanalysis	6.6	U	J*
12B03A / SB2	9/11/2007	510-18106-4	VOC	Toluene	ug/Kg	5	J	J+				X		Reanalysis	5	J	+
12B03A / SB3	9/11/2007	510-18106-5	VOC	Acetone	ug/Kg	22	H	J-	X		X				22	H	J-
12B03A / SB3	9/11/2007	510-18106-5	VOC	Benzene	ug/Kg	2.5	J	J+			X	X			2.5	J	+
12B03A / SB3	9/11/2007	510-18106-5	VOC	Methylene Chloride	ug/Kg	12		J+			X				12		J+
12B03A / SB3	9/11/2007	510-18106-5	VOC	Toluene	ug/Kg	2.9	J	J+			X	X			2.9	J	+
12B03A / SB4	9/11/2007	510-18106-6	VOC	Acetone	ug/Kg	21	H	J-	X		X				21	H	J-
12B03A / SB4	9/11/2007	510-18106-6	VOC	Benzene	ug/Kg	2.3	J	J+			X	X			2.3	J	+
12B03A / SB4	9/11/2007	510-18106-6	VOC	Methylene Chloride	ug/Kg	13		J+			X				13		J+
12B03A / SB4	9/11/2007	510-18106-6	VOC	Toluene	ug/Kg	3.2	J	J+			X	X			3.2	J	+
SWMU 13 - Pickle Liquor Tanks																	
13B09A / SB1	9/10/2007	510-17977-1	METAL	Silver	mg/Kg	0.21	JB	U*		X					0.21	JB	U*
13B09A / SB1	9/10/2007	510-17977-1	SVOC	4,6-Dinitro-2-methylphenol	ug/Kg	3700	U	J-				X			3700	U	J-
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,1,1-Trichloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,1,2,2-Tetrachloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,1,2-Trichloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,1-Dichloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*

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									HT	MB	Surr	LCS/D	MS/D				
SWMU 13 - Pickle Liquor Tanks																	
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,1-Dichloroethene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,2-Dichloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	1,2-Dichloropropane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	2-Butanone (MEK)	ug/Kg	12	U	J*			X				12	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	2-Hexanone	ug/Kg	12	U	J*			X				12	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	4-Methyl-2-pentanone (MIBK)	ug/Kg	12	U	J*			X				12	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Acetone	ug/Kg	12	U	J*			X				12	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Benzene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Bromodichloromethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Bromoform	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Bromomethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Carbon disulfide	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Carbon tetrachloride	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Chlorobenzene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Chloroethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Chloroform	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Chloromethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	cis-1,2-Dichloroethene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	cis-1,3-Dichloropropene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Dibromochloromethane	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Ethylbenzene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Methylene Chloride	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Styrene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Tetrachloroethene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Toluene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	trans-1,2-Dichloroethene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	trans-1,3-Dichloropropene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Trichloroethene	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Vinyl acetate	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Vinyl chloride	ug/Kg	6.2	U	J*			X				6.2	U	J*
13B09A / SB1	9/10/2007	510-17977-1	VOC	Xylenes, Total	ug/Kg	12	U	J*			X				12	U	J*
13B09A / SB2	9/10/2007	510-17977-2	METAL	Silver	mg/Kg	0.32	B	U*		X					0.32	B	U*
13B09A / SB2	9/10/2007	510-17977-2	SVOC	4,6-Dinitro-2-methylphenol	ug/Kg	2000	U	J-				X			2000	U	J-
13B09A / SB2	9/10/2007	510-17977-2	VOC	Acetone	ug/Kg	15	H	J-	X					Reanalysis	15	H	J-
13B09A / SB2	9/10/2007	510-17977-2	VOC	Carbon disulfide	ug/Kg	2.7	HJ	J-	X					Reanalysis	2.7	HJ	-

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Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports		
									HT	MB	Surr	LCS/D	MS/D				
13B09A / SB3	9/10/2007	510-17977-3	METAL	Silver	mg/Kg	0.24	JB	U*		X					0.24	JB	U*
13B09A / SB3	9/10/2007	510-17977-3	SVOC	4,6-Dinitro-2-methylphenol	ug/Kg	2300	U	J-				X			2300	U	J-
13B09A / SB3	9/10/2007	510-17977-3	VOC	Methylene Chloride	ug/Kg	1.9	JB	U*		X					1.9	JB	U*
13B09A / SB3	9/10/2007	510-17977-3	VOC	Toluene	ug/Kg	2.2	J	J+				X			2.2	J	+
13B09A / SB4	9/10/2007	510-17977-4	METAL	Silver	mg/Kg	0.68	B	J+		X					0.68	B	J+
13B09A / SB4	9/10/2007	510-17977-4	SVOC	4,6-Dinitro-2-methylphenol	ug/Kg	2300	U	J-				X			2300	U	J-
13B09A / SB4	9/10/2007	510-17977-4	VOC	Acetone	ug/Kg	330	HB	J*	X	X	X				330	HB	J*
13B09A / SB4	9/10/2007	510-17977-4	VOC	Carbon disulfide	ug/Kg	6.7	HJ	J-	X					Reanalysis	6.7	HJ	-
13B09A / SB4	9/10/2007	510-17977-4	VOC	Methylene Chloride	ug/Kg	2.8	J	J+			X				2.8	J	+
13B09A / SB4	9/10/2007	510-17977-4	VOC	Toluene	ug/Kg	2	J	J+			X	X			2	J	+
SWMU 17 - Wire Mill Rinsewater Neutralization Tank																	
17B08B / SB1	9/10/2007	510-17978-1	VOC	Benzene	ug/Kg	2.3	J	J+				X			2.3	J	+
17B08B / SB1	9/10/2007	510-17978-1	VOC	Methylene Chloride	ug/Kg	12	B	U*		X					12	B	U*
17B08B / SB1	9/10/2007	510-17978-1	VOC	Toluene	ug/Kg	2.4	J	J+				X			2.4	J	+
17B08B / SB2	9/10/2007	510-17978-2	VOC	Acetone	ug/Kg	52		J+			X				52		J+
17B08B / SB2	9/10/2007	510-17978-2	VOC	Benzene	ug/Kg	1.3	J	J+			X	X			1.3	J	+
17B08B / SB2	9/10/2007	510-17978-2	VOC	Carbon disulfide	ug/Kg	3.4	J	J+			X				3.4	J	+
17B08B / SB2	9/10/2007	510-17978-2	VOC	cis-1,2-Dichloroethene	ug/Kg	21		J+			X				21		J+
17B08B / SB2	9/10/2007	510-17978-2	VOC	Methylene Chloride	ug/Kg	6.7		U*		X	X				6.7		U*
17B08B / SB2	9/10/2007	510-17978-2	VOC	Toluene	ug/Kg	0.92	J	J+			X	X			0.92	J	+
17B08B / SB2	9/10/2007	510-17978-2	VOC	Trichloroethene	ug/Kg	130		J+			X				130		J+
17B08B / SB3	9/10/2007	510-17978-3	VOC	Methylene Chloride	ug/Kg	5.9	B	U*		X					5.9	B	U*
17B08B / SB3	9/10/2007	510-17978-3	VOC	Toluene	ug/Kg	1.6	J	J+				X			1.6	J	+
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,1,1-Trichloroethane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,1,2,2-Tetrachloroethane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,1,2-Trichloroethane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,1-Dichloroethane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,1-Dichloroethene	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,2-Dichloroethane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	1,2-Dichloropropane	ug/Kg	28	HU	J-	X						28	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	2-Butanone (MEK)	ug/Kg	57	HU	J-	X						57	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	2-Hexanone	ug/Kg	57	HU	J-	X						57	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	4-Methyl-2-pentanone (MIBK)	ug/Kg	57	HU	J-	X						57	HU	J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Acetone	ug/Kg	52	HJ	J-	X						52	HJ	-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Benzene	ug/Kg	28	HU	J-	X						28	HU	J-

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									HT	MB	Surr	LCS/D	MS/D		
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Bromodichloromethane	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Bromoform	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Bromomethane	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Carbon disulfide	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Carbon tetrachloride	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Chlorobenzene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Chloroethane	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Chloroform	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Chloromethane	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	cis-1,2-Dichloroethene	ug/Kg	27	HJ	J-	X						27 HJ J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	cis-1,3-Dichloropropene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Dibromochloromethane	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Ethylbenzene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Methylene Chloride	ug/Kg	310	H	J-	X						310 H J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Styrene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Tetrachloroethene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Toluene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	trans-1,2-Dichloroethene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	trans-1,3-Dichloropropene	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Trichloroethene	ug/Kg	650	H	J-	X						650 H J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Vinyl acetate	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Vinyl chloride	ug/Kg	28	HU	J-	X						28 HU J-
17B08B / SB3D	9/11/2007	510-18106-1	VOC	Xylenes, Total	ug/Kg	57	HU	J-	X						57 HU J-
17B08B / SB4	9/11/2007	510-18106-2	VOC	1,1-Dichloroethene	ug/Kg	1.6	J	J+			X	X			1.6 J +
17B08B / SB4	9/11/2007	510-18106-2	VOC	Acetone	ug/Kg	17	H	J-	X						17 H J-
17B08B / SB4	9/11/2007	510-18106-2	VOC	Carbon disulfide	ug/Kg	1.9	J	J+			X	X			1.9 J +
17B08B / SB4	9/11/2007	510-18106-2	VOC	cis-1,2-Dichloroethene	ug/Kg	52	H	J-	X						52 H J-
17B08B / SB4	9/11/2007	510-18106-2	VOC	trans-1,2-Dichloroethene	ug/Kg	3.3	J	J+			X				3.3 J +
17B08B / SB4	9/11/2007	510-18106-2	VOC	Trichloroethene	ug/Kg	180		J+			X				180 J+
17B08B / SB4	9/11/2007	510-18106-2	VOC	Vinyl chloride	ug/Kg	4.4	J	J+			X				4.4 J +
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks															
06B16 / SB2	9/18/2007	510-18356-7	PAH	Phenanthrene	ug/Kg	47	J	J+			X				47 J +
06B17 / SB1	9/18/2007	510-18356-1	PAH	1-Methylnaphthalene	ug/Kg	420	U	J*					X		420 U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	2-Methylnaphthalene	ug/Kg	420	U	J*					X		420 U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Acenaphthene	ug/Kg	420	U	J*					X		420 U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Acenaphthylene	ug/Kg	420	U	J*					X		420 U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Anthracene	ug/Kg	420	U	J*					X		420 U J*

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									HT	MB	Surr	LCS/D	MS/D			
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks																
06B17 / SB1	9/18/2007	510-18356-1	PAH	Benzo[a]anthracene	ug/Kg	70	J	J*					X		70	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Benzo[a]pyrene	ug/Kg	70	J	J*					X		70	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Benzo[b]fluoranthene	ug/Kg	99	J	J*					X		99	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Benzo[g,h,i]perylene	ug/Kg	72	J	J*					X		72	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Benzo[k]fluoranthene	ug/Kg	45	J	J*					X		45	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Chrysene	ug/Kg	89	J	J*					X		89	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Dibenz(a,h)anthracene	ug/Kg	420	U	J*					X		420	U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Fluoranthene	ug/Kg	110	J	J*					X		110	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Fluorene	ug/Kg	420	U	J*					X		420	U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Indeno[1,2,3-cd]pyrene	ug/Kg	420	U	J*					X		420	U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Naphthalene	ug/Kg	420	U	J*					X		420	U J*
06B17 / SB1	9/18/2007	510-18356-1	PAH	Phenanthrene	ug/Kg	84	J	J*					X		84	J *
06B17 / SB1	9/18/2007	510-18356-1	PAH	Pyrene	ug/Kg	130	J	J*					X		130	J *
06B22 / SB1	9/18/2007	510-18356-26	PAH	Naphthalene	ug/Kg	3900	U	J-				X			3900	U J-
06B22 / SB2	9/18/2007	510-18356-27	PAH	Naphthalene	ug/Kg	48	J	J-				X			48	J -
06B22 / SB2	9/18/2007	510-18356-27	TPH	Diesel	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Fuel Oil	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Hydraulic Fluid	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Kerosene	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Mineral Spirits	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Motor Oil	mg/kg	180	U	J-							180	U J-
06B22 / SB2	9/18/2007	510-18356-27	TPH	Unknown Hydrocarbons	mg/kg	8400		J-							8400	J-
06B23 / SB1	9/18/2007	510-18356-24	PAH	Benzo[a]anthracene	ug/Kg	150	J	J+			X				150	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Benzo[b]fluoranthene	ug/Kg	210	J	J+			X				210	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Benzo[k]fluoranthene	ug/Kg	80	J	J+			X				80	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Chrysene	ug/Kg	250	J	J+			X				250	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Fluoranthene	ug/Kg	330	J	J+			X				330	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Naphthalene	ug/Kg	360	U	J-				X			360	U J-
06B23 / SB1	9/18/2007	510-18356-24	PAH	Phenanthrene	ug/Kg	210	J	J+			X				210	J +
06B23 / SB1	9/18/2007	510-18356-24	PAH	Pyrene	ug/Kg	430		J+			X				430	J+
06B23 / SB2	9/18/2007	510-18356-25	PAH	Naphthalene	ug/Kg	350	U	J-				X			350	U J-
AOC 4 - Boiler Furnace Area																
A04B06 / SB1	9/18/2007	510-18356-22	PAH	Naphthalene	ug/Kg	360	U	J-				X			360	U J-

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									HT	MB	Surr	LCS/D	MS/D				
AOC 4 - Boiler Furnace Area																	
A04B06 / SB2	9/18/2007	510-18356-23	PAH	1-Methylnaphthalene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	2-Methylnaphthalene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Acenaphthene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Acenaphthylene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Anthracene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Benzo[a]anthracene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Benzo[a]pyrene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Benzo[b]fluoranthene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Benzo[g,h,i]perylene	ug/Kg	360	U	R			X			Use Reanalysis - Lab ID 510-18356-23RA	360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Benzo[k]fluoranthene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Chrysene	ug/Kg	45	J	R			X				45	J	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Dibenz(a,h)anthracene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Fluoranthene	ug/Kg	55	J	R			X				55	J	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Fluorene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Indeno[1,2,3-cd]pyrene	ug/Kg	360	U	R			X				360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Naphthalene	ug/Kg	360	U	R			X	X			360	U	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Phenanthrene	ug/Kg	58	J	R			X				58	J	R
A04B06 / SB2	9/18/2007	510-18356-23	PAH	Pyrene	ug/Kg	61	J	R			X				61	J	R
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	1-Methylnaphthalene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	2-Methylnaphthalene	ug/Kg	67	J								67	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Acenaphthene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Acenaphthylene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Anthracene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Benzo[a]anthracene	ug/Kg	40	J								40	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Benzo[a]pyrene	ug/Kg	370	U							No Data Review Qualifiers - Reanalysis Data for 510-18356-23	370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Benzo[b]fluoranthene	ug/Kg	47	J								47	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Benzo[g,h,i]perylene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Benzo[k]fluoranthene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Chrysene	ug/Kg	59	J								59	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Dibenz(a,h)anthracene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Fluoranthene	ug/Kg	67	J								67	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Fluorene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Indeno[1,2,3-cd]pyrene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Naphthalene	ug/Kg	370	U								370	U	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Phenanthrene	ug/Kg	66	J								66	J	
A04B06 / SB2	9/18/2007	510-18356-23RA	PAH	Pyrene	ug/Kg	78	J								78	J	

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									HT	MB	Surr	LCS/D	MS/D			
SWMU 24 - Waste Hydraulic Lubricating Oil Storage Tanks																
24B11 / SB1	9/17/2007	510-18284-1	METAL	Arsenic	mg/Kg	0.47	U	J*					X		0.47	U J*
24B11 / SB1	9/17/2007	510-18284-1	METAL	Barium	mg/Kg	0.12	U	J*					X		0.12	U J*
24B11 / SB1	9/17/2007	510-18284-1	METAL	Cadmium	mg/Kg	0.24	U	J*					X		0.24	U J*
24B11 / SB1	9/17/2007	510-18284-1	METAL	Chromium	mg/Kg	710		J*					X		710	J*
24B11 / SB1	9/17/2007	510-18284-1	METAL	Lead	mg/Kg	0.12	U	J*					X		0.12	U J*
24B11 / SB1	9/17/2007	510-18284-1	METAL	Mercury	mg/Kg	0.0078	J	J+					X		0.0078	J +
24B11 / SB1	9/17/2007	510-18284-1	METAL	Selenium	mg/Kg	0.053	J	J*					X		0.053	J *
24B11 / SB1	9/17/2007	510-18284-1	VOC	Benzene	ug/Kg	1.7	J	J+			X	X			1.7	J +
24B11 / SB1	9/17/2007	510-18284-1	VOC	Carbon disulfide	ug/Kg	3.9	J	J+			X	X		Reanalysis	3.9	J +
24B11 / SB1	9/17/2007	510-18284-1	VOC	Methylene Chloride	ug/Kg	10		J+			X				10	J+
24B11 / SB2	9/17/2007	510-18284-2	METAL	Arsenic	mg/Kg	0.54	U	J*					X		0.54	U J*
24B11 / SB2	9/17/2007	510-18284-2	METAL	Barium	mg/Kg	0.14	U	J*					X		0.14	U J*
24B11 / SB2	9/17/2007	510-18284-2	METAL	Cadmium	mg/Kg	0.27	U	J*					X		0.27	U J*
24B11 / SB2	9/17/2007	510-18284-2	METAL	Chromium	mg/Kg	940		J*					X		940	J*
24B11 / SB2	9/17/2007	510-18284-2	METAL	Lead	mg/Kg	0.14	U	J*					X		0.14	U J*
24B11 / SB2	9/17/2007	510-18284-2	METAL	Mercury	mg/Kg	0.01	J	J+					X		0.01	J +
24B11 / SB2	9/17/2007	510-18284-2	METAL	Selenium	mg/Kg	0.064	J	J*					X		0.064	J *
24B11 / SB2	9/17/2007	510-18284-2	VOC	Methylene Chloride	ug/Kg	12	B	U*		X					12	B U*
24B11 / SB2	9/17/2007	510-18284-2	VOC	Toluene	ug/Kg	1.3	J	J+				X			1.3	J +
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Arsenic	mg/Kg	0.064	JB	U*J*		X			X		0.064	JB U*
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Barium	mg/Kg	0.12	U	J*					X		0.12	U J*
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Cadmium	mg/Kg	0.23	U	J*					X		0.23	U J*
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Chromium	mg/Kg	840		J*					X		840	J*
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Lead	mg/Kg	0.12	U	J*					X		0.12	U J*
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Mercury	mg/Kg	0.021	J	J+					X		0.021	J +
24B11 / SB2D	9/17/2007	510-18284-3	METAL	Selenium	mg/Kg	0.08	J	J*					X		0.08	J *
24B11 / SB2D	9/17/2007	510-18284-3	VOC	Carbon disulfide	ug/Kg	2.5	J	J+			X	X		Reanalysis	2.5	J +
24B11 / SB2D	9/17/2007	510-18284-3	VOC	Methylene Chloride	ug/Kg	13		J+			X				13	J+
24B11 / SB3	9/17/2007	510-18284-4	METAL	Arsenic	mg/Kg	0.51	U	J*					X		0.51	U J*
24B11 / SB3	9/17/2007	510-18284-4	METAL	Barium	mg/Kg	0.13	U	J*					X		0.13	U J*
24B11 / SB3	9/17/2007	510-18284-4	METAL	Cadmium	mg/Kg	0.26	U	J*					X		0.26	U J*
24B11 / SB3	9/17/2007	510-18284-4	METAL	Chromium	mg/Kg	1300		J*					X		1300	J*
24B11 / SB3	9/17/2007	510-18284-4	METAL	Lead	mg/Kg	0.13	U	J*					X		0.13	U J*
24B11 / SB3	9/17/2007	510-18284-4	METAL	Mercury	mg/Kg	0.011	J	J+					X		0.011	J +
24B11 / SB3	9/17/2007	510-18284-4	METAL	Selenium	mg/Kg	0.12	J	J*					X		0.12	J *
24B11 / SB3	9/17/2007	510-18284-4	VOC	Benzene	ug/Kg	1.6	J	J+			X	X			1.6	J +

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Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports
									HT	MB	Surr	LCS/D	MS/D		
24B11 / SB3	9/17/2007	510-18284-4	VOC	Carbon disulfide	ug/Kg	3.7	J	J+			X	X		Reanalysis	3.7 J +
24B11 / SB3	9/17/2007	510-18284-4	VOC	Methylene Chloride	ug/Kg	8.7		J+			X				8.7 J+
24B11 / SB3	9/17/2007	510-18284-4	VOC	Toluene	ug/Kg	1.7	J	J+			X	X		Reanalysis	1.7 J +
24B11 / SB4	9/17/2007	510-18284-5	METAL	Arsenic	mg/Kg	0.5	U	J*					X		0.5 U J*
24B11 / SB4	9/17/2007	510-18284-5	METAL	Barium	mg/Kg	0.12	U	J*					X		0.12 U J*
24B11 / SB4	9/17/2007	510-18284-5	METAL	Cadmium	mg/Kg	0.25	U	J*					X		0.25 U J*
24B11 / SB4	9/17/2007	510-18284-5	METAL	Chromium	mg/Kg	11		J*					X		11 J*
24B11 / SB4	9/17/2007	510-18284-5	METAL	Lead	mg/Kg	0.12	U	J*					X		0.12 U J*
24B11 / SB4	9/17/2007	510-18284-5	METAL	Mercury	mg/Kg	0.14		J+					X		0.14 J+
24B11 / SB4	9/17/2007	510-18284-5	METAL	Selenium	mg/Kg	0.14	J	J*					X		0.14 J *
24B11 / SB4	9/17/2007	510-18284-5	VOC	Acetone	ug/Kg	37	B	U*		X					37 B U*
24B11 / SB4	9/17/2007	510-18284-5	VOC	Methylene Chloride	ug/Kg	3.3	JB	U*		X					3.3 JB U*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Arsenic	mg/Kg	0.077	JB	U*J*		X			X		0.077 JB U*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Barium	mg/Kg	0.14	U	J*					X		0.14 U J*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Cadmium	mg/Kg	0.27	U	J*					X		0.27 U J*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Chromium	mg/Kg	27		J*					X		27 J*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Lead	mg/Kg	0.14	U	J*					X		0.14 U J*
24B12 / SB1	9/17/2007	510-18284-7	METAL	Mercury	mg/Kg	0.054		J+					X		0.054 J+
24B12 / SB1	9/17/2007	510-18284-7	METAL	Selenium	mg/Kg	0.12	J	J*					X		0.12 J *
24B12 / SB1	9/17/2007	510-18284-7	VOC	Acetone	ug/Kg	22	B	U*		X					22 B U*
24B12 / SB1	9/17/2007	510-18284-7	VOC	Benzene	ug/Kg	2.4	J	J+			X				2.4 J +
24B12 / SB1	9/17/2007	510-18284-7	VOC	Methylene Chloride	ug/Kg	5.4	JB	U*		X					5.4 JB U*
24B12 / SB1	9/17/2007	510-18284-7	VOC	Toluene	ug/Kg	1.7	J	J+			X				1.7 J +
24B12 / SB2	9/17/2007	510-18284-8	METAL	Arsenic	mg/Kg	0.08	JB	U*J*		X			X		0.08 JB U*
24B12 / SB2	9/17/2007	510-18284-8	METAL	Barium	mg/Kg	0.12	U	J*					X		0.12 U J*
24B12 / SB2	9/17/2007	510-18284-8	METAL	Cadmium	mg/Kg	0.25	U	J*					X		0.25 U J*
24B12 / SB2	9/17/2007	510-18284-8	METAL	Chromium	mg/Kg	23		J*					X		23 J*
24B12 / SB2	9/17/2007	510-18284-8	METAL	Lead	mg/Kg	0.12	U	J*					X		0.12 U J*
24B12 / SB2	9/17/2007	510-18284-8	METAL	Mercury	mg/Kg	0.039		J+					X		0.039 J+
24B12 / SB2	9/17/2007	510-18284-8	METAL	Selenium	mg/Kg	0.18	J	J*					X		0.18 J *
24B12 / SB2	9/17/2007	510-18284-8	VOC	Acetone	ug/Kg	21	B	U*		X					21 B U*
24B12 / SB2	9/17/2007	510-18284-8	VOC	Benzene	ug/Kg	1.9	J	J+			X				1.9 J +
24B12 / SB2	9/17/2007	510-18284-8	VOC	Carbon disulfide	ug/Kg	2.5	J	J+			X				2.5 J +
24B12 / SB2	9/17/2007	510-18284-8	VOC	Methylene Chloride	ug/Kg	2.8	JB	U*		X					2.8 JB U*
24B12 / SB2	9/17/2007	510-18284-8	VOC	Toluene	ug/Kg	1.6	J	J+			X				1.6 J +

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Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports	
									HT	MB	Surr	LCS/D	MS/D			
24B12 / SB3	9/17/2007	510-18284-9	METAL	Arsenic	mg/Kg	11	B	J*		X			X		11	B J*
24B12 / SB3	9/17/2007	510-18284-9	METAL	Barium	mg/Kg	110		J*					X		110	J*
24B12 / SB3	9/17/2007	510-18284-9	METAL	Cadmium	mg/Kg	1.7		J*					X		1.7	J*
24B12 / SB3	9/17/2007	510-18284-9	METAL	Chromium	mg/Kg	31		J*					X		31	J*
24B12 / SB3	9/17/2007	510-18284-9	METAL	Lead	mg/Kg	110		J*					X		110	J*
24B12 / SB3	9/17/2007	510-18284-9	METAL	Mercury	mg/Kg	0.08		J+					X		0.08	J+
24B12 / SB3	9/17/2007	510-18284-9	METAL	Selenium	mg/Kg	0.68		J*					X		0.68	J*
24B12 / SB3	9/17/2007	510-18284-9	PAH	Fluoranthene	ug/Kg	680		J-					X		680	J-
24B12 / SB3	9/17/2007	510-18284-9	PAH	Indeno[1,2,3-cd]pyrene	ug/Kg	96	J	J-					X		96	J -
24B12 / SB3	9/17/2007	510-18284-9	PAH	Phenanthrene	ug/Kg	620		J-					X		620	J-
24B12 / SB3	9/17/2007	510-18284-9	VOC	Acetone	ug/Kg	18	B	U*		X	X				18	B U*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Benzene	ug/Kg	5.8	J	J*			X				5.8	J *
24B12 / SB3	9/17/2007	510-18284-9	VOC	Bromodichloromethane	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Bromoform	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Bromomethane	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Carbon disulfide	ug/Kg	2.5	J	J*			X				2.5	J *
24B12 / SB3	9/17/2007	510-18284-9	VOC	Carbon tetrachloride	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Chlorobenzene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Chloroethane	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Chloroform	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Chloromethane	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	cis-1,2-Dichloroethene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	cis-1,3-Dichloropropene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Dibromochloromethane	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Ethylbenzene	ug/Kg	1.4	J	J*			X				1.4	J *
24B12 / SB3	9/17/2007	510-18284-9	VOC	Methylene Chloride	ug/Kg	1.8	JB	U*		X	X				1.8	JB U*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Styrene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Tetrachloroethene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Toluene	ug/Kg	5	J	J*			X				5	J *
24B12 / SB3	9/17/2007	510-18284-9	VOC	trans-1,2-Dichloroethene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	trans-1,3-Dichloropropene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Trichloroethene	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Vinyl acetate	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Vinyl chloride	ug/Kg	6.1	U	J*			X				6.1	U J*
24B12 / SB3	9/17/2007	510-18284-9	VOC	Xylenes, Total	ug/Kg	12	U	J*			X				12	U J*
24B12 / SB4	9/17/2007	510-18284-10	METAL	Arsenic	mg/Kg	0.5	U	J*					X		0.5	U J*
24B12 / SB4	9/17/2007	510-18284-10	METAL	Barium	mg/Kg	0.13	U	J*					X		0.13	U J*
24B12 / SB4	9/17/2007	510-18284-10	METAL	Cadmium	mg/Kg	0.25	U	J*					X		0.25	U J*
24B12 / SB4	9/17/2007	510-18284-10	METAL	Chromium	mg/Kg	21		J*					X		21	J*

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Sample Name	Date Sampled	Lab ID	Analysis	Parameter	Units	Result	Lab Qualifier	Data Review Qualifier	Reason for Qualifier					Comments	Results for Subsequent Reports
									HT	MB	Surr	LCS/D	MS/D		
24B12 / SB4	9/17/2007	510-18284-10	METAL	Lead	mg/Kg	0.13	U	J*					X		0.13 U J*
24B12 / SB4	9/17/2007	510-18284-10	METAL	Mercury	mg/Kg	0.02		J+					X		0.02 J+
24B12 / SB4	9/17/2007	510-18284-10	METAL	Selenium	mg/Kg	0.13	J	J*					X		0.13 J *
24B12 / SB4	9/17/2007	510-18284-10	VOC	Acetone	ug/Kg	18	B	U*		X					18 B U*
24B12 / SB4	9/17/2007	510-18284-10	VOC	Methylene Chloride	ug/Kg	3.6	JB	U*		X					3.6 JB U*
SWMU 33 - Nail Mill Degreasing Area															
33MW4 / GW4	9/26/2007	510-18739-1	VOC	Bromoform	ug/L	5	HU	J-	X						5 HU J-
33MW5S / GW4	10/4/2007	510-19035-12	METAL	Selenium	mg/L	0.0017	B	U*		X					0.0017 B U*
33MW5S / GW4D	10/4/2007	510-19035-13	METAL	Selenium	mg/L	0.0014	B	U*		X					0.0014 B U*
33MW5D / GW4	9/26/2007	510-18739-2	FMET	Silver, Dissolved	mg/L	0.00066	JB	U*		X					0.00066 JB U*
33MW5D / GW4	9/26/2007	510-18739-2	METAL	Silver	mg/L	0.00073	JB	U*		X					0.00073 JB U*
33MW5D / GW4	9/26/2007	510-18739-2	VOC	Bromoform	ug/L	5	HU	J-	X						5 HU J-
33MW11S / GW4	9/27/2007	510-18739-3	FMET	Silver, Dissolved	mg/L	0.00076	JB	U*		X					0.00076 JB U*
33MW11S / GW4	9/27/2007	510-18739-3	METAL	Silver	mg/L	0.00047	JB	U*		X					0.00047 JB U*
33MW12S / GW4	9/27/2007	510-18739-5	FMET	Silver, Dissolved	mg/L	0.00043	JB	U*		X					0.00043 JB U*
33MW12S / GW4	9/27/2007	510-18739-5	METAL	Silver	mg/L	0.00039	JB	U*		X					0.00039 JB U*
33MW12D / GW4	9/27/2007	510-18739-4	FMET	Silver, Dissolved	mg/L	0.00047	JB	U*		X					0.00047 JB U*
33MW12D / GW4	9/27/2007	510-18739-4	METAL	Silver	mg/L	0.00044	JB	U*		X					0.00044 JB U*
33MW13S / GW4	10/2/2007	510-18936-9	FMET	Chromium, Dissolved	mg/L	0.00048	J	U*		X					0.00048 J U*

ID = Identification
FMET = Filtered Metals
PAH = Polynuclear Aromatic Hydrocarbons
SVOC = Semivolatile Organic Compounds
VOC = Volatile Organic Compounds
HT = Holding Time
MB = Method Blank
Surr = Surrogate
LCS/D = Laboratory Control Sample / Laboratory Control Sample Duplicate
MS/D = Matrix Spike / Matrix Spike Duplicate

mg/L = milligrams per liter
mg/kg = milligrams per kilogram
ug/L = micrograms per liter
ug/kg = micrograms per kilogram

Description of Lab Qualifiers and Data Review Qualifiers is provided on Table 3.

Table 3
Description of Data Flags
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Qualifier	Description
Qualifiers Added by the Laboratories	
B	Blank contamination. Analyte was found in the associated method blank as well as the sample.
H	The sample was prepared or analyzed beyond the specified holding time.
J	The compound was detected. The result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL), and the reported concentration is an estimated value.
U	The compound was analyzed, but was not detected above the reporting limit.
Qualifiers Assigned during Data Review	
J+	The result is an estimated value and may be biased high.
J-	The result is an estimated value and may be biased low.
J*	The result is an estimated value. Quality control results exhibit accuracy and/or precision criteria outside of limits.
R	The data are unusable. The sample results are rejected due to inability to meet quality control criteria.
U*	The compound was not detected. Results were disregarded as false positive due to blank contamination.
Possible Combinations of Qualifiers (Lab and Data Review)	
BJ+	The analyte was detected in the method blank, and the result should be considered estimated with a high bias due to potential for contamination.
BJ*	The analyte was detected in the method blank. In addition, quality control results exhibited accuracy and/or precision criteria outside of limits. The result is an estimated value.
BU*	The analyte was detected in the method blank, and the result should be considered nondetect (i.e., false positive) due to contamination.
HBJ*	The sample was prepared or analyzed outside of holding time and blank contamination was noted in the analysis. The result is an estimated value that may be biased due to either the holding time (potential for low bias) or blank contamination (potential for high bias).
HJ-	The sample was prepared or analyzed outside of holding time and the result is an estimated value that may be biased low.
HUJ-	The sample was prepared or analyzed outside of holding time, and the analyte was not detected above the reporting limit. Due to the holding time exceedence, the reporting limit is an approximate value and may be biased low.
JBU*	The analyte was detected in the method blank at a concentration less than the reporting limit, and the result should be considered nondetect (i.e., false positive) due to contamination.
JR	The compound was detected at a concentration between the RL and MDL. However, the data is unusable/rejected due to inability to meet quality control criteria.
JU*	The analyte was detected at a concentration less than the reporting limit, and the result should be considered nondetect (i.e., false positive) due to contamination.
UJ-	The analyte was not detected above the reporting limit. However, the reporting limit is an approximate value and may be biased low.
UJ*	The analyte was not detected above the reporting limit. However, the reporting limit is an approximate value.
UR	The analyte was not detected above the reporting limit. However, the data is unusable/rejected due to inability to meet quality control criteria.

Table 4
Holding Time Exceedences
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Sample Name	Lab ID	Date Sampled	Analysis	Parameter	Analysis Date	Hold Time (Days)	Comment	Units	Lab Result	Data Review Qualifier Added
SWMU 12 - AMOCO Landfarm										
12B01A / SB1	510-18045-1	9/11/2007	VOC	Acetone	9/26/2007	15	Reanalysis	ug/Kg	12 HU	J-
12B03A / SB1	510-18106-3	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	12 HU	J-
12B03A / SB2	510-18106-4	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	6.2 HJ	J-
12B03A / SB3	510-18106-5	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	22 H	J-
12B03A / SB4	510-18106-6	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	21 H	J-
SWMU 13 - Pickle Liquor Tanks										
13B09A / SB2	510-17977-2	9/10/2007	VOC	Acetone	9/26/2007	16	Reanalysis	ug/Kg	15 H	J-
13B09A / SB2	510-17977-2	9/10/2007	VOC	Carbon disulfide	9/26/2007	16	Reanalysis	ug/Kg	2.7 HJ	J-
13B09A / SB4	510-17977-4	9/10/2007	VOC	Acetone	9/27/2007	17	Reanalysis and Dilution	ug/Kg	330 HB	J*
13B09A / SB4	510-17977-4	9/10/2007	VOC	Carbon disulfide	9/26/2007	16	Reanalysis	ug/Kg	6.7 HJ	J-
SWMU 17 - Wire Mill Rinsewater Neutralization Tank										
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,1,1-Trichloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,1,2,2-Tetrachloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,1,2-Trichloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,1-Dichloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,1-Dichloroethene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,2-Dichloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	1,2-Dichloropropane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	2-Butanone (MEK)	9/27/2007	16	Reanalysis	ug/Kg	57 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	2-Hexanone	9/27/2007	16	Reanalysis	ug/Kg	57 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	4-Methyl-2-pentanone (MIBK)	9/27/2007	16	Reanalysis	ug/Kg	57 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	52 HJ	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Benzene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Bromodichloromethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Bromoform	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Bromomethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Carbon disulfide	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-

Table 4
Holding Time Exceedences
Supplemental Investigation
AK Steel Kansas City Facility

Sample Name	Lab ID	Date Sampled	Analysis	Parameter	Analysis Date	Hold Time (Days)	Comment	Units	Lab Result	Data Review Qualifier Added
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Carbon tetrachloride	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Chlorobenzene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Chloroethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Chloroform	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Chloromethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	cis-1,2-Dichloroethene	9/27/2007	16	Reanalysis	ug/Kg	27 HJ	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	cis-1,3-Dichloropropene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Dibromochloromethane	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Ethylbenzene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Methylene Chloride	9/27/2007	16	Reanalysis	ug/Kg	310 H	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Styrene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Tetrachloroethene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Toluene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	trans-1,2-Dichloroethene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	trans-1,3-Dichloropropene	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Trichloroethene	9/27/2007	16	Reanalysis	ug/Kg	650 H	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Vinyl acetate	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Vinyl chloride	9/27/2007	16	Reanalysis	ug/Kg	28 HU	J-
17B08B / SB3D	510-18106-1	9/11/2007	VOC	Xylenes, Total	9/27/2007	16	Reanalysis	ug/Kg	57 HU	J-
17B08B / SB4	510-18106-2	9/11/2007	VOC	Acetone	9/27/2007	16	Reanalysis	ug/Kg	17 H	J-
17B08B / SB4	510-18106-2	9/11/2007	VOC	cis-1,2-Dichloroethene	9/27/2007	16	Reanalysis	ug/Kg	52 H	J-
SWMU 33 - Nail Mill Degreasing Area										
33MW4 / GW4	510-18739-1	9/26/2007	VOC	Bromoform	10/11/2007	15	Reanalysis	ug/L	5 HU	J-
33MW5D / GW4	510-18739-2	9/26/2007	VOC	Bromoform	10/11/2007	15	Reanalysis	ug/L	5 HU	J-

ID = Identification
VOC = Volatile Organic Compound
ug/kg = micrograms per kilogram
ug/L = microgram per liter

Description of Lab Qualifiers and Data Review Qualifiers is provided on Table 3.

Table 5
Method Blank Detections
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package	Analyte(s)	Blank Value	Associated Field Sample Discussion Sample Name: Lab ID:
510-23579	510-17977-1	Acetone	5.4 J ug/kg	The acetone result for the associated field sample was >10X the blank value and could not be disregarded as false positive. No data qualifiers were added. 13B09A/SB4 510-17977-4
510-23294 / 510-22825	510-17977-1	Silver	0.22 J mg/kg	Silver results for 3 of the 4 associated field samples were < 5X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as noted below. The silver result for the remaining sample was >5X the blank value and was qualified as estimated, potenital high bias (J+) 13B09A/SB1 510-17977-1 13B09A/SB2 510-17977-2 13B09A/SB3 510-17977-3 13B09A/SB4 510-17977-4
510-23177	510-17878-1 510-17977-1 510-18045-1	Methylene chloride	2.5 J ug/kg	The methylene chloride results for the associated field samples were <10X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as follows: 17B08/SB1 510-17978-1 17B08/SB2 510-17978-2 17B08/SB3 510-17978-3 13B09A/SB3 510-17977-3 12B01A/SB2 510-18045-2 12B01A/SB2D 510-18045-3 12B01A/SB3 510-18045-4 12B01A/SB4 510-18045-5
510-23188	510-18284-1	Methylene chloride	2.0 J ug/kg	The methylene chloride result for the associated field sample was <10X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as follows: 24B11/SB2 510-18284-2
510-23579	510-18284-1	Acetone Methylene chloride	5.4 J ug/kg 2.4 J ug/kg	The acetone and methylene chloride results for the associated field samples were <10X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as follows: 24B11/SB4 510-18284-5 24B12/SB1 510-18284-7 24B12/SB2 510-18284-8 24B12/SB3 510-18284-9 24B12/SB4 510-18284-10
510-23463 / 510-23319	510-18284-1	Arsenic	0.055 J mg/kg	Arsenic results for 3 of the 9 associated field samples were < 5X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as noted below. The remaining samples were either non-detect (5 samples) or >5X the blank value (1 sample) and did not require qualification. 24B11/SB2D 510-18284-3 24B12/SB1 510-18284-7 24B12/SB2 510-18284-8

Table 5
Method Blank Detections
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package	Analyte(s)	Blank Value	Associated Field Sample Discussion Sample Name: Lab ID:
400-55769	510-18356-1	Diesel	0.52 J mg/L	Diesel results for associated field samples were non-detect. Cross-contamination was not an issue. No qualifiers were required.
510-23801 / 510-23707	510-18739-1	Silver	0.55 J ug/L	Silver results for associated samples were <5X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as indicated: 33MW5D/GW4 510-18739-2 33MW11S/GW4 510-18739-3 33MW12D/GW4 510-18739-4 33MW12S/GW4 510-18739-5
510-23896	510-18739-1	Silver, Dissolved	0.64 J ug/L	Dissolved Silver results for associated samples were <5X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as indicated: 33MW5D/GW4 510-18739-2 33MW11S/GW4 510-18739-3 33MW12D/GW4 510-18739-4 33MW12S/GW4 510-18739-5
510-23929 / 510-23898	510-18936-1	Chromium	0.14 J ug/L	Chromium results for all associated samples were >5X the blank value and could not be disregarded as false positive. No data qualifiers were added. 33MW13D/GW4 510-18936-1 33MW13S/GW4 510-18936-9
510-23929	510-18936-1	Chromium, Dissolved	0.14 J ug/L	The dissolved chromium result for one of the associated field samples was <5X the blank value and disregarded as false positive. Results for this sample were qualified as undetecte (U*) as indicated: 33MW13S/GW4 510-18936-9
510-24045	510-19035-1	Barium	0.27 J ug/L	Barium results for associate samples was >5X the blank value and could not be disregarded as false positive. No data qualifiers were added. 33MW11D/GW4 510-19035-8
510-24149 / 510-24011	510-19035-1	Selenium	0.69 J ug/L	Selenium results for associated samples were <5X the blank value and disregarded as false positive. Results were qualified as undetected (U*) as indicated: 33MW5S/GW4 510-19035-12 33MW5S/GW4D 510-19035-13

ID = Identification
QC = Quality Control
ug/kg = micrograms per kilogram
ug/L = micrograms per liter
mg/kg = milligrams per kilogram
5X = five times
10X = ten times

Description of qualifiers is provided on Table 3.

Table 6
Trip Blank Results
Supplemental Investigation
AK Steel Kansas City Facility

Sample:		TB / 091207	TB / 091707	TB092707 / GW4	TB / 100207	TB / 100307	TB / 100307QA	TB / 100507
Date Collected:		9/12/2007	9/17/2007	9/27/2007	10/2/2007	10/3/2007	10/3/2007	10/5/2007
Lab ID:		510-18114-1	510-18284-12	510-18739-6	510-18936-10	510-19035-1	07100531	510-19072-1
Comments:							QA Split Lab	
Parameter	**Units**							
Volatile Organic Compounds								
1,1,1-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,1,2-Trichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,1-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,1-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,2-Dichloroethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
1,2-Dichloropropane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
2-Butanone (MEK)	ug/L	10 U	10 U	10 U	10 U	10 U	25 U	25 U
2-Hexanone	ug/L	10 U	10 U	10 U	10 U	10 U	25 U	25 U
4-Methyl-2-pentanone (MIBK)	ug/L	***0.78 J***	10 U	10 U	10 U	10 U	25 U	25 U
Acetone	ug/L	10 U	10 U	10 U	10 U	10 U	25 U	***6.3 J***
Benzene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	1 U
Bromodichloromethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Bromoform	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Bromomethane	ug/L	10 U	10 U	10 U	10 U	10 U	1 U	5 U
Carbon disulfide	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Carbon tetrachloride	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Chlorobenzene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Chloroethane	ug/L	10 U	10 U	10 U	10 U	10 U	1 U	5 U
Chloroform	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Chloromethane	ug/L	10 U	10 U	10 U	10 U	10 U	1 U	5 U
cis-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
cis-1,3-Dichloropropene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Dibromochloromethane	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Ethylbenzene	ug/L	5 U	5 U	5 U	5 U	***0.38 J***	1 U	5 U
Methylene Chloride	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Styrene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Tetrachloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Toluene	ug/L	5 U	5 U	5 U	5 U	***0.91 J***	1 U	***0.94 J***
trans-1,2-Dichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
trans-1,3-Dichloropropene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Trichloroethene	ug/L	5 U	5 U	5 U	5 U	5 U	1 U	5 U
Vinyl acetate	ug/L	5 U	5 U	5 U	5 U	5 U	25 U	25 U
Vinyl chloride	ug/L	2 U	2 U	2 U	2 U	2 U	1 U	5 U
Xylenes, Total	ug/L	10 U	10 U	10 U	10 U	***0.51 J***	3 U	15 U

Description of qualifiers is provided on Table 3. ug/L = micrograms per liter Bold, italics = Compound was detected.

Table 7
Rinsate Blank Results
Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	**09G04 / RINSATE**	
	Date Collected:	**9/10/2007**	
	Lab ID:	**510-17978-14**	
	Comments:		
Parameter	**Units**		
Total Metals			
Cadmium	mg/L	0.001	U
Lead	mg/L	***0.0022***	

Description of data qualifiers is provided on Table 3.

Bold, italic = Compound was detected.
mg/L = milligrams per liter

Table 8
Surrogate Results Outside QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

Sample Identification	Laboratory Number	Analysis Type	Surrogate	Surrogate REC (%)	QC Limits (%)	Qualifiers Added
02B21/DW1D	510-18114-4	VOC	4-Bromofluorobenzene	128	89-120	VOC detections (ethylbenzene, toluene, and xylenes) were qualified as estimated, potential high bias (J+ flag).
17B08B/SB2	510-17978-2	VOC	1,2-Dichloroethane-d4	131	80-124	VOC detections (acetone, benzene, carbon disulfide, cis-1,2-dichloroethene, toluene, and trichloroethene) were qualified as estimated, potential high bias (J+ flag). Methylene chloride did not require qualification since it was previously discounted as a false positive due to blank contamination.
13B09A/SB1	510-17977-1	VOC	1,2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene	227 78 141	80-124 83-113 68-134	Sample VOC results were non-detect. Surrogate recovery problems indicate potential for both low and high bias. Sample results were non-detect and qualified as estimated (UJ* flag) to indicate potential bias.
13B09A/SB2	510-17977-2	VOC	1,2-Dichloroethane-d4	161	80-124	Sample VOC results were non-detect. Surrogate recovery problems indicate potential for high bias, which is not an issue for a non-detect sample. No qualifiers were added. (Note acetone and carbon disulfide results represent a reanalysis which has acceptable surrogate results.)
13B09/SB4	510-17977-4	VOC	4-Bromofluorobenzene	136	68-134	VOC detections (methylene chloride and toluene) were qualified as estimated, potential high bias (J+ flag). (Note carbon disulfide results represent a reanalysis which has acceptable surrogate results.)
13B09/SB4	510-17977-4RA2	VOC	4-Bromofluorobenzene	143	68-134	Sample was a reanalysis with only carbon disulfide reported. Surrogate recovery indicates potential for high bias; however, sample was analyzed outside of holding time which can cause low bias. The result was qualified a estimated (J*) to indicate potential problems with the analysis.
12B01A/SB1	510-18045-1	VOC	1,2-Dichloroethane-d4 Toluene-d8 4-Bromofluorobenzene	145 78 167	80-124 83-113 68-134	Surrogate recovery problems indicate potential for both low and high bias. Surrogate outliers require qualification as estimated (UJ* for nondetect and J* for detections).

Table 8
Surrogate Results Outside QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

Sample Identification	Laboratory Number	Analysis Type	Surrogate	Surrogate REC (%)	QC Limits (%)	Qualifiers Added
12B01A/SB1	510-18045-1RA2	VOC	Toluene-d8 4-Bromofluorobenzene	80 196	83-113 68-134	Sample was a reanalysis with only acetone reported. Surrogate recovery indicates potential for both low and high bias. In addition, sample was analyzed outside of holding time which can cause low bias. The result was qualified a estimated (J*) to indicate potential problems with the analysis.
12B01A/SB1	510-18045-1	TPH	Not Applicable - Diluted Out			Extractable TPH was diluted by a factor of 50, which resulted in loss of surrogates. No qualifiers were required.
17B08B/SB4	510-18106-2	VOC	1,2-Dichloroethane-d4	125	80-124	VOC detections (1,1-dichloroethene, carbon disulfide, trans-1,2-dichloroethene, trichloroethene, and vinyl chloride) were qualified as estimated, potential high bias (J+ flag). (Note acetone and cis-1,2-dichloroethene results represent a reanalysis which has acceptable surrogate results.)
12B03A/SB1	510-18106-3	VOC	1,2-Dichloroethane-d4 Toluene-d8	129 81	80-124 83-113	Surrogate recovery problems indicate potential for both low and high bias. Surrogate outliers require qualification as estimated (UJ* for nondetect and J* for detections).
12B03A/SB1	510-18106-3RA2	VOC	Toluene-d8 4-Bromofluorobenzene	72 188	83-113 68-134	Sample was a reanalysis with only acetone reported. Surrogate recovery indicates potential for both low and high bias. In addition, sample was analyzed outside of holding time which can cause low bias. The result was qualified a estimated (J-) to indicate potential problems with the analysis.
12B03A/SB1	510-18106-3RADL	VOC	1,2-Dichloroethane-d4 4-Bromofluorobenzene	127 148	80-124 68-134	Sample was a reanalysis with only carbon disulfide and toluene reported. Surrogate recovery indicates potential for high bias. Since results were non-detect, high bias was not a concern. No qualifiers were added.
12B03A/SB1	510-18106-3	TPH	Not Applicable - Diluted Out			Extractable TPH was diluted by a factor of 50, which resulted in loss of surrogates. No qualifiers were required.
12B03A/SB2	510-18106-4RA	VOC	1,2-Dichloroethane-d4	128	80-124	Sample was a reanalysis with only carbon disulfide reported. Surrogate recovery indicates potential for high bias. Since results were non-detect, high bias was not a concern. No qualifiers were added.

Table 8
Surrogate Results Outside QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

Sample Identification	Laboratory Number	Analysis Type	Surrogate	Surrogate REC (%)	QC Limits (%)	Qualifiers Added
12B03A/SB3	510-18106-5	VOC	1,2-Dichloroethane-d4	132	80-124	VOC detections (benzene, methylene chloride, and toluene) were qualified as estimated, potential high bias (J+ flag).
12B03A/SB3	510-18106-5RA2	VOC	1,2-Dichloroethane-d4	78	80-124	Sample was a reanalysis with only acetone reported. Surrogate recovery and holding time exceedence indicate potential for low bias. The results was qualified as estimated, potential low bias (J-).
12B03A/SB4	510-18106-6	VOC	1,2-Dichloroethane-d4	133	80-124	VOC detections (benzene, methylene chloride, and toluene) were qualified as estimated, potential high bias (J+ flag).
12B03A/SB4	510-18106-6RA2	VOC	1,2-Dichloroethane-d4	79	80-124	Sample was a reanalysis with only acetone reported. Surrogate recovery and holding time exceedence indicate potential for low bias. The results was qualified as estimated, potential low bias (J-).
24B11/SB1	510-18284-1	VOC	1,2-Dichloroethane-d4	140	80-124	VOC detections (benzene and methylene chloride) were qualified as estimated, potential high bias (J+ flag).
24B11/SB1	510-18284-1RA	VOC	1,2-Dichloroethane-d4	132	80-124	Sample was a reanalysis with carbon disulfide, cis-1,2-dichloroethene, and toluene reported. Carbon disulfide was the only detection, and it was qualified as estimated, potential high bias (J+ flag).
24B11/SB2D	510-18284-3	VOC	1,2-Dichloroethane-d4	149	80-124	VOC detections (methylene chloride) were qualified as estimated, potential high bias (J+ flag).
24B11/SB2D	510-18284-3RA	VOC	1,2-Dichloroethane-d4	128	80-124	Sample was a reanalysis with carbon disulfide, cis-1,2-dichloroethene, and toluene reported. Carbon disulfide was the only detection, and it was qualified as estimated, potential high bias (J+ flag).
24B11/SB3	510-18284-4	VOC	1,2-Dichloroethane-d4	160	80-124	VOC detections (benzene, methylene chloride, and toluene) were qualified as estimated, potential high bias (J+ flag).
24B11/SB3	510-18284-4RA	VOC	1,2-Dichloroethane-d4	128	80-124	Sample was a reanalysis with carbon disulfide and cis-1,2-dichloroethene reported. Carbon disulfide was the only detection, and it was qualified as estimated, potential high bias (J+ flag).

Table 8
Surrogate Results Outside QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

Sample Identification	Laboratory Number	Analysis Type	Surrogate	Surrogate REC (%)	QC Limits (%)	Qualifiers Added
24B11/SB4	510-18284-5	VOC	4-Bromofluorobenzene	135	68-135	After qualification for method blank, all results were non-detect. Surrogate recovery problems indicate potential for high bias, which is not an issue for a non-detect sample. No qualifiers were added.
24B12/SB1	510-18284-7	VOC	4-Bromofluorobenzene	153	68-135	VOC detections (benzene and toluene) were qualified as estimated, potential high bias (J+ flag).
24B12/SB2	510-18284-8	VOC	4-Bromofluorobenzene	150	68-135	VOC detections (benzene, carbon disulfide, and toluene) were qualified as estimated, potential high bias (J+ flag).
24B12/SB3	510-18284-9	VOC	Toluene-d8 4-Bromofluorobenzene	80 166	83-113 68-134	Surrogate recovery problems indicate potential for both low and high bias. Surrogate outliers require qualification as estimated (UJ* for nondetect and J* for detections).
24B12/DW1	510-18284-11	VOC	1,2-Dichloroethane-d4 4-Bromofluorobenzene	121 122	87-120 89-120	Sample VOC results were non-detect. Surrogate recovery problems indicate potential for high bias, which is not an issue for a non-detect sample. No qualifiers were added.
06B16/SB2	510-18356-7	PAH	Terphenyl-d14	97	53-96	PAH detections (phenanthrene) were qualified as estimated, potential high bias (J+ flag).
06B23/SB1	510-18356-24	PAH	Terphenyl-d14	103	53-96	PAH detections (benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene) were qualified as estimated, potential high bias (J+ flag).
A04B06/SB2	510-18356-23	PAH	2-Fluorobiphenyl Nitrobenzene-d5	17 2	41-94 22-94	Lab reanalyzed sample, and all surrogate were within control limits for the reanalysis. Results from this analysis were rejected (R) due to surrogate recovery less than 10%.
06B18/SB1 06B18/SB2 06B20/SB1 A04B07/SB1 A04B05/SB2 06B23/SB2 06B22/SB1 06B22/SB2	510-18356-8 510-18356-9 510-18356-10 510-18356-16 510-18356-19 510-18356-25 510-18356-26 510-18356-27	TPH	Not Applicable - Diluted Out			Extractable TPH was diluted by a factor of 50, which resulted in loss of surrogates. No qualifiers were required.

Table 8
Surrogate Results Outside QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

Sample Identification	Laboratory Number	Analysis Type	Surrogate	Surrogate REC (%)	QC Limits (%)	Qualifiers Added
33MW11S/GW4	510-18739-3RA	VOC	1,2-Dichloroethane-d4 4-Bromofluorobenzene	125 122	87-120 89-120	Sample was a reanalysis with bromoform reported. Surrogate recovery problems indicate potential for high bias. Since bromoform was not detected, high bias was not a concern. No qualifiers were added.
33MW12D/GW4	510-18739-4RA	VOC	1,2-Dichloroethane-d4	135	87-120	Sample was a reanalysis with bromoform reported. Surrogate recovery problems indicate potential for high bias. Since bromoform was not detected, high bias was not a concern. No qualifiers were added.
33MW12S/GW4	510-18739-5RA	VOC	1,2-Dichloroethane-d4	135	87-120	Sample was a reanalysis with bromoform reported. Surrogate recovery problems indicate potential for high bias. Since bromoform was not detected, high bias was not a concern. No qualifiers were added.
TB092707/GW4	510-18739-6RA	VOC	1,2-Dichloroethane-d4 4-Bromofluorobenzene	155 128	87-120 89-120	Sample was a reanalysis with bromoform reported. Surrogate recovery problems indicate potential for high bias. Since bromoform was not detected, high bias was not a concern. No qualifiers were added.

PAH = Polynuclear Aromatic Hydrocarbons
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds
QC = Quality Control
REC = Percent Recovery

Description of data qualifiers is provided on Table 3.

Table 9
LCS/LCSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package(s)	Analysis	Parameter	LCS REC (%)	LCSD REC (%)	QC Limits (%)	LCS/LCSD RPD (%)	QC Limits (%)	Corrective Actions and/or Qualifiers Added Sample ID: Lab ID:
1MS9281	28707 QA Split Sample Lab	VOC	Chloroethane Vinyl chloride	129 129	NA NA	76.2 - 124 73.4 - 128	NA NA	NA NA	Elevated RECs suggest high bias. Since parameters were not detected, high bias was not a concern. No qualifiers were added. Associated samples are as follows: 33MW10S/GW4QA 07100529 33MW10D/GW4QA 07100530 TB100307 07100531
510-23177	510-17977-1 510-17978-1 510-18045-1	VOC	1,1-Dichloroethene Benzene Chlorobenzene Tetrachloroethene Toluene trans-1,2-Dichloroethene	119 124 117 131 124 131	OK 120 115 OK 118 OK	76 - 117 81 - 116 80 - 112 82 - 127 77 - 117 82 - 129	2 3 2 7 6 3	30 30 30 30 30 30	Elevated LCS/LCSD results indicate potential for high bias. Detections for the outlier parameters were qualified as estimated, bias high (J+ flag). Benzene and/or toluene were the only parameters detected in the associated field samples. The field samples initial analysis results associated with this QC batch are as follows: 13B09A/SB3 510-17977-3 17B08/SB1 510-17978-1 17B08/SB2 510-17978-2 17B08/SB3 510-17978-3 12B01A/SB2 510-18045-2 12B01A/SB2D 510-18045-3 12B01A/SB3 510-18045-4 12B01A/SB4 510-18045-5
510-23188	510-18284-1	VOC	1,1,1-Trichloroethane 1,1-Dichloroethane Benzene Carbon tetrachloride Chlorobenzene cis-1,2-Dichloroethene Styrene Tetrachloroethene Toluene trans-1,2-Dichloroethene Trichloroethene	126 125 122 126 126 127 OK 132 127 136 OK	128 124 123 125 124 129 117 133 127 133 123	78 - 125 80 - 123 81 - 116 81 - 124 80 - 112 81 - 122 80 - 116 82 - 127 77 - 117 82 - 129 81 - 122	2 0 1 0 2 2 1 0 0 2 4	30 30 30 30 30 30 30 30 30 30 30	Elevated LCS/LCSD results indicate potential for high bias. Detections for the outlier parameters were qualified as estimated, bias high (J+ flag). Toluene was the only parameter detected in the associated field samples. The field samples associated with this QC batch are as follows: 24B11/SB2 510-18284-2

Table 9
LCS/LCSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package(s)	Analysis	Parameter	LCS REC (%)	LCSD REC (%)	QC Limits (%)	LCS/LCSD RPD (%)	QC Limits (%)	Corrective Actions and/or Qualifiers Added Sample ID: Lab ID:
510-23358	510-18114-1	VOC	Carbon disulfide	139	NA	64 - 120	NA	NA	Elevated LCS result indicates potential for high bias. The carbon disulfide detection in the following associated sample was qualified as estimated, bias high (J+ flag): 02B20/DW1 510-18114-6
510-23290	510-17977-1 510-18045-1 510-18106-1 510-18284-1	VOC	1,1,1-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 2-Hexanone Acetone Benzene Carbon disulfide Carbon tetrachloride Chlorobenzene cis-1,2-Dichloroethene Toluene Vinyl acetate	131 132 127 137 118 123 OK 131 121 OK 122 146	131 132 129 OK OK 127 127 129 120 128 124 144	78 - 125 80 - 123 76 - 117 67 - 119 57 - 117 81 - 116 66 - 126 81 - 124 80 - 112 81 - 122 77 - 117 80 - 141	0 0 1 20 17 3 2 2 1 5 2 2	30 30 30 30 30 30 30 30 30 30 30 30	Elevated LCS/LCSD results indicate potential for high bias. Detections for the outlier parameters were qualified as estimated, bias high (J+ flag). Benzene, carbon disulfide, 1,1-dichloroethene, and toluene were the only parameters detected in one or more of the associated field samples. The field samples associated with this QC batch are as follows: 13B09A/SB1 510-17977-1 13B09A/SB2 510-17977-2 13B09A/SB3 510-17977-3 13B09A/SB4 510-17977-4 12B01A/SB1 510-18045-1 17B08B/SB3D 510-18106-2 12B03A/SB1 510-18106-3 12B03A/SB2 510-18106-4 12B03A/SB3 510-18106-5 12B03A/SB4 510-18106-6 24B11/SB1 510-18284-1 24B11/SB2D 510-18284-3 24B11/SB3 510-18284-4
510-23456	510-18106-1 510-18284-1	VOC	Carbon disulfide cis-1,2-Dichloroethene Toluene	81 90 88	154 137 147	66 - 126 81 - 122 77 - 117	63 41 50	30 30 30	Elevated LCSD results indicate the potential for high bias. In addition, the elevated RPD values indicate potential precision problems with the analysis. Results for samples from SWMU 12 were qualified as estimated, not specific bias (J*). The results for SWMU 24 samples were qualified as estimated, high bias (J+) due to elevated surrogate recovery problems indicating a likely high bias. The field samples associated with this reanalysis QC batch are as follows: 12B03A/SB1 510-18106-3RADL 12B03A/SB2 510-18196-4RA 24B11/SB1 510-18284-1RA 24B11/SB2D 510-18284-3RA 24B11/SB3 510-18284-4RA

Table 9
LCS/LCSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package(s)	Analysis	Parameter	LCS REC (%)	LCSD REC (%)	QC Limits (%)	LCS/LCSD RPD (%)	QC Limits (%)	Corrective Actions and/or Qualifiers Added Sample ID: Lab ID:
510-23465	510-18114-1	VOC	Carbon disulfide Chloroethane	129 78	146 OK	64 - 120 85 - 131	12 20	30 30	Elevated LCS for carbon disulfide indicates potential high bias. Carbon disulfide detections in the associated field samples were qualified as estimated, bias high (J+). Low LCS for chloroethane indicates potential for low bias. Chloroethane was not detected in the field samples, and the reporting limits were qualified as estimated, bias low (UJ- flag). Associated samples are as follows: 02B18/DW1 510-18114-2 02B21/DW1 510-18114-3 02B21/DW1D 510-18114-4 02B19/DW1 510-18114-5
510-23500	510-18284-1	VOC	Carbon disulfide	132	130	64 - 120	1	30	Elevated LCS/LCSD results indicate the potential for high bias. Since carbon disulfide was not detected in the associated field samples, high bias was not a concern. No qualifiers were added. Associated field samples are as follows: 24B11/DW1 510-18284-6 24B12/DW1 510-18284-11 TB/091707 510-18284-12
510-23550	510-17977-1 510-18045-1 510-18106-1 510-18284-1	VOC	Vinyl acetate	221	NA	80 - 141	NA	NA	Elevated LCS results indicate the potential for high bias. Since vinyl acetate was not detected in the associated field samples, high bias was not a concern. No qualifiers were added. Associated field samples with vinyl acetate reported from this batch are as follows: 17B08B/SB3 510-18106-1
510-23579	510-17977-1 510-18284-1	VOC	Vinyl acetate	163	NA	80 - 141	NA	NA	Elevated LCS results indicate the potential for high bias. Since vinyl acetate was not detected in the associated field samples, high bias was not a conern. No qualifiers were added. Associated field samples with vinyl acetate reported from this batch are as follows: 24B11/SB4 510-18284-5 24B12/SB1 510-18284-7 24B12/SB2 510-18284-8 24B12/SB3 510-18284-9 24B12/SB4 510-18284-10

Table 9
LCS/LCSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch	Data Package(s)	Analysis	Parameter	LCS REC (%)	LCSD REC (%)	QC Limits (%)	LCS/LCSD RPD (%)	QC Limits (%)	Corrective Actions and/or Qualifiers Added Sample ID: Lab ID:
400-55339	510-17977-1	SVOC	4,6-Dinitro-2-methylphenol	28	NA	30 - 107	NA	NA	Low LCS results indicate the potential for low bias. 4,6-Dinitro-2-methylphenol was not detected in the field samples, and the reporting limits were qualified as estimated, bias low (UJ- flag). Associated samples are as follows: 13B09A/SB1 510-17977-1 13B09A/SB2 510-17977-2 13B09A/SB3 510-17977-3 13B09A/SB4 510-17977-4
400-55766	510-18356-1	PAH	Naphthalene	35	NA	44 - 112	NA	NA	Low LCS results indicated the potential for low bias. Detections of naphthalene in the associated field samples were qualified as estimated, bias low (J-). In addition, the reporting limits for non-detects were qualified as estimated, bias low (UJ- flag). Associated samples are as follows: A04B06/SB1 510-18356-22 A04B06/SB2 510-18356-23 06B23/SB1 510-18356-24 06B23/SB2 510-18356-25 06B22/SB1 510-18356-26 06B22/SB2 510-18356-27

LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
NA = Not applicable
OK = Result was within QC limits
PAH = Polynuclear Aromatic Hydrocarbons
QA = Quality Assurance
QC = Quality Control
REC = Percent recovery
RPD = Relative Percent Difference
SVOC = Semivolatile Organic Compounds
VOC = Volatile Organic Compounds

Description of data qualifiers is provided on Table 3.

Table 10
Site-Specific MS/MSD Batches
Supplemental Investigation
AK Steel Kansas City Facility

QC Batches		Lab			MS/MSD Spike Sample	
Analysis	Prep	Report(s)	Analysis	Parameters	Sample ID:	Lab ID:
Volatile Organic Compounds						
510-23550		510-17977-1	VOC	All VOCs	13B09A/SB4	510-17977-4
510-23579		510-17977-1	VOC	All VOCs	13B09A/SB4	510-17977-4
510-23358		510-18114-1	VOC	All VOCs	02B20/DW1	510-18114-6
510-24199		510-18936-1	VOC	All VOCs	33MW13S/GW4	510-18936-9
400-57152		510-18936-1	VOC	1,1,2,2-Tetrachloroethane Bromoform	33MW13S/GW4	510-18936-9
400-57216		510-19035-1	VOC	1,1,2,2-Tetrachloroethane Bromoform	33MW16D/GW4	510-19035-2
400-57286		510-19035-1	VOC	All VOCs	33MW9S/GW4	510-19035-9
Semivolatile Organic Compounds						
400-55654	400-55409	510-18106-1 510-18045-1	SVOC	All SVOCs	12B03A/SB1	510-18106-3
Polynuclear Aromatic Hydrocarbons						
400-56250	400-55889	510-18284-1	PAH	All PAHs	24B12/SB3	510-18284-9
400-56248	400-55764	510-18356-1	PAH	All PAHs	06B17/SB1	510-18356-1
400-56164	400-55766	510-18356-1	PAH	All PAHs	06B22/SB2	510-18356-27
Total Volatile Petroleum Hydrocarbons						
400-55929	400-55927	510-18045-1	TPH	Gasoline Range Organics (C6-C10)	12B01A/SB2	510-18045-3
400-55957	400-55956	510-18045-1	TPH	Gasoline Range Organics (C6-C10)	12B01A/SB4	510-18045-5
400-55957	400-55956	510-18106-1	TPH	Gasoline Range Organics (C6-C10)	12B03A/SB1	510-18106-3
Total Extractable Petroleum Hydrocarbons						
400-55802	400-55515	510-18106-1 510-18045-1	TPH	Extractable TPH Fractions	12B03A/SB1	510-18106-3
400-56126	400-55911	510-18284-1	TPH	Extractable TPH Fractions	24B12/SB3	510-18284-9
400-56122	400-55769	510-18356-1	TPH	Extractable TPH Fractions	06B17/SB1	510-18356-1
400-56124	400-55770	510-18356-1	TPH	Extractable TPH Fractions	06B22/SB2	510-18356-27
Metals						
510-23100	510-23002	510-18106-1	METAL	Chromium Lead	12B03A/SB1	510-18106-3
510-23454		510-18114-1	METAL	Cadmium Lead	02B20/DW1	510-18114-6
510-23250		510-18156-1	METAL	Cadmium Lead	03B08A/DW1	510-18156-1

Table 10
Site-Specific MS/MSD Batches
Supplemental Investigation
AK Steel Kansas City Facility

QC Batches		Lab			MS/MSD Spike Sample	
Analysis	Prep	Report(s)	Analysis	Parameters	Sample ID:	Lab ID:
Metals						
510-23463	510-23319	510-18284-1	METAL	Arsenic Barium Cadmium Chromium Lead Selenium	24B12/SB3	510-18284-9
510-23555	510-23508	510-18284-1	METAL	Silver	24B12/SB3	510-18284-9
510-23454	510-23331	510-18356-1	METAL	Cadmium Lead	06B20/SB2	510-18356-11
510-23814		510-18739-1	METAL	Arsenic, Dissolved Barium, Dissolved Cadmium, Dissolved Chromium, Dissolved Lead, Dissolved Selenium, Dissolved	33MW12D/GW4	510-18739-4
510-23896		510-18739-1	METAL	Chromium, Dissolved Silver, Dissolved	33MW12D/GW4	510-18739-4
510-23801	510-23707	510-18739-1	METAL	Arsenic Barium Cadmium Chromium Lead Selenium Silver	33MW12S/GW4	510-18739-5
510-23929	510-23898	510-18936-1	METAL	Arsenic Barium Cadmium Chromium Lead Selenium	33MW13S/GW4	510-18936-9
510-23929		510-18936-1	METAL	Arsenic Barium Cadmium Chromium Lead Selenium	33MW13S/GW4	510-18936-9
510-23994		510-18936-1	METAL	Silver	33MW13S/GW4	510-18936-9
510-24149	510-24011	510-19035-1	METAL	Selenium	33MW5I/GW4	510-19035-14
510-23048	510-23001	510-17977-1	METAL	Mercury	13B09A/SB1	510-17977-1
510-23370	510-23341	510-18284-1	METAL	Mercury	24B12/SB3	510-18284-9

Table 10
Site-Specific MS/MSD Batches
Supplemental Investigation
AK Steel Kansas City Facility

QC Batches		Lab			MS/MSD Spike Sample	
Analysis	Prep	Report(s)	Analysis	Parameters	Sample ID:	Lab ID:
Metals						
510-23809	510-23725	510-18739-1	METAL	Mercury	33MW12S/GW4	510-18739-5
510-23910	510-23874	510-18936-1	METAL	Mercury	33MW13S/GW4	510-18936-9
510-24118	510-24078	510-19035-1	METAL	Mercury	33MW11D/GW4	510-19035-8
680-86374	680-85805	510-18106-1	METAL	Chromium, hexavalent	12B03A/SB1	510-18106-3

MS = Matrix Spike
MSD = Matrix Spike Duplicate
PAH = Polynuclear Aromatic Hydrocarbons
Prep = Preparation
QC = Quality Control
SVOC = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOC = Volatile Organic Compounds

Table 11
MS/MSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch		Data	MS/MSD Spike Sample				MS	MSD	QC	MS/MSD	QC	Corrective Actions
							REC	REC	Limits	RPD	Limits	and/or Qualifiers Added:
Analysis	Prep	Package(s)	Sample ID:	Lab ID:	Analysis	Parameter	(%)	(%)	(%)	(%)	(%)	Sample ID: Lab ID:
Volatile Organic Compounds												
510-23550		510-17977-1	13B09A/SB4	510-17977-4	VOC	1,1,2-Trichloroethane	66	66	70 - 127	1	30	Low RECs were noted. In addition, the acetone spike amount was less than 1/4 of the parent sample concentration. Reanalysis of the MS/MSD sample was performed in Analysis Batch 510-23579 (see below). Fewer outliers were noted in the reanalysis. Based on surrogate results, the problem appeared isolated to the parent spiked sample. No data qualifiers were added to samples in the batch.
		510-18045-1				1,1-Dichloroethene	71	72	76 - 117	2	30	
		510-18106-1				1,2-Dichloroethane	60	63	72 - 130	4	30	
		510-18284-1				1,2-Dichloropropane	69	69	77 - 122	1	30	
						2-Butanone (MEK)	54	53	57 - 171	0	30	
						2-Hexanone	39	37	67 - 119	6	30	
						Acetone	NA	NA	57 - 117	NA	30	
						Benzene	74	78	81 - 116	5	30	
						Bromoform	58	54	74 - 122	6	30	
						Carbon disulfide	64	OK	66 - 126	3	30	
						Carbon tetrachloride	67	64	81 - 124	5	30	
						Chlorobenzene	62	60	80 - 112	3	30	
						Chlorodibromomethane	63	64	83 - 130	1	30	
						Chloroform	76	OK	77 - 124	5	30	
						cis-1,2-Dichloroethene	72	76	81 - 122	6	30	
						cis-1,3-Dichloropropene	54	53	61 - 127	3	30	
						Dichlorobromomethane	65	67	72 - 132	2	30	
						Ethylbenzene	65	61	84 - 124	7	30	
						Styrene	52	48	80 - 116	8	30	
						Tetrachloroethene	63	66	82 - 127	5	30	
						Toluene	70	70	77 - 117	0	30	
						trans-1,2-Dichloroethene	78	80	82 - 129	3	30	
						trans-1,3-Dichloropropene	48	47	63 - 133	4	30	
						Trichloroethene	71	73	81 - 122	2	30	
510-23579		510-17977-1	13B09A/SB4	510-17977-4	VOC	2-Hexanone	50	49	67 - 119	2	30	Based on surrogate results of samples in the batch, the low RECs appear isolated to the parent spiked sample. No data qualifiers were added to samples in the batch.
		510-18284-1				Acetone	39	44	57 - 117	4	30	
						Ethylbenzene	82	77	84 - 124	6	30	
						Styrene	77	72	80 - 116	7	30	
						Vinyl acetate	150	OK	80 - 141	7	30	
510-23358		510-18114-1	02B20/DW1	510-18114-6	VOC	Carbon disulfide	137	136	64 - 120	1	30	Elevated REC indicated potential for high bias. The carbon disulfide result for the parent sample was qualified as estimated, bias high (J+ flag). Detections of other samples in the batch were previously qualified due to elevated LCS/LCSD.

Table 11
MS/MSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch		Data	MS/MSD Spike Sample				MS	MSD	QC	MS/MSD	QC	Corrective Actions
							REC	REC	Limits	RPD	Limits	and/or Qualifiers Added:
Analysis	Prep	Package(s)	Sample ID:	Lab ID:	Analysis	Parameter	(%)	(%)	(%)	(%)	(%)	Sample ID: Lab ID:
400-57286		510-19035-1	33MW9S/GW4	510-19035-9	VOC	2-Butanone (MEK)	163	118	60 - 146	32	18	Elevated RECs indicated potential for high bias. Since 2-butanone and bromomethane were not detected in the samples, high bias was not a concern. No qualifiers were added.
						Bromomethane	124	127	60 - 118	2	13	
Semivolatile Organic Compounds												
400-55654	400-55409	510-18106-1	12B03A/SB1	510-18106-3	SVOC	2,4-Dinitrophenol	0	0	10 - 154	NC	24	Due to RPD and recovery outliers, results for the impacted parameters were qualified as estimated (J*) in the parent sample. Detections were noted for the PAH constituents. Since surrogates were acceptable for other samples in the batch, the matrix effect appeared limited to the spiked sample. No additional qualifiers were required for the samples in the batch.
		510-18045-1				4,6-Dinitro-2-methylphenol	0	4	8 - 97	NC	34	
						Benzo[a]pyrene	-11	58	55 - 104	35	21	
						Benzo[b]fluoranthene	-35	38	49 - 105	40	24	
						Benzo[g,h,i]perylene	OK	136	41 - 119	39	26	
						Benzo[k]fluoranthene	OK	143	58 - 116	39	23	
						Benzoic acid	0	0	1 - 149	NC	53	
						Chrysene	70	142	56 - 113	46	21	
						N-Nitrosodiphenylamine	21	OK	26 - 60	21	23	
						Pyrene	83	116	51 - 120	26	21	
Polynuclear Aromatic Hydrocarbons												
400-56250	400-55889	510-18284-1	24B12/SB3	510-18284-9	PAH	Fluoranthene	58	48	59 - 116	11	24	Low REC indicates the potential for low bias. Results for the impacted parameters were qualified as estimated, bias low (J- flag) in the parent sample. Since surrogate results were acceptable for the remaining samples in the batch, the problem appeared limited to the spike sample. No additional qualifiers were added to other samples in the batch.
						Phenanthrene	50	OK	52 - 115	2	20	
						Indeno[1,2,3-cd]pyrene	OK	50	52 - 107	12	24	
400-56248	400-55764	510-18356-1	06B17/SB1	510-18356-1	PAH	1-Methylnaphthalene	63	92	43 - 107	37	26	Elevated RPDs indicate potential precision problems. The results for the impacted parameters were qualified as estimated (J*) in the parent sample. Since the problem appeared isolated to the spike, additional qualifiers for other samples in the batch was not required.
						2-Methylnaphthalene	60	87	43 - 105	37	28	
						Acenaphthene	61	87	46 - 110	34	24	
						Acenaphthylene	62	88	49 - 114	35	24	
						Anthracene	64	90	53 - 105	34	23	
						Benzo[a]anthracene	62	91	57 - 110	35	20	
						Benzo[a]pyrene	63	92	55 - 104	35	21	
						Benzo[b]fluoranthene	59	85	49 - 105	34	24	
						Benzo[k]fluoranthene	69	101	58 - 116	36	23	
						Chrysene	65	92	56 - 113	33	21	
						Dibenz(a,h)anthracene	80	109	29 - 159	30	25	

Table 11
MS/MSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch		Data	MS/MSD Spike Sample				MS	MSD	QC	MS/MSD	QC	Corrective Actions
Analysis	Prep	Package(s)	Sample ID:	Lab ID:	Analysis	Parameter	REC (%)	REC (%)	Limits (%)	RPD (%)	Limits (%)	and/or Qualifiers Added: Sample ID: Lab ID:
400-56248 (continued)	400-55764	510-18356-1	06B17/SB1	510-18356-1	PAH	Fluoranthene	68	96	59 - 116	31	24	
						Fluorene	63	90	51 - 113	34	24	
						Indeno[1,2,3-cd]pyrene	62	83	52 - 107	28	24	
						Naphthalene	58	84	40 - 100	36	28	
						Phenanthrene	65	94	52 - 115	34	20	
						Pyrene	59	89	51 - 120	37	21	
Total Petroleum Hydrocarbons												
400-55957	400-55956	510-18106-1	12B03A/SB1	510-18106-3	TPH	Gasoline Range Organics	19	23	35 - 167	15	21	Low RECs indicate potetnial for low bias. The gasoline range organics result for the parent sample was not detected, and the reporting limits was qualified as estimated, bias low (UJ- flag). Since surrogates were acceptable for other samples in the batch, the matrix effect appeared limited to the spiked sample. No additional qualifiers were required for the samples in the batch.
400-55802	400-55515	510-18106-1 510-18045-1	12B03A/SB1	510-18106-3	TPH	Diesel	719	1030	33 - 133	35	60	Laboratory noted clear matrix effect on the chromatorgram. The problem appeared isolated to the parent sample. Therefore, the unknown hydrocarbon detection for the spike sample was qualified as estimated, bias high (J+ flag).
400-56124	400-55770	510-18356-1	06B22/SB2	510-18356-27	TPH	Diesel	0	0	33 - 133	NC	60	Laboraory confirmed matrix effect by review of chromatogram. Extractable TPH results for the parent sample were qualified as estimated, bias low (UJ- for non-detect results and J- for detections).
Metals												
510-23100	510-23002	510-18106-1	12B03A/SB1	510-18106-3	METAL	Chromium	NA	NA	75 - 125	NA	20	Chromium and lead spike amounts were less than 1/4 of the unspiked, parent sample concentration. Therefore, accuracy and precision were not assessed using the MS/MSD in accordance with EPA guidelines. Accuracy and precision were assessed by review of LCS/LCSD results.
						Lead	NA	NA	75 - 125	NA	20	

Table 11
MS/MSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch		Data	MS/MSD Spike Sample				MS	MSD	QC	MS/MSD	QC	Corrective Actions	
Analysis	Prep	Package(s)	Sample ID:	Lab ID:	Analysis	Parameter	REC (%)	REC (%)	Limits (%)	RPD (%)	Limits (%)	and/or Qualifiers Added: Sample ID:	Lab ID:
510-22926	510-22825	510-17978-1	09B01/SB1	510-17978-4	METAL	Lead	128	OK	75 - 125	6	20	Elevated REC suggests potential for high bias. Lead detections were qualified as estimated, potential high bias (J+ flag) in the following associated samples:	
												09B01/SB1	510-17978-4
												09B01/SB2	510-17978-5
												09G04/SB1	510-17978-6
												09G04/SB2	510-17978-7
												07B03A/SB1	510-17978-8
												07B03A/SB2	510-17978-9
												07B02A/SB1	510-17978-10
												07B02A/SB2	510-17978-11
												07B01A/SB1	510-17978-12
												07B01A/SB2	510-17978-13
510-23463	510-23319	510-18284-1	24B12/SB3	510-18284-9	METAL	Arsenic	-22	-21	75 - 125	18	20	Low REC was noted across the batch. The post-digest spike was within control limits, and the laboratory indicated that the problem was isolated to the MS/MSD. Based on EPA guidelines, results for the impacted metals were qualified as estimated (UJ* flag for non-detects and J* flag for detects). Associated samples that were qualified are as follows:	
						Barium	-216	-204	75 - 125	NC	20		
						Cadmium	-3	-3	75 - 125	NC	20		
						Chromium	-62	-59	75 - 125	NC	20		
						Lead	-207	-195	75 - 125	NC	20		
						Selenium	-1	-1	75 - 125	30	20		
												24B11/SB1	510-18284-1
												24B11/SB2	510-18284-2
												24B11/SB2D	510-18284-3
												24B11/SB3	510-18284-4
												24B11/SB4	510-18284-5
												24B12/SB1	510-18284-7
												24B12/SB2	510-18284-8
												24B12/SB3	510-18284-9
												24B12/SB4	510-18284-10

Table 11
MS/MSD Results Outside of QC Limits
Supplemental Investigation
AK Steel Kansas City Facility

QC Batch		Data	MS/MSD Spike Sample				MS REC	MSD REC	QC Limits	MS/MSD RPD	QC Limits	Corrective Actions and/or Qualifiers Added:	
Analysis	Prep	Package(s)	Sample ID:	Lab ID:	Analysis	Parameter	(%)	(%)	(%)	(%)	(%)	Sample ID:	Lab ID:
510-23454	510-23331	510-18356-1	06B20/SB2	510-18356-11	METAL	Lead	NA	NA	75 - 125	NA	20	The lead spike amount was less than 1/4 of the unspiked, parent sample concentration. Therefore, accuracy and precision were not assessed using the MS/MSD in accordance with EPA guidelines. Accuracy and precision were assessed by review of LCS/LCSD results.	
680-86374	680-85805	510-18106-1	12B03A/SB1	510-18106-3	7196A	Chromium, hexavalent	0	0	80 - 120	NC	30	Hexavalent chromium was not recovered. The lack of recovery indicates reducing conditions in the soils. The reducing conditions result in immediate transformation of the hexavalent chromium spike to the trivalent form. Therefore, the reducing conditions present in the subsurface preclude the existence of hexavalent chromium at SWMU 12.	
510-23370	510-23341	510-18284-1	24B12/SB3	510-18284-9	METAL	Mercury	147	OK	75 - 125	12	25	Elevated REC indicates the potential for high bias. Mercury was detected in the associated field samples, and these detections were qualified as estimated, bias high (J+ flag). Associated samples are as follows:	
												24B11/SB1	510-18284-1
												24B11/SB2	510-18284-2
												24B11/SB2D	510-18284-3
												24B11/SB3	510-18284-4
												24B11/SB4	510-18284-5
												24B12/SB1	510-18284-7
												24B12/SB2	510-18284-8
												24B12/SB3	510-18284-9
												24B12/SB4	510-18284-10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
Prep = Preparation
QC = Quality Control
REC = Percent recovery
RPD = Relative percent difference

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 2 - Old Blue River "W" Landfill				
02B21 / DW1	510-18114-3	VOC	All VOCs	20
02B21 / DW1D	510-18114-4	VOC	All VOCs	20
SWMU 7 - No. 1 Melt Shop Baghouse Dust Storage Tanks				
07B01A / SB1	510-17978-12	METAL	Cadmium	5
		METAL	Lead	5
07B01A / SB2	510-17978-13	METAL	Cadmium	5
		METAL	Lead	5
07B02A / SB1	510-17978-10	METAL	Cadmium	5
		METAL	Lead	5
07B02A / SB2	510-17978-11	METAL	Cadmium	5
		METAL	Lead	5
07B03A / SB1	510-17978-8	METAL	Cadmium	5
		METAL	Lead	5
07B03A / SB2	510-17978-9	METAL	Cadmium	5
		METAL	Lead	5
SWMU 9 - No. 1 Melt Shop Baghouse Dust Conveyor				
09B01 / SB1	510-17978-4	METAL	Cadmium	5
		METAL	Lead	5
09B01 / SB2	510-17978-5	METAL	Cadmium	5
		METAL	Lead	5
09G04 / SB1	510-17978-6	METAL	Cadmium	5
		METAL	Lead	5
09G04 / SB2	510-17978-7	METAL	Cadmium	5
		METAL	Lead	5
SWMU 12 - AMOCO Landfarm				
12B01A / SB1	510-18045-1	METAL	Chromium	5
		METAL	Lead	5
		SVOC	Benzo[b]fluoranthene	10
		SVOC	Benzo[k]fluoranthene	10
		TPH	Extractable TPH Parameters	50
12B01A / SB2	510-18045-2	METAL	Chromium	5
		METAL	Lead	5
12B01A / SB2D	510-18045-3	METAL	Chromium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	10
12B01A / SB3	510-18045-4	METAL	Chromium	5
		METAL	Lead	5

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 12 - AMOCO Landfarm				
12B01A / SB4	510-18045-5	METAL	Chromium	5
		METAL	Lead	5
12B03A / SB1	510-18106-3	METAL	Chromium	5
		METAL	Lead	5
		SVOC	Benzo[a]pyrene	5
		SVOC	Benzo[b]fluoranthene	5
		SVOC	Benzo[g,h,i]perylene	5
		SVOC	Benzo[k]fluoranthene	5
		SVOC	Dibenz(a,h)anthracene	5
		SVOC	Indeno[1,2,3-cd]pyrene	5
		TPH	Extractable TPH Parameters	50
		VOC	Carbon disulfide	5
		VOC	Toluene	5
12B03A / SB2	510-18106-4	METAL	Chromium	5
		METAL	Lead	5
12B03A / SB3	510-18106-5	METAL	Chromium	5
		METAL	Lead	5
12B03A / SB4	510-18106-6	METAL	Chromium	5
		METAL	Lead	5
SWMU 13 - Pickle Liquor Tanks				
13B09A / SB1	510-17977-1	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
		SVOC	All SVOCs	2
13B09A / SB2	510-17977-2	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
13B09A / SB3	510-17977-3	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 13 - Pickle Liquor Tanks				
13B09A / SB4	510-17977-4	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
		VOC	Acetone	5
SWMU 17 - Wire Mill Rinsewater Neutralization Tank				
17B08B / SB3D	510-18106-1	VOC	All VOCs	5
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks				
06B15 / SB1	510-18356-4	METAL	Cadmium	5
		METAL	Lead	5
06B15 / SB2	510-18356-5	METAL	Cadmium	5
		METAL	Lead	5
06B16 / SB1	510-18356-6	METAL	Cadmium	5
		METAL	Lead	5
06B16 / SB2	510-18356-7	METAL	Cadmium	5
		METAL	Lead	5
06B17 / SB1	510-18356-1	METAL	Cadmium	5
		METAL	Lead	5
06B17 / SB2	510-18356-2	METAL	Cadmium	5
		METAL	Lead	5
06B17 / SB2D	510-18356-3	METAL	Cadmium	5
		METAL	Lead	5
06B18 / SB1	510-18356-8	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	50
06B18 / SB2	510-18356-9	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	50
06B19 / SB1	510-18356-14	TPH	Extractable TPH Parameters	10
06B19 / SB2	510-18356-15	TPH	Extractable TPH Parameters	10
06B20 / SB1	510-18356-10	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	50
06B20 / SB2	510-18356-11	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	10

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 6 - RCRA Permitted Baghouse Dust Storage Tanks				
06B21 / SB1	510-18356-12	TPH	Extractable TPH Parameters	10
06B21 / SB2	510-18356-13	TPH	Extractable TPH Parameters	10
06B22 / SB1	510-18356-26	METAL	Cadmium	5
		METAL	Lead	5
		PAH	All PAHs	10
		TPH	Extractable TPH Parameters	50
06B22 / SB2	510-18356-27	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	50
06B23 / SB1	510-18356-24	TPH	Extractable TPH Parameters	10
06B23 / SB2	510-18356-25	METAL	Cadmium	5
		METAL	Lead	5
		TPH	Extractable TPH Parameters	50
AOC 4 - Boiler Furnace Area				
A04B05 / SB2	510-18356-19	TPH	Extractable TPH Parameters	50
A04B07 / SB1	510-18356-16	TPH	Extractable TPH Parameters	50
A04B07 / SB2	510-18356-17	PAH	All PAHs	10
SWMU 24 - Waste Hydraulic Lubricating Oil Storage Tanks				
24B11 / SB1	510-18284-1	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
		TPH	Extractable TPH Parameters	5
24B11 / SB2	510-18284-2	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
24B11 / SB2D	510-18284-3	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 24 - Waste Hydraulic Lubricating Oil Storage Tanks				
24B11 / SB3	510-18284-4	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
24B11 / SB4	510-18284-5	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
		TPH	Extractable TPH Parameters	50
24B12 / SB1	510-18284-7	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
24B12 / SB2	510-18284-8	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
24B12 / SB3	510-18284-9	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5
24B12 / SB4	510-18284-10	METAL	Arsenic	5
		METAL	Barium	5
		METAL	Cadmium	5
		METAL	Chromium	5
		METAL	Lead	5
		METAL	Selenium	5
		METAL	Silver	5

Table 12
Dilution Factors
Supplemental Investigation
AK Steel Kansas City Facility

Sample ID	Lab ID	Analysis	Parameter	Dilution Factor
SWMU 33 - Nail Mill Degreasing Area				
33MW2 / GW4	510-19072-3	VOC	All VOCs	10
33MW2S / GW4	510-19072-2	VOC	All VOCs	10
33MW3 / GW4	510-19035-11	VOC	1,2-Dichloroethane	10
		VOC	cis-1,2-Dichloroethene	10
		VOC	Trichloroethene	10
		VOC	All Other VOCs	2
33MW5I / GW4	510-19035-14	VOC	All VOCs	5
AOC 8 - "Owl Gun Club" Shooting Park				
A08B26A / SB1	510-18114-9	METAL	Lead	5
A08B26A / SB2	510-18114-10	METAL	Lead	5
A08B49 / SB1	510-18114-7	METAL	Lead	5
A08B49 / SB2	510-18114-8	METAL	Lead	5
A08B50 / SB1	510-18114-11	METAL	Lead	5
A08B50 / SB2	510-18114-12	METAL	Lead	5

AOC = Area of Concern
SWMU = Solid Waste Management Unit
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TPH = Total Petroleum Hydrocarbon

Table 13
Field Duplicate Results - 02B21/DW1 and 02B21/DW1D

Supplemental Investigation
AK Steel Kansas City Facility

Sample:		02B21 / DW1			02B21 / DW1D			Meets Criteria?
Depth (ft):		16 - 20			16 - 20			
Date Collected:		9/12/2007			9/12/2007			
Lab ID:		510-18114-3			510-18114-4			
Comments:					Duplicate			
Parameter	**Units**							
Filtered Metals								
Cadmium, Dissolved	ug/L	1	U		1	U		Yes
Lead, Dissolved	ug/L	***57***			***21***			No (RPD=92%)
Volatile Organic Compounds								
1,1,1-Trichloroethane	ug/L	100	U		100	U		Yes
1,1,2,2-Tetrachloroethane	ug/L	100	U		100	U		Yes
1,1,2-Trichloroethane	ug/L	100	U		100	U		Yes
1,1-Dichloroethane	ug/L	100	U		100	U		Yes
1,1-Dichloroethene	ug/L	100	U		100	U		Yes
1,2-Dichloroethane	ug/L	100	U		100	U		Yes
1,2-Dichloropropane	ug/L	100	U		100	U		Yes
2-Butanone (MEK)	ug/L	200	U		200	U		Yes
2-Hexanone	ug/L	200	U		200	U		Yes
4-Methyl-2-pentanone (MIBK)	ug/L	200	U		200	U		Yes
Acetone	ug/L	200	U		200	U		Yes
Benzene	ug/L	***7***	***J***		100	U		Yes
Bromodichloromethane	ug/L	100	U		100	U		Yes
Bromoform	ug/L	100	U		100	U		Yes
Bromomethane	ug/L	200	U		200	U		Yes
Carbon disulfide	ug/L	100	U		100	U		Yes
Carbon tetrachloride	ug/L	100	U		100	U		Yes
Chlorobenzene	ug/L	100	U		100	U		Yes
Chloroethane	ug/L	200	U	J-	200	U	J-	Yes
Chloroform	ug/L	100	U		100	U		Yes
Chloromethane	ug/L	200	U		200	U		Yes
cis-1,2-Dichloroethene	ug/L	100	U		100	U		Yes
cis-1,3-Dichloropropene	ug/L	100	U		100	U		Yes
Dibromochloromethane	ug/L	100	U		100	U		Yes
Ethylbenzene	ug/L	***830***			***880***		***J+***	Yes
Methylene Chloride	ug/L	100	U		100	U		Yes
Styrene	ug/L	100	U		100	U		Yes
Tetrachloroethene	ug/L	100	U		100	U		Yes
Toluene	ug/L	***180***			***190***		***J+***	Yes
trans-1,2-Dichloroethene	ug/L	100	U		100	U		Yes
trans-1,3-Dichloropropene	ug/L	100	U		100	U		Yes
Trichloroethene	ug/L	100	U		100	U		Yes
Vinyl acetate	ug/L	100	U		100	U		Yes
Vinyl chloride	ug/L	40	U		40	U		Yes
Xylenes, Total	ug/L	***3200***			***3300***		***J+***	Yes

Bold, italic = Detected
ug/L = micrograms per liter
Table 3 provides definition of data flags.
RPD = Relative Percent Difference

Table 14
Field Duplicate Results - 03B08A/DW1 and 03B08A/DW1D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	03B08A / DW1	03B08A / DW1D	Meets
	Depth (ft):	23 - 27	23 - 27	Criteria?
	Date Collected:	9/13/2007	9/13/2007	
	Lab ID:	510-18156-1	510-18156-2	
	Comments:		Duplicate	
Parameter	**Units**			
Filtered Metals				
Cadmium, Dissolved	ug/L	***1***	***1.4***	Yes
Lead, Dissolved	ug/L	0.5 U	0.5 U	Yes

Bold, italic = Detected
ug/L = micrograms per liter
Table 3 provides definition of data flags.

Table 15
Field Duplicate Results - 06B17/SB2 and 06B17/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	06B17 / SB2		06B17 / SB2D		Meets
	Depth (ft):	4 - 8		4 - 8		Criteria?
	Date Collected:	9/18/2007		9/18/2007		
	Lab ID:	510-18356-2		510-18356-3		
	Comments:			Duplicate		
Parameter	**Units**					
Metals						
Cadmium	mg/Kg	***0.42***		***4.5***		No (RPD=166%)
Lead	mg/Kg	***8.4***		***160***		No (RPD=180%)
Polynuclear Aromatic Hydrocarbons						
1-Methylnaphthalene	ug/Kg	***100***	***J***	***51***	***J***	Yes
2-Methylnaphthalene	ug/Kg	***140***	***J***	***55***	***J***	Yes
Acenaphthene	ug/Kg	370	U	370	U	Yes
Acenaphthylene	ug/Kg	370	U	370	U	Yes
Anthracene	ug/Kg	370	U	370	U	Yes
Benzo[a]anthracene	ug/Kg	370	U	***94***	***J***	Yes
Benzo[a]pyrene	ug/Kg	370	U	***85***	***J***	Yes
Benzo[b]fluoranthene	ug/Kg	370	U	***120***	***J***	Yes
Benzo[g,h,i]perylene	ug/Kg	370	U	***75***	***J***	Yes
Benzo[k]fluoranthene	ug/Kg	370	U	***56***	***J***	Yes
Chrysene	ug/Kg	370	U	***98***	***J***	Yes
Dibenz(a,h)anthracene	ug/Kg	370	U	370	U	Yes
Fluoranthene	ug/Kg	370	U	***150***	***J***	Yes
Fluorene	ug/Kg	370	U	370	U	Yes
Indeno[1,2,3-cd]pyrene	ug/Kg	370	U	***48***	***J***	Yes
Naphthalene	ug/Kg	***65***	***J***	370	U	Yes
Phenanthrene	ug/Kg	***84***	***J***	***120***	***J***	Yes
Pyrene	ug/Kg	370	U	***160***	***J***	Yes
Extractable Petroleum Hydrocarbons						
Diesel	mg/Kg	3.4	U	3.4	U	Yes
Fuel Oil	mg/Kg	3.4	U	3.4	U	Yes
Hydraulic Fluid	mg/Kg	3.4	U	3.4	U	Yes
Kerosene	mg/Kg	3.4	U	3.4	U	Yes
Mineral Spirits	mg/Kg	3.4	U	3.4	U	Yes
Motor Oil	mg/Kg	3.4	U	3.4	U	Yes
Unknown Hydrocarbons	mg/Kg	***48***		***150***		No (RPD=103%)

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 3 provides definition of data flags.
RPD = Relative Percent Difference

Table 16
Field Duplicate Results - 12B01A/SB2 and 12B01A/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B01A / SB2	12B01A / SB2D	Meets
	Depth (ft):	2 - 4	2 - 4	Criteria?
	Date Collected:	9/11/2007	9/11/2007	
	Lab ID:	510-18045-2	510-18045-3	
	Comments:		Duplicate	
Parameter	**Units**			
Metals				
Chromium	mg/Kg	***52***	***22***	No (RPD=81%)
Chromium, hexavalent	mg/Kg	1.2 U	1.4 U	Yes
Lead	mg/Kg	***250***	***74***	No (RPD=109%)
Semivolatile Organic Compounds				
1,2,4-Trichlorobenzene	ug/Kg	470 U	460 U	Yes
1,2-Dichlorobenzene	ug/Kg	470 U	460 U	Yes
1,3-Dichlorobenzene	ug/Kg	470 U	460 U	Yes
1,4-Dichlorobenzene	ug/Kg	470 U	460 U	Yes
2,2'-oxybis(2-chloropropane)	ug/Kg	470 U	460 U	Yes
2,4,5-Trichlorophenol	ug/Kg	2400 U	2400 U	Yes
2,4-Dichlorophenol	ug/Kg	470 U	460 U	Yes
2,4-Dimethylphenol	ug/Kg	470 U	460 U	Yes
2,4-Dinitrophenol	ug/Kg	2400 U	2400 U	Yes
2,4-Dinitrotoluene	ug/Kg	470 U	460 U	Yes
2,6-Dinitrotoluene	ug/Kg	470 U	460 U	Yes
2-Chloronaphthalene	ug/Kg	470 U	460 U	Yes
2-Chlorophenol	ug/Kg	470 U	460 U	Yes
2-Methylnaphthalene	ug/Kg	470 U	***1000***	Yes
2-Methylphenol	ug/Kg	470 U	460 U	Yes
2-Nitroaniline	ug/Kg	470 U	460 U	Yes
2-Nitrophenol	ug/Kg	470 U	460 U	Yes
3 & 4 Methylphenol	ug/Kg	940 U	920 U	Yes
3,3'-Dichlorobenzidine	ug/Kg	2400 U	2400 U	Yes
3-Nitroaniline	ug/Kg	470 U	460 U	Yes
4,6-Dinitro-2-methylphenol	ug/Kg	2400 U	2400 U	Yes
4-Bromophenyl phenyl ether	ug/Kg	470 U	460 U	Yes
4-Chloro-3-methylphenol	ug/Kg	470 U	460 U	Yes
4-Chloroaniline	ug/Kg	470 U	460 U	Yes
4-Chlorophenyl phenyl ether	ug/Kg	470 U	460 U	Yes
4-Nitroaniline	ug/Kg	470 U	460 U	Yes
4-Nitrophenol	ug/Kg	2400 U	2400 U	Yes
Acenaphthene	ug/Kg	470 U	460 U	Yes
Acenaphthylene	ug/Kg	470 U	460 U	Yes
Anthracene	ug/Kg	470 U	460 U	Yes
Benzo[a]anthracene	ug/Kg	470 U	***210 J***	Yes
Benzo[a]pyrene	ug/Kg	470 U	***530***	Yes
Benzo[b]fluoranthene	ug/Kg	470 U	***530***	Yes
Benzo[g,h,i]perylene	ug/Kg	470 U	***1100***	Yes
Benzo[k]fluoranthene	ug/Kg	470 U	***140 J***	Yes
Benzoic acid	ug/Kg	2400 U	2400 U	Yes
Benzyl alcohol	ug/Kg	470 U	460 U	Yes
Bis(2-chloroethoxy)methane	ug/Kg	470 U	460 U	Yes
Bis(2-chloroethyl)ether	ug/Kg	470 U	460 U	Yes
Bis(2-ethylhexyl) phthalate	ug/Kg	470 U	460 U	Yes
Butyl benzyl phthalate	ug/Kg	470 U	460 U	Yes
Chrysene	ug/Kg	470 U	***500***	Yes
Dibenz(a,h)anthracene	ug/Kg	470 U	***550***	Yes
Dibenzofuran	ug/Kg	470 U	460 U	Yes

Table 16
Field Duplicate Results - 12B01A/SB2 and 12B01A/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B01A / SB2	12B01A / SB2D	Meets
	Depth (ft):	2 - 4	2 - 4	Criteria?
	Date Collected:	9/11/2007	9/11/2007	
	Lab ID:	510-18045-2	510-18045-3	
	Comments:		Duplicate	
Parameter	**Units**			
Diethyl phthalate	ug/Kg	470 U	460 U	Yes
Dimethyl phthalate	ug/Kg	470 U	460 U	Yes
Di-n-butyl phthalate	ug/Kg	470 U	460 U	Yes
Di-n-octyl phthalate	ug/Kg	470 U	460 U	Yes
Fluoranthene	ug/Kg	470 U	460 U	Yes
Fluorene	ug/Kg	470 U	460 U	Yes
Hexachlorobenzene	ug/Kg	470 U	460 U	Yes
Hexachlorobutadiene	ug/Kg	470 U	460 U	Yes
Hexachlorocyclopentadiene	ug/Kg	470 U	460 U	Yes
Hexachloroethane	ug/Kg	470 U	460 U	Yes
Indeno[1,2,3-cd]pyrene	ug/Kg	470 U	***270 J***	Yes
Isophorone	ug/Kg	470 U	460 U	Yes
Naphthalene	ug/Kg	470 U	***620***	Yes
Nitrobenzene	ug/Kg	470 U	460 U	Yes
N-Nitrosodi-n-propylamine	ug/Kg	470 U	460 U	Yes
N-Nitrosodiphenylamine	ug/Kg	470 U	460 U	Yes
Pentachlorophenol	ug/Kg	2400 U	2400 U	Yes
Phenanthrene	ug/Kg	470 U	460 U	Yes
Phenol	ug/Kg	470 U	460 U	Yes
Pyrene	ug/Kg	470 U	***240 J***	Yes
Total Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	ug/Kg	140 U	140 U	Yes
Diesel	mg/Kg	4.3 U	42 U	Yes
Fuel Oil	mg/Kg	4.3 U	42 U	Yes
Hydraulic Fluid	mg/Kg	4.3 U	42 U	Yes
Kerosene	mg/Kg	4.3 U	42 U	Yes
Mineral Spirits	mg/Kg	4.3 U	42 U	Yes
Motor Oil	mg/Kg	4.3 U	42 U	Yes
Unknown Hydrocarbons	mg/Kg	***26***	***1100***	No (RPD=191%)
Volatile Organic Compounds				
1,1,1-Trichloroethane	ug/Kg	8.2 U	8.3 U	Yes
1,1,2,2-Tetrachloroethane	ug/Kg	8.2 U	8.3 U	Yes
1,1,2-Trichloroethane	ug/Kg	8.2 U	8.3 U	Yes
1,1-Dichloroethane	ug/Kg	8.2 U	8.3 U	Yes
1,1-Dichloroethene	ug/Kg	8.2 U	8.3 U	Yes
1,2-Dichloroethane	ug/Kg	8.2 U	8.3 U	Yes
1,2-Dichloropropane	ug/Kg	8.2 U	8.3 U	Yes
2-Butanone (MEK)	ug/Kg	16 U	***17***	Yes
2-Hexanone	ug/Kg	16 U	17 U	Yes
4-Methyl-2-pentanone (MIBK)	ug/Kg	16 U	17 U	Yes
Acetone	ug/Kg	***54***	***63***	Yes
Benzene	ug/Kg	***4.7 J +***	***3.5 J +***	Yes
Bromodichloromethane	ug/Kg	8.2 U	8.3 U	Yes
Bromoform	ug/Kg	8.2 U	8.3 U	Yes
Bromomethane	ug/Kg	8.2 U	8.3 U	Yes
Carbon disulfide	ug/Kg	***3.9 J***	***4.8 J***	Yes
Carbon tetrachloride	ug/Kg	8.2 U	8.3 U	Yes
Chlorobenzene	ug/Kg	8.2 U	8.3 U	Yes
Chloroethane	ug/Kg	8.2 U	8.3 U	Yes
Chloroform	ug/Kg	8.2 U	8.3 U	Yes

Table 16
Field Duplicate Results - 12B01A/SB2 and 12B01A/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	12B01A / SB2	12B01A / SB2D	Meets
	Depth (ft):	2 - 4	2 - 4	Criteria?
	Date Collected:	9/11/2007	9/11/2007	
	Lab ID:	510-18045-2	510-18045-3	
	Comments:		Duplicate	
Parameter	**Units**			
Chloromethane	ug/Kg	8.2 U	8.3 U	Yes
cis-1,2-Dichloroethene	ug/Kg	8.2 U	8.3 U	Yes
cis-1,3-Dichloropropene	ug/Kg	8.2 U	8.3 U	Yes
Dibromochloromethane	ug/Kg	8.2 U	8.3 U	Yes
Ethylbenzene	ug/Kg	***10***	***9.1***	Yes
Methylene Chloride	ug/Kg	11 B U*	14 B U*	Yes
Styrene	ug/Kg	8.2 U	8.3 U	Yes
Tetrachloroethene	ug/Kg	8.2 U	8.3 U	Yes
Toluene	ug/Kg	***7.2 J +***	***2.1 J +***	Yes
trans-1,2-Dichloroethene	ug/Kg	8.2 U	8.3 U	Yes
trans-1,3-Dichloropropene	ug/Kg	8.2 U	8.3 U	Yes
Trichloroethene	ug/Kg	8.2 U	8.3 U	Yes
Vinyl acetate	ug/Kg	8.2 U	8.3 U	Yes
Vinyl chloride	ug/Kg	8.2 U	8.3 U	Yes
Xylenes, Total	ug/Kg	***15 J***	17 U	Yes

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 3 provides definition of data flags.
RPD = Relative Percent Difference

Table 17
Field Duplicate Results - 24B11/SB2 and 24B11/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

Sample:		24B11 / SB2		24B11 / SB2D		Meets
Depth (ft):		2 - 4		2 - 4		Criteria?
Date Collected:		9/17/2007		9/17/2007		
Lab ID:		510-18284-2		510-18284-3		
Comments:				Duplicate		
Parameter	**Units**					
RCRA Metals						
Arsenic	mg/Kg	0.54	U J*	0.064	JB U*	Yes
Barium	mg/Kg	0.14	U J*	0.12	U J*	Yes
Cadmium	mg/Kg	0.27	U J*	0.23	U J*	Yes
Chromium	mg/Kg	***940***	***J****	***840***	***J****	Yes
Lead	mg/Kg	0.14	U J*	0.12	U J*	Yes
Mercury	mg/Kg	***0.01***	***J +***	***0.021***	***J +***	Yes
Selenium	mg/Kg	***0.064***	***J ****	***0.08***	***J ****	Yes
Silver	mg/Kg	***1.1***		***1.2***		Yes
Polynuclear Aromatic Hydrocarbons						
1-Methylnaphthalene	ug/Kg	360	U	360	U	Yes
2-Methylnaphthalene	ug/Kg	360	U	360	U	Yes
Acenaphthene	ug/Kg	360	U	360	U	Yes
Acenaphthylene	ug/Kg	360	U	360	U	Yes
Anthracene	ug/Kg	360	U	360	U	Yes
Benzo[a]anthracene	ug/Kg	360	U	360	U	Yes
Benzo[a]pyrene	ug/Kg	360	U	***52***	***J***	Yes
Benzo[b]fluoranthene	ug/Kg	360	U	***46***	***J***	Yes
Benzo[g,h,i]perylene	ug/Kg	360	U	***43***	***J***	Yes
Benzo[k]fluoranthene	ug/Kg	360	U	360	U	Yes
Chrysene	ug/Kg	360	U	***61***	***J***	Yes
Dibenz(a,h)anthracene	ug/Kg	360	U	360	U	Yes
Fluoranthene	ug/Kg	360	U	***52***	***J***	Yes
Fluorene	ug/Kg	360	U	360	U	Yes
Indeno[1,2,3-cd]pyrene	ug/Kg	360	U	360	U	Yes
Naphthalene	ug/Kg	360	U	360	U	Yes
Phenanthrene	ug/Kg	360	U	360	U	Yes
Pyrene	ug/Kg	***43***	***J***	***73***	***J***	Yes
Extractable Petroleum Hydrocarbons						
Diesel	mg/Kg	3.3	U	***120***		No (Difference Test)
Fuel Oil	mg/Kg	3.3	U	3.3	U	Yes
Hydraulic Fluid	mg/Kg	3.3	U	3.3	U	Yes
Kerosene	mg/Kg	3.3	U	3.3	U	Yes
Mineral Spirits	mg/Kg	3.3	U	3.3	U	Yes
Motor Oil	mg/Kg	3.3	U	3.3	U	Yes
Unknown Hydrocarbons	mg/Kg	***230***		***250***		Yes
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/Kg	6.3	U	6.2	U	Yes
1,1,2,2-Tetrachloroethane	ug/Kg	6.3	U	6.2	U	Yes
1,1,2-Trichloroethane	ug/Kg	6.3	U	6.2	U	Yes
1,1-Dichloroethane	ug/Kg	6.3	U	6.2	U	Yes
1,1-Dichloroethene	ug/Kg	6.3	U	6.2	U	Yes
1,2-Dichloroethane	ug/Kg	6.3	U	6.2	U	Yes
1,2-Dichloropropane	ug/Kg	6.3	U	6.2	U	Yes
2-Butanone (MEK)	ug/Kg	13	U	12	U	Yes
2-Hexanone	ug/Kg	13	U	12	U	Yes
4-Methyl-2-pentanone (MIBK)	ug/Kg	13	U	12	U	Yes
Acetone	ug/Kg	***38***		***7.2***	***J***	No (Difference Test)
Benzene	ug/Kg	6.3	U	6.2	U	Yes

Table 17
Field Duplicate Results - 24B11/SB2 and 24B11/SB2D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	24B11 / SB2		24B11 / SB2D		Meets
	Depth (ft):	2 - 4		2 - 4		Criteria?
	Date Collected:	9/17/2007		9/17/2007		
	Lab ID:	510-18284-2		510-18284-3		
	Comments:			Duplicate		
Parameter	**Units**					
Bromodichloromethane	ug/Kg	6.3	U	6.2	U	Yes
Bromoform	ug/Kg	6.3	U	6.2	U	Yes
Bromomethane	ug/Kg	6.3	U	6.2	U	Yes
Carbon disulfide	ug/Kg	***12***		***2.5***	***J +***	Yes
Carbon tetrachloride	ug/Kg	6.3	U	6.2	U	Yes
Chlorobenzene	ug/Kg	6.3	U	6.2	U	Yes
Chloroethane	ug/Kg	6.3	U	6.2	U	Yes
Chloroform	ug/Kg	6.3	U	6.2	U	Yes
Chloromethane	ug/Kg	6.3	U	6.2	U	Yes
cis-1,2-Dichloroethene	ug/Kg	6.3	U	5.5	U	Yes
cis-1,3-Dichloropropene	ug/Kg	6.3	U	6.2	U	Yes
Dibromochloromethane	ug/Kg	6.3	U	6.2	U	Yes
Ethylbenzene	ug/Kg	6.3	U	6.2	U	Yes
Methylene Chloride	ug/Kg	12	B U*	***13***	***J+***	Yes
Styrene	ug/Kg	6.3	U	6.2	U	Yes
Tetrachloroethene	ug/Kg	6.3	U	6.2	U	Yes
Toluene	ug/Kg	***1.3***	***J +***	5.5	U	Yes
trans-1,2-Dichloroethene	ug/Kg	6.3	U	6.2	U	Yes
trans-1,3-Dichloropropene	ug/Kg	6.3	U	6.2	U	Yes
Trichloroethene	ug/Kg	6.3	U	6.2	U	Yes
Vinyl acetate	ug/Kg	6.3	U	6.2	U	Yes
Vinyl chloride	ug/Kg	6.3	U	6.2	U	Yes
Xylenes, Total	ug/Kg	13	U	12	U	Yes
Physical Parameters						
pH	S.U.	***11.8***		***11.9***		Yes

Bold, italic = Detected
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
Table 3 provides definition of data flags.

Table 18
Field Duplicate Results - 33MW5S/GW4 and 33MW5S/GW4D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW5S / GW4		33MW5S / GW4D		Meets
	Depth:	Shallow		Shallow		Criteria?
	Date Collected:	10/4/2007		10/4/2007		
	Lab ID:	510-19035-12		510-19035-13		
	Comments:			Duplicate		
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	5	U	5	U	Yes
1,1,2,2-Tetrachloroethane	ug/L	5	U	5	U	Yes
1,1,2-Trichloroethane	ug/L	5	U	5	U	Yes
1,1-Dichloroethane	ug/L	5	U	5	U	Yes
1,1-Dichloroethene	ug/L	5	U	5	U	Yes
1,2-Dichloroethane	ug/L	5	U	5	U	Yes
1,2-Dichloropropane	ug/L	5	U	5	U	Yes
2-Butanone (MEK)	ug/L	25	U	25	U	Yes
2-Hexanone	ug/L	25	U	25	U	Yes
4-Methyl-2-pentanone (MIBK)	ug/L	25	U	25	U	Yes
Acetone	ug/L	25	U	25	U	Yes
Benzene	ug/L	***0.26***	***J***	***0.27***	***J***	Yes
Bromodichloromethane	ug/L	5	U	5	U	Yes
Bromoform	ug/L	5	U	5	U	Yes
Bromomethane	ug/L	5	U	5	U	Yes
Carbon disulfide	ug/L	5	U	5	U	Yes
Carbon tetrachloride	ug/L	5	U	5	U	Yes
Chlorobenzene	ug/L	5	U	5	U	Yes
Chloroethane	ug/L	5	U	5	U	Yes
Chloroform	ug/L	5	U	5	U	Yes
Chloromethane	ug/L	5	U	5	U	Yes
cis-1,2-Dichloroethene	ug/L	***53***		***55***		Yes
cis-1,3-Dichloropropene	ug/L	5	U	5	U	Yes
Dibromochloromethane	ug/L	5	U	5	U	Yes
Ethylbenzene	ug/L	5	U	5	U	Yes
Methylene Chloride	ug/L	5	U	5	U	Yes
Styrene	ug/L	5	U	5	U	Yes
Tetrachloroethene	ug/L	5	U	5	U	Yes
Toluene	ug/L	5	U	5	U	Yes
trans-1,2-Dichloroethene	ug/L	5	U	***0.51***	***J***	Yes
trans-1,3-Dichloropropene	ug/L	5	U	5	U	Yes
Trichloroethene	ug/L	***2.4***	***J***	***3.2***	***J***	Yes
Vinyl acetate	ug/L	25	U	25	U	Yes
Vinyl chloride	ug/L	***4.1***	***J***	***4.2***	***J***	Yes
Xylenes, Total	ug/L	15	U	15	U	Yes
Total Metals						
Arsenic	mg/L	***0.0092***		***0.0093***		Yes
Barium	mg/L	***0.25***		***0.25***		Yes
Cadmium	mg/L	***0.0003***	***J***	***0.00032***	***J***	Yes
Chromium	mg/L	***0.0013***		***0.00073***	***J***	Yes
Lead	mg/L	***0.0023***		***0.0018***		Yes
Mercury	mg/L	0.0002	U	0.0002	U	Yes
Selenium	mg/L	0.0017	B U*	0.0014	B U*	Yes
Silver	mg/L	0.001	U	0.001	U	Yes
Filtered Metals						
Arsenic, Dissolved	mg/L	***0.0085***		**0.0088**		Yes
Barium, Dissolved	mg/L	***0.22***		**0.22**		Yes
Cadmium, Dissolved	mg/L	0.001	U	0.001	U	Yes
Chromium, Dissolved	mg/L	0.001	U	***0.00023***	***J***	Yes

Table 18
Field Duplicate Results - 33MW5S/GW4 and 33MW5S/GW4D

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW5S / GW4		33MW5S / GW4D		Meets
	Depth:	Shallow		Shallow		Criteria?
	Date Collected:	10/4/2007		10/4/2007		
	Lab ID:	510-19035-12		510-19035-13		
	Comments:			Duplicate		
Parameter	**Units**					
Lead, Dissolved	mg/L	0.0005	U	0.0005	U	Yes
Mercury, Dissolved	mg/L	0.0002	U	0.0002	U	Yes
Selenium, Dissolved	mg/L	0.001	U	0.001	U	Yes
Silver, Dissolved	mg/L	0.001	U	0.001	U	Yes

Bold, italic = Detected
mg/L = millgrams per liter
ug/L = micrograms per liter
Table 3 provides definition of data flags.

Table 19
Field Duplicate and QA Split Results
33MW10D/GW4, 33MW10D/GW4D, and 33MW10D/GW4QA

Supplemental Investigation
AK Steel Kansas City Facility

Sample:		33MW10D / GW4	33MW10D / GW4D	33MW10D / GW4QA	Meets
Depth:		Deep	Deep	Deep	Criteria?
Date Collected:		10/3/2007	10/3/2007	10/3/2007	
Lab ID:		510-19035-4	510-19035-5	07100530	
Comments:			Duplicate	QA Lab Sample	
Parameter	**Units**				
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/L	5 U	5 U	1 U	Yes
1,1,2,2-Tetrachloroethane	ug/L	5 U	5 U	1 U	Yes
1,1,2-Trichloroethane	ug/L	5 U	5 U	1 U	Yes
1,1-Dichloroethane	ug/L	5 U	5 U	1 U	Yes
1,1-Dichloroethene	ug/L	5 U	5 U	1 U	Yes
1,2-Dichloroethane	ug/L	5 U	5 U	1 U	Yes
1,2-Dichloropropane	ug/L	5 U	5 U	1 U	Yes
2-Butanone (MEK)	ug/L	10 U	10 U	25 U	Yes
2-Hexanone	ug/L	10 U	10 U	25 U	Yes
4-Methyl-2-pentanone (MIBK)	ug/L	10 U	10 U	25 U	Yes
Acetone	ug/L	10 U	10 U	25 U	Yes
Benzene	ug/L	5 U	5 U	1 U	Yes
Bromodichloromethane	ug/L	5 U	5 U	1 U	Yes
Bromoform	ug/L	5 U	5 U	1 U	Yes
Bromomethane	ug/L	10 U	10 U	1 U	Yes
Carbon disulfide	ug/L	5 U	5 U	1 U	Yes
Carbon tetrachloride	ug/L	5 U	5 U	1 U	Yes
Chlorobenzene	ug/L	5 U	5 U	1 U	Yes
Chloroethane	ug/L	10 U	10 U	1 U	Yes
Chloroform	ug/L	5 U	5 U	1 U	Yes
Chloromethane	ug/L	10 U	10 U	1 U	Yes
cis-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	Yes
cis-1,3-Dichloropropene	ug/L	5 U	5 U	1 U	Yes
Dibromochloromethane	ug/L	5 U	5 U	1 U	Yes
Ethylbenzene	ug/L	5 U	5 U	1 U	Yes
Methylene Chloride	ug/L	5 U	5 U	1 U	Yes
Styrene	ug/L	5 U	5 U	1 U	Yes
Tetrachloroethene	ug/L	5 U	5 U	1 U	Yes
Toluene	ug/L	5 U	5 U	1 U	Yes
trans-1,2-Dichloroethene	ug/L	5 U	5 U	1 U	Yes
trans-1,3-Dichloropropene	ug/L	5 U	5 U	1 U	Yes
Trichloroethene	ug/L	5 U	5 U	1 U	Yes
Vinyl acetate	ug/L	5 U	5 U	25 U	Yes
Vinyl chloride	ug/L	2 U	***0.88 J***	***0.8 J***	Yes
Xylenes, Total	ug/L	10 U	10 U	3 U	Yes

Bold, italic = Detected
ug/L = micrograms per liter
Table 3 provides definition of data flags.

Table 20
QA Split Lab Results - 33MW10S/GW4 and 33MW10S/GW4QA

Supplemental Investigation
AK Steel Kansas City Facility

	Sample:	33MW10S / GW4		33MW10S / GW4QA		Meets
	Depth:	Shallow		Shallow		Criteria?
	Date Collected:	10/3/2007		10/3/2007		
	Lab ID:	510-19035-3		07100529		
	Comments:			QA Lab Sample		
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	5	U	1	U	Yes
1,1,2,2-Tetrachloroethane	ug/L	5	U	1	U	Yes
1,1,2-Trichloroethane	ug/L	5	U	1	U	Yes
1,1-Dichloroethane	ug/L	5	U	1	U	Yes
1,1-Dichloroethene	ug/L	5	U	1	U	Yes
1,2-Dichloroethane	ug/L	5	U	1	U	Yes
1,2-Dichloropropane	ug/L	5	U	1	U	Yes
2-Butanone (MEK)	ug/L	10	U	25	U	Yes
2-Hexanone	ug/L	10	U	25	U	Yes
4-Methyl-2-pentanone (MIBK)	ug/L	10	U	25	U	Yes
Acetone	ug/L	10	U	25	U	Yes
Benzene	ug/L	5	U	1	U	Yes
Bromodichloromethane	ug/L	5	U	1	U	Yes
Bromoform	ug/L	5	U	1	U	Yes
Bromomethane	ug/L	10	U	1	U	Yes
Carbon disulfide	ug/L	5	U	1	U	Yes
Carbon tetrachloride	ug/L	5	U	1	U	Yes
Chlorobenzene	ug/L	5	U	1	U	Yes
Chloroethane	ug/L	10	U	1	U	Yes
Chloroform	ug/L	5	U	1	U	Yes
Chloromethane	ug/L	10	U	1	U	Yes
cis-1,2-Dichloroethene	ug/L	5	U	1	U	Yes
cis-1,3-Dichloropropene	ug/L	5	U	1	U	Yes
Dibromochloromethane	ug/L	5	U	1	U	Yes
Ethylbenzene	ug/L	5	U	1	U	Yes
Methylene Chloride	ug/L	5	U	1	U	Yes
Styrene	ug/L	5	U	1	U	Yes
Tetrachloroethene	ug/L	5	U	1	U	Yes
Toluene	ug/L	5	U	1	U	Yes
trans-1,2-Dichloroethene	ug/L	5	U	1	U	Yes
trans-1,3-Dichloropropene	ug/L	5	U	1	U	Yes
Trichloroethene	ug/L	5	U	1	U	Yes
Vinyl acetate	ug/L	5	U	25	U	Yes
Vinyl chloride	ug/L	2	U	1	U	Yes
Xylenes, Total	ug/L	10	U	3	U	Yes

Bold, italic = Detected
ug/L = micrograms per liter
Table 3 provides definition of data flags.

Table 21
Field Completeness
Supplmental Investigation
AK Steel Kansas City Facility

Analysis	Number of Samples Planned	Number of Samples Collected	Field Completeness
Soil Samples			
Total Cadmium	34	34	100%
Total Lead	46	48	100%
Total Chromium	6	8	100%
Hexavalent Chromium	6	8	100%
RCRA Metals	12	12	100%
pH	12	12	100%
VOCs	22	24	100%
SVOCs	10	12	100%
PAHs	32	32	100%
Volatile TPH	10	12	100%
Extractable TPH	42	40	95%
Groundwater Samples			
Filtered Cadmium	8	5	63%
Filtered Lead	8	5	63%
Total RCRA Metals	9	9	100%
Filtered RCRA Metals	9	9	100%
VOCs	33	33	100%
Grand Total =	**299**	**303**	**97%**
		Field Completeness Goal =	**90%**

Planned samples obtained from Table 2-1 of the QA SAP.

APPENDIX E
Drilling Logs

Drilling Log

Project Name: AK STEEL	Project Number: 46619	Boring Number: B04B05
Ground Elevation:	Location:	Page: 1 OF 1
Air Monitoring Equipment: MINIRAE		Total Footage: BGS

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	-	-	2	-

Drilling Company: BOART LONGYEAR	Driller(s):
Drilling Rig: TRACK-MOUNTED M.MSONIC	Type of Sampler: 5' ROTOSONIC CORE BARREL
Date: 9/10/07 To: 9/10/07	Field Observer(s): TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace sand, w gravel, brown 10YR4/2 dry, soft, non plastic	ML/FILL				SB1 0940			0.0	
2				3.0/4.0					0.0	
3	SILT, w gravel, trace clay, v dark gray-ish brown 10YR3/2, dry, soft, non plastic								0.0	
4									0.0	
5	SAND AND GRAVEL, trace silt, black 10YR2/1, moist, loose, fine to med grained								0.0	
6				3.5/4.0		SB2 0945			0.0	
7	CLAY, black 7.5YR4/1, damp, med. stiff low plasticity trace silt	CL				SB2MS SB2MSD 0945			0.0	
8	TOTAL DEPTH 8.0 FT									
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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051601 Form WCD-2-1

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	A04B06

Ground Elevation	Location	Page
		1 OF 1

Air Monitoring Equipment	Total Footage
MINIRAE	8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	–	–	2	–

Drilling Company	Driller(s)
BOART LONGYEAR	

Drilling Rig	Type of Sampler
TRACK-MOUNTED MINISONIC	5' ROTOSONIC CORE BARREL

Date	To	Field Observer(s)
9/10/07	9/10/07	TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace sand and gravel, brown 10YR 4/3, dry, soft, non plastic	ML / FILL				SB1 1015			0.0	
2	CONCRETE			3.5 / 4.0					0.0	
3	SILT, w/gravel, trace clay, very dark grayish brown 10YR 3/2, dry, soft, lo plasticity								0.0	
4									0.0	
5	SAND & GRAVEL, trace silt, black 10YR 2/1, moist, loose, non plastic, fine to med grained sand			3.5 / 4.0		SB2 1020			0.0	
6									0.0	
7	SAND, dark gray 5Y 4/1, moist, loose, fine to med grained, well sorted								0.0	
8	TOTAL DEPTH 8 FT								0.0	
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name: AK STEEL	Project Number: 46619	Boring Number: A04B07
Ground Elevation:	Location:	Page: 1 OF 1
Air Monitoring Equipment: MINIRAE		Total Footage: 8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	-	-	2	-

Drilling Company: BOART LONGYEAR	Driller(s):
Drilling Rig: TRACK MOUNTED MINISONIC	Type of Sampler: 3" ROTOSONIC CORE BARREL
Date: 9/18/07 To: 9/18/07	Field Observer(s): T. M STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace gravel, brown 10YR 4/3, dry, soft, nonplastic	ML		20 / 4.0		SB1 0920			0.0	
2									0.0	
3										
4									0.0	
5									0.0	
6	CLAY, trace silt & sand very dark gray 10YR 3/1, damp, soft, med. plasticity	CL		1.5 / 4.0		SB7 0925				
7										
8	TOTAL DEPTH 8 FT									
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	A06 B22

Ground Elevation	Location	Page
		1 of 1

Air Monitoring Equipment	Total Footage
MINRAE	8 FT

Drilling Type.	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	—	2	—

Drilling Company	Driller(s)
BOART LONGYEAR	

Drilling Rig	Type of Sampler
TRACKMOUNTED ROTOSONIC	5' ROTOSONIC CORE BARREL

Date	To	Field Observer(s)
		TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
0–2	SLAG GRAVEL / BRICKS	FILL		3.0 / 4.0					0.1	
2–4	SILT, trace gravel and sand, dark grayish brown	ML / FILL				SB1 1055			4.9 / 5.7	
4–6.5	SAND and GRAVEL, tr silt, v. dark grayish brown 10YR 3/2, damp, loose, fine to med grained, nonplastic. ROOTS present	FILL				SB2 1100			1.0 / 0 / 0.1	
6.5–8	SAND, dark gray, 5Y 4/1, moist, loose, fine to ~~med grained~~ ~~[illegible]~~ CLAY, black 7.5Y 2/1, ~~dark gray~~ ~~[illegible]~~, damp, med stiffness low to med plasticity, Trace silt.	CL							52	
8	TD = 8.0 FT									

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	A06B23
Ground Elevation	**Location**	**Page**
		1 OF 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	-	-	2	-

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACKMOUNTED MINISONIC	5' ROTOSONIC CORE BARREL
Date / **To**	**Field Observer(s)**
9/18/07 / 9/18/07	TIM STECHER, JOHN WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG BOULDERS, BRICK	FILL				SB1		0.0		
2	SILT, trace sand and gravel, dk. gray-ish brown 10YR 4/2, dry, soft/loose, non plastic	ML/FILL		2.5/4.0		1030		0.0		
3								0.0		
4	SAND and GRAVEL, some silt, V. dk. gray-ish brown 10YR 3/2, damp, loose, FINE to MED grained, non plastic							0.0		
5								0.0		
6				1.5/4.0		SB2 1035		0.0		
7										
8	TOTAL DEPTH 8.0 FT									
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	06B15

Ground Elevation	Location	Page
		1 of 1

Air Monitoring Equipment	Total Footage
MINIRAE	8.0 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	–	–	2	–

Drilling Company	Driller(s)
BOART LONGYEAR	

Drilling Rig	Type of Sampler
TRACKMOUNTED MINISONIC	5 FT ROTOSONIC CORE BARRELL

Date	To	Field Observer(s)
9/18/07	9/18/07	TIM STELTER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, w/ slag gravel, dark grayish brown 10YR 4/2, dry, soft/loose, non plastic	ML/FILL				SB1			0.0	
	Zone of slag gravel @ 2.5-3.5 FT					0740				
2				4.0					0.0	
3				/4.0					0.0	
4									0.0	
5	CLAY, w/ silt, v. dry gray 2.5Y 3/1, dry med stiffness, trace plasticity, orange/ lt brown mottling from 8-10 FT.	CL							0.0	
6						SB2			0.0	
7				4.0		0745			0.0	
8				/4.0					0.0	
	TOTAL DEPTH = 8.0 FT									
9									0	
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	OGB16
Ground Elevation	**Location**	**Page**
		1 of 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		9.0

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	-	2	-

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRANSMOUNTED MINISONIC	5FT ROTOSONIC CORE BARRELL
Date / **To**	**Field Observer(s)**
9.8.07 / 9.8.07	TIM STECKER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, w slag gravel, dk grayish brown 10YR 4/1, dry, stiff, non plastic, slag gravel zone from 2-3.5 FT					SB1 0755			0.0	
2				3.5 / 4.0					0.0	
3									0.0	
4	CLAY w silt, trace gravel, very dk gray 2.5Y 3/1, damp, soft to med stiff, low plasticity, orange mottling present throughout								0.0	
5									0.0	
6						SB2 0800			0.0	
7				3.5 / 4.0					0.0	
8										
9	CLAY, w/ silt, trace sand, v. dk gray 2.5Y 3/1, damp, soft, med plasticity, orange mottling		TOTAL DEPTH 9.0 FT							
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619.	QB17
Ground Elevation	**Location**	**Page**
		1 OF 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		8.0 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	—	2	—

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACK MOUNTED MINISONIC	5FT ROTOSONIC CORE BARREL
Date	**To**	**Field Observer(s)**
9/19/07	9/19/07	TIM SCHAFER, SR. WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, some clay, some gravel, v.m. fine sand, grayish brown (10YR 5/2), dry, soft, non-plastic	ML/FILL				SB1 SB1D 0730			0.0	0725
2				2.5					0.0	
3				4.0					0.0	
4										
5									0.0	
6	SILT, some clay, trace gravel, v.m. sand, grayish brown (10YR 4/2), dry, med. stiff, trace plasticity			5.0		SB2 0735			0.0	
7				4.0					0.0	
8	CLAY, some silt, trace gravel, mottled grayish brown, soft, low to med. plasticity	CL							0.0	0730
9										
10										ORWB
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name: AK STEEL	Project Number: 46619	Boring Number: OWB-8
Ground Elevation:	Location:	Page: 1 of 1
Air Monitoring Equipment: MINIRAE		Total Footage: 8.0 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	–	–	2	–

Drilling Company: BOART LONGYEAR	Driller(s):
Drilling Rig: TRAILER MOUNTED MINISONIC	Type of Sampler: 5 FT ROTOSONIC CORE BARREL
Date: 9/18/07 To: 9/18/07	Field Observer(s): TIM STECHER, SAM WOODARD

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace gravel, brown 10YR 4/3, dry, soft, nonplastic.	ML/ FILL				SB1 0810			0	
2				3.5/ 4.0					0	
3	SILT, slag gravel, trace sand, V. light gray 5Y 7/1, dry, soft, nonplastic								0	
4										
5									0	
6						SB7 0805			0	
7	CLAY, w/silt, trace gravel, V. dark gray 5Y 3/1, damp, soft, low to med plasticity. Roots present @ 8.0 FT & mottled color yellow/dk gray from 7.5-8.0 FT.			4.0					0	
8				4.0					0	
9	TOTAL DEPTH = 8.0 FT								N	
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	06B19
Ground Elevation	**Location**	**Page**
		1 OF 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	–	–	2	–

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACK MOUNTED MINI ~~ROTOSONIC~~	5' ROTOSONIC CORE BARREL
Date / **To**	**Field Observer(s)**
9/18/07 / 9/18/07	TIM STEUER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace gravel, ~~dark~~ brown (10YR 4/3), dry, soft, non plastic	ML/FILL				SS1 0'-2'			0.0	
2				2.5/2.0					0.0	
3										
4				———		———			0.0	
5	SILT & SAND, w/ slag gravel, black (10YR 2/1), moist, loose/soft, non plastic fine to med grained sand			~~0.0~~		SS2 4'-6'			0.0	
6									0.0	
7	CLAY, trace silt & sand, very dk. gray (10YR 3/1), damp, soft, med plasticity, trace gravel also present.	CL		3.5/4.0					0.0	
8										
9	TD = 8.0 ft									
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46019	06B20
Ground Elevation	**Location**	**Page**
		1 OF 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		9.0 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	—	2	—

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACK MOUNTED MINISONIC	5FT ROTOSONIC CORE BARREL
Date / **To**	**Field Observer(s)**
9/18/07 / 9/18/07	TIM STECHER, SAM WOODWARD

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace gravel, brown 10YR 4/3, dry, soft, nonplastic	ML/FILL				SB1 0835			0.0	
2				4.0					0.0	
3				4.0					0.0	
4	SILT, some gravel, trace clay, brown 10YR 4/3, dry, med stiff, nonplastic								0.0	
5									0.0	
6						SS2 0845			0.1	
7	SAND, slag gravel, silt, trace clay, black 10YR 2/1, moist, loose/soft, nonplastic, fine to med grained sand			3.5/5.0					0.0	
8		CL							0.0	
	TOTAL DEPTH = 8.0 FT									
9	CLAY, trace sand, trace silt, very dk gray 10YR 3/1, damp, soft, medium plasticity									
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

051601 Form WCD-2-1

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46614	06B21
Ground Elevation	**Location**	**Page**
		1 of 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		8.0 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	–	–	2	–

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACK MOUNTED	5' ROTOSONIC CORE BARREL
Date / **To**	**Field Observer(s)**
9/18/07 / 9/18/07	TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, trace gravel, dark grayish brown 10YR 4/2, dry, soft, non plastic	ML/CL				SB1			0.0	
				3.5/4.0		0830			0.0	
2	SILT w/ CLAY & SLAG gravel, very dark gray 10YR 3/1, damp, soft/loose, non plastic								0.0	
3									0.0	
4									0.0	
5									0.0	
6	SILT & SAND, w/ slag gravel; trace clay; black 10YR 2/1, moist loose/soft, non plastic, fine to med grained sand			3.5/4.0		SB2 0845			0.2	
7									0.0	
8	clay, tr. sand & silt, very dark gray 10YR 3/1, damp, soft, med plasticity	CL							0.0	
	TD = 8.0 FT									
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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051601 Form WCD-2-1

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	12B01A
Ground Elevation	**Location**	**Page**
		1 of 1
Air Monitoring Equipment		**Total Footage**
		8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
DIRECT PUSH	2"	–	–	4	–

Drilling Company	Driller(s)
DETECH, INC	JOHN MCCUPE
Drilling Rig	**Type of Sampler**
TRACK MOUNTED GEOPROBE	MACROCORE
Date 9/6/07 **To**	**Field Observer(s)** TIM STECHER, SAM WOODLAMP

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SILT, dark brown 10YR 3/3, damp, med. stiffness, low plasticity	ML				0-2'				1400 Begin drilling
2				3.5/4.2		1405				
3						2-4'				
4	SAND, some clay & silt, v. dk. gray 5Y 3/1, SC damp, med. stiffness, low plasticity, v. fine grained, well graded					2-4' D 1415				
5						4-6				
6				4.0/4.0		1430				
7	CLAY, silty, v. dark gray 5Y 3/1, moist, soft, med. to high plasticity,	CL/CH				6-8'				
8						1445				
9	TOTAL DEPTH 8.0 FT									
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	12B03A

Ground Elevation	Location	Page
		1 OF 1

Air Monitoring Equipment	Total Footage
	8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
DIRECT PUSH	2"	8'	—	4	—

Drilling Company	Driller(s)
DETECH	JOHN MCCLURE

Drilling Rig	Type of Sampler
TRACK MOUNTED GEOPROBE 6620	MACROCORE

Date	To	Field Observer(s)
9/11/07	9/11/07	TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	BH	S	Remarks/ Water Levels
0–2	SILT, dark brown 10YR-3/3, damp, med. consistency, trace plasticity			4.0/4.0		12B03A 0-2' 1050				1015 Begin
2–3	SAND, trace silt, brown 10YR-5/3, damp, med density, v. fine grained, well graded					12B03A 2-4' 1100				
3–4	SAND, some clay & silt, v. dark gray 5Y3/1, damp, med density, tr. plasticity, very fine grained sand, well graded									
4–6				4.0/4.0		12B03A 4-6' 1115				
6–8	CLAY, w/ sand, v. dark gray 5Y3/1, moist, soft, mod. to high plasticity, v. fine grained sand well graded & grout.					12B03A 6-8' 1140				1135 end drilling
8	TOTAL DEPTH 8.0 FT									

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

051601 Form WCD-2-1

Drilling Log

Project Name	Project Number	Boring Number
AIC STEEL	46619	17B08B
Ground Elevation	**Location**	**Page**
		1 of 1
Air Monitoring Equipment		**Total Footage**

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
DIRECT PUSH					

Drilling Company	Driller(s)
DETECH	J. McCLURE
Drilling Rig	**Type of Sampler**
TRUCKMOUNTED GEOPROBE	MACROCORE
Date / **To**	**Field Observer(s)**
9/10/07 / 9/10/07	TIM STEWART, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG, SAND, Gravel, Very dark gray (5YR 3/1), dry, loose, non plastic trace brick fragments	FILL		2.0/2.5		17B08B 0.0 0940				09:20 Begin drilling
2										
3				1.0/1.5		17B08B 2-4 0945				(1) Refusal @ 3'10" OFFSET 5' SOUTH
4										
5	CLAY, with sand, slag, brick [illegible] black (5YR 2.5/1), moist, soft, trace plasticity, trace historical chips present Red brick @ 5 FT BGS		4-6 < 9/10/07	6.0/6.0		17B08B 4-6 0950	(2) Refusal @ 5' OFFSET 1' SOUTH OF LOCATION			
6				1.5/2.0		4-6 9/10/07 0950				
7	CLAY, trace silt and sand, very dark gray (10YR 3/1), damp, moderate plasticity, low to medium plasticity	CL		2.0/2.0		6-8 9/10/07 0:00	(3) 9/11/07 PERFORM 2nd installation during 1st water sample			
8	TOTAL DEPTH 8.0 FT									09:00 9/11/07 COMPLETE FOR 4
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

Drilling Log

Project Name: AK STEEL	Project Number: 46619	Boring Number: 13B09A
Ground Elevation:	Location:	Page: 1 of 1
Air Monitoring Equipment:		Total Footage: 8 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
DIRECT PUSH	2"	–	–	4	–

Drilling Company: DETECH, INC	Driller(s): JOHN MCLINTÉ
Drilling Rig: ~~TRACKED~~ TRUCK-MOUNTED GEOPROBE	Type of Sampler: MACROCORE
Date: 9/10/07 To: 9/10/07	Field Observer(s): TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG, sand, gravel	FILL				0-2' 1415				1405 Begin drilling
2	CLAY, trace slag & silt, V. dk. gray, damp, medium consistency, med. plasticity	CL/FILL		3/4						
3						2-4' 1430				
4										
5				4.0		4-6' 1445				
6	CLAY, trace silt, V. dk. gray, damp, med consistency, medium plasticity	CL		4.0						
7						6-8' 1503				
8	TOTAL DEPTH 8.0 FT									
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

051601 Form WCD-2-1

Drilling Log

Project Name: AK STEEL	Project Number: 41669	Boring Number: 24B11
Ground Elevation:	Location:	Page: 1 OF 1
Air Monitoring Equipment: MINIRAE		Total Footage: 10 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	—	4	—

Drilling Company: BOART LONGYEAR	Driller(s):
Drilling Rig: TRACK-MOUNTED MINISONIC	Type of Sampler: 5 FT ROTOSONIC CORE BARREL
Date: 9/17/07 To: 9/17/07	Field Observer(s): TIM STEWART, SAM WOODWARD

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG, silt, some sand, large slag gravel, dry, loose.	FILL				SB1 1405			0.0	1400 Begin drilling
2				4.5 / 5.0					0.0	
3						SB2 1410			0.0	
4									0.0	
5	SILT, some clay, some sand, dry, dark reddish brown 5YR3/2, soft, non-plastic	ML				SB3 1415			0.0	
6									0.0	
7	CLAY, black 5YR 2.5/1, damp, med. stiff, med. plasticity, ~~trace~~ some sand, tr. gravel.	CL				SB4 1420			0.0	
8				4.5 / 5.0					0.0	
9									0.0	
10									0.0	
11	BOREHOLE LOGGED 0-10 FT									BOREHOLE DRILLED TO 35 FT BGS
12										GROUNDWATER ENCOUNTERED 30-35 FT
13										END DRILLING @ 1440
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

051601 Form WCD-2-1

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	466.9	24B12
Ground Elevation	**Location**	**Page**
	SWMU 24	1 of 1
Air Monitoring Equipment		**Total Footage**
MINIRAE		10 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"	—	—	4	—

Drilling Company	Driller(s)
BOART LONGYEAR	
Drilling Rig	**Type of Sampler**
TRACK-MOUNTED MINISONIC	5 FT ROTOSONIC CORE BARREL
Date / **To**	**Field Observer(s)**
9/17/07 / 9/17/07	TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG, GRAVEL, SILT, CONCRETE, d/y loose.	FILL				SB1 1625		0.0		1620 BEGIN DRILLING
2				4.0 / 5.0				0.0		
3						SB2 1630		0.0		
4								0.0		
5	SILT, some slag, gravel, mottled color, d-y, very loose & soft, non plastic	ML/FILL				1635 SB3 SB3MS SB3MSD		0.0		
6								0.0		
7				4.5 / 5.0		SB4 1640		0.0		
8								0.0		
9								0.0		
10	CLAY, black 5YR 2.5/1, damp, med. stiff, wet, CL med plasticity, trace gravel & sand.							0.0		END 1655
11	BOREHOLE LOGGED TO 10FT									GROUNDWATER SAMPLE COLLECTED FROM 30-35 FT
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	33MW157
Ground Elevation	**Location**	**Page**
		1 OF 6
Air Monitoring Equipment		**Total Footage**
MINIRAE		95 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"/6"	94 FT	1 FT	—	—

Drilling Company: BOART LONGYEAR	Driller(s):
Drilling Rig: TRACK-MOUNTED MINISONIC	Type of Sampler: 5 FT ROTOSONIC CORE BARREL
Date: 9/18/07 To: 9/19/07	Field Observer(s): TIM STEUER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	SLAG, with silt and sand, loose, non plastic SILT is soft, non plastic very dark grayish brown 10YR 3/2	FILL						0.0		1310 Begin drilling
2				3.0				0.0		
3				/5.0				0.0		
4	CLAY, some silt, trace gravel, brown 10YR 4/3, damp, soft, low to med. plasticity SLAG present @ 7.5 FT	ML/FILL								
5				—				0.0		
6								0.0		
7								0.0		
8				4.0 /5.0				0.0		
9	CLAY, some silt, brown 10YR 5/3, damp, medium to stiff, true to med. plasticity	CL								
10				—				0.0		
11								0.0		
12				4.0 /5.0				0.0		
13								0.0		
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell SINCE 1898

051601 Form WCD-2-1

Drilling Log Continuation

Project Name	AK STEEL
Project Number	44619
Boring Number	33MW15D
Page	2 of 6
Date	9/18/07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	CLAY, some silt, brown 10YR 5/3, damp med to stiff, low to med plasticity	CL						0.0		
16								0.0		
17				3.5				0.0		
18				1.0				0.0		
19										
20								0.0		
21								0.0		
22	CLAY, with sand, dk grayish brown 10YR 4/2, moist, soft, med to high plasticity. Trace calcareous nodules	SL		5.0				0.0		
23				5.0				0.0		
24								0.0		
25								0.0		
26								0.0		
27								0.0		
28				4.5				0.0		
29	CLAY, some sand, very dk gray 5Y3/1, moist, soft, med to high plasticity	CL		5.0				0.0		
30								0.0		

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log Continuation

	Boring Number AOI 33MW15D
Project Name AK STEEL	Page 3 of 6
Project Number 46614	Date 9/18/97

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
	CLAY, some sand, very dark gray 5Y3/1	CL								
32	moist, soft, med. to high plasticity			1.5/5.0					0.0	
33										
34										
35				—					0.0	1410
36									0.0	
37				4.5/5.0					0.0	
38	CLAY, w/ sand very dark gray 5Y3/1, moist, soft, med to high plasticity	SC							0.0	
39									0.0	
40				—					0.0	
41									0.0	
42									0.0	
43	CLAY, trace sand, dark gray 5Y4/1, moist, soft, med. to high plasticity	CL		3.5/5.0					0.0	
44										
45				—					0.0	
46									0.0	
47				4.5/5.0					0.0	
48										

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell Waste Consultants, Inc.

11/11/1992

Form WCI-OP2-2

Drilling Log Continuation

Project Name	AK STEEL
Project Number	4669
Boring Number	33MW15D
Page	4 of 6
Date	9/16/92

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
49	CLAY, trace sand, dark gray 5Y 4/1, moist to wet, soft, medium to high plasticity	CL		4.5/5.0					0.0	
50									0.0	
51									0.0	
52				4.0/5.0					0.0	
53									0.0	
54	CLAY, trace sand, very dark gray 5Y 3/1, moist to wet, soft, med. to high plasticity								0.0	
55									0.0	
56									0.0	
57	CLAY, trace sand, dark gray 5Y 4/1, moist to wet, soft, med. to high plasticity			5.0/5.0					0.0	
58									0.0	
59									0.0	
60									0.0	
61	SAND, dark gray 5Y 3/1, wet, well graded fine to medium coarse to very coarse grained subangular to subrounded.	SW								
62										
63										
64	GRAVEL some clay, some sand, dark gray 5Y 4/1, wet, poorly graded, subangular	GC								

BZ=Breathing Zone BH=Bore Hole S=Sample

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Form WCI-OP2-2

Drilling Log Continuation

Project Name	AK STEEL
Project Number	44615
Boring Number	33MW15D
Page	5 of 6
Date	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
65	GRAVEL, some clay some sand dark grey 5Y4/1, wet, poorly graded, subangular	GC							1.0	
66	SAND w/clay, very dark grey 5Y3/1, wet, soft/loose, fine grained, ~~poorly graded~~	SC							0.0	
67									0.0	
68									0.0	
69									0.0	
70	GRAVEL, trace sand & clay, very dark grey 5Y3/1, wet, loose, subangular	GC								
71									0.0	
72				30 / 50						
73									0.0	
74										
75									0.0	
76									0.0	
77	GRAVEL, w/clay & sand light olive grey 5Y4/2, wet, loose, subangular			45 / 50						
78									0.0	
79	GRAVEL, with sand, dark olive grey 5Y3/2, wet, loose, subrounded to rounded								0.0	
80										
81				40 / 50						

BZ=Breathing Zone BH=Bore Hole S=Sample

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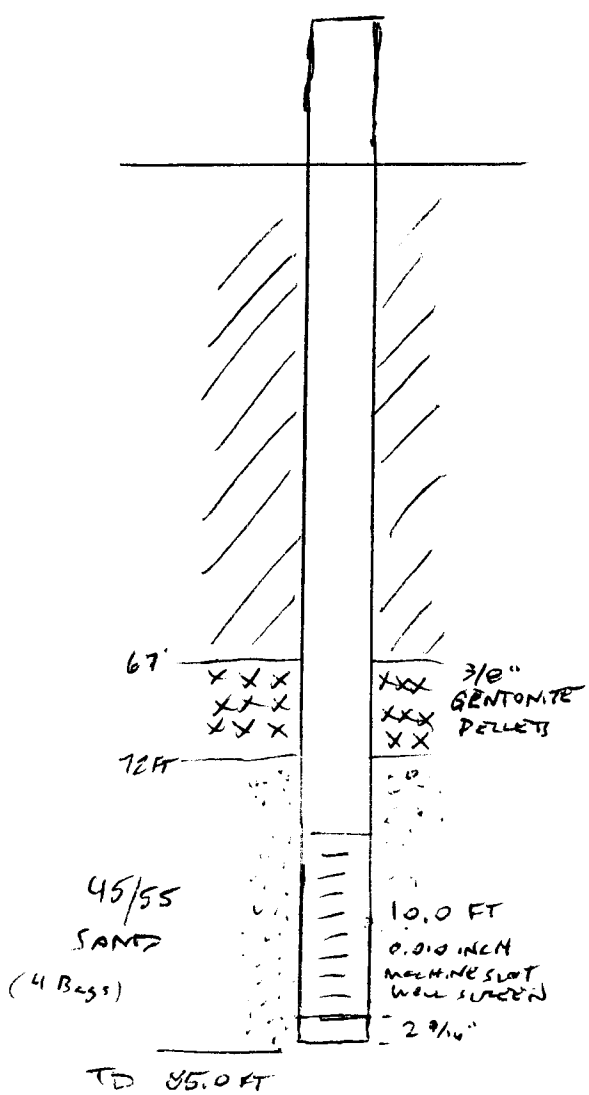
Drilling Log, continued

	Boring No. 33MW15D
Project Name AK STEEL	Page 6 of 6
Project No. 46619	Date 9/10/00

Depth	Description	Class.	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks
82	GRAVEL, some sand, trace clay, trace of vegetation, 5Y 3/2, wet, loose, coarse to fine gravel, subangular to well rounded	GC						
83					4.0/5.0			
84	SHALE, very weathered, gray 5Y 6/1, damp							
85								1538 END DRILLING
	TOTAL DEPTH 85.0 FT							1530 Begin Well Installation



NOT TO SCALE

END CAP 2 9/16"

Burns & McDonnell Waste Consultants, Inc.

Drilling Log

Project Name	Project Number	Boring Number
AK STEEL	46619	33MW155
Ground Elevation	Location	Page
		1 OF 3
Air Monitoring Equipment		Total Footage
~		25 FT

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
ROTOSONIC	4"/6"		—	—	

Drilling Company: BOART LONGYEAR ~	Driller(s):
Drilling Rig: TRACK MOUNTED MINISONIC	Type of Sampler:
Date: 9/19/07 To: 9/19/07	Field Observer(s): TIM STECHER, SAM WOODLAND

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	REFER TO 33MW15D FOR LITHOLOGY DETAILS									0835 Begin Drilling
2	NOTE: 33MW15S LOCATED 5FT NORTH OF 33MW15D									
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log Continuation

Project Name AK STEEL	Boring Number 33MW155
Project Number 44019	Page 2 of 3
	Date 9/19/07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	REFER TO 33MW15D FOR LITHOLOGY DETAILS.									
16										
17										
18										
19										
20										
21										
22										
23										
24										
25	TOTAL DEPTH = 25 FT									CROSS ENDORSEMENT

BZ=Breathing Zone BH=Bore Hole S=Sample

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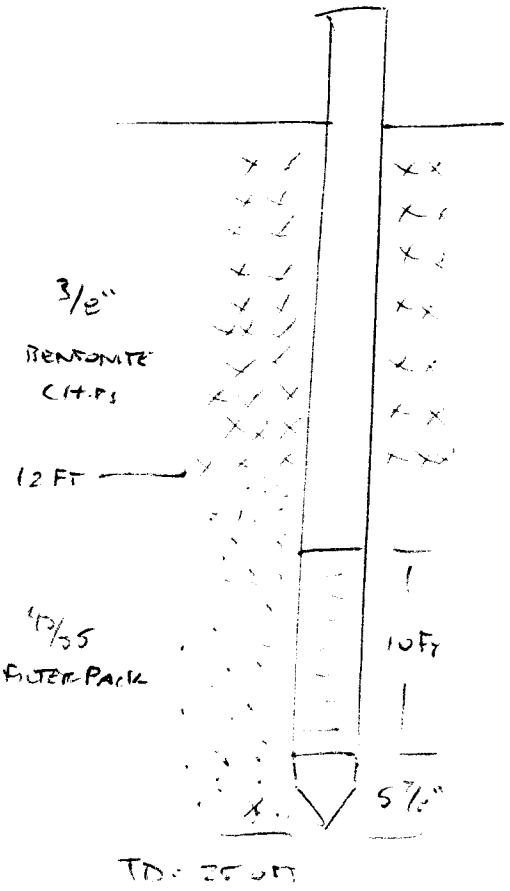
Drilling Log Continuation

Project Name	AK STEEL
Project Number	4666.9
Boring Number	~~DW~~ 33MW15S
Page	3 of 3
Date	9/19/07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels



4 1/2 BAGS OF FILTER PACK

BOREHOLE 6" DIAMETER

BZ=Breathing Zone BH=Bore Hole S=Sample

Burns & McDonnell | Waste Consultants, Inc.

Drilling Log

Project Name: AM Steel	Project Number:	Boring Number: 33MW 16D
Ground Elevation:	Location:	Page: 1 of 6
Air Monitoring Equipment:		Total Footage: 79 ft

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Rotosonic	4"/6"				

Drilling Company: Boart Longyear	Driller(s):
Drilling Rig: Trackmounted Minisonic	Type of Sampler: 5ft Rotosonic Core Barrell
Date: 9-28-07 To:	Field Observer(s): Tim Stecker, Sam Woodland

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Slag, Asphalt, Concrete, loose, moist									Start 1055
2		4.9 5.0								
3										
4										
5	Gravel with sand, silt, loose, Soft, moist, 10YR 4/2							0.0		
6		3.9 5.0						0.0		
7	Concrete									
8										
9	Silt some Sand, 10YR 4/3, medium Plastisty							0.0		
10	Clay trace of silt, sand, 10YR 4/3 Damp, trace plasticity							0.0		
11										
12								0.0		
13	Clay ~~with~~ trace of silt, Sand, 10YR 3/1 Damp, Trace of Plasticity									
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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051601 Form WCD-2-1

Drilling Log Continuation

	Boring Number 33 MW 16D
Project Name AK Steel	Page 2 of 6
Project Number 46619	Date 9.19.07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	Clay trace of Silt, Sand, 10YR 3/1 Damp, Trace of Plasticity							0.0		
16	Slag and Sand, 10YR 3/3 moist, medium plastic			3/5				0.0		
17										
18	Clay trace of sand, 10YR 3/2 Trace Plasticity, Dry							0.0		
19										
20								0.0		
21	Silty Clay trace Sand, 10YR 3/2 moist, Trace Plasticity									
22								0.0		
23										
24										
25								0.0		
26										
27										
28								0.0		
29										
30										
31								0.0		

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log Continuation

Project Name	Ak Steel
Project Number	466619
Boring Number	33MW16D
Page	3 of 6
Date	9.19.07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32	Silty Clay trace sand, 10YR 3/2 moist, Trace Plasticity			5/5				0.0		
33										
34										
35	Clay Trace Silt, 5YR 4/1							0.0		
36										
37				5/5				0.0		
38										
39								0.0		
40										
41								0.0		
42	Sand, 5Y/R 4/1, fine medium grain, loose, Sub rounded, Wellgraded			5/5						
43								0.0		
44	Sand 5YR 5/1 Coarse, loose Sub rounded, Poorly graded									
45								0.0		
46										
47								0.0		
48										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log Continuation

Project Name	AK Steel
Project Number	46619
Boring Number	33MW160D
Page	4 of 6
Date	9-19-07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
49	Sand 5YR 5/1 Coarse, loose subrounded, poorly graded							0.0		
50										
51								0.0		
52										
53				2/5				0.0		
54								0.0		
55										
56	Clay some Gravel, 5YR3/1									
57	subrounded, moist, medium Plasticity			4/5				0.0		
58								0.0		
59										
60								0.0		
61										
62				5/5						
63								0.0		
64	Gravel and Clay, 5YR 3/1									
65	Subrounded, moist, well graded							0.0		

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Boring Number	4 53MW16D
Project Name	AK Steel
Page	5 of 6
Project Number	46619
Date	9.19.07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
66	Gravel and Clay 5YR 3/1 Subrounded, moist, well graded								0.0	
67				5/5					0.0	
68									0.0	
69										
70	Silty Clay trace gravel sand 5YR 3/1 dry, Sub rounded well graded								0.0	
71										
72	Silty Clay trace Sand 5YR 3/1 medium Plastic, moist, stiff								0.0	
73				5/5					0.0	
74	Gravel traces Sand, 5YR 4/1 loose, Poorly Graded, moist								0.0	
75										
76	Shale, very weathered 2.5YR 5/1								0.0	
77			4/5							
78									0.0	14K' End drilling
79	Total Depth									1415
80									0.0	Begin well installation
81										
82									0.0	

BZ=Breathing Zone BH=Bore Hole S=Sample

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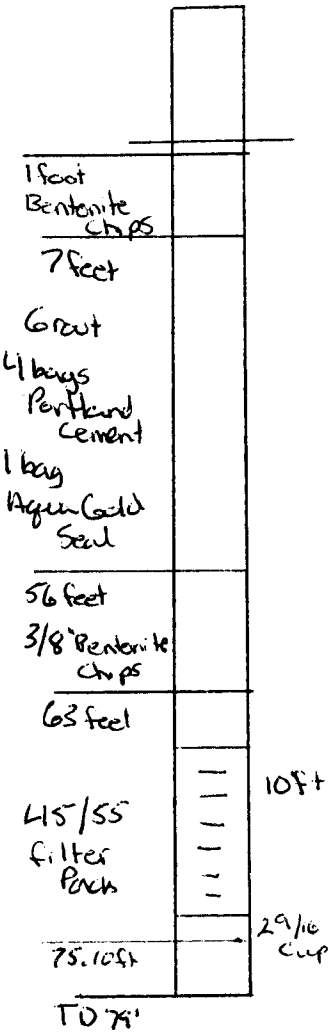
Drilling Log Continuation

Project Name	Ak Steel
Project Number	46619
Boring Number	23MW16D
Page	6 of 6
Date	~~9-18-02~~ ~~9-19-02~~ 9-20-02 9:45

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels



BZ=Breathing Zone BH=Bore Hole S=Sample

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051601 Form WCD-KC-2-2

Drilling Log

Project Name	Project Number	Boring Number
AK Steel	46619	33MW16S

Ground Elevation	Location	Page
		1 of 3

Air Monitoring Equipment	Total Footage
Mini Rae	25 ft

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes

Drilling Company	Driller(s)
BOART Longyear	

Drilling Rig	Type of Sampler
Truck mounted Mimsonic	5 ft Rotasonic Core Barrell

Date	To	Field Observer(s)
9.19.07	9.20.07	Tim Stecher, Sam Woodland

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Refer to 33MW16D For Lithology Details									Begin Drilling 1540
2										
3	Note: 33MW16S is located to the west of 33MW16D									
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

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Drilling Log Continuation

Boring Number 33MW16S

Project Name AK Steel

Page 2 of 3

Project Number 46619

Date ~~9.18.07~~ 9.19.07

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	Refer to 33MW16D For Lithology Details									
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										1605 Complete Drilling
26	Total Depth 25 ft									
27										Begin Well Construction 0745
28										
29										
30										
31										

BZ=Breathing Zone BH=Bore Hole S=Sample

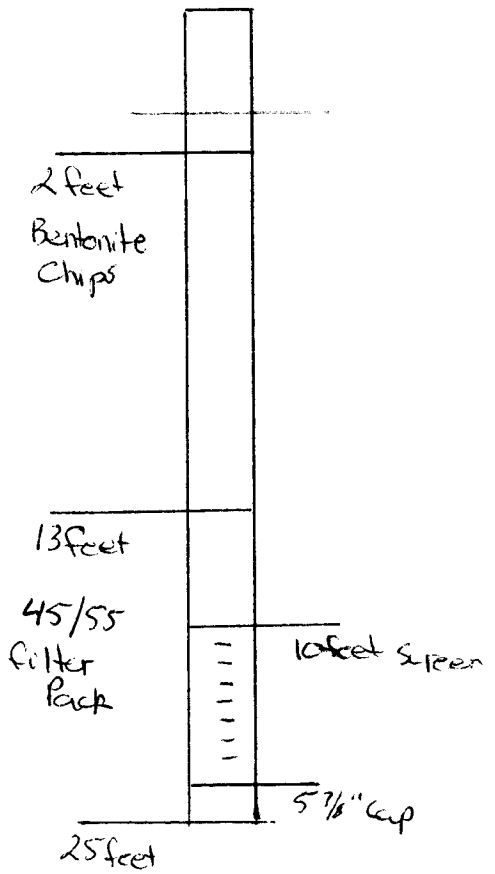
Burns & McDonnell

051601 Form WCD-KC-2-2

Drilling Log, continued

Project Name	AK Steel
Project No.	46619
Boring No.	33MW165
Page	3 of 3
Date	9 20 07

Depth	Description	Class.	Blow Count	Field Strength	Recov.		Sample or Box No.	Remarks



Burns & McDonnell Waste Consultants, Inc.

APPENDIX F
Monitoring Well Construction Diagrams

Project No. 46619 Project Name Ak Steel

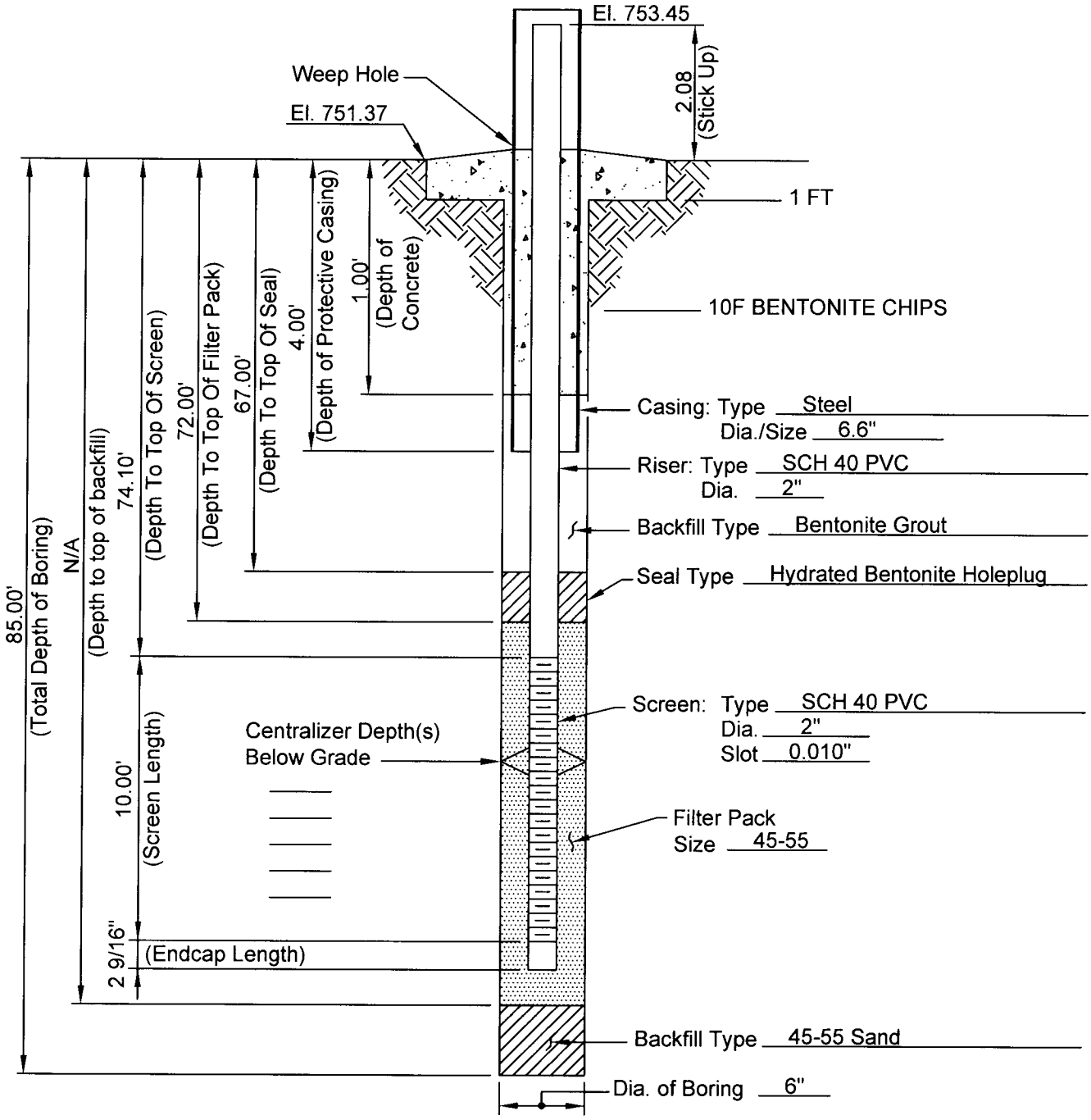
Well No. MW-15D Date Started 9/18/07 Date Completed 9/20/07 Locking Cover (Y/N) Y

Installed By Boart Longyear Recorded By T. Stecher

Method of Developement Waterra Pump w/ 3/4" Flexible Polytubing w/ Check Valve Date Developed 9/20/07

Depth To Water 37.09 Reference Point Ground Surface

Notes



MW-15D

BURNS & MCDONNELL STICK-UP WELL CONSTRUCTION DETAIL

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Project No. 46619 Project Name Ak Steel

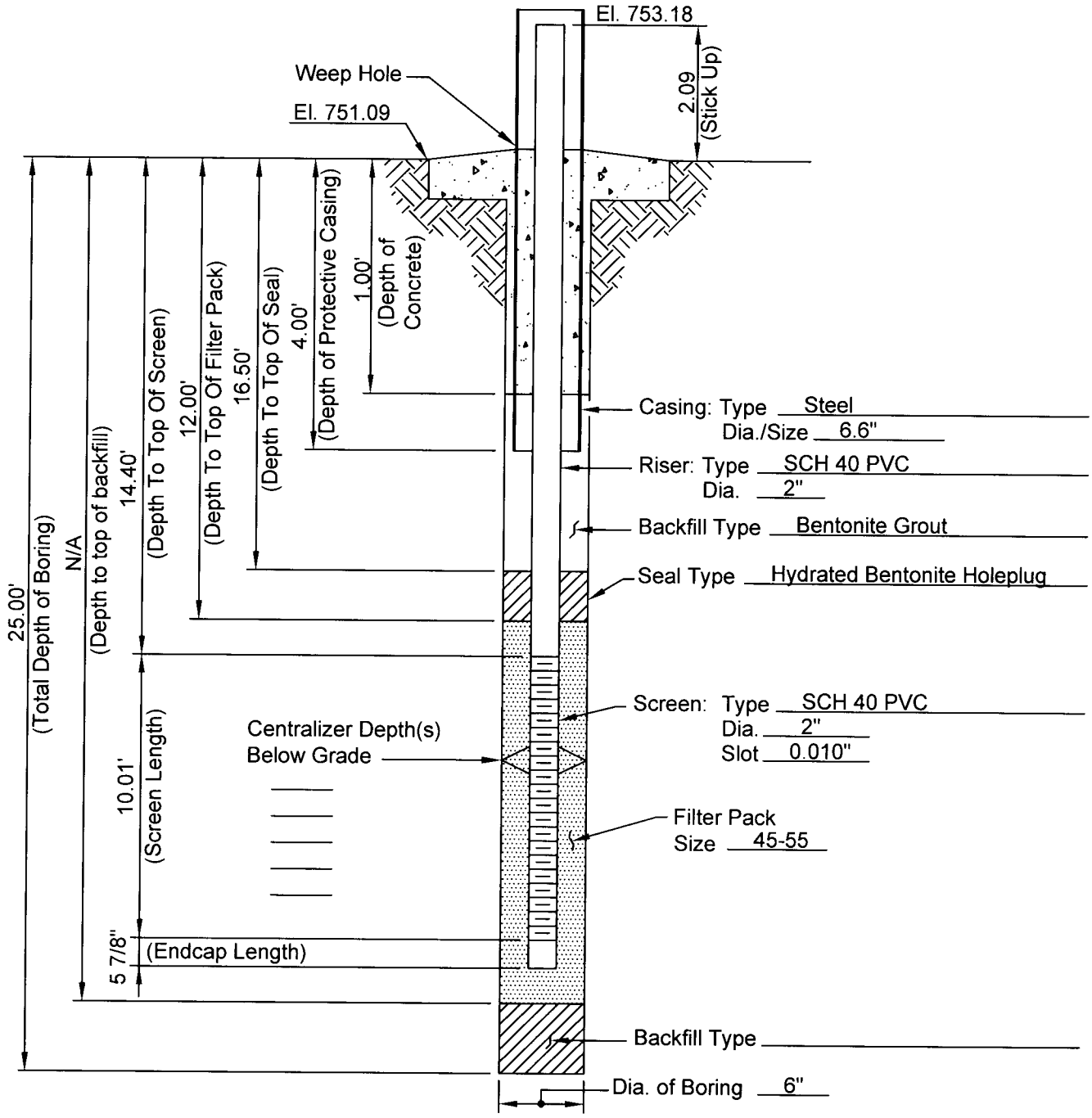
Well No. MW-15S Date Started 9/19/07 Date Completed 9/20/07 Locking Cover (Y/N) Y

Installed By Boart Longyear Recorded By T. Stecher

Method of Developement Waterra Pump w/ 3/4" Flexible Polytubing w/ Check Valve Date Developed 9/20/07

Depth To Water 9.70 Reference Point Ground Surface

Notes



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MW-15S

BURNS & MCDONNELL STICK-UP WELL CONSTRUCTION DETAIL

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Project No. 46619 Project Name Ak Steel

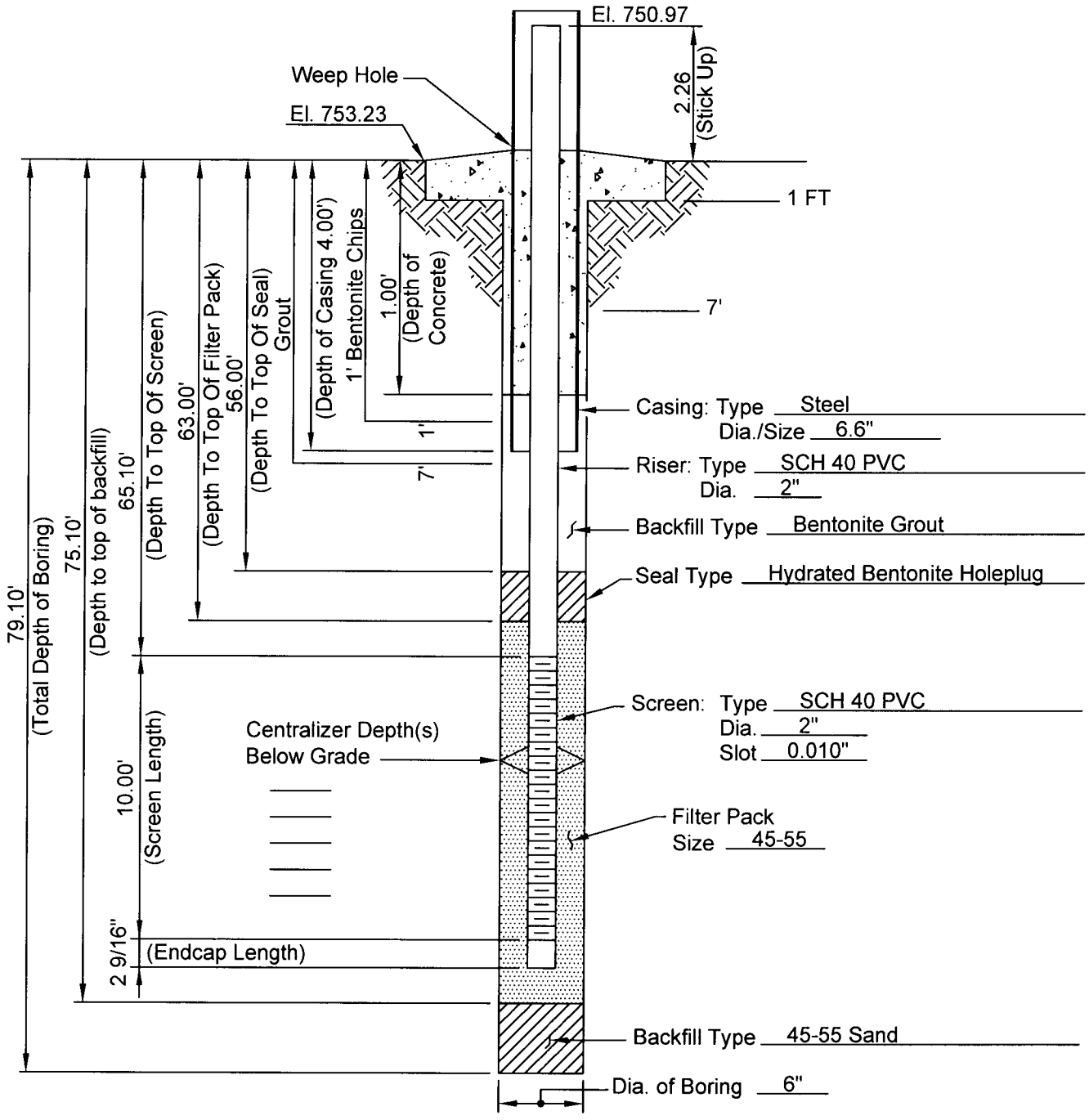
Well No. MW-16D Date Started 9/19/07 Date Completed 9/20/07 Locking Cover (Y/N) Y

Installed By Boart Longyear Recorded By S. Woodland

Method of Developement Waterra Pump w/ 3/4" Flexible Polytubing w/ Check Valve Date Developed 9/20/07

Depth To Water 36.66 Reference Point Ground Surface

Notes



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MW-16D

BURNS & MCDONNELL STICK-UP WELL CONSTRUCTION DETAIL

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Project No. 46619 Project Name Ak Steel

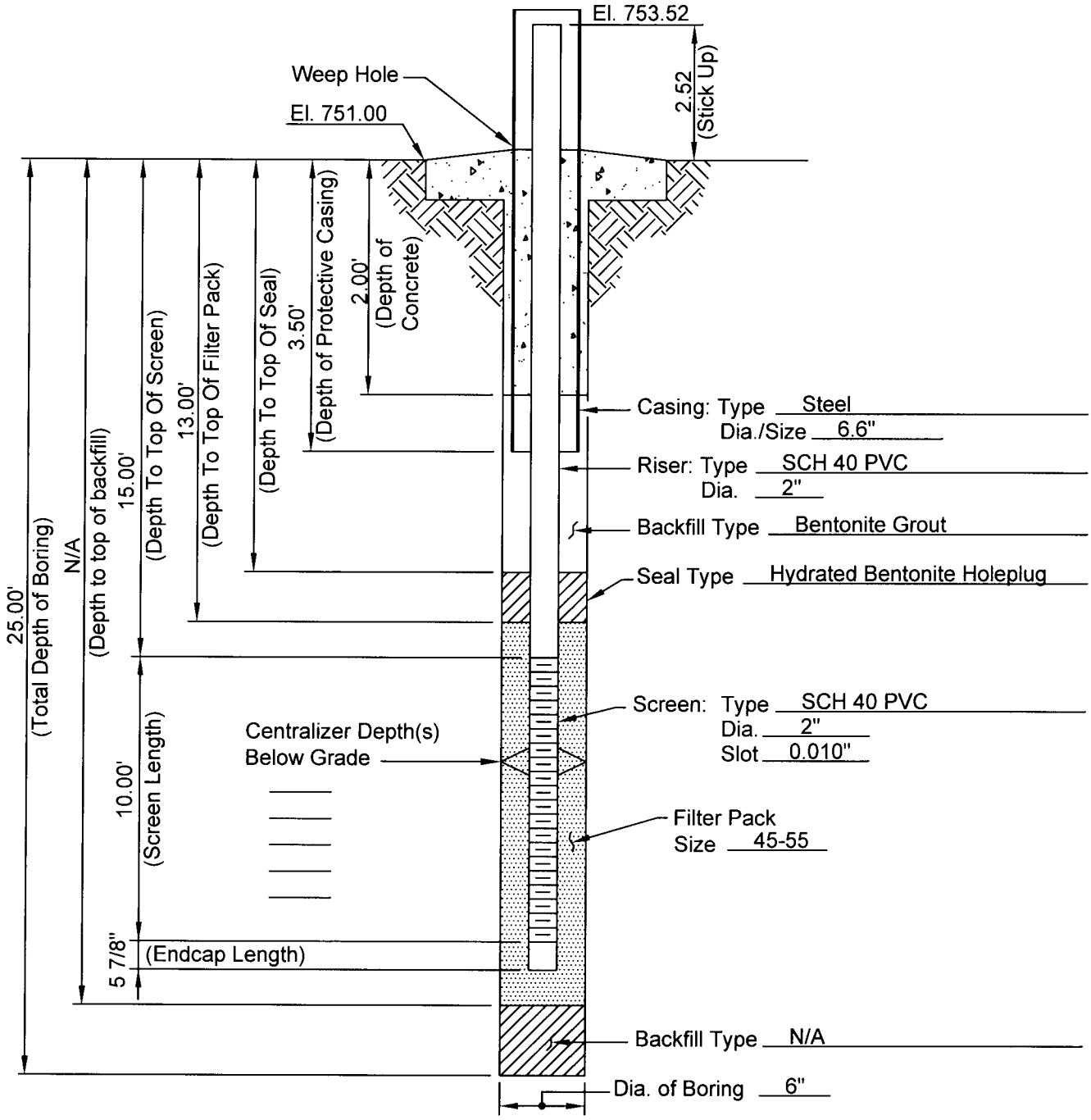
Well No MW-16S Date Started 9/19/07 Date Completed 9/21/07 Locking Cover (Y/N) Y

Installed By Boart Longyear Recorded By S. Woodland

Method of Developement Waterra Pump w/ 3/4" Flexible Tubing w/ Check Valve Date Developed 9/21/07

Depth To Water 18.05 Reference Point Ground Surface

Notes



MW-16S

BURNS & MCDONNELL STICK-UP WELL CONSTRUCTION DETAIL

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APPENDIX G
Monitoring Well Development Records

Well Development Form

Project Number: 46619	Well Number: 33MW15D

Project Information

Facility Name:	AK STEEL
Location:	N E

Elevation of Well

Ground Surface Elevation (GS):	751.37
Top of Casing Elevation (TOC):	753.45

Well Information

Date Well Installed:	9/18/07	
Total Depth of Well:	86.60	feet from TOC
Depth to Top of Screen:		feet from TOC
Length of Casing Screened:	10'	feet
Type of Formation Screened:	SAND/GRAVEL	

Well Volume Calculation

Depth to Water: 37.04 ft TOC

TD: 86.60 ft TOC

8.09 gallons/volume

1 well volume (gallons) = initial height of water column (ft) x 0.0408 x (casing diameter (in))2

Well Development Method

Equipment:				Method Description:
Surge	✓	Bail		Waterra pump w/ 3/4" Flexible poly Tubing w/ check valve
Airlift		Pump	✓	

Observations During Well Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (degrees F)	pH (units)	S.C. (µS/cm)	Turbidity (NTU)	Fluid Appearance and Remarks (color, odor, etc.)
9/20/07	1005			I		80.4	9.1	470	~	Sl. cloudy
	1014	37.10		8	8	76.1	7.1	2200	—	Turbid, brown
	1025			8	16	72.1	6.9	2500	—	" "
	1037			8	24	72.5	6.9	2700	—	M. CLOUDY
	1050			8	32	72.6	6.9	2700	—	M. CLOUDY
	1100			8	40	72.1	6.8	2900	—	SL. CLOUDY
	1109	37.09		8	48	72.5	6.8	2800	—	SL. CLOUDY/M. CLEAR

* From TOC unless otherwise noted in Remarks

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10% ÷ 2 = 10%

Well Development Form

Project Number: 46619	Well Number: 33MW15S

Project Information

Facility Name:	AK STEEL
Location:	N E

Elevation of Well

Ground Surface Elevation (GS):	751.09
Top of Casing Elevation (TOC):	753.18

Well Information

Date Well Installed:	9/18/07	
Total Depth of Well:	26.74	feet from TOC
Depth to Top of Screen:		feet from
Length of Casing Screened:	10.0'	feet
Type of Formation Screened:		

Well Volume Calculation

Water level: 9.70 FT TOC — 17.04 FT of Water Column

Total Depth: 26.74 FT TOC — 2.78 gallons / well volume

1 well volume (gallons) = initial height of water column (ft) x 0.0408 x (casing diameter (in))2

"4

Well Development Method

Equipment:				Method Description:
Surge	✓	Bail		Waterra surge pump w/ 3/4" Flexible poly tubing w/ check valve
Airlift		Pump	✓	

Observations During Well Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (degrees F)	pH (units)	S.C. (µS/cm)	Turbidity (NTU)	Fluid Appearance and Remarks (color, odor, etc.)
9/20/07	1115			I		83.3	9.3	780	—	M. cloudy, brown
	1120			3	3	79.5	9.8	560	—	Turb. ↓
	1145	DRY*		3	6	85.8	9.7	610	—	Turb. ↓
		DRY		3	9					*Pumping rate of groundwater infiltration (~300 mL/min)
				3	12					
				3	15					
	1320	18.56								
	~~1320~~/1330	~~18.56~~		I		78.2	8.6	670		Turbid Brown
	1340	Dry		~~Dry~~ 1		82.0	8.9	660		" "
	1350	Dry		21.5		87.4	8.6	650		350mL/min

* From TOC unless otherwise noted in Remarks

Well Development Form

Project Number: 46619	Well Number: 33MW161D

Project Information

Facility Name:	AK Steel
Location:	N E

Elevation of Well

Ground Surface Elevation (GS):	750.97
Top of Casing Elevation (TOC):	753.23

Well Information

Date Well Installed:	9-19-07
Total Depth of Well:	78 feet from TOC
Depth to Top of Screen:	feet from
Length of Casing Screened:	feet
Type of Formation Screened:	

Well Volume Calculation

Depth to WL: 36.64 ft — 42.36 ft of water Column
TD: 78 ft — 6.91 gallons/well volume

1 well volume (gallons) = initial height of water column (ft) x 0.0408 x (casing diameter (in))2

Well Development Method

Equipment:				Method Description:
Surge		Bail		Waterra Surge Pump w/ 3/4" Flexible poly tubing w/ check valve
Airlift		Pump		

Observations During Well Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (degrees F)	pH (units)	S.C. (µS/cm)	Turbidity (NTU)	Fluid Appearance and Remarks (color, odor, etc.)
9-20-07	1534			I		75.9	8.2	540		Little murky
	1545			7		72.1	7.3	1000		Turbid brown
	1603			14		72.3	7.0	1110		" "
	1620			21		71.4	6.9	1170		" "
	1633			28		71.3	6.9	1220		Turbid lite brown
	1646			35		71.3	6.9	1270		Milky
				42						
	1653	36.66								

* From TOC unless otherwise noted in Remarks

10% ± .2 10%

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Well Development Form

Project Number: 46619	Well Number: 53 MW 165

Project Information

Facility Name: AK Steel	
Location: N E	

Elevation of Well

Ground Surface Elevation (GS):	751.00
Top of Casing Elevation (TOC):	753.52

Well Information

Date Well Installed:	9.20.07	
Total Depth of Well:	27.46	feet from TOC
Depth to Top of Screen:		feet from
Length of Casing Screened:		feet
Type of Formation Screened:		

Well Volume Calculation

Wh: 18.05 — 9.41 ft of water column

TD: 27.46

1.53 gallons / well volumn

1 well volume (gallons) = initial height of water column (ft) x 0.0408 x (casing diameter (in))2

Well Development Method

Equipment:				Method Description:
Surge		Bail		Waterra pump w/ 3/4" Flexible Poly Tubing w/ check valve
Airlift		Pump		

Observations During Well Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (degrees F)	pH (units)	S.C. (S/cm)	Turbidity (NTU)	Fluid Appearance and Remarks (color, odor, etc.)
9.21.07	0735	8.98		I		65.8	11.4	12.20		Turbid Dark Brown
	0740			1.5		65.4	11.4	890		Turbid lite Brown
	0747	Dry / 26.51		3		65.6	10.7	610		Turbid lite Brown
	0805	Dry/26.95		4		72.1	10.9	990		Turbid Med Brown

* From TOC unless otherwise noted in Remarks

APPENDIX H
Field Groundwater Sampling Forms

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-05-07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 466A WEATHER: _____

WELL NUMBER: 33MW 2S

DEPTH TO WATER (ft): 7.72

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0800	I	200	5.66	20.83	0.678	9.91	187.3	1.80	8.45
0805		200	5.51	20.48	0.672	14	155.3	0.29	8.46
0810		200	5.54	20.63	0.670	11.2	139.8	0.16	8.72
0815		200	5.61	20.63	0.671	8.20	130.8	0.13	8.72
0820		200	5.62	20.53	0.672	6.99	126.5	0.12	8.72
0825	2.5	200	5.61	20.44	0.673	7.39	123.4	0.11	8.72

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0825	2.5	5.61	20.44	0.673	7.39	123.4	6.11	8.72	

FERROUS IRON (mg/L): _____ IDW TOTAL: 2.5 gal

FINAL DEPTH TO WATER (ft TOC): 8.72 TIME FINAL DEPTH TAKEN: 0830

SAMPLE ID: 33MW 2S/6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	AM Woodland	A Woodland	10-05-07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-05-07 SITE: Alameda Point PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 46619 WEATHER: _____

WELL NUMBER: 33MW2 DEPTH TO WATER (ft): 8.36

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0845	I	200	5.98	20.52	2.411	68.4	44.4	1.18	8.36
0850	~~200~~ 100	~~200~~ 100	5.76	19.81	2.470	62.9	42.5	0.24	8.36
0855		200	5.77	19.43	2.485	45.7	36.8	0.14	8.36
0900		200	5.77	19.32	2.484	39.7	30.3	0.12	8.36
0905		200	5.74	19.44	2.485	38.8	30.8	0.11	8.36
0910	2gal	200	5.76	19.17	2.486	41.4	24.2	0.10	8.36

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0910	2	5.76	19.17	2.486	41.4	24.2	0.10	8.36	

FERROUS IRON (mg/L): _____ IDW TOTAL: 2

FINAL DEPTH TO WATER (ft TOC): 8.36 TIME FINAL DEPTH TAKEN: 0915

SAMPLE ID: 33MW2 / GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☑ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sam Woodland	S Woodland	10-05-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-4-07 SITE: Aksfuel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW3 DEPTH TO WATER (ft): 28.52

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1220	1	300	5.87	20.31	1.843	84.60	8.4	3.73	28.52
1225		300	5.92	18.59	1.859	42.05	0.9	0.64	28.52
1230		300	6.29	18.19	1.825	8.77	-55.8	0.20	28.52
1235		300	6.39	18.13	1.778	5.35	-75.5	0.15	28.52
1240		300	6.41	18.15	1.726	5.11	-85.9	0.13	28.52
1245		300	6.44	18.09	1.687	4.26	-88.1	0.12	28.52
1250		300	6.44	18.03	1.652	3.57	-88.2	0.12	28.52
1255		300	6.47	18.21	1.625	2.99	-89.8	0.11	28.52
1300		300	6.50	18.24	1.608	2.77	-92.2	0.09	28.52
1305		300	6.51	18.27	1.595	2.23	-94.1	0.09	28.52
1310	4.5	300	6.53	18.32	1.592	2.78	-95.6	0.08	28.52
1315									
1320									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1310	4.5	6.53	18.32	1.592	2.78	-95.6	0.08	28.52	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4.5

FINAL DEPTH TO WATER (ft TOC): 28.52 TIME FINAL DEPTH TAKEN: 1315

SAMPLE ID: 33MW3/6WG1 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAMWoodland	SWoodland	10-4-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-1-07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW 4S DEPTH TO WATER (ft): 10.66

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1640	I	100	5.73	23.65	0.915	390	132.3	2.99	10.81
1645		100	5.77	23.95	0.914	368	144.0	2.51	11.02
1650		100	6.05	24.05	0.914	343	140.7	3.80	11.11
1655		100	6.24	24.22	0.911	325	136.0	3.49	11.16
1700		100	6.36	24.37	0.911	285	138.7	3.46	11.19
1705		100	6.50	24.48	0.911	254	129.8	3.26	11.21
1710		100	6.60	24.43	0.911	219	125.7	3.08	11.25
1715		100	6.63	24.56	0.911	194	126.0	3.00	11.22
1720		100	6.67	24.90	0.913	164	124.6	2.81	11.22
1725		100	6.69	25.00	0.917	149	119.3	2.52	11.22
1730		100	6.71	24.96	0.922	126	117.5	2.27	11.22
1735		100	6.72	24.90	0.923	110	117.9	2.03	11.23
1740		100	6.72	24.91	0.927	94.0	116.0	1.88	11.22
1745		100	6.72	24.89	0.931	89.4	114.8	1.78	11.22

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1805	4.5	6.67	24.64	0.935	<4.8	112.6	1.28	11.22	

FERROUS IRON (mg/L): _____ IDW TOTAL: 45

FINAL DEPTH TO WATER (ft TOC): 11.22 TIME FINAL DEPTH TAKEN: 1810

SAMPLE ID: 33MW 4S/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: 45I 558 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	C Woodland	10-1-07
REVIEWED:			

WELL NUMBER

33MW 4S

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1750		100	6.71	24.86	0.937	86.2	114.0	1.51	11.22
1755		100	6.69	24.76	0.944	89.5	113.1	1.33	11.22
1800		100	6.69	24.72	0949	86.4	112.6	1.35	11.22
1805	45	100	6.67	24.64	0.955	84.8	112.6	1.28	11.22

COMMENTS

FIELD GROUNDWATER SAMPLING REPORT

DATE: 9-26-07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER

33MW ~~10~~ 4

DEPTH TO WATER (ft): 30.92

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2"

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1500	I	100	6.84	22.07	1.233	73.3	-94.0	2.71	30.91
1505		"	6.80	20.90	1.376	37.0	-95.7	1.04	30.91
1510		"	6.85	20.56	1.505	17.2	-99.1	.61	30.91
1515		"	6.86	20.50	1.532	13.3	-94.3	.57	30.91
1520	1	"	6.88	20.54	1.550	12.0	-93.9	.52	30.91
1525									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1520	2	6.88	20.54	1.550	12.0	-93.9	.52	30.91	

FERROUS IRON (mg/L): — IDW TOTAL: 1

FINAL DEPTH TO WATER (ft TOC): 30.91 TIME FINAL DEPTH TAKEN: 1520

SAMPLE ID: 33MW 4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: —

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sam Woodland		9/26/07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10.04.07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 46619 WEATHER: _____

WELL NUMBER: 33MW5s DEPTH TO WATER (ft): 8.81

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1345	I	300	5.90	21.93	1.037	502	84.3	.72	8.81
1350		300	5.91	21.21	1.033	409	74.0	0.13 ~~0.13~~	8.81
1355		300	5.91	20.79	1.039	332	75.0	0.14	8.81
1400		300	5.90	20.56	1.044	218	72.8	0.12	8.81
1405		300	5.89	20.35	1.047	150	70.9	0.10	8.81
1410		300	5.88	20.21	1.046	100	69.9	0.09	8.81
1415		300	5.88	20.13	1.049	77	68.8	0.09	8.81
1420	3.5	300	5.88	20.19	1.050	48.2	67.6	0.08	8.81

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1420	3.5	5.88	20.19	1.050	48.2	67.6	0.08	8.81	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3.5

FINAL DEPTH TO WATER (ft TOC): 8.81 TIME FINAL DEPTH TAKEN: 1425

SAMPLE ID: 33MW5s/GW4 SAMPLE ID FOR QC: 33MW5s/GW4A

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sitm Woolland	O Woolland	10.4.07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10·04·07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 46614 WEATHER: _____

WELL NUMBER

33MW 5I

DEPTH TO WATER (ft): 8.11

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1450	I	300	6.22	20.94	1.020	23	20.1	0.87	8.11
1455		300	5.82	20.36	1.043	17.4	-0.7	0.42	8.11
1500		300	5.79	20.16	1.028	9.84	0.7	0.24	8.11
1505		300	5.74	20.18	1.041	6.93	3.8	0.19	8.11
1510		300	5.74	19.93	1.057	4.64	6.5	0.15	8.11
1515		300	5.68	19.89	1.068	3.77	10.8	0.13	8.11
1520		300	5.67	19.91	1.078	3.03	13.4	0.12	8.11
1525	3	300	5.66	19.82	1.081	2.82	15.9	0.11	8.11
1530		300	5.64	20.00	1.079	2.60	17.2	0.11	8.11
1535									
1540									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1530	3	5.64	20.00	1.079	2.60	17.2	0.11	8.11	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3

FINAL DEPTH TO WATER (ft TOC): 8.11 TIME FINAL DEPTH TAKEN: 1535

SAMPLE ID: 33MW5I/6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
REPARED:	SAM Woodland	[signature]	10·4·07

FIELD GROUNDWATER SAMPLING REPORT

DATE: 9-26-07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW5D

DEPTH TO WATER (ft): 28.32

TOTAL DEPTH (ft): ~~28.32~~ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1605	I	150	6.72	20.84	1.826	~~-99.4~~ 206	-99.4	3.02	28.28
1610		"	6.72	20.39	1.978	199	-104.8	1.42	28.25
1615		"	6.72	19.94	2.176	132	-113.6	.87	28.25
1620		"	6.72	19.93	2.268	88.4	-117.6	.75	28.25
1625		"	6.73	19.66	2.316	82.7	-121.7	.65	28.25
1630		"	6.73	19.53	2.352	75.7	-121.1	.57	28.25
1635		"	6.72	19.49	2.385	69.4	-117.8	.63	28.25
1640		"	6.73	19.44	2.405	62.0	-120.5	.51	28.25
1645		"	6.73	19.44	2.422	58.0	-123.5	.45	28.25
1650		"	6.73	19.31	2.427	59.3	-120.0	.38	28.25
1655		"	6.74	19.27	2.439	~~58.0~~	-118.6	.35	28.25
1700		"	6.72	19.67	2.441	~~52.0~~ 46.5	-118.6	.31	28.25
1705		"	6.73	19.26	2.453	42.5	-119.3	.28	28.25
1710	3	"	6.73	19.21	2.470	40.3	-118.9	.26	28.25

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1710	3	6.73	19.21	2.470	40.3	-118.9	.26	28.25	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3

FINAL DEPTH TO WATER (ft TOC): 28.25 TIME FINAL DEPTH TAKEN: 1710

SAMPLE ID: 33MW5D SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: [X] COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	[signature]	9/26/07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10·1·07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW156D

DEPTH TO WATER (ft): 35.18

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump ~~Nondedicated Bladder Pump~~ Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1150	1	250	6.87	20.47	1.791	250	-30.1	5.82	35.18
1155		250	6.74	18.99	1.937	173	-60.3	2.19	35.18
1200		250	6.81	18.32	1.304	235	-77.2	1.35	35.18
1205		250	6.89	18.58	2.291	337	-97.6	0.56	35.18
1210		250	6.89	18.62	2.401	292	-105.9	0.28	35.18
1215		250	6.89	19.04	2.501	229	-98.5	0.26	35.18
1220		250	6.91	19.09	2.573	176	-101.2	0.23	35.18
1225		250	6.90	19.14	2.601	123	-98.4	0.23	35.18
1230		250	6.89	19.20	2.608	96.7	-96.3	0.24	35.18
1235		250	6.83	19.21	2.614	76.2	-95.3	0.23	35.18
1240		250	6.84	19.20	2.623	58.3	-95.7	0.22	35.18
1245	4.5	250	6.84	19.24	2.624	~~71~~ 38.6	-92.8	0.22	35.18
1250									
1255									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1245	4.5	6.84	19.24	2.624	38.6	-92.8	0.22	35.18	

FERROUS IRON (mg/L): _____ IDW TOTAL: 45

FINAL DEPTH TO WATER (ft TOC): 35.18 TIME FINAL DEPTH TAKEN: 1250

SAMPLE ID: 33MW 6D/6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	[signature]	10·1·07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-1-07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER

33MW79

DEPTH TO WATER (ft): 2.36

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1515	I	175	6.02	18.85	2.994	62.5	85.2	2.17	7.55
1520		125	6.00	18.57	2.478	58.2	91.0	0.94	7.55
1525		125	6.01	18.43	2.503	51.9	94.5	0.52	7.55
1530		125	6.01	18.27	2.473	35.9	97.4	0.36	7.55
1535	1.5	125	6.29	17.98	2.401	23.9	86.6	0.22	7.55
1540		125	6.57	17.87	2.318	17.5	71.1	0.22	7.55
1545		125	6.63	17.84	2.267	13.3	63.0	0.19	7.55
1550	2.5	125	6.62	17.81	2.227	9.19	58.0	0.19	7.55
1555		125	6.62	17.93	2.172	7.99	52.6	0.18	7.55
1600		125	6.61	17.88	2.148	6.54	49.9	0.22	7.55
1605	3.5	125	6.60	17.82	2.158	6.34	48.9	0.17	7.55
1610									
1615									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1605	3.5	6.60	17.82	2.158	6.34	48.9	0.17	7.55	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3.5

FINAL DEPTH TO WATER (ft TOC): 7.55 TIME FINAL DEPTH TAKEN: 1610

SAMPLE ID: 33MW79/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	C Woodland	~~33MW~~ 10-1-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-1-07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER

33MW 70

DEPTH TO WATER (ft): 27.78

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1415	I	225	6.76	19.68	1.460	141	-43.3	5.94	27.78
1420		225	6.41	17.29	1.718	94.4	-48.6	3.80	27.78
1425		225	6.70	16.64	1.785	54.3	-63.6	1.84	27.78
1430		225	6.77	16.50	1.882	37.1	-108.0	0.82	27.78
1435		225	6.79	16.42	1.837	27.9	-114.6	0.53	27.78
1440		225	6.77	16.38	1.834	25.4	-110.1	0.39	27.78
1445		225	6.74	16.34	1.835	24.7	-107.7	0.35	27.78
1450	3.5	225	6.74	16.32	1.833	26.5	-106.6	0.32	27.78
1455									
1500									
1505									
1510									
1515									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1450	3.5	6.74	16.32	1.833	26.5	-106.6	0.32	27.78	

FERROUS IRON (mg/L): _____ IDW TOTAL: _____

FINAL DEPTH TO WATER (ft TOC): 27.78 TIME FINAL DEPTH TAKEN: 1455

SAMPLE ID: 33MW 70/6W04 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPI

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	S Woodland	10-1-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10·4·07 SITE: 4k Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46604 WEATHER: _____

WELL NUMBER: 33MW8S (8k) DEPTH TO WATER (ft): ~~9.04~~ 9.41

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1080	I	350	5.92	23.65	1.723	>1000	144.3	1.02	9.41
1035		350	5.81	22.98	1.784	>1000	152.3	0.20	9.41
1040		350	5.81	22.58	1.784	>1000	153.1	0.17	9.41
1045		350	5.79	22.04	1.773	>1000	153.4	0.13	9.41
1050		350	5.78	21.73	1.766	>1000	153.4	0.10	9.41
1055		350	5.58	21.28	1.759	>1000	152.9	0.10	9.41
1100		350	5.86	20.95	1.748	>1000	151.8	0.09	9.41
1105		350	5.84	20.74	1.743	991	151.6	0.08	9.41
1110		350	5.76	20.78	1.736	815	152.7	0.07	9.41
1115		350	5.72	20.79	1.736	>1000	153.9	0.06	9.41
1120	4	350	5.67	20.90	1.737	>1000	154.9	0.06	9.41
1125									
1130									
1135									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1200	4	5.67	20.90	1.737	>1000	154.9	0.06	9.41	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4

FINAL DEPTH TO WATER (ft TOC): 9.41 TIME FINAL DEPTH TAKEN: 1125

SAMPLE ID: 33MW8S/6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: X COMMENTS: YSI ~~556~~ 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SM Woodland	C Woodland	10·04·07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-4-07 SITE: Alsted PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46649 WEATHER: _____

WELL NUMBER

53 MW 9s

DEPTH TO WATER (ft): 15.91

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
905 ~~0845~~	I	225	5.27	19.47	0.593	>1000	108.8	0.71	15.91
910 ~~0850~~		225	5.15	18.60	0.550	>1000	134.9	0.19	15.91
915 ~~0855~~		225	5.13	18.41	0.559	>1000	146.7	0.12	15.91
920 ~~0900~~		225	5.13	18.29	0.563	>1000	155.6	0.09	15.91
925 ~~0905~~		225	5.11	18.27	0.568	946	164.0	0.07	15.91
0930		225	5.12	18.27	0.581	621	168.4	0.05	15.91
0935		225	5.13	18.28	0.591	473	173.1	0.04	15.91
0940		225	5.14	18.33	0.601	315	177.0	0.05	15.91
0945		225	5.14	18.38	0.606	209	180.8	0.04	15.91
0950		225	5.15	18.44	0.610	155	183.8	0.04	15.91
0955		225	5.15	18.51	0.608	114	186.4	0.05	15.91
1000	3.5	225	5.15	18.59	0.611	92.4	188.5	0.04	15.91
1005									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1000	3.5	5.15	18.59	0.611	92.4	188.5	0.04	15.91	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3.5

FINAL DEPTH TO WATER (ft TOC): 15.91 TIME FINAL DEPTH TAKEN: 1005

SAMPLE ID: 33 MW9s / 6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	[signature]	10-4-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10.3.07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 40669 WEATHER: _____

WELL NUMBER

33 MW 10S

DEPTH TO WATER (ft): 9.71

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1210	1	200	5.10	21.91	1.369	28.2	144.9	1.03	9.71
1215		200	4.94	21.41	1.369	21.2	170.7	0.58	9.71
1220		200	4.90	21.11	1.361	16.6	186.5	0.41	9.71
1225		200	4.89	20.86	1.373	12.8	198.6	0.32	9.71
1230		200	4.89	20.79	1.372	11.4	204.0	0.29	9.71
1235	2	200	4.99	20.70	1.375	8.95	209.4	0.25	9.71
1240									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
~~1240~~ 1235	2	4.88	20.70	1.375	8.95	209.4	0.25	9.71	

FERROUS IRON (mg/L): _____ IDW TOTAL: 2.0

FINAL DEPTH TO WATER (ft TOC): 9.71 TIME FINAL DEPTH TAKEN: 1235

SAMPLE ID: 33MW10S/GW4 SAMPLE ID FOR QC: 33MW10S/GW4 QA, ~~33MW10S/GW4D~~

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodward	[signature]	10.3.07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-3-07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 41664 WEATHER: _____

WELL NUMBER

33 MW 10D

DEPTH TO WATER (ft): 29.41

TD: 62.42
SC. 56.4

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1315	1	300	6.32	19.43	1.367	614	-3.3	6.91	29.41
1320	1 gal	300	~84	19.04	1.420	946	34.3	2.66	29.41
1325		300	5.67	18.41	1.437	586	48.9	0.28	29.41
1330		200	5.57	18.64	1.440	399	40.3	0.17	29.41
1335		200	6.18	18.27	1.441	407	-2.5	0.16	29.41
1340		200	6.29	18.23	1.409	319	-24.8	0.17	29.41
1345		200	6.35	18.20	1.411	236	-34.4	0.16	29.41
1350		200	6.42	18.11	1.413	138	-45.7	0.15	29.41
1355	4 gal	200	6.43	18.12	1.419	87.2	-50.2	0.12	29.41
1400		200	6.46	18.08	1.420	62.4	-54.2	0.11	29.41

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1400	4	6.46	18.08	1.420	62.4	-54.2	0.11	29.41	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4.0

FINAL DEPTH TO WATER (ft TOC): 29.41 TIME FINAL DEPTH TAKEN: 1400

SAMPLE ID: 33 MW 10D/GW4 SAMPLE ID FOR QC: 33MW10D/GW4D, ~~33MW10D/GW4QA~~ 33 MW 10D/GW4 QA

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: [X] COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SHMWoodland	SHWoodland	10-3-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 9.27.07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 466119 WEATHER: _____

WELL NUMBER: 33MW11S DEPTH TO WATER (ft): 7.84

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
~~0955~~		225	6.57	19.72	1.575	90.0	+20.5	16.70	8.30
1000			6.65	19.80	1.558	42.4	-126.5	3.94	8.53
1005			6.69	19.67	1.579	15.1	-128.5	2.84	8.69
~~1010~~ 1010		1 gal	6.68	19.54	1.599	7.95	-125.9	2.23	8.72
1015		225	6.68	19.45	1.619	6.00	-119.4	1.96	8.85
1020		2 gal	6.68	19.46	1.637	4.62	-118.1	1.53	8.92
1025			6.67	19.37	1.659	4.15	-119.6	1.25	8.98
1030			6.67	19.34	1.670	3.47	-119.9	1.10	9.07
1035		3 gal	6.66	19.29	1.667	3.50	-130.1	1.03	9.03
1040			6.67	19.29	1.667	2.97	-132.0	.83	9.04
1045			6.666	19.33	1.664	2.92	-129.3	.73	9.11
1050		4.0	6.67	19.33	1.660	3.29	-131.5	.77	9.14
1055									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1050	4.0	6.67	19.33	1.660	3.29	-131.5	.77	9.14	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4.0

FINAL DEPTH TO WATER (ft TOC): 9.14 TIME FINAL DEPTH TAKEN: 1050

SAMPLE ID: 33MW11S/6W4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sam Woodland	Woodland	9.27.07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10·5·07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW11D DEPTH TO WATER (ft): 23.41

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0805	1	300	5.72	17.13	2.830	159	69.2	3.20	23.41
0810		300	5.62	16.71	3.678	314	33.3	0.25	23.41
0815		300	5.57	16.81	3.570	189	32.5	0.16	23.41
0820		300	5.52	16.83	3.620	120	36.4	0.12	23.41
0825		300	5.58	16.77	3.611	78	31.9	0.10	23.41
0830		300	5.53	16.83	3.631	64.3	34.2	0.09	23.41
0835	4	300	5.53	16.85	3.627	41.2	33.8	0.08	23.41

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0835	4	5.53	16.85	3.627	41.2	33.8	0.08	23.41	

FERROUS IRON (mg/L): _____ IDW TOTAL: _____

FINAL DEPTH TO WATER (ft TOC): 23.41 TIME FINAL DEPTH TAKEN: 0840

SAMPLE ID: 33MW11D/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: [X] COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	Woodland	10·04·07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 9.27.07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 46619 WEATHER: _____

WELL NUMBER: 33MW12s DEPTH TO WATER (ft): 8.96

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1500	I	150	5.24	19.86	0.505	476	154.7	8.90	9.16
1505		150	5.07	19.22	0.488	273	163.7	4.77	9.16
1510		150	5.04	19.18	0.488	229	160.0	3.85	9.16
1515		150	5.05	19.10	0.491	157	155.2	3.27	9.16
1520		150	5.04	19.02	0.521	103	480.0	2.72	9.16
1525		150	5.05	19.00	0.593	89.3	129.7	2.52	9.16
1530		150	5.05	18.79	0.631	70.7	123.0	2.60	9.16
1535		150	5.06	18.88	0.643	67.8	122.8	2.28	9.16
1540		150	5.06	18.82	0.648	55.0	121.9	2.45	9.16
1545		150	5.07	18.84	0.657	36.6	121.5	209	9.16
1550		150	5.06	18.85	0.688	29.5	120.8	2.14	9.16
1555		150	5.06	18.81	0.727	21.8	117.4	2.44	9.16
1600		150	4.99	18.61	0.757	93.5	119.6	2.50	9.16
1605	4.5	150	4.90	18.84	0.771	62.8	129.7	2.68	9.16

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1605	4.5	4.90	18.84	0.771	62.8	129.7	2.68	9.16	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4.5

FINAL DEPTH TO WATER (ft TOC): 9.16 TIME FINAL DEPTH TAKEN: 1605

SAMPLE ID: 33MW12s/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	[signature]	9.27.07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 9.27.07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW12D DEPTH TO WATER (ft): 27.48

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump ~~Nondedicated Bladder Pump~~ Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1215	I	150	6.06	19.98	1.164	>1000	18.7	9.04	27.51
1220			6.46	17.96	1.394	>1000	-44.2	6.84	27.51
1225			6.58	17.55	1.446	>1000	-70.1	3.37	27.51
1230			6.65	17.69	1.461	>1000	-84.3	2.49	27.51
1235			6.68	17.14	1.470	>1000	-91.8	1.67	27.51
1240			6.69	17.10	1.471	>1000	-96.7	1.45	27.51
1245			6.70	16.59	1.466	>1000	-101.1	1.05	27.51
1250			6.70	16.63	1.469	>1000	-102.3	1.16	27.51
1255			6.71	16.58	1.473		-109.6	.71	27.51
1300			6.73	16.59	1.474	440	-110.6	.71	27.51
1305			6.73	16.81	1.474	571	-112.3	.73	27.51
1310			6.74	17.38	1.483	370	-110.5	1.36	27.51
1315			6.75	16.95	1.484	284	-112.1	.93	27.51
1320			6.76	16.84	1.485	178	-115.4	.57	27.51

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1345	7.5	6.77	16.56	1.487	87.7	-116.7	.41	27.51	

FERROUS IRON (mg/L): _____ IDW TOTAL: 60

FINAL DEPTH TO WATER (ft TOC): 27.51 TIME FINAL DEPTH TAKEN: 1345

SAMPLE ID: 33MW/12D/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: 556 YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	Woodland	9.27.07
REVIEWED:			

WELL NUMBER

33MW 12D

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1325			6.67	16.66	1.487	~~178~~ 139	-118.3	.46	27.51
1330	6gal		6.77	16.60	1.487	118	-115.7	.42	27.51
1335			6.77	16.52	1.486	97.6	-117.7	.45	27.51
1340			6.77	16.59	1.486	88.8	-119.1	.43	27.51
1345			6.77	16.56	1.487	87.7	-116.7	.41	27.51
1350									
1355									
1400									

COMMENTS

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10·2·07 SITE: Ah Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER DEPTH TO WATER (ft): 7.55

33MW 13s

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1400	I	100	5.74	22.97	2.486	191	69.9	2.48	7.83
1405		100	5.85	23.14	2.489	119	53.2	0.80	7.91
1410		100	6.01	23.26	2.492	79.2	28.4	0.45	7.96
1415		100	6.12	23.39	2.495	53.8	8.3	0.35	7.99
1420		100	6.15	23.46	2.503	40.7	1.6	0.26	8.02
1425		100	6.17	23.52	2.511	32.8	-3.3	0.21	8.02
1430	1.5	100	6.23	23.69	2.515	28.8	-11.6	0.16	8.02

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1430	1.5	6.23	23.69	2.515	28.8	-11.6	0.16	8.02	

FERROUS IRON (mg/L): _____

FINAL DEPTH TO WATER (ft TOC): 8.02 TIME FINAL DEPTH TAKEN: 1505

SAMPLE ID: 33MW 13s/GW4 SAMPLE ID FOR QC: 33MW 13s/GW4MS, 33MW 13s/GW4MSD

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

IDW TOTAL: 1.5 Flow through cell model number.: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sam Woodland	S Woodland	10·2·07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10/1/07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW13D DEPTH TO WATER (ft): 26.81

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1000	I	150	6.41	18.56	1433	>1000	-42.7	6.03	26.81
1005		150	6.33	18.05	1.438	>1000	-27.4	4.80	26.81
1010		150	6.05	17.98	1.495	>1000	2.0	2.63	26.81
1015		150	6.05	17.87	1.501	>1000	4.9	1.61	26.81
1020	1.075 gal	150	5.81	17.66	1.502	909	26.0	0.52	26.81
1025		150	6.15	17.27	1.498	784	-11.9	0.23	26.81
1030		150	6.38	17.26	1.496	519	-34.8	0.20	26.81
1035		150	6.49	17.25	1.497	378	-57.4	0.15	26.81
1040		150	6.52	17.25	1.499	350	-63.0	0.13	26.81
1045	3.5 gal	150	6.54	17.25	1.499	289	-67.4	0.12	26.81
1050		150	6.55	17.21	1500	194	-70.7	0.11	26.81
1055		150	6.55	~~17.1~~ 17.25	1.500	143	-72.3	0.10	26.81
1100	5 gal	150	6.55	17.24	1.500	97.0	-74.1	0.10	26.81

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1105	5 gal	6.55	17.24	1.500	97.0	-74.1	0.10	26.81	

FERROUS IRON (mg/L): _____ IDW TOTAL: _____

FINAL DEPTH TO WATER (ft TOC): 26.81 TIME FINAL DEPTH TAKEN: 1100

SAMPLE ID: 33MW13D SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☑ COMMENTS: ~~[illegible]~~ YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	Sam Woodland	Woodland	10/1/07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-3-07 SITE: Ak Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW145 DEPTH TO WATER (ft): 8.28

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1430	1	200	5.94	24.19	1.519	274	34.7	0.76	8.29
1435		200	5.79	23.73	1.560	249	21.9	0.38	8.28
1440		200	5.78	23.08	1.510	168	11.7	0.13	8.28
1445		200	5.77	23.07	1.484	141	11.9	0.11	8.28
1450		200	5.80	22.99	1.452	85.2	4.6	0.08	8.28
1455		200	5.72	22.94	1.400	67.6	10.3	0.09	8.28
1500		200	5.68	22.95	1.362	47.5	17.6	0.07	8.28
1505		200	5.67	23.05	1.359	39.6	19.3	0.06	8.28
1510		200	5.66	23.12	1.322	32.2	20.4	0.06	8.28
1515		200	5.65	23.09	1.304	23.3	21.5	0.06	8.28
1520		200	5.65	23.03	1.283	17.5	22.1	0.06	8.28
1525		200	5.64	23.07	1.272	16.3	22.7	0.05	8.28
1530		200	5.64	23.14	1.260	13.2	23.2	0.05	8.28
1535	4.0	200	5.64	23.14	1.263	11.6	23.1	0.04	8.28

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1535	4.0	5.64	23.14	1.263	11.6	23.1	0.04	8.28	

FERROUS IRON (mg/L): _____ IDW TOTAL: 40

FINAL DEPTH TO WATER (ft TOC): 8.28 TIME FINAL DEPTH TAKEN: 1535

SAMPLE ID: 33MW145/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: [X] COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Cieadlo		10-3-07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-3-07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: ~~37799~~ 46614 WEATHER: _____

WELL NUMBER: 33MW 14D DEPTH TO WATER (ft): 30.78

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1600	1	300	6.63	19.30	1.365	247	7.1	2.16	30.78
1605		300	6.69	18.51	1.378	245	-36.4	0.73	30.78
1610		300	6.63	18.36	1.372	202	-44.0	0.66	30.78
1615		300	6.67	18.37	1.366	135	-47.3	0.56	30.78
1620		300	6.65	18.34	1.364	70.7	-46.3	0.45	30.78
1625		300	6.64	18.31	1.361	50.4	-48.0	0.35	30.78
1630	3	300	6.64	18.33	1.361	36.6	-46.4	0.38	30.78

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1630	3	6.64	18.33	1.361	36.6	-46.4	0.38	30.78	

FERROUS IRON (mg/L): _____ IDW TOTAL: 3

FINAL DEPTH TO WATER (ft TOC): 30.78 TIME FINAL DEPTH TAKEN: 1630

SAMPLE ID: 33MW 14D/GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOC's

DO METER MODEL No.: _____ ORP METER MODEL No.: _____ FLOW CELL TYPE.: _____

CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: [X] COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	S Woodland	10-3-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-2-07 SITE: Alkstead PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW 15s DEPTH TO WATER (ft): 12.58

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
~~0955~~	~~1~~	~~125~~	~~6.59~~	~~21.08~~	~~0.887~~	~~7.50~~	~~66.8~~	~~5.41~~	~~13.04~~
1000	1	125	6.59	21.08	0.887	7.50	66.8	5.41	13.04
1005		125	6.30	21.00	0.787	7.91	82.2	4.29	13.46
1010		125	6.36	21.35	0.767	5.56	83.9	4.18	13.51
1015		125	6.51	21.60	0.762	5.12	83.6	4.03	13.51
1020		125	6.68	21.92	0.758	4.20	78.4	3.86	13.51
1025		125	6.92	22.19	0.756	2.66	71.7	3.63	13.51
1030		125	7.05	22.22	0.755	2.58	67.7	3.54	13.51
1035		125	7.24	22.25	0.754	2.38	63.7	3.46	13.51
1040		125	7.38	22.28	0.753	1.70	60.3	3.31	13.51
1045		125	7.52	22.29	0.752	1.79	56.9	3.19	13.51
1050		125	7.61	22.32	0.751	1.65	55.0	3.06	13.51
1055	3.0	125	7.62	22.32	0.751	1.50	54.0	3.00	13.51
1100									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.

FERROUS IRON (mg/L): _____ IDW TOTAL: 3.0

FINAL DEPTH TO WATER (ft TOC): 13.51 TIME FINAL DEPTH TAKEN: 1102

SAMPLE ID: 33MW 15s | GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodward		10-2-07
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10·2·07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW 15D DEPTH TO WATER (ft): 32.02

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump (Nondedicated Bladder Pump) Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0845	1	125	6.27	19.80	1.679	19.1	123.9	4.41	37.05
0850		125	6.62	19.49	3.022	16.9	-58.9	1.35	37.05
0855		125	6.74	19.44	3.163	11.2	-78.5	1.15	37.05
0900		125	6.80	19.51	3.221	11.2	-82.5	0.95	37.05
0905		125	6.82	19.59	3.277	6.56	-88.6	0.64	37.05
0910	1	125	6.85	19.62	3.338	5.70	-90.1	0.55	37.05
0915		125	6.85	19.66	3.446	4.60	-94.0	0.49	37.05
0920		125	6.86	19.85	3.538	4.91	-94.9	0.51	37.05
0925		125	6.88	19.98	3.616	3.83	-91.2	0.54	37.05
0930		125	6.88	19.87	3.641	3.50	-91.0	0.44	37.05
0935	2	125	6.88	19.84	3.657	3.14	-92.0	0.50	37.05

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0935	6	6.88	19.84	3.657	3.14	-92.0	0.50	37.05	

FERROUS IRON (mg/L): _____

FINAL DEPTH TO WATER (ft TOC): 37.05 TIME FINAL DEPTH TAKEN: 0935

SAMPLE ID: 33MW 15D SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

IDW TOTAL: 2 Flow through cell model number.: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	[signature]	10·2·07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10-2-07 SITE: AkSteel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER: 33MW 16S DEPTH TO WATER (ft): 18.63

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1130	1	50	6.04	21.35	0.462	3.63	134.4	5.72	18.92
1135		50	5.99	21.45	0.459	2.45	136.9	3.51	19.02
1140		50	6.06	21.70	0.454	2.19	135.2	3.10	19.05
1145		50	6.16	21.97	0.451	1.80	133.1	2.75	19.10
1150		50	6.28	22.12	0.450	1.92	131.0	2.44	19.16
1155		50	6.34	22.28	0.449	1.74	128.5	2.10	19.16
1200		50	6.38	22.49	0.449	1.70	128.5	2.17	19.16
1205	1	50	6.41	22.64	0.449	1.65	127.3	2.21	19.16
1210									

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1205	1.25	6.41	22.64	0.449	1.65	127.3	2.21	19.16	

FERROUS IRON (mg/L): _____ IDW TOTAL: 1

FINAL DEPTH TO WATER (ft TOC): 19.16 TIME FINAL DEPTH TAKEN: 1218

SAMPLE ID: 33MW16S/GW04 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodard	[signature]	10-2-07
REVIEWED:			

FIELD GROUNDWATER SAMPLING REPORT

DATE: 10·3·07 SITE: AK Steel PID READING at WELL HEAD (ppm): _____

PROJECT NUMBER: 46619 WEATHER: _____

WELL NUMBER

33MW160

DEPTH TO WATER (ft): 36.75

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): _____

PURGING

CASING VOLUME CALCULATION: _____ ft of water in casing X _____ gallons/foot = _____ total gallons/casing volume

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1035	I	125	5.95	17.40	1.391	467	42.0	3.50	36.75
1040		125	6.32	17.26	1.610	707	-29.4	1.22	36.75
1045		125	6.53	17.14	1.704	666	-66.3	0.64	36.75
1050		125	6.61	17.17	1.732	617	-82.2	0.54	36.75
1055		200	6.66	17.15	1.745	559	-90.5	0.35	36.74
1100		200	6.66	16.93	1.752	481	-93.5	0.29	36.67
1105		200	6.29	16.93	1.723	303	-55.7	0.32	36.40
1110		200	6.11	16.95	1.715	225	-36.0	0.29	36.61
1115		200	5.96	16.94	1.707	164	-18.7	0.23	36.62
1120		200	5.88	16.97	1.703	122	-4.9	0.19	36.59
1125		200	5.90	17.01	1.686	94.5	4.5	0.17	36.59
1130		200	5.75	17.10	1.671	71.1	10.7	0.15	36.59
1135		200	5.76	17.07	1.680	60.2	12.9	0.13	36.59
1140	4.5	200	5.76	17.07	1.684	48.5	14.2	0.12	36.59

Continued on back (circle one) yes / no

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1140	4.5	5.76	17.07	1.684	48.5	14.2	0.12	36.59	

FERROUS IRON (mg/L): _____ IDW TOTAL: 4.5

FINAL DEPTH TO WATER (ft TOC): 36.59 TIME FINAL DEPTH TAKEN: 1140

SAMPLE ID: 33MW160 | GW4 SAMPLE ID FOR QC: _____

PARAMETERS REQUESTED FOR ANALYSIS: VOCs

WATER QUALITY METER MODEL No: _____

DO CHECK IN AIR: Before: _____ After: _____

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: YSI 556 MPS

	NAME	SIGNATURE	DATE
PREPARED:	SAM Woodland	S Woodland	10.3.07
REVIEWED:			

APPENDIX I
Survey Data

6-49-32
07-11-38016-1
38016_F4 well locations REV 11-07.DWG

BLUE RIVER

15" CONC. WALL

ASPHALT DRIVE

6" WALL

OLD FOUNDATION WALL

IRON GRATE

GATE VALVE

EDGE OF ASPHALT

ASPHALT

15" CONC. WALL

15" CONC. WALL

RIVER

SET IRON PIN ON CORNER

CONC. BOX WITH METAL LID AND GUARD RAIL

WV

ELEC. METERS AND SWITCHES

CONC. PAD WITH TRANSFORMER

CONC.

IRON GRATE

OLD BUILDING COLUMN LINE

CONCRETE

OLD BUILDING FLOOR

METAL ROOF AREA

DIRT

CONCRETE

METAL BUILDING

GRAVEL

PIPE ENTERS BUILDING HERE

12" CONC. WALL

OVERHEAD PIPE BEAM - 12" STEEL BEAM (PIPE AND BEAM SUPPORTED)

ASPHALT

GRAVEL

CONC.

OLD INLET (NO TOP)

CONCRETE PIERS

OVERHEAD WATER LINE

TRACKS DIRT COVERED IN THIS AREA

8" CONC. WALL

CHAIN LINK FENCE

CONCRETE

SUPPORTED ROOF OVER LOADING AREA

CONCRETE LOADING DOCK

OLD BUILDING FLOOR (BROKE UP)

OLD CONC. BUILDING FLOOR

OLD BUILDING FLOOR (BROKE UP)

MH (NO COVER)

NORTH SIDE OF BUILDING IS OPEN

ASPHALT

WIRE MILL
7400 WINNER ROAD
238617 S.F.

LEASE TRACT (L4D)

SCALE: 1"=40'

40 20 0 40 80 120

SCALE IN FEET

THE IMPROVEMENTS SHOWN HEREON ARE BASED ON FIELD WORK DATED SEPTEMBER 26, 1994.

THE COORDINATES SHOWN HEREON ARE ON THE MISSOURI STATE PLANE COORDINATE SYSTEM, NAD 1927.

DATE	REVISION	BY
10/31/2007	ADDED NEW WELLS 33MW15&D AND 33MW16&D. CHECK 33MWBS	PJH
7/8/98	MISC REVISIONS	KIRK
7/8/98	ADDED NEW WELL AND BH LOCATIONS AND ELEVATIONS	KIRK
6/3/98	ADDED NEW SAMPLE LOCATIONS AND ELEVATIONS	KIRK
12/31/97	CHANGED COORDINATE SYSTEM TO STATE PLANE	KIRK

WELL LOCATIONS SWMU SITES 33, 17 AND 13

DATE: MAY 9, 1997

FOR: BURNS AND McDONNELL WASTE CONSULTANTS
9400 WARD PARKWAY
KANSAS CITY, MISSOURI

ATTN: REYNOLD TOMES

ANDERSON SURVEY COMPANY
203 NW EXECUTIVE WAY
LEES SUMMIT, MISSOURI 64063
(816) 246-5050

BY: _____

DRN. GJP | P.C. | CK. | APP.

6-49-32
07-11-38016-1
38016_F4 well locations REV 11-07.DWG

APPENDIX J
Chemical Data Analytical Laboratory Reports

APPENDIX J - Chemical Data Analytical Laboratory Reports (Submitted on CD)

Continental – 27807

TestAmerica – 510-17977-1
TestAmerica – 510-17978-1
TestAmerica – 510-18045-1
TestAmerica – 510-18106-1
TestAmerica – 510-18114-1
TestAmerica – 510-18156-1
TestAmerica – 510-18284-1
TestAmerica – 510-18356-1
TestAmerica – 510-18739-1
TestAmerica – 510-18936-1
TestAmerica – 510-19035-1
TestAmerica – 510-19072-1

Continental Analytical Services, Inc.

11/09/2007

Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Received: 10/04/2007
Continental File No.: 5588
Continental Order No.: 28707
P.O./Project No: 46619
Project ID: AK Steel

Dear Shelton:

This laboratory report, consisting of 14 pages, contains the analytical and quality control results for the following samples:

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
07100529	33MW10S/GW4QA/////L//7.7	Liquid	10/3/2007
07100530	33MW10D/GW4QA/////L//7.7	Liquid	10/3/2007
07100531	TB100307/TB01/////L//7.7	Liquid	10/3/2007

This report has been reissued to lower the reporting limit on vinyl chloride for sample 33MW10D. Please replace the previous report with this revision (Excluding the original chain of custody and cooler receipt forms).

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

The Appendix and Quality Control sections are an integral part of this report and may contain important data qualifiers. The chain of custody and sample receipt form are also included as attachments to this report.

All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for 35 days unless Continental is otherwise notified.

Thank you for choosing Continental for this project. If you have any questions please contact me at (800)535-3076.

This report may not be reproduced, except in full, without written approval from Continental Analytical Services, Inc.

CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker
Technical Manager

Gregory J. Groene
Project Manager

P.O. Box 3737 - 525 N. Eighth St. - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830
KDHE Environmental Laboratory Accreditation No. E-10146

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Lab Number: 07100529
Sample Description: 33MW10S/GW4QA/////L//7.7

Date Sampled: 10/03/2007
Time Sampled: 1235

Analysis	Concentration	Units	Dilution Factor	PQL
TCL/HSL Low Level Volatiles	QC			
1,1,1-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2,2-Tetrachloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethylene	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloropropane	ND(1.0)	µg/L	1.0	1.0
2-Butanone	ND(25)	µg/L	1.0	25
2-Hexanone	ND(25)	µg/L	1.0	25.
4-Methyl-2-Pentanone	ND(25)	µg/L	1.0	25.
Acetone	ND(25)	µg/L	1.0	25.
Benzene	ND(1.0)	µg/L	1.0	1.0
Bromodichloromethane	ND(1.0)	µg/L	1.0	1.0
Bromoform	ND(1.0)	µg/L	1.0	1.0
Bromomethane	ND(1.0)	µg/L	1.0	1.0
Carbon Disulfide	ND(1.0)	µg/L	1.0	1.0
Carbon Tetrachloride	ND(1.0)	µg/L	1.0	1.0
Chlorobenzene	ND(1.0)	µg/L	1.0	1.0
Chloroethane	ND(1.0)	µg/L	1.0	1.0
Chloroform	ND(1.0)	µg/L	1.0	1.0
Chloromethane	ND(1.0)	µg/L	1.0	1.0
cis-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Dibromochloromethane	ND(1.0)	µg/L	1.0	1.0
Ethylbenzene	ND(1.0)	µg/L	1.0	1.0
Methylene Chloride	ND(1.0)	µg/L	1.0	1.0
Styrene	ND(1.0)	µg/L	1.0	1.0
Tetrachloroethene	ND(1.0)	µg/L	1.0	1.0
Toluene	ND(1.0)	µg/L	1.0	1.0
trans-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Trichloroethene	ND(1.0)	µg/L	1.0	1.0
Vinyl Acetate	ND(25) EV	µg/L	1.0	25.
Vinyl Chloride	ND(1.0)	µg/L	1.0	1.0
o-Xylene	ND(1.0)	µg/L	1.0	1.0
m+p-Xylene	ND(2.0)	µg/L	1.0	2.0
1,2-Dichloroethylene (Cis)	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethylene (Trans)	ND(1.0)	µg/L	1.0	1.0

-Continued-

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
TCL/HSL Low Level Volat	N/A	10/08/2007	1MS9281	1MS9281	GMA	8260B

Conclusion of Lab Number: 07100529

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Lab Number: 07100530
Sample Description: 33MW10D/GW4QA/////L//7.7

Date Sampled: 10/03/2007
Time Sampled: 1400

Analysis	Concentration	Units	Dilution Factor	PQL
TCL/HSL Low Level Volatiles	QC			
1,1,1-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2,2-Tetrachloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethylene	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloropropane	ND(1.0)	µg/L	1.0	1.0
2-Butanone	ND(25)	µg/L	1.0	25
2-Hexanone	ND(25)	µg/L	1.0	25.
4-Methyl-2-Pentanone	ND(25)	µg/L	1.0	25.
Acetone	ND(25)	µg/L	1.0	25.
Benzene	ND(1.0)	µg/L	1.0	1.0
Bromodichloromethane	ND(1.0)	µg/L	1.0	1.0
Bromoform	ND(1.0)	µg/L	1.0	1.0
Bromomethane	ND(1.0)	µg/L	1.0	1.0
Carbon Disulfide	ND(1.0)	µg/L	1.0	1.0
Carbon Tetrachloride	ND(1.0)	µg/L	1.0	1.0
Chlorobenzene	ND(1.0)	µg/L	1.0	1.0
Chloroethane	ND(2.2) M	µg/L	1.0	1.0
Chloroform	ND(1.0)	µg/L	1.0	1.0
Chloromethane	ND(1.0)	µg/L	1.0	1.0
cis-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Dibromochloromethane	ND(1.0)	µg/L	1.0	1.0
Ethylbenzene	ND(1.0)	µg/L	1.0	1.0
Methylene Chloride	ND(1.0)	µg/L	1.0	1.0
Styrene	ND(1.0)	µg/L	1.0	1.0
Tetrachloroethene	ND(1.0)	µg/L	1.0	1.0
Toluene	ND(1.0)	µg/L	1.0	1.0
trans-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Trichloroethene	ND(1.0)	µg/L	1.0	1.0
Vinyl Acetate	ND(25) EV	µg/L	1.0	25.
Vinyl Chloride	0.8 RB	µg/L	1.0	1.0
o-Xylene	ND(1.0)	µg/L	1.0	1.0
m+p-Xylene	ND(2.0)	µg/L	1.0	2.0
1,2-Dichloroethylene (Cis)	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethylene (Trans)	ND(1.0)	µg/L	1.0	1.0

-Continued-

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
TCL/HSL Low Level Volat	N/A	10/08/2007	1MS9281	1MS9281	GMA	8260B

Conclusion of Lab Number: 07100530

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Lab Number: 07100531
Sample Description: TB100307/TB01/////L//7.7

Date Sampled: 10/03/2007
Time Sampled: 0700

Analysis	Concentration	Units	Dilution Factor	PQL
TCL/HSL Low Level Volatiles	QC			
1,1,1-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2,2-Tetrachloroethane	ND(1.0)	µg/L	1.0	1.0
1,1,2-Trichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,1-Dichloroethylene	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethane	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloropropane	ND(1.0)	µg/L	1.0	1.0
2-Butanone	ND(25)	µg/L	1.0	25
2-Hexanone	ND(25)	µg/L	1.0	25.
4-Methyl-2-Pentanone	ND(25)	µg/L	1.0	25.
Acetone	ND(25)	µg/L	1.0	25.
Benzene	ND(1.0)	µg/L	1.0	1.0
Bromodichloromethane	ND(1.0)	µg/L	1.0	1.0
Bromoform	ND(1.0)	µg/L	1.0	1.0
Bromomethane	ND(1.0)	µg/L	1.0	1.0
Carbon Disulfide	ND(1.0)	µg/L	1.0	1.0
Carbon Tetrachloride	ND(1.0)	µg/L	1.0	1.0
Chlorobenzene	ND(1.0)	µg/L	1.0	1.0
Chloroethane	ND(1.0)	µg/L	1.0	1.0
Chloroform	ND(1.0)	µg/L	1.0	1.0
Chloromethane	ND(1.0)	µg/L	1.0	1.0
cis-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Dibromochloromethane	ND(1.0)	µg/L	1.0	1.0
Ethylbenzene	ND(1.0)	µg/L	1.0	1.0
Methylene Chloride	ND(1.0)	µg/L	1.0	1.0
Styrene	ND(1.0)	µg/L	1.0	1.0
Tetrachloroethene	ND(1.0)	µg/L	1.0	1.0
Toluene	ND(1.0)	µg/L	1.0	1.0
trans-1,3-Dichloropropene	ND(1.0)	µg/L	1.0	1.0
Trichloroethene	ND(1.0)	µg/L	1.0	1.0
Vinyl Acetate	ND(25) EV	µg/L	1.0	25.
Vinyl Chloride	ND(1.0)	µg/L	1.0	1.0
o-Xylene	ND(1.0)	µg/L	1.0	1.0
m+p-Xylene	ND(2.0)	µg/L	1.0	2.0
1,2-Dichloroethylene (Cis)	ND(1.0)	µg/L	1.0	1.0
1,2-Dichloroethylene (Trans)	ND(1.0)	µg/L	1.0	1.0

-Continued-

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
TCL/HSL Low Level Volat	N/A	10/09/2007	1MS9281	1MS9281	GMA	8260B

Conclusion of Lab Number: 07100531

ND indicates none detected with the reporting limit in parentheses or otherwise noted. The PQL limits have been adjusted for the dilution factor and percent solids if applicable. Due to rounding differences these calculated limits may vary slightly from the reported concentrations.

APPENDIX

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Sample Rptd: 11/09/2007
Date Sample Recd: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Not all samples were received at the recommended temperature of less than 6 degrees Celsius. Refer to the attached cooler/sample receipt form(s) for the affected coolers and samples.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

QC - QC data qualifiers were noted. See the Quality Control Report.

EV - Using the recommended analytical procedure, this analyte routinely yields low and/or variable recoveries. The stated reporting limit or concentration is an estimated value.

M - Reporting limit higher than normal due to matrix interferences.

RB - Reported concentration is below the reporting limit but within the instrument calibration range and above the calculated MDL.

Quality Control Report
Batch Summary

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Reported: 11/09/2007
Date Sample Received: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
MS432	TCL/HSL Low Level Volatiles	1MS9281	BLK1MS9281	LCS1MS9281	

Lab numbers associated with this batch:
07100529 07100530 07100531

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Reported: 11/09/2007
Date Sample Received: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 1MS9281	**For sample analyzed on: 10/08/2007**					**Spiked sample:**						
TCL/HSL Low Level Volatiles						MN	MN					
1,1,1-Trichloroethane	ND(1.0)	109.	77.4-121	10.0	µg/L			77.6-130			**	9.2
1,1,2,2-Tetrachloroethane	ND(1.0)	110.	72.5-114	10.0	µg/L			73.2-124			**	11.8
1,1,2-Trichloroethane	ND(1.0)	107.	80.6-114	10.0	µg/L			81.3-118			**	10.7
1,1-Dichloroethane	ND(1.0)	108.	78.8-117	10.0	µg/L			82.7-123			**	8.7
1,1-Dichloroethylene	ND(1.0)	118.	74.7-123	10.0	µg/L			77.8-126			**	10.8
1,2-Dichloroethane	ND(1.0)	108.	72.7-123	10.0	µg/L			74.5-136			**	10.6
1,2-Dichloropropane	ND(1.0)	108.	74.4-109	10.0	µg/L			74.7-117			**	7.9
2-Butanone	ND(25)	109.	46.1-134	20.0	µg/L			49.7-138			**	30.9
2-Hexanone	ND(25)	105.	47.8-124	20.0	µg/L			48.0-127			**	17.2
4-Methyl-2-Pentanone	ND(25)	114.	46.0-118	20.0	µg/L			47.3-128			**	14.6
Acetone	ND(25)	125.	42.9-156	20.0	µg/L			35.5-178			**	29.4
Benzene	ND(1.0)	109.	76.2-116	10.0	µg/L			76.3-126			**	9.9
Bromodichloromethane	ND(1.0)	110.	77.4-110	10.0	µg/L			78.9-119			**	7.5
Bromoform	ND(1.0)	92.8	70.3-121	10.0	µg/L			67.4-129			**	12.6
Bromomethane	ND(1.0)	104.	64.3-130	10.0	µg/L			49.0-146			**	16.5
Carbon Disulfide	ND(1.0)	119.	70.8-122	20.0	µg/L			67.7-129			**	10.1
Carbon Tetrachloride	ND(1.0)	110.	77.6-123	10.0	µg/L			75.5-132			**	9.2
Chlorobenzene	ND(1.0)	112.	86.5-120	10.0	µg/L			87.7-119			**	6.3
Chloroethane	ND(1.0)	129. LH	76.2-124	10.0	µg/L			76.8-130			**	12.9
Chloroform	ND(1.0)	113.	81.3-116	10.0	µg/L			81.4-125			**	9.1
Chloromethane	ND(1.0)	133.	70.2-133	10.0	µg/L			74.0-133			**	13.2
cis-1,3-Dichloropropene	ND(1.0)	100.	71.5-105	10.0	µg/L			67.0-107			**	9.2
Dibromochloromethane	ND(1.0)	100.	78.7-114	10.0	µg/L			75.5-124			**	8.4
Ethylbenzene	ND(1.0)	115.	84.3-120	10.0	µg/L			84.5-121			**	8.1
Methylene Chloride	ND(1.0)	107.	76.6-116	10.0	µg/L			76.8-127			**	9.6
Styrene	ND(1.0)	113.	83.5-114	10.0	µg/L			79.0-113			**	20.3
Tetrachloroethene	ND(1.0)	101.	85.4-129	10.0	µg/L			87.1-124			**	9.4
Toluene	ND(1.0)	114.	86.4-117	10.0	µg/L			85.1-120			**	8.3
trans-1,3-Dichloropropene	ND(1.0)	94.2	75.2-112	10.0	µg/L			75.9-108			**	7.4
Trichloroethene	ND(1.0)	105.	80.4-110	10.0	µg/L			80.3-118			**	7.8
Vinyl Acetate	ND(25) EV	108. EV	54.9-111	20.0	µg/L			35.5-112			**	12.3
Vinyl Chloride	ND(1.0)	129. LH	73.4-128	10.0	µg/L			73.6-130			**	11.3
o-Xylene	ND(1.0)	106.	83.7-120	10.0	µg/L			80.9-121			**	10.6
m+p-Xylene	ND(2.0)	113.	88.1-118	20.0	µg/L			85.2-119			**	10.2
1,2-Dichloroethylene (Cis)	ND(1.0)	103.	80.1-108	10.0	µg/L			81.7-116			**	8.9
1,2-Dichloroethylene (Trans	ND(1.0)	104.	79.9-118	10.0	µg/L			80.1-124			**	9.4
Surrogates:												
1,2-Dichloroethane-d4	106.	103.	79.2-133	10.0	µg/L	MN	MN				**	
Toluene-d8	102.	106.	84.9-111	10.0	µg/L	MN	MN				**	
4-BFB(MS)	96.3	101.	74.4-115	10.0	µg/L	MN	MN				**	

Data Qualifiers:
MN - The MS/MSD sample analyses were not performed on a sample from this Continental order number.

LH - The Laboratory Control Sample (LCS) recovery for this analyte was above the method or laboratory quality control limit. The reported sample concentration may be biased high.

EV - Using the recommended analytical procedure, this analyte routinely yields low and/or variable recoveries. The stated reporting limit or concentration is an estimated value.

- Limits not available.

** - RPD cannot be calculated.

> - This analyte is designated as a representative spike compound for this analysis. Recoveries for any additional analytes are provided for information only.

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Reported: 11/09/2007
Date Sample Received: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Reported: 11/09/2007
Date Sample Received: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Surrogate	Date Prepared	Date Analyzed	Spike Level	Units	% Recovery	Acceptable % Limits
Lab Number: 07100529		**Sample Description:33MW10S/GW4QA/////L//7.7**				
TCL/HSL Low Level Volatiles						
1,2-Dichloroethane-d4	N/A	10/08/2007	10	µg/L	109.	79.2-133
Toluene-d8	N/A	10/08/2007	10	µg/L	102.	84.9-111
4-BFB(MS)	N/A	10/08/2007	10	µg/L	94.5	74.4-115
Lab Number: 07100530		**Sample Description:33MW10D/GW4QA/////L//7.7**				
TCL/HSL Low Level Volatiles						
1,2-Dichloroethane-d4	N/A	10/08/2007	10	µg/L	121.	79.2-133
Toluene-d8	N/A	10/08/2007	10	µg/L	97.8	84.9-111
4-BFB(MS)	N/A	10/08/2007	10	µg/L	93.8	74.4-115
Lab Number: 07100531		**Sample Description:TB100307/TB01/////L//7.7**				
TCL/HSL Low Level Volatiles						
1,2-Dichloroethane-d4	N/A	10/09/2007	10	µg/L	109.	79.2-133
Toluene-d8	N/A	10/09/2007	10	µg/L	102.	84.9-111
4-BFB(MS)	N/A	10/09/2007	10	µg/L	90.0	74.4-115

Quality Control Report
Continuing Calibration Verification Data Summary

Client: Burns & McDonnell
Attn: Sharon Shelton
P.O. Box 419173
Kansas City, MO 64141

Date Reported: 11/09/2007
Date Sample Received: 10/04/2007
Continental File No: 5588
Continental Order No: 28707

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
TCL/HSL Low Level Volatiles	10/08/2007					
Vinyl Acetate	10/08/2007	1MS9281	20.0	21.6	µg/L	108. EV
Vinyl Chloride	10/08/2007	1MS9281	10.0	12.9	µg/L	129. CC CH

Samples associated with this Continuing Calibration Verification:

Laboratory Number	Instrument Batch	Sample Description
07100529	1MS9281	33MW10S/GW4QA/////L//7.7
07100530	1MS9281	33MW10D/GW4QA/////L//7.7
07100531	1MS9281	TB100307/TB01/////L//7.7

Data Qualifiers:

EV - Using the recommended analytical procedure, this analyte routinely yields low and/or variable recoveries. The stated reporting limit or concentration is an estimated value.

CC - This analyte is a method CCC compound and did not meet the continuing calibration method criteria.

CH - The continuing calibration verification (CCV) standard recovery for this analyte was above the method or SOP limit. The reported sample concentration may be biased high.

- Laboratory Report Conclusion -

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

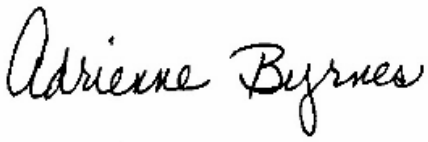
ANALYTICAL REPORT

Job Number: 510-17977-1

Job Description: AK Steel - Kansas City Facility

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/07/2007
Revision: 1

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Job Narrative
510-J17977-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) for analytical batch 23177 exceeded control limits for the following analytes: 1,1-Dichloroethene; Benzene; Chlorobenzene; Tetrachloroethene; Toluene, and trans-1,2-Dichloroethene. Similarly, the laboratory control standard duplicate (LCSD) had high recoveries for Benzene, Chlorobenzene, and Toluene These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data has been reported.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23290 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; 2-Hexanone; Acetone; Benzene; Carbon Tetrachloride; Chlorobenzene; Toluene; and Vinyl Acetate. Likewise the laboratory control standard duplicate (LCSD) exceeded control limits for 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; Benzene; Carbon Disulfide; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Isopropyl Benzene; Toluene, and Vinyl Acetate; These analytes were biased high in the LCS/LCSD and were not detected in the associated samples; therefore, the data have been reported. Any result for any of the target compounds that exceeds the reporting limit has been rejected and will be reanlyzed.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-17977-1, 510-17977-2. The sample(s) shows evidence of matrix interference. TALS batch 23290.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-17977-1, 510-17977-2, 510-17977-4. Evidence of matrix interference is present based on reproducibility; therefore, re-extraction and/or re-analysis was not performed. LIMS batch 23290.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23550 exceeded control limits for the following analyte: Vinyl Acetate. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Reanalysis of the sample was performed outside of the analytical holding time due to QC failures.: 510-17977-2, 510-17977-4. TALS batch 23550.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-17977-2, 510-17977-4. The sample(s) shows evidence of matrix interference based on the reproducibility of the occurence. TALS batch 23550.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-17977-4. Evidence of matrix interference is present based on the reproducibility of the occurence; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23550.

Method 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 23550 were outside control limits. The associated laboratory control standard (LCS) met acceptance criteria.

Method 8260B: The laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for analytical batch 23579 exceeded control limits for the following analyte: Vinyl Acetate. This analyte was biased high in the LCS and LCSD and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to QC failures. TALS batch 23579.: 510-17977-4.

Method 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 23579 were outside control limits. The associated laboratory control standard (LCS) met acceptance criteria.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method 8270C: The method blank and the LCS for prep batch 55339 had the surrogate 2-fluorobiphenyl recover slightly above the upper control limit. All but one of the spike compounds passed criteria; therefore, no re-extraction was preformed. There were no hits in the associated samples for the one spike compound that recovered below the control limts.

No other analytical or quality issues were noted.

GC VOA
No analytical or quality issues were noted.

Metals

No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-17977-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Closed System Purge & Trap/Frozen Water	TAL VAL		SW846 5035
GRO by 8015M	TAL PEN	SW846 8015M	
Closed System Purge & Trap/Field Preservation	TAL PEN		SW846 5035
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	TAL PEN	SW846 8270C	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)	TAL VAL	SW846 7471A	
Mercury in Solid or Semi-Solid Waste (Manual Cold	TAL VAL		SW846 7471A
Soil and Waste pH	TAL VAL	SW846 9045C	

Lab References:

TAL PEN = TestAmerica Pensacola

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-17977-1

Method	Analyst	Analyst ID
SW846 8260B	Hobart, Wes E	WEH
SW846 8270C	Wingo, Rita	RW
SW846 8015M	Potts, Charles	CP
SW846 6020	Hamner, Barb J	BJH
SW846 7471A	Hamner, Barb J	BJH
SW846 9045C	Boyd, Dan W	DWB
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-17977-1	13B09A 0-2'	Solid	09/10/2007 1415	09/11/2007 1015
510-17977-2	13B09A 2-4'	Solid	09/10/2007 1430	09/11/2007 1015
510-17977-3	13B09A 4-6'	Solid	09/10/2007 1445	09/11/2007 1015
510-17977-4	13B09A 6-8'	Solid	09/10/2007 1500	09/11/2007 1015

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 0-2'**

Lab Sample ID:	510-17977-1			Date Sampled:	09/10/2007 1415
Client Matrix:	Solid	% Moisture:	8.2	Date Received:	09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23290		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23440		Lab File ID:	L8719.D
Dilution:	1.0			Initial Weight/Volume:	32.71 g
Date Analyzed:	09/20/2007 2037			Final Weight/Volume:	36.9761 g
Date Prepared:	09/11/2007 0901				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<6.2	*	0.85	6.2
1,1,2,2-Tetrachloroethane		<6.2		1.4	6.2
1,1,2-Trichloroethane		<6.2		1.9	6.2
1,1-Dichloroethane		<6.2	*	0.77	6.2
1,1-Dichloroethene		<6.2	*	0.68	6.2
1,2-Dichloroethane		<6.2		0.63	6.2
2-Butanone (MEK)		<12		3.5	12
1,2-Dichloropropane		<6.2		0.53	6.2
2-Hexanone		<12	*	1.7	12
methyl isobutyl ketone		<12		1.6	12
Acetone		<12	*	1.7	12
Benzene		<6.2	*	1.4	6.2
Dichlorobromomethane		<6.2		0.68	6.2
Bromoform		<6.2		1.5	6.2
Bromomethane		<6.2		2.2	6.2
Carbon disulfide		<6.2	*	1.3	6.2
Carbon tetrachloride		<6.2	*	0.56	6.2
Chlorobenzene		<6.2	*	0.84	6.2
Chloroethane		<6.2		1.3	6.2
Chloroform		<6.2		0.92	6.2
Chloromethane		<6.2		1.2	6.2
cis-1,2-Dichloroethene		<6.2	*	0.89	6.2
cis-1,3-Dichloropropene		<6.2		0.93	6.2
Chlorodibromomethane		<6.2		1.0	6.2
Ethylbenzene		<6.2		0.79	6.2
Methylene Chloride		<6.2		0.48	6.2
Styrene		<6.2		0.42	6.2
Tetrachloroethene		<6.2		1.6	6.2
Toluene		<6.2	*	0.95	6.2
trans-1,2-Dichloroethene		<6.2		0.68	6.2
trans-1,3-Dichloropropene		<6.2		0.74	6.2
Trichloroethene		<6.2		0.99	6.2
Vinyl acetate		<6.2	*	0.57	6.2
Vinyl chloride		<6.2		1.7	6.2
Xylenes, Total		<12		2.1	12

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	227	X	80 - 124
Toluene-d8 (Surr)	78	X	83 - 113
4-Bromofluorobenzene (Surr)	141	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID: 510-17977-2 | Date Sampled: 09/10/2007 1430
Client Matrix: Solid | % Moisture: 17.8 | Date Received: 09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23440 | Lab File ID: L8720.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/20/2007 2110 | Final Weight/Volume: 5 mL
Date Prepared: 09/11/2007 0901

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.3	*	1.0	7.3
1,1,2,2-Tetrachloroethane		<7.3		1.6	7.3
1,1,2-Trichloroethane		<7.3		2.2	7.3
1,1-Dichloroethane		<7.3	*	0.91	7.3
1,1-Dichloroethene		<7.3	*	0.80	7.3
1,2-Dichloroethane		<7.3		0.74	7.3
2-Butanone (MEK)		<15		4.2	15
1,2-Dichloropropane		<7.3		0.63	7.3
2-Hexanone		<15	*	2.0	15
methyl isobutyl ketone		<15		1.9	15
Benzene		<7.3	*	1.7	7.3
Dichlorobromomethane		<7.3		0.80	7.3
Bromoform		<7.3		1.7	7.3
Bromomethane		<7.3		2.5	7.3
Carbon tetrachloride		<7.3	*	0.66	7.3
Chlorobenzene		<7.3	*	0.99	7.3
Chloroethane		<7.3		1.6	7.3
Chloroform		<7.3		1.1	7.3
Chloromethane		<7.3		1.4	7.3
cis-1,2-Dichloroethene		<7.3	*	1.1	7.3
cis-1,3-Dichloropropene		<7.3		1.1	7.3
Chlorodibromomethane		<7.3		1.2	7.3
Ethylbenzene		<7.3		0.93	7.3
Methylene Chloride		<7.3		0.56	7.3
Styrene		<7.3		0.50	7.3
Tetrachloroethene		<7.3		1.9	7.3
Toluene		<7.3	*	1.1	7.3
trans-1,2-Dichloroethene		<7.3		0.80	7.3
trans-1,3-Dichloropropene		<7.3		0.87	7.3
Trichloroethene		<7.3		1.2	7.3
Vinyl acetate		<7.3	*	0.67	7.3
Vinyl chloride		<7.3		2.1	7.3
Xylenes, Total		<15		2.5	15

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	161	X	80 - 124
Toluene-d8 (Surr)	105		83 - 113
4-Bromofluorobenzene (Surr)	124		68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID:	510-17977-2			Date Sampled:	09/10/2007 1430
Client Matrix:	Solid	% Moisture:	17.8	Date Received:	09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8829.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2130	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		15	H	1.7	12
Carbon disulfide		2.7	J H	1.3	6.1

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8829.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2130	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	120	80 - 124
Toluene-d8 (Surr)	90	83 - 113
4-Bromofluorobenzene (Surr)	121	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 4-6'**

Lab Sample ID:	510-17977-3			Date Sampled:	09/10/2007 1445
Client Matrix:	Solid	% Moisture:	25.5	Date Received:	09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23177		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23180		Lab File ID:	L8683.D
Dilution:	1.0			Initial Weight/Volume:	32.62 g
Date Analyzed:	09/18/2007 2020			Final Weight/Volume:	36.4568 g
Date Prepared:	09/11/2007 1435				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.5		1.0	7.5
1,1,2,2-Tetrachloroethane		<7.5		1.6	7.5
1,1,2-Trichloroethane		<7.5		2.3	7.5
1,1-Dichloroethane		<7.5		0.94	7.5
1,1-Dichloroethene		<7.5	*	0.83	7.5
1,2-Dichloroethane		<7.5		0.76	7.5
2-Butanone (MEK)		<15		4.3	15
1,2-Dichloropropane		<7.5		0.65	7.5
2-Hexanone		<15		2.1	15
methyl isobutyl ketone		<15		1.9	15
Acetone		29		2.1	15
Benzene		<7.5	*	1.7	7.5
Dichlorobromomethane		<7.5		0.83	7.5
Bromoform		<7.5		1.8	7.5
Bromomethane		<7.5		2.6	7.5
Carbon disulfide		15		1.6	7.5
Carbon tetrachloride		<7.5		0.68	7.5
Chlorobenzene		<7.5	*	1.0	7.5
Chloroethane		<7.5		1.6	7.5
Chloroform		<7.5		1.1	7.5
Chloromethane		<7.5		1.4	7.5
cis-1,2-Dichloroethene		<7.5		1.1	7.5
cis-1,3-Dichloropropene		<7.5		1.1	7.5
Chlorodibromomethane		<7.5		1.3	7.5
Ethylbenzene		<7.5		0.96	7.5
Methylene Chloride		1.9	J B	0.58	7.5
Styrene		<7.5		0.51	7.5
Tetrachloroethene		<7.5	*	1.9	7.5
Toluene		2.2	J *	1.2	7.5
trans-1,2-Dichloroethene		<7.5	*	0.83	7.5
trans-1,3-Dichloropropene		<7.5		0.90	7.5
Trichloroethene		<7.5		1.2	7.5
Vinyl acetate		<7.5		0.69	7.5
Vinyl chloride		<7.5		2.1	7.5
Xylenes, Total		<15		2.6	15

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	105	80 - 124
Toluene-d8 (Surr)	95	83 - 113
4-Bromofluorobenzene (Surr)	120	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID: 510-17977-4 | Date Sampled: 09/10/2007 1500
Client Matrix: Solid | % Moisture: 26.0 | Date Received: 09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23440 | Lab File ID: L8721.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/20/2007 2143 | Final Weight/Volume: 5 mL
Date Prepared: 09/11/2007 0901

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.9	*	1.1	7.9
1,1,2,2-Tetrachloroethane		<7.9		1.7	7.9
1,1,2-Trichloroethane		<7.9		2.5	7.9
1,1-Dichloroethane		<7.9	*	0.99	7.9
1,1-Dichloroethene		<7.9	*	0.87	7.9
1,2-Dichloroethane		<7.9		0.81	7.9
2-Butanone (MEK)		<16		4.5	16
1,2-Dichloropropane		<7.9		0.68	7.9
2-Hexanone		<16	*	2.2	16
methyl isobutyl ketone		<16		2.0	16
Benzene		<7.9	*	1.8	7.9
Dichlorobromomethane		<7.9		0.88	7.9
Bromoform		<7.9		1.9	7.9
Bromomethane		<7.9		2.8	7.9
Carbon tetrachloride		<7.9	*	0.72	7.9
Chlorobenzene		<7.9	*	1.1	7.9
Chloroethane		<7.9		1.7	7.9
Chloroform		<7.9		1.2	7.9
Chloromethane		<7.9		1.5	7.9
cis-1,2-Dichloroethene		<7.9	*	1.1	7.9
cis-1,3-Dichloropropene		<7.9		1.2	7.9
Chlorodibromomethane		<7.9		1.3	7.9
Ethylbenzene		<7.9		1.0	7.9
Methylene Chloride		2.8	J	0.61	7.9
Styrene		<7.9		0.54	7.9
Tetrachloroethene		<7.9		2.1	7.9
Toluene		2.0	J *	1.2	7.9
trans-1,2-Dichloroethene		<7.9		0.87	7.9
trans-1,3-Dichloropropene		<7.9		0.95	7.9
Trichloroethene		<7.9		1.3	7.9
Vinyl acetate		<7.9	*	0.73	7.9
Vinyl chloride		<7.9		2.2	7.9
Xylenes, Total		<16		2.8	16

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	119		80 - 124
Toluene-d8 (Surr)	93		83 - 113
4-Bromofluorobenzene (Surr)	136	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID:	510-17977-4			Date Sampled:	09/10/2007 1500
Client Matrix:	Solid	% Moisture:	26.0	Date Received:	09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8830.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2203	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		6.7	J H	1.4	6.8

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8830.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2203	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98		80 - 124
Toluene-d8 (Surr)	91		83 - 113
4-Bromofluorobenzene (Surr)	143	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID:	510-17977-4			Date Sampled:	09/10/2007 1500
Client Matrix:	Solid	% Moisture:	26.0	Date Received:	09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23579		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8848.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1118	Run Type:	RADL	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		330	H B	9.3	68

Method:	8260B	Analysis Batch: 510-23579		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8848.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1118	Run Type:	RADL	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	80 - 124
Toluene-d8 (Surr)	92	83 - 113
4-Bromofluorobenzene (Surr)	108	68 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 0-2'**

Lab Sample ID: 510-17977-1 | Date Sampled: 09/10/2007 1415
Client Matrix: Solid | % Moisture: 8.2 | Date Received: 09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-55674 | Instrument ID: GC/MS
Preparation: 3550B | Prep Batch: 400-55339 | Lab File ID: 17977D5.D
Dilution: 2.0 | Initial Weight/Volume: 30.12 g
Date Analyzed: 09/19/2007 2345 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/17/2007 0859 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<720		72	720
1,2-Dichlorobenzene		<720		72	720
1,3-Dichlorobenzene		<720		72	720
1,4-Dichlorobenzene		<720		72	720
2,2'-oxybis(2-chloropropane)		<720		72	720
2,4,5-Trichlorophenol		<3700		72	3700
2,4-Dichlorophenol		<720		72	720
2,4-Dimethylphenol		<720		72	720
2,4-Dinitrophenol		<3700		330	3700
2,4-Dinitrotoluene		<720		72	720
2,6-Dinitrotoluene		<720		72	720
2-Chloronaphthalene		<720		72	720
2-Chlorophenol		<720		72	720
2-Methylnaphthalene		<720		72	720
2-Methylphenol		<720		72	720
2-Nitroaniline		<720		72	720
2-Nitrophenol		<720		72	720
3 & 4 Methylphenol		<1400		72	1400
3,3'-Dichlorobenzidine		<3700		72	3700
3-Nitroaniline		<720		72	720
4,6-Dinitro-2-methylphenol		<3700	*	72	3700
4-Bromophenyl phenyl ether		<720		72	720
4-Chloro-3-methylphenol		<720		72	720
4-Chloroaniline		<720		72	720
4-Chlorophenyl phenyl ether		<720		72	720
4-Nitroaniline		<720		72	720
4-Nitrophenol		<3700		80	3700
Acenaphthene		<720		72	720
Acenaphthylene		150	J	72	720
Anthracene		<720		72	720
Benzo[a]anthracene		580	J	72	720
Benzo[a]pyrene		570	J	72	720
Benzo[b]fluoranthene		790		72	720
Benzo[g,h,i]perylene		250	J	72	720
Benzo[k]fluoranthene		400	J	72	720
Benzoic acid		<3700		610	3700
Benzyl alcohol		<720		72	720
Bis(2-chloroethoxy)methane		<720		72	720
Bis(2-chloroethyl)ether		<720		72	720
Bis(2-ethylhexyl) phthalate		<720		72	720
Butyl benzyl phthalate		<720		72	720
Chrysene		470	J	72	720
Dibenz(a,h)anthracene		<720		72	720
Dibenzofuran		<720		72	720

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 0-2'**

Lab Sample ID:	510-17977-1			Date Sampled:	09/10/2007 1415
Client Matrix:	Solid	% Moisture:	8.2	Date Received:	09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55674		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55339		Lab File ID:	17977D5.D
Dilution:	2.0			Initial Weight/Volume:	30.12 g
Date Analyzed:	09/19/2007 2345			Final Weight/Volume:	1.0 mL
Date Prepared:	09/17/2007 0859			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<720		72	720
Dimethyl phthalate		630	J	72	720
Di-n-butyl phthalate		<720		72	720
Di-n-octyl phthalate		<720		72	720
Fluoranthene		690	J	72	720
Fluorene		<720		72	720
Hexachlorobenzene		<720		72	720
Hexachlorobutadiene		<720		72	720
Hexachlorocyclopentadiene		<720		72	720
Hexachloroethane		<720		91	720
Indeno[1,2,3-cd]pyrene		250	J	72	720
Isophorone		<720		72	720
Naphthalene		<720		72	720
Nitrobenzene		<720		72	720
N-Nitrosodi-n-propylamine		<720		72	720
N-Nitrosodiphenylamine		<720		72	720
Pentachlorophenol		<3700		72	3700
Phenanthrene		87	J	72	720
Phenol		<720		72	720
Pyrene		820		72	720

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	59	24 - 111
2-Fluorobiphenyl	67	41 - 94
2-Fluorophenol	61	22 - 73
Nitrobenzene-d5	66	22 - 94
Phenol-d5	64	28 - 84
Terphenyl-d14	74	53 - 96

Client: Burns & McDonnell Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID: 510-17977-2 Date Sampled: 09/10/2007 1430
Client Matrix: Solid % Moisture: 17.8 Date Received: 09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C Analysis Batch: 400-55674 Instrument ID: GC/MS
Preparation: 3550B Prep Batch: 400-55339 Lab File ID: 17977D2.D
Dilution: 1.0 Initial Weight/Volume: 30.35 g
Date Analyzed: 09/19/2007 2215 Final Weight/Volume: 1.0 mL
Date Prepared: 09/17/2007 0859 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<400		40	400
1,2-Dichlorobenzene		<400		40	400
1,3-Dichlorobenzene		<400		40	400
1,4-Dichlorobenzene		<400		40	400
2,2'-oxybis(2-chloropropane)		<400		40	400
2,4,5-Trichlorophenol		<2000		40	2000
2,4-Dichlorophenol		<400		40	400
2,4-Dimethylphenol		<400		40	400
2,4-Dinitrophenol		<2000		180	2000
2,4-Dinitrotoluene		<400		40	400
2,6-Dinitrotoluene		<400		40	400
2-Chloronaphthalene		<400		40	400
2-Chlorophenol		<400		40	400
2-Methylnaphthalene		390	J	40	400
2-Methylphenol		<400		40	400
2-Nitroaniline		<400		40	400
2-Nitrophenol		<400		40	400
3 & 4 Methylphenol		<790		40	790
3,3'-Dichlorobenzidine		<2000		40	2000
3-Nitroaniline		<400		40	400
4,6-Dinitro-2-methylphenol		<2000	*	40	2000
4-Bromophenyl phenyl ether		<400		40	400
4-Chloro-3-methylphenol		<400		40	400
4-Chloroaniline		<400		40	400
4-Chlorophenyl phenyl ether		<400		40	400
4-Nitroaniline		<400		40	400
4-Nitrophenol		<2000		44	2000
Acenaphthene		<400		40	400
Acenaphthylene		64	J	40	400
Anthracene		45	J	40	400
Benzo[a]anthracene		290	J	40	400
Benzo[a]pyrene		250	J	40	400
Benzo[b]fluoranthene		470		40	400
Benzo[g,h,i]perylene		210	J	40	400
Benzo[k]fluoranthene		160	J	40	400
Benzoic acid		<2000		340	2000
Benzyl alcohol		<400		40	400
Bis(2-chloroethoxy)methane		<400		40	400
Bis(2-chloroethyl)ether		<400		40	400
Bis(2-ethylhexyl) phthalate		<400		40	400
Butyl benzyl phthalate		<400		40	400
Chrysene		330	J	40	400
Dibenz(a,h)anthracene		<400		40	400
Dibenzofuran		53	J	40	400

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID:	510-17977-2			Date Sampled:	09/10/2007 1430
Client Matrix:	Solid	% Moisture:	17.8	Date Received:	09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55674		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55339		Lab File ID:	17977D2.D
Dilution:	1.0			Initial Weight/Volume:	30.35 g
Date Analyzed:	09/19/2007 2215			Final Weight/Volume:	1.0 mL
Date Prepared:	09/17/2007 0859			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<400		40	400
Dimethyl phthalate		<400		40	400
Di-n-butyl phthalate		110	J	40	400
Di-n-octyl phthalate		<400		40	400
Fluoranthene		580		40	400
Fluorene		<400		40	400
Hexachlorobenzene		<400		40	400
Hexachlorobutadiene		<400		40	400
Hexachlorocyclopentadiene		<400		40	400
Hexachloroethane		<400		50	400
Indeno[1,2,3-cd]pyrene		180	J	40	400
Isophorone		<400		40	400
Naphthalene		120	J	40	400
Nitrobenzene		<400		40	400
N-Nitrosodi-n-propylamine		<400		40	400
N-Nitrosodiphenylamine		<400		40	400
Pentachlorophenol		<2000		40	2000
Phenanthrene		230	J	40	400
Phenol		<400		40	400
Pyrene		400		40	400

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	55	24 - 111
2-Fluorobiphenyl	70	41 - 94
2-Fluorophenol	61	22 - 73
Nitrobenzene-d5	69	22 - 94
Phenol-d5	66	28 - 84
Terphenyl-d14	78	53 - 96

Client: Burns & McDonnell Job Number: 510-17977-1

Client Sample ID: **13B09A 4-6'**

Lab Sample ID: 510-17977-3 Date Sampled: 09/10/2007 1445
Client Matrix: Solid % Moisture: 25.5 Date Received: 09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C Analysis Batch: 400-55674 Instrument ID: GC/MS
Preparation: 3550B Prep Batch: 400-55339 Lab File ID: 17977D3.D
Dilution: 1.0 Initial Weight/Volume: 30.13 g
Date Analyzed: 09/19/2007 2245 Final Weight/Volume: 1.0 mL
Date Prepared: 09/17/2007 0859 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<440		44	440
1,2-Dichlorobenzene		<440		44	440
1,3-Dichlorobenzene		<440		44	440
1,4-Dichlorobenzene		<440		44	440
2,2'-oxybis(2-chloropropane)		<440		44	440
2,4,5-Trichlorophenol		<2300		44	2300
2,4-Dichlorophenol		<440		44	440
2,4-Dimethylphenol		<440		44	440
2,4-Dinitrophenol		<2300		200	2300
2,4-Dinitrotoluene		<440		44	440
2,6-Dinitrotoluene		<440		44	440
2-Chloronaphthalene		<440		44	440
2-Chlorophenol		<440		44	440
2-Methylnaphthalene		100	J	44	440
2-Methylphenol		<440		44	440
2-Nitroaniline		<440		44	440
2-Nitrophenol		<440		44	440
3 & 4 Methylphenol		<880		44	880
3,3'-Dichlorobenzidine		<2300		44	2300
3-Nitroaniline		<440		44	440
4,6-Dinitro-2-methylphenol		<2300	*	44	2300
4-Bromophenyl phenyl ether		<440		44	440
4-Chloro-3-methylphenol		<440		44	440
4-Chloroaniline		<440		44	440
4-Chlorophenyl phenyl ether		<440		44	440
4-Nitroaniline		<440		44	440
4-Nitrophenol		<2300		49	2300
Acenaphthene		<440		44	440
Acenaphthylene		<440		44	440
Anthracene		<440		44	440
Benzo[a]anthracene		45	J	44	440
Benzo[a]pyrene		56	J	44	440
Benzo[b]fluoranthene		64	J	44	440
Benzo[g,h,i]perylene		64	J	44	440
Benzo[k]fluoranthene		<440		44	440
Benzoic acid		<2300		370	2300
Benzyl alcohol		<440		44	440
Bis(2-chloroethoxy)methane		<440		44	440
Bis(2-chloroethyl)ether		<440		44	440
Bis(2-ethylhexyl) phthalate		<440		44	440
Butyl benzyl phthalate		<440		44	440
Chrysene		48	J	44	440
Dibenz(a,h)anthracene		<440		44	440
Dibenzofuran		<440		44	440

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 4-6'**

Lab Sample ID:	510-17977-3			Date Sampled:	09/10/2007 1445
Client Matrix:	Solid	% Moisture:	25.5	Date Received:	09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55674		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55339		Lab File ID:	17977D3.D
Dilution:	1.0			Initial Weight/Volume:	30.13 g
Date Analyzed:	09/19/2007 2245			Final Weight/Volume:	1.0 mL
Date Prepared:	09/17/2007 0859			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<440		44	440
Dimethyl phthalate		<440		44	440
Di-n-butyl phthalate		<440		44	440
Di-n-octyl phthalate		<440		44	440
Fluoranthene		82	J	44	440
Fluorene		<440		44	440
Hexachlorobenzene		<440		44	440
Hexachlorobutadiene		<440		44	440
Hexachlorocyclopentadiene		<440		44	440
Hexachloroethane		<440		56	440
Indeno[1,2,3-cd]pyrene		<440		44	440
Isophorone		<440		44	440
Naphthalene		<440		44	440
Nitrobenzene		<440		44	440
N-Nitrosodi-n-propylamine		<440		44	440
N-Nitrosodiphenylamine		<440		44	440
Pentachlorophenol		<2300		44	2300
Phenanthrene		<440		44	440
Phenol		<440		44	440
Pyrene		75	J	44	440

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	63	24 - 111
2-Fluorobiphenyl	57	41 - 94
2-Fluorophenol	49	22 - 73
Nitrobenzene-d5	55	22 - 94
Phenol-d5	52	28 - 84
Terphenyl-d14	68	53 - 96

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID: 510-17977-4 | Date Sampled: 09/10/2007 1500
Client Matrix: Solid | % Moisture: 26.0 | Date Received: 09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-55674 | Instrument ID: GC/MS
Preparation: 3550B | Prep Batch: 400-55339 | Lab File ID: 17977D4.D
Dilution: 1.0 | Initial Weight/Volume: 30.10 g
Date Analyzed: 09/19/2007 2315 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/17/2007 0859 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<440		44	440
1,2-Dichlorobenzene		<440		44	440
1,3-Dichlorobenzene		<440		44	440
1,4-Dichlorobenzene		<440		44	440
2,2'-oxybis(2-chloropropane)		<440		44	440
2,4,5-Trichlorophenol		<2300		44	2300
2,4-Dichlorophenol		<440		44	440
2,4-Dimethylphenol		<440		44	440
2,4-Dinitrophenol		<2300		200	2300
2,4-Dinitrotoluene		<440		44	440
2,6-Dinitrotoluene		<440		44	440
2-Chloronaphthalene		<440		44	440
2-Chlorophenol		<440		44	440
2-Methylnaphthalene		370	J	44	440
2-Methylphenol		<440		44	440
2-Nitroaniline		<440		44	440
2-Nitrophenol		<440		44	440
3 & 4 Methylphenol		<890		44	890
3,3'-Dichlorobenzidine		<2300		44	2300
3-Nitroaniline		<440		44	440
4,6-Dinitro-2-methylphenol		<2300	*	44	2300
4-Bromophenyl phenyl ether		<440		44	440
4-Chloro-3-methylphenol		<440		44	440
4-Chloroaniline		<440		44	440
4-Chlorophenyl phenyl ether		<440		44	440
4-Nitroaniline		<440		44	440
4-Nitrophenol		<2300		50	2300
Acenaphthene		190	J	44	440
Acenaphthylene		<440		44	440
Anthracene		110	J	44	440
Benzo[a]anthracene		160	J	44	440
Benzo[a]pyrene		140	J	44	440
Benzo[b]fluoranthene		190	J	44	440
Benzo[g,h,i]perylene		74	J	44	440
Benzo[k]fluoranthene		79	J	44	440
Benzoic acid		<2300		380	2300
Benzyl alcohol		<440		44	440
Bis(2-chloroethoxy)methane		<440		44	440
Bis(2-chloroethyl)ether		<440		44	440
Bis(2-ethylhexyl) phthalate		<440		44	440
Butyl benzyl phthalate		<440		44	440
Chrysene		160	J	44	440
Dibenz(a,h)anthracene		<440		44	440
Dibenzofuran		<440		44	440

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID: 510-17977-4 | Date Sampled: 09/10/2007 1500
Client Matrix: Solid | % Moisture: 26.0 | Date Received: 09/11/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55674		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55339		Lab File ID:	17977D4.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/19/2007 2315			Final Weight/Volume:	1.0 mL
Date Prepared:	09/17/2007 0859			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<440		44	440
Dimethyl phthalate		<440		44	440
Di-n-butyl phthalate		<440		44	440
Di-n-octyl phthalate		<440		44	440
Fluoranthene		380	J	44	440
Fluorene		110	J	44	440
Hexachlorobenzene		<440		44	440
Hexachlorobutadiene		<440		44	440
Hexachlorocyclopentadiene		<440		44	440
Hexachloroethane		<440		57	440
Indeno[1,2,3-cd]pyrene		65	J	44	440
Isophorone		<440		44	440
Naphthalene		190	J	44	440
Nitrobenzene		<440		44	440
N-Nitrosodi-n-propylamine		<440		44	440
N-Nitrosodiphenylamine		<440		44	440
Pentachlorophenol		<2300		44	2300
Phenanthrene		240	J	44	440
Phenol		<440		44	440
Pyrene		310	J	44	440

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	66	24 - 111
2-Fluorobiphenyl	67	41 - 94
2-Fluorophenol	61	22 - 73
Nitrobenzene-d5	72	22 - 94
Phenol-d5	65	28 - 84
Terphenyl-d14	70	53 - 96

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 0-2'**

Lab Sample ID:	510-17977-1			Date Sampled:	09/10/2007 1415
Client Matrix:	Solid	% Moisture:	8.2	Date Received:	09/11/2007 1015

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092116.D
Dilution:	1.0			Initial Weight/Volume:	5.01 g
Date Analyzed:	09/22/2007 0048			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<110		36	110

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

Client: Burns & McDonnell

Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID: 510-17977-2
Client Matrix: Solid
% Moisture: 17.8
Date Sampled: 09/10/2007 1430
Date Received: 09/11/2007 1015

8015M GRO by 8015M

Method: 8015M
Preparation: 5035
Dilution: 1.0
Date Analyzed: 09/22/2007 0148
Date Prepared: 09/21/2007 0937
Analysis Batch: 400-55929
Prep Batch: 400-55927
Instrument ID: GC/PID/FID
Lab File ID: B092117.D
Initial Weight/Volume: 5.00 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		1100		40	120

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

Client: Burns & McDonnell

Job Number: 510-17977-1

Client Sample ID: **13B09A 4-6'**

Lab Sample ID:	510-17977-3			Date Sampled:	09/10/2007 1445
Client Matrix:	Solid	% Moisture:	25.5	Date Received:	09/11/2007 1015

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092118.D
Dilution:	1.0			Initial Weight/Volume:	5.06 g
Date Analyzed:	09/22/2007 0247			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		3300		44	130

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	96	60 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID:	510-17977-4			Date Sampled:	09/10/2007 1500
Client Matrix:	Solid	% Moisture:	26.0	Date Received:	09/11/2007 1015

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55993		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55989		Lab File ID:	B092405.D
Dilution:	1.0			Initial Weight/Volume:	0.99 g
Date Analyzed:	09/24/2007 1448			Final Weight/Volume:	5 g
Date Prepared:	09/24/2007 1148			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		30000		230	680

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	89	60 - 134

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 0-2'**

Lab Sample ID:	510-17977-1	Date Sampled:	09/10/2007 1415
Client Matrix:	Solid % Moisture: 8.2	Date Received:	09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0327 g
Date Analyzed:	09/13/2007 1704		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		2.3		0.055	0.53
Barium		330		0.041	0.13
Cadmium		1.6		0.014	0.26
Chromium		1600		0.026	0.26
Lead		34		0.055	0.13

Method:	6020	Analysis Batch: 510-23294	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0327 g
Date Analyzed:	09/20/2007 1947		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.21	J B	0.012	0.26

Method:	6020	Analysis Batch: 510-23446	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0327 g
Date Analyzed:	09/24/2007 1426		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Selenium		<0.26		0.049	0.26

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23048	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23001	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5509 g
Date Analyzed:	09/17/2007 1508		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0950		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.048		0.0046	0.020

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 2-4'**

Lab Sample ID: 510-17977-2 | Date Sampled: 09/10/2007 1430
Client Matrix: Solid | % Moisture: 17.8 | Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0234 g
Date Analyzed:	09/13/2007 1709			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		5.8		0.062	0.59
Barium		270		0.046	0.15
Cadmium		0.96		0.016	0.30
Chromium		300		0.030	0.30
Lead		210		0.062	0.15

Method:	6020	Analysis Batch: 510-23294		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0234 g
Date Analyzed:	09/20/2007 1951			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.32	B	0.014	0.30

Method:	6020	Analysis Batch: 510-23446		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0234 g
Date Analyzed:	09/24/2007 1429			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Selenium		<0.30		0.055	0.30

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23048		Instrument ID:	Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23001		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	0.5091 g
Date Analyzed:	09/17/2007 1609			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0950				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.67		0.0056	0.024

Client: Burns & McDonnell Job Number: 510-17977-1

Client Sample ID: 13B09A 4-6'

Lab Sample ID: 510-17977-3 Date Sampled: 09/10/2007 1445
Client Matrix: Solid % Moisture: 25.5 Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-22926 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-22825 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0104 g
Date Analyzed: 09/13/2007 1714 Final Weight/Volume: 50 mL
Date Prepared: 09/12/2007 1040

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		6.7		0.070	0.66
Barium		240		0.051	0.17
Cadmium		1.9		0.018	0.33
Chromium		17		0.033	0.33
Lead		91		0.069	0.17

Method: 6020 Analysis Batch: 510-23294 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-22825 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0104 g
Date Analyzed: 09/20/2007 1955 Final Weight/Volume: 50 mL
Date Prepared: 09/12/2007 1040

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.24	J B	0.015	0.33

Method: 6020 Analysis Batch: 510-23446 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-22825 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0104 g
Date Analyzed: 09/24/2007 1431 Final Weight/Volume: 50 mL
Date Prepared: 09/12/2007 1040

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Selenium		<0.33		0.062	0.33

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A Analysis Batch: 510-23048 Instrument ID: Leeman Hydra AA
Preparation: 7471A Prep Batch: 510-23001 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 0.5569 g
Date Analyzed: 09/17/2007 1515 Final Weight/Volume: 50 mL
Date Prepared: 09/17/2007 0950

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.22		0.0057	0.024

Client: Burns & McDonnell | Job Number: 510-17977-1

Client Sample ID: **13B09A 6-8'**

Lab Sample ID:	510-17977-4	Date Sampled:	09/10/2007 1500
Client Matrix:	Solid % Moisture: 26.0	Date Received:	09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0206 g
Date Analyzed:	09/13/2007 1720		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		19		0.070	0.66
Barium		310		0.051	0.17
Cadmium		7.5		0.018	0.33
Chromium		25		0.033	0.33
Lead		280		0.069	0.17

Method:	6020	Analysis Batch: 510-23294	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0206 g
Date Analyzed:	09/20/2007 1959		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.68	B	0.015	0.33

Method:	6020	Analysis Batch: 510-23446	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0206 g
Date Analyzed:	09/24/2007 1439		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Selenium		<0.33		0.062	0.33

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23048	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23001	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5451 g
Date Analyzed:	09/17/2007 1518		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0950		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.45		0.0058	0.025

General Chemistry

Client Sample ID: 13B09A 0-2'

Lab Sample ID: 510-17977-1 Date Sampled: 09/10/2007 1415
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	10.4		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23072	Date Analyzed		09/17/2007 1715		DryWt Corrected: N	
Percent Moisture	8.2		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			

Client Sample ID: 13B09A 2-4'

Lab Sample ID: 510-17977-2 Date Sampled: 09/10/2007 1430
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	10.7		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23072	Date Analyzed		09/17/2007 1715		DryWt Corrected: N	
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			

Client Sample ID: 13B09A 4-6'

Lab Sample ID: 510-17977-3 Date Sampled: 09/10/2007 1445
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	8.96		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23072	Date Analyzed		09/17/2007 1715		DryWt Corrected: N	
Percent Moisture	25		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			
Percent Solids	75		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed		09/17/2007 2000			

General Chemistry

Client Sample ID: **13B09A 6-8'**

Lab Sample ID: 510-17977-4
Client Matrix: Solid

Date Sampled: 09/10/2007 1500
Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	8.58		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23072	Date Analyzed	09/17/2007 1715			DryWt Corrected: N	
Percent Moisture	26		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed	09/17/2007 2000				
Percent Solids	74		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed	09/17/2007 2000				

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-17977-1

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	MS or MSD exceeds the control limits
	X	Surrogate exceeds the control limits
	*	LCS or LCSD exceeds the control limits
	B	Compound was found in the blank and sample.
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	H	Sample was prepped or analyzed beyond the specified holding time
GC/MS Semi VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	*	LCS or LCSD exceeds the control limits
	X	Surrogate exceeds the control limits
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	B	Compound was found in the blank and sample.

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23177

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23177/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1807
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8679.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	2.5	J	0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	99	80 - 124
Toluene-d8 (Surr)	95	83 - 113
4-Bromofluorobenzene (Surr)	108	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23177/1	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8677.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1701			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23177/2	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8678.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1734			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1-Trichloroethane	125	125	78 - 125	0	30		
1,1,2,2-Tetrachloroethane	105	97	61 - 131	7	30		
1,1,2-Trichloroethane	116	113	70 - 127	2	30		
1,1-Dichloroethane	122	122	80 - 123	0	30		
1,1-Dichloroethene	119	117	76 - 117	2	30	*	
1,2-Dichloroethane	109	107	72 - 130	2	30		
2-Butanone (MEK)	112	106	57 - 171	5	30		
1,2-Dichloropropane	111	109	77 - 122	2	30		
2-Hexanone	112	102	67 - 119	10	30		
methyl isobutyl ketone	105	101	42 - 181	4	30		
Acetone	115	100	57 - 117	14	30		
Benzene	124	120	81 - 116	3	30	*	*
Dichlorobromomethane	115	116	72 - 132	1	30		
Bromoform	102	103	74 - 122	1	30		
Bromomethane	101	97	10 - 212	5	30		
Carbon disulfide	123	126	66 - 126	2	30		
Carbon tetrachloride	123	121	81 - 124	2	30		
Chlorobenzene	117	115	80 - 112	2	30	*	*
Chloroethane	102	108	10 - 208	6	30		
Chloroform	112	116	77 - 124	4	30		
Chloromethane	95	99	10 - 189	5	30		
cis-1,2-Dichloroethene	115	120	81 - 122	4	30		
cis-1,3-Dichloropropene	104	104	61 - 127	0	30		
Chlorodibromomethane	117	108	83 - 130	8	30		
Ethylbenzene	112	111	84 - 124	1	30		
Methylene Chloride	111	111	62 - 130	0	30		
Styrene	110	107	80 - 116	2	30		
Tetrachloroethene	131	122	82 - 127	7	30	*	
Toluene	124	118	77 - 117	6	30	*	*
trans-1,2-Dichloroethene	131	127	82 - 129	3	30	*	
trans-1,3-Dichloropropene	107	103	63 - 133	4	30		
Trichloroethene	117	117	81 - 122	1	30		

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23177/1	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8677.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1701			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23177/2	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8678.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1734			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	120	111	80 - 141	8	30		
Vinyl chloride	105	110	10 - 203	5	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98	99	80 - 124
Toluene-d8 (Surr)	101	101	83 - 113
4-Bromofluorobenzene (Surr)	102	97	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23290

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23290/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1931
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8717.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	117	80 - 124
Toluene-d8 (Surr)	99	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1-Trichloroethane	131	131	78 - 125	0	30	*	*
1,1,2,2-Tetrachloroethane	108	95	61 - 131	13	30		
1,1,2-Trichloroethane	125	127	70 - 127	1	30		
1,1-Dichloroethane	132	132	80 - 123	0	30	*	*
1,1-Dichloroethene	127	129	76 - 117	1	30	*	*
1,2-Dichloroethane	130	129	72 - 130	0	30		
2-Butanone (MEK)	125	99	57 - 171	23	30		
1,2-Dichloropropane	118	119	77 - 122	1	30		
2-Hexanone	137	112	67 - 119	20	30	*	
methyl isobutyl ketone	130	121	42 - 181	7	30		
Acetone	118	100	57 - 117	17	30	*	
Benzene	123	127	81 - 116	3	30	*	*
Dichlorobromomethane	129	127	72 - 132	2	30		
Bromoform	111	104	74 - 122	6	30		
Bromomethane	91	94	10 - 212	4	30		
Carbon disulfide	124	127	66 - 126	2	30		*
Carbon tetrachloride	131	129	81 - 124	2	30	*	*
Chlorobenzene	121	120	80 - 112	1	30	*	*
Chloroethane	110	112	10 - 208	2	30		
Chloroform	124	121	77 - 124	3	30		
Chloromethane	109	110	10 - 189	1	30		
cis-1,2-Dichloroethene	121	128	81 - 122	5	30		*
cis-1,3-Dichloropropene	111	112	61 - 127	1	30		
Chlorodibromomethane	116	119	83 - 130	3	30		
Ethylbenzene	115	118	84 - 124	2	30		
Methylene Chloride	113	107	62 - 130	5	30		
Styrene	114	116	80 - 116	2	30		
Tetrachloroethene	119	111	82 - 127	7	30		
Toluene	122	124	77 - 117	2	30	*	*
trans-1,2-Dichloroethene	124	123	82 - 129	1	30		
trans-1,3-Dichloropropene	115	115	63 - 133	0	30		
Trichloroethene	109	109	81 - 122	0	30		

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	146	144	80 - 141	2	30	*	*
Vinyl chloride	110	113	10 - 203	3	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	122	116	80 - 124
Toluene-d8 (Surr)	104	105	83 - 113
4-Bromofluorobenzene (Surr)	98	96	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23550/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 2024
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8827.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23550/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 1951
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8826.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	54.8	110	78 - 125	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	61 - 131	
1,1,2-Trichloroethane	50.0	47.9	96	70 - 127	
1,1-Dichloroethane	50.0	55.6	111	80 - 123	
1,1-Dichloroethene	50.0	51.1	102	76 - 117	
1,2-Dichloroethane	50.0	49.4	99	72 - 130	
2-Butanone (MEK)	50.0	49.6	99	57 - 171	
1,2-Dichloropropane	50.0	50.7	101	77 - 122	
2-Hexanone	50.0	47.2	94	67 - 119	
methyl isobutyl ketone	50.0	47.4	95	42 - 181	
Acetone	50.0	43.8	88	57 - 117	
Benzene	50.0	51.7	103	81 - 116	
Dichlorobromomethane	50.0	52.9	106	72 - 132	
Bromoform	50.0	48.4	97	74 - 122	
Bromomethane	50.2	45.6	91	10 - 212	
Carbon disulfide	50.0	50.0	100	66 - 126	
Carbon tetrachloride	50.0	55.2	110	81 - 124	
Chlorobenzene	50.0	52.7	105	80 - 112	
Chloroethane	50.2	44.9	89	10 - 208	
Chloroform	50.0	53.4	107	77 - 124	
Chloromethane	50.2	41.2	82	10 - 189	
cis-1,2-Dichloroethene	50.0	50.3	101	81 - 122	
cis-1,3-Dichloropropene	50.0	49.9	100	61 - 127	
Chlorodibromomethane	50.0	52.9	106	83 - 130	
Ethylbenzene	50.0	52.3	105	84 - 124	
Methylene Chloride	50.0	51.9	104	62 - 130	
Styrene	50.0	51.4	103	80 - 116	
Tetrachloroethene	50.0	51.6	103	82 - 127	
Toluene	50.0	52.5	105	77 - 117	
trans-1,2-Dichloroethene	50.0	56.7	113	82 - 129	
trans-1,3-Dichloropropene	50.0	49.2	98	63 - 133	
Trichloroethene	50.0	54.1	108	81 - 122	
Vinyl acetate	50.0	111	221	80 - 141	*
Vinyl chloride	50.2	43.2	86	10 - 203	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	80 - 124
Toluene-d8 (Surr)	102	83 - 113
4-Bromofluorobenzene (Surr)	101	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23550

Method: 8260B
Preparation: N/A

MS Lab Sample ID:	510-17977-4	Analysis Batch:	510-23550	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8831.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2236			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-17977-4	Analysis Batch:	510-23550	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8832.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2309			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,1,1-Trichloroethane	78	78	78 - 125	0	30		
1,1,2,2-Tetrachloroethane	105	124	61 - 131	17	30		
1,1,2-Trichloroethane	66	66	70 - 127	1	30	F	F
1,1-Dichloroethane	81	82	80 - 123	1	30		
1,1-Dichloroethene	71	72	76 - 117	2	30	F	F
1,2-Dichloroethane	60	63	72 - 130	4	30	F	F
2-Butanone (MEK)	54	53	57 - 171	0	30	F	F
1,2-Dichloropropane	69	69	77 - 122	1	30	F	F
2-Hexanone	39	37	67 - 119	6	30	F	F
methyl isobutyl ketone	57	55	42 - 181	4	30		
Acetone	-50	-40	57 - 117	3	30	4	4
Benzene	74	78	81 - 116	5	30	F	F
Dichlorobromomethane	65	67	72 - 132	2	30	F	F
Bromoform	58	54	74 - 122	6	30	F	F
Bromomethane	64	71	10 - 212	11	30		
Carbon disulfide	64	67	66 - 126	3	30	F	
Carbon tetrachloride	67	64	81 - 124	5	30	F	F
Chlorobenzene	62	60	80 - 112	3	30	F	F
Chloroethane	67	72	10 - 208	7	30		
Chloroform	76	80	77 - 124	5	30	F	
Chloromethane	47	53	10 - 189	11	30		
cis-1,2-Dichloroethene	72	76	81 - 122	6	30	F	F
cis-1,3-Dichloropropene	54	53	61 - 127	3	30	F	F
Chlorodibromomethane	63	64	83 - 130	1	30	F	F
Ethylbenzene	65	61	84 - 124	7	30	F	F
Methylene Chloride	86	70	62 - 130	8	30		
Styrene	52	48	80 - 116	8	30	F	F
Tetrachloroethene	63	66	82 - 127	5	30	F	F
Toluene	70	70	77 - 117	0	30	F	F

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23550

Method: 8260B
Preparation: N/A

MS Lab Sample ID:	510-17977-4	Analysis Batch:	510-23550	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8831.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2236			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-17977-4	Analysis Batch:	510-23550	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8832.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2309			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
trans-1,2-Dichloroethene	78	80	82 - 129	3	30	F	F
trans-1,3-Dichloropropene	48	47	63 - 133	4	30	F	F
Trichloroethene	71	73	81 - 122	2	30	F	F
Vinyl acetate	93	86	80 - 141	8	30		
Vinyl chloride	54	63	10 - 203	17	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	82	82	80 - 124
Toluene-d8 (Surr)	95	95	83 - 113
4-Bromofluorobenzene (Surr)	122	132	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23579

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23579/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1045
Date Prepared: N/A

Analysis Batch: 510-23579
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8847.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	5.4	J	1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	4.2	J	0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	86	80 - 124
Toluene-d8 (Surr)	96	83 - 113
4-Bromofluorobenzene (Surr)	113	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike - Batch: 510-23579

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23579/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 0826
Date Prepared: N/A

Analysis Batch: 510-23579
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8846.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	43.0	86	78 - 125	
1,1,2,2-Tetrachloroethane	50.0	41.6	83	61 - 131	
1,1,2-Trichloroethane	50.0	44.5	89	70 - 127	
1,1-Dichloroethane	50.0	44.6	89	80 - 123	
1,1-Dichloroethene	50.0	41.4	83	76 - 117	
1,2-Dichloroethane	50.0	37.5	75	72 - 130	
2-Butanone (MEK)	50.0	48.1	96	57 - 171	
1,2-Dichloropropane	50.0	39.9	80	77 - 122	
2-Hexanone	50.0	35.4	71	67 - 119	
methyl isobutyl ketone	50.0	33.9	68	42 - 181	
Acetone	50.0	47.7	95	57 - 117	
Benzene	50.0	45.3	91	81 - 116	
Dichlorobromomethane	50.0	44.1	88	72 - 132	
Bromoform	50.0	48.0	96	74 - 122	
Bromomethane	50.2	44.7	89	10 - 212	
Carbon disulfide	50.0	46.1	92	66 - 126	
Carbon tetrachloride	50.0	43.8	88	81 - 124	
Chlorobenzene	50.0	47.2	94	80 - 112	
Chloroethane	50.2	39.6	79	10 - 208	
Chloroform	50.0	44.3	89	77 - 124	
Chloromethane	50.2	26.9	54	10 - 189	
cis-1,2-Dichloroethene	50.0	46.9	94	81 - 122	
cis-1,3-Dichloropropene	50.0	42.9	86	61 - 127	
Chlorodibromomethane	50.0	49.4	99	83 - 130	
Ethylbenzene	50.0	44.1	88	84 - 124	
Methylene Chloride	50.0	56.5	113	62 - 130	
Styrene	50.0	46.5	93	80 - 116	
Tetrachloroethene	50.0	49.1	98	82 - 127	
Toluene	50.0	45.5	91	77 - 117	
trans-1,2-Dichloroethene	50.0	52.5	105	82 - 129	
trans-1,3-Dichloropropene	50.0	41.3	83	63 - 133	
Trichloroethene	50.0	47.9	96	81 - 122	
Vinyl acetate	50.0	81.6	163	80 - 141	*
Vinyl chloride	50.2	34.2	68	10 - 203	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	86	80 - 124
Toluene-d8 (Surr)	101	83 - 113
4-Bromofluorobenzene (Surr)	97	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23579

Method: 8260B
Preparation: N/A

MS Lab Sample ID:	510-17977-4	Analysis Batch:	510-23579	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8849.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1151			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-17977-4	Analysis Batch:	510-23579	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8850.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1224			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,1,1-Trichloroethane	93	89	78 - 125	4	30		
1,1,2,2-Tetrachloroethane	115	109	61 - 131	5	30		
1,1,2-Trichloroethane	90	88	70 - 127	3	30		
1,1-Dichloroethane	96	90	80 - 123	7	30		
1,1-Dichloroethene	90	84	76 - 117	8	30		
1,2-Dichloroethane	79	75	72 - 130	5	30		
2-Butanone (MEK)	71	80	57 - 171	10	30		
1,2-Dichloropropane	84	83	77 - 122	2	30		
2-Hexanone	50	49	67 - 119	2	30	F	F
methyl isobutyl ketone	69	67	42 - 181	3	30		
Acetone	39	44	57 - 117	4	30	F	F
Benzene	95	91	81 - 116	4	30		
Dichlorobromomethane	91	84	72 - 132	8	30		
Bromoform	82	84	74 - 122	3	30		
Bromomethane	88	79	10 - 212	11	30		
Carbon disulfide	94	88	66 - 126	7	30		
Carbon tetrachloride	87	85	81 - 124	2	30		
Chlorobenzene	87	83	80 - 112	6	30		
Chloroethane	86	74	10 - 208	14	30		
Chloroform	97	92	77 - 124	5	30		
Chloromethane	58	54	10 - 189	7	30		
cis-1,2-Dichloroethene	96	94	81 - 122	2	30		
cis-1,3-Dichloropropene	83	80	61 - 127	3	30		
Chlorodibromomethane	90	89	83 - 130	1	30		
Ethylbenzene	82	77	84 - 124	6	30	F	F
Methylene Chloride	122	124	62 - 130	1	30		
Styrene	77	72	80 - 116	7	30	F	F
Tetrachloroethene	90	88	82 - 127	2	30		
Toluene	90	87	77 - 117	4	30		

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23579

Method: 8260B
Preparation: N/A

MS Lab Sample ID:	510-17977-4	Analysis Batch:	510-23579	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8849.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1151			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-17977-4	Analysis Batch:	510-23579	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8850.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 1224			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
trans-1,2-Dichloroethene	107	101	82 - 129	6	30		
trans-1,3-Dichloropropene	77	74	63 - 133	3	30		
Trichloroethene	99	96	81 - 122	3	30		
Vinyl acetate	150	139	80 - 141	7	30	F	
Vinyl chloride	69	67	10 - 203	3	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	82	82	80 - 124
Toluene-d8 (Surr)	97	100	83 - 113
4-Bromofluorobenzene (Surr)	110	113	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 400-55339

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55339/9-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1614
Date Prepared: 09/17/2007 0859

Analysis Batch: 400-55674
Prep Batch: 400-55339
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: MB55339S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
1,2,4-Trichlorobenzene	<330		33	330
1,2-Dichlorobenzene	<330		33	330
1,3-Dichlorobenzene	<330		33	330
1,4-Dichlorobenzene	<330		33	330
2,2'-oxybis(2-chloropropane)	<330		33	330
2,4,5-Trichlorophenol	<1700		33	1700
2,4-Dichlorophenol	<330		33	330
2,4-Dimethylphenol	<330		33	330
2,4-Dinitrophenol	<1700		150	1700
2,4-Dinitrotoluene	<330		33	330
2,6-Dinitrotoluene	<330		33	330
2-Chloronaphthalene	<330		33	330
2-Chlorophenol	<330		33	330
2-Methylnaphthalene	<330		33	330
2-Methylphenol	<330		33	330
2-Nitroaniline	<330		33	330
2-Nitrophenol	<330		33	330
3 & 4 Methylphenol	<660		33	660
3,3'-Dichlorobenzidine	<1700		33	1700
3-Nitroaniline	<330		33	330
4,6-Dinitro-2-methylphenol	<1700		33	1700
4-Bromophenyl phenyl ether	<330		33	330
4-Chloro-3-methylphenol	<330		33	330
4-Chloroaniline	<330		33	330
4-Chlorophenyl phenyl ether	<330		33	330
4-Nitroaniline	<330		33	330
4-Nitrophenol	<1700		37	1700
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Benzoic acid	<1700		280	1700
Benzyl alcohol	<330		33	330
Bis(2-chloroethoxy)methane	<330		33	330
Bis(2-chloroethyl)ether	<330		33	330
Bis(2-ethylhexyl) phthalate	<330		33	330
Butyl benzyl phthalate	<330		33	330

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 400-55339

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55339/9-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1614
Date Prepared: 09/17/2007 0859

Analysis Batch: 400-55674
Prep Batch: 400-55339
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: MB55339S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Dibenzofuran	<330		33	330
Diethyl phthalate	<330		33	330
Dimethyl phthalate	<330		33	330
Di-n-butyl phthalate	<330		33	330
Di-n-octyl phthalate	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Hexachlorobenzene	<330		33	330
Hexachlorobutadiene	<330		33	330
Hexachlorocyclopentadiene	<330		33	330
Hexachloroethane	<330		42	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Isophorone	<330		33	330
Naphthalene	<330		33	330
Nitrobenzene	<330		33	330
N-Nitrosodi-n-propylamine	<330		33	330
N-Nitrosodiphenylamine	<330		33	330
Pentachlorophenol	<1700		33	1700
Phenanthrene	<330		33	330
Phenol	<330		33	330
Pyrene	<330		33	330

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	88		24 - 111
2-Fluorobiphenyl	76		41 - 94
2-Fluorophenol	75	X	22 - 73
Nitrobenzene-d5	79		22 - 94
Phenol-d5	79		28 - 84
Terphenyl-d14	93		53 - 96

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

Lab Control Spike - Batch: 400-55339

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55339/8-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1644
Date Prepared: 09/17/2007 0859

Analysis Batch: 400-55674
Prep Batch: 400-55339
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: LC55339S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,2,4-Trichlorobenzene	1670	1380	83	44 - 112	
1,2-Dichlorobenzene	1670	1270	76	46 - 102	
1,3-Dichlorobenzene	1670	1220	73	45 - 100	
1,4-Dichlorobenzene	1670	1240	75	45 - 100	
2,2'-oxybis(2-chloropropane)	1670	1570	94	39 - 119	
2,4,5-Trichlorophenol	1670	1540	92	56 - 119	J
2,4-Dichlorophenol	1670	1400	84	45 - 115	
2,4-Dimethylphenol	1670	1400	84	39 - 109	
2,4-Dinitrophenol	1670	1010	60	28 - 167	J
2,4-Dinitrotoluene	1670	1590	96	65 - 126	
2,6-Dinitrotoluene	1670	1590	96	64 - 116	
2-Chloronaphthalene	1670	1200	72	44 - 106	
2-Chlorophenol	1670	1310	79	47 - 100	
2-Methylnaphthalene	1670	1340	81	48 - 118	
2-Methylphenol	1670	1440	87	44 - 105	
2-Nitroaniline	1670	1670	100	56 - 121	
2-Nitrophenol	1670	1340	80	41 - 109	
3 & 4 Methylphenol	3330	3030	91	43 - 122	
3,3'-Dichlorobenzidine	1670	1330	80	43 - 104	J
3-Nitroaniline	1670	1490	89	50 - 108	
4,6-Dinitro-2-methylphenol	1670	465	28	30 - 107	J *
4-Bromophenyl phenyl ether	1670	1480	89	59 - 117	
4-Chloro-3-methylphenol	1670	1550	93	50 - 116	
4-Chloroaniline	1670	1240	75	40 - 100	
4-Chlorophenyl phenyl ether	1670	1450	87	55 - 126	
4-Nitroaniline	1670	1620	97	42 - 109	
4-Nitrophenol	1670	1150	69	49 - 115	J
Acenaphthene	1670	1380	83	54 - 118	
Acenaphthylene	1670	1370	82	58 - 124	
Anthracene	1670	1360	82	56 - 120	
Benzo[a]anthracene	1670	1300	78	65 - 118	
Benzo[a]pyrene	1670	1470	88	66 - 114	
Benzo[b]fluoranthene	1670	1260	76	60 - 110	
Benzo[g,h,i]perylene	1670	1280	77	47 - 130	
Benzo[k]fluoranthene	1670	1700	102	68 - 128	
Benzoic acid	1670	2340	141	5 - 149	
Benzyl alcohol	1670	1480	89	44 - 110	
Bis(2-chloroethoxy)methane	1670	1450	87	42 - 113	
Bis(2-chloroethyl)ether	1670	1380	83	45 - 107	
Bis(2-ethylhexyl) phthalate	1670	1370	82	68 - 133	
Butyl benzyl phthalate	1670	1410	84	67 - 121	

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike - Batch: 400-55339

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55339/8-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1644
Date Prepared: 09/17/2007 0859

Analysis Batch: 400-55674
Prep Batch: 400-55339
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: LC55339S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chrysene	1670	1440	86	66 - 120	
Dibenz(a,h)anthracene	1670	1720	103	30 - 177	
Dibenzofuran	1670	1460	88	59 - 119	
Diethyl phthalate	1670	1530	92	67 - 126	
Dimethyl phthalate	1670	1460	87	63 - 116	
Di-n-butyl phthalate	1670	1470	88	68 - 124	
Di-n-octyl phthalate	1670	1380	83	65 - 123	
Fluoranthene	1670	1520	91	69 - 125	
Fluorene	1670	1420	85	58 - 124	
Hexachlorobenzene	1670	1610	97	63 - 121	
Hexachlorobutadiene	1670	1390	83	39 - 117	
Hexachlorocyclopentadiene	1670	901	54	24 - 169	
Hexachloroethane	1670	1230	74	41 - 104	
Indeno[1,2,3-cd]pyrene	1670	1310	79	60 - 117	
Isophorone	1670	1730	104	50 - 124	
Naphthalene	1670	1350	81	44 - 112	
Nitrobenzene	1670	1500	90	43 - 110	
N-Nitrosodi-n-propylamine	1670	1620	97	48 - 122	
N-Nitrosodiphenylamine	1670	712	43	32 - 62	
Pentachlorophenol	1670	1560	93	49 - 136	J
Phenanthrene	1670	1380	83	63 - 122	
Phenol	1670	1420	85	44 - 104	
Pyrene	1670	1440	86	62 - 124	

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	101		24 - 111
2-Fluorobiphenyl	83		41 - 94
2-Fluorophenol	81	X	22 - 73
Nitrobenzene-d5	87		22 - 94
Phenol-d5	84		28 - 84
Terphenyl-d14	92		53 - 96

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

Method Blank - Batch: 400-55927

Method: 8015M
Preparation: 5035

Lab Sample ID: MB 400-55927/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 2150
Date Prepared: 09/21/2007 0937

Analysis Batch: 400-55929
Prep Batch: 400-55927
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092113.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline Range Organics (GRO)-C6-C10	<100		33	100

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Lab Control Spike - Batch: 400-55927

Method: 8015M
Preparation: 5035

Lab Sample ID: LCS 400-55927/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 0937
Date Prepared: 09/21/2007 0937

Analysis Batch: 400-55929
Prep Batch: 400-55927
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092101.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Gasoline Range Organics (GRO)-C6-C10	1000	1060	106	75 - 124	

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

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

Method Blank - Batch: 400-55989

Method: 8015M
Preparation: 5035

Lab Sample ID: MB 400-55989/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1311
Date Prepared: 09/24/2007 1148

Analysis Batch: 400-55993
Prep Batch: 400-55989
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092404.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline Range Organics (GRO)-C6-C10	<100		33	100

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	91	60 - 134

Lab Control Spike - Batch: 400-55989

Method: 8015M
Preparation: 5035

Lab Sample ID: LCS 400-55989/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1148
Date Prepared: 09/24/2007 1148

Analysis Batch: 400-55993
Prep Batch: 400-55989
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092403.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Gasoline Range Organics (GRO)-C6-C10	1000	1020	102	75 - 124	

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	92	60 - 134

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

Method Blank - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-22825/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/13/2007 1653
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-22926
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<0.50		0.053	0.50
Barium	<0.13		0.039	0.13
Cadmium	<0.25		0.014	0.25
Chromium	<0.25		0.025	0.25
Lead	<0.13		0.052	0.13

Method Blank - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-22825/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/20/2007 1912
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-23294
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Silver	0.022	J	0.012	0.25

Method Blank - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-22825/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/24/2007 1408
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-23446
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Selenium	<0.25		0.047	0.25

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

Lab Control Spike - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-22825/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/13/2007 1659
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-22926
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0006 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	197	186	95	80 - 120	
Barium	645	721	112	82 - 117	
Cadmium	77.3	73.5	95	78 - 121	
Chromium	129	122	94	80 - 119	
Lead	106	106	100	81 - 118	

Lab Control Spike - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-22825/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/20/2007 1923
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-23294
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0006 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Silver	155	169	109	66 - 133	

Lab Control Spike - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-22825/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/24/2007 1410
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-23446
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0006 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Selenium	104	89.1	86	77 - 122	

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23001

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 510-23001/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 1503
Date Prepared: 09/17/2007 0950

Analysis Batch: 510-23048
Prep Batch: 510-23001
Units: mg/Kg

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<0.020		0.0047	0.020

Lab Control Spike - Batch: 510-23001

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 510-23001/2-A
Client Matrix: Solid
Dilution: 2.0
Date Analyzed: 09/17/2007 1504
Date Prepared: 09/17/2007 0950

Analysis Batch: 510-23048
Prep Batch: 510-23001
Units: mg/Kg

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.1024 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	3.90	3.59	92	66 - 133	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23001

Method: 7471A
Preparation: 7471A

MS Lab Sample ID: 510-17977-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 1509
Date Prepared: 09/17/2007 0950

Analysis Batch: 510-23048
Prep Batch: 510-23001

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5681 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 510-17977-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 1511
Date Prepared: 09/17/2007 0950

Analysis Batch: 510-23048
Prep Batch: 510-23001

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5465 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	116	99	75 - 125	11	25		

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Lab Control Spike - Batch: 510-23072

Method: 9045C
Preparation: N/A

Lab Sample ID: LCS 510-23072/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 1715
Date Prepared: N/A

Analysis Batch: 510-23072
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	12.0	11.97	100	97 - 103	

Lab Control Spike - Batch: 510-23072

Method: 9045C
Preparation: N/A

Lab Sample ID: LCS 510-23072/12
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 1715
Date Prepared: N/A

Analysis Batch: 510-23072
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	7.00	7.010	100	97 - 103	

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

Client: Burns & McDonnell

Job Number: 510-17977-1

Method Blank - Batch: 510-23085

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23085/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 2000
Date Prepared: N/A

Analysis Batch: 510-23085
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

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

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

3.2°C
510-50-041

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

17977

Client Information	Sampler: T. STECHER	Lab PM: Byrnes, Adrienne R	Carrier Tracking No(s):	COC No: 510-2378.1
Client Contact: Ms. Sharon Shelton	Phone:	E-Mail: adrienne.byrnes@testamericainc.com		Page: Page 1 of 1
Company: Burns & McDonnell				STL Job #:

Address: 9400 Ward Parkway	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Kansas City	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MO, 64114			
Phone:	PO #: Purchase Order not requir		
Email: sshelton@burnsmcd.com	WO #:		Other:
Project Name: SWMU 13	Project #: 51001006		
Site: Missouri	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 - (MOD) RCRA Metals by 6020	7471A - Hg	8270C - (MOD) Local Method	9045C - pH	SUBCONTRACT - GRO- GC 8015	8260 VOCs (3 40mL VOAs)	MOISTURE CONTENT (2 JAR)							Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N										
13B09A/0-2' 17977-1	9/10/07	1415	G	Solid			X	X	X	X	X	X	X							9	VOCs SAMPLED w/ENCORE
13B09A/2-4' -2		1430	G	Solid			X	X	X	X	X	X	X							9	SAMPLED
13B09A/4-6' -3		1445	G	Solid			X	X	X	X	X	X	X							9	
13B09A/6-8' -4		1500	G	Solid			X	X	X	X	X	X	X							9	

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Fed Ex Priority

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
TIM STECHER	9/10/07 1625	BMcD		9/10/07 1735	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				9/11/2007 1015	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-17977-1

Login Number: 17977

List Source: TestAmerica Valparaiso

Creator: Wesson, Pete J

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

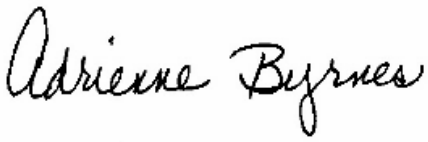
ANALYTICAL REPORT

Job Number: 510-17978-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
09/28/2007

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TestAmerica Laboratories, Inc.
TestAmerica Valparaiso 2400 Cumberland Drive, Valparaiso, IN 46383
Tel (219) 464-2389 Fax (219) 462-2953 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Job Narrative
510-J17978-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) for analytical batch 23177 exceeded control limits for the following analytes: 1,1-Dichloroethene; Benzene; Chlorobenzene; Tetrachloroethene; Toluene, and trans-1,2-Dichloroethene. Similarly, the laboratory control standard duplicate (LCSD) had high recoveries for Benzene, Chlorobenzene, and Toluene These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data has been reported.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23177 exceeded control limits for the following analytes: 1,1-Dichloroethene; Benzene; Chlorobenzene; Tetrachloroethene; Toluene, and trans-1,2-Dichloroethene. Similarly, the laboratory control standard duplicate (LCSD) had high recoveries for Benzene, Chlorobenzene, and Toluene These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data has been reported.

Method 8260B: The sample had the third internal standard, 1,4-Dichlorobenzene-d4, with an area less than 50% of that in the continuing calibration. Furthermore, the first surrogate, 1,2,-Dichloroethane-d4 had a high recovery with results for target compounds greater than the reporting limit. A reanalysis was performed, however, the Encore sample leaked. Due to a lack of further sample, the initial run is being reported. LIMS batch 23177.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23177 exceeded control limits for the following analytes: 1,1-Dichloroethene; Benzene; Chlorobenzene; Tetrachloroethene; Toluene, and trans-1,2-Dichloroethene. Similarly, the laboratory control standard duplicate (LCSD) had high recoveries for Benzene, Chlorobenzene, and Toluene These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data has been reported.

No other analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-17978-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Closed System Purge & Trap/Frozen Water	TAL VAL		SW846 5035
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Matrix: Water			
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Aqueous Samples and Extracts for	TAL VAL		SW846 3010A

Lab References:

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-17978-1

Method	Analyst	Analyst ID
SW846 8260B	Hobart, Wes E	WEH
SW846 6020	Hamner, Barb J	BJH
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-17978-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-17978-1	17 B 08B / 0-2'	Solid	09/10/2007 0940	09/11/2007 1015
510-17978-2	17 B 08B / 2-4'	Solid	09/10/2007 0945	09/11/2007 1015
510-17978-3	17 B 08B / 4-6'	Solid	09/10/2007 0950	09/11/2007 1015
510-17978-4	09 B 01 / 0-6"	Solid	09/10/2007 1110	09/11/2007 1015
510-17978-5	09 B 01 / 6-12"	Solid	09/10/2007 1110	09/11/2007 1015
510-17978-6	09 G 04 / 0-6"	Solid	09/10/2007 1200	09/11/2007 1015
510-17978-7	09 G 04 / 6-12"	Solid	09/10/2007 1202	09/11/2007 1015
510-17978-8	07 B 03 A / 0-6"	Solid	09/10/2007 1215	09/11/2007 1015
510-17978-9	07 B 03 A / 6-12"	Solid	09/10/2007 1217	09/11/2007 1015
510-17978-10	07 B 02 A / 0-6"	Solid	09/10/2007 1222	09/11/2007 1015
510-17978-11	07 B 02 A / 6-12"	Solid	09/10/2007 1224	09/11/2007 1015
510-17978-12	07 B 01 A / 0-6"	Solid	09/10/2007 1230	09/11/2007 1015
510-17978-13	07 B 01 A / 6-12"	Solid	09/10/2007 1232	09/11/2007 1015
510-17978-14	09 G 04 / RINSATE	Water	09/10/2007 1530	09/11/2007 1015

Client: Burns & McDonnell | Job Number: 510-17978-1

Client Sample ID: 17 B 08B / 0-2'

Lab Sample ID: 510-17978-1 | Date Sampled: 09/10/2007 0940
Client Matrix: Solid | % Moisture: 15.0 | Date Received: 09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23177 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23180 | Lab File ID: L8685.D
Dilution: 1.0 | Initial Weight/Volume: 31.635 g
Date Analyzed: 09/18/2007 2126 | Final Weight/Volume: 36.5128 g
Date Prepared: 09/11/2007 1435

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		40		1.9	14
Benzene		2.3	J *	1.5	6.8
Bromoform		<6.8		1.6	6.8
Bromomethane		<6.8		2.4	6.8
2-Butanone (MEK)		<14		3.9	14
Carbon disulfide		3.5	J	1.4	6.8
Carbon tetrachloride		<6.8		0.61	6.8
Chlorobenzene		<6.8	*	0.92	6.8
Chlorodibromomethane		<6.8		1.1	6.8
Chloroethane		<6.8		1.5	6.8
Chloroform		<6.8		1.0	6.8
Chloromethane		<6.8		1.3	6.8
cis-1,2-Dichloroethene		14		0.99	6.8
cis-1,3-Dichloropropene		<6.8		1.0	6.8
Dichlorobromomethane		<6.8		0.75	6.8
1,1-Dichloroethane		<6.8		0.85	6.8
1,2-Dichloroethane		<6.8		0.69	6.8
1,1-Dichloroethene		<6.8	*	0.75	6.8
1,2-Dichloropropane		<6.8		0.59	6.8
Ethylbenzene		8.2		0.87	6.8
2-Hexanone		<14		1.9	14
Methylene Chloride		12	B	0.53	6.8
methyl isobutyl ketone		<14		1.7	14
Styrene		<6.8		0.46	6.8
1,1,2,2-Tetrachloroethane		<6.8		1.5	6.8
Tetrachloroethene		<6.8	*	1.8	6.8
Toluene		2.4	J *	1.1	6.8
trans-1,2-Dichloroethene		<6.8	*	0.75	6.8
trans-1,3-Dichloropropene		<6.8		0.81	6.8
1,1,1-Trichloroethane		<6.8		0.94	6.8
1,1,2-Trichloroethane		<6.8		2.1	6.8
Trichloroethene		140		1.1	6.8
Vinyl acetate		<6.8		0.62	6.8
Vinyl chloride		<6.8		1.9	6.8
Xylenes, Total		21		2.4	14

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	111	68 - 134
1,2-Dichloroethane-d4 (Surr)	106	80 - 124
Toluene-d8 (Surr)	96	83 - 113

Client: Burns & McDonnell | Job Number: 510-17978-1

Client Sample ID: 17 B 08B / 2-4'

Lab Sample ID: 510-17978-2 | Date Sampled: 09/10/2007 0945
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23177 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8686.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/18/2007 2159 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		52		1.5	11
Benzene		1.3	J	1.3	5.6
Bromoform		<5.6		1.3	5.6
Bromomethane		<5.6		2.0	5.6
2-Butanone (MEK)		<11		3.2	11
Carbon disulfide		3.4	J	1.2	5.6
Carbon tetrachloride		<5.6		0.50	5.6
Chlorobenzene		<5.6		0.76	5.6
Chlorodibromomethane		<5.6		0.94	5.6
Chloroethane		<5.6		1.2	5.6
Chloroform		<5.6		0.83	5.6
Chloromethane		<5.6		1.1	5.6
cis-1,2-Dichloroethene		21		0.81	5.6
cis-1,3-Dichloropropene		<5.6		0.84	5.6
Dichlorobromomethane		<5.6		0.62	5.6
1,1-Dichloroethane		<5.6		0.70	5.6
1,2-Dichloroethane		<5.6		0.57	5.6
1,1-Dichloroethene		<5.6		0.61	5.6
1,2-Dichloropropane		<5.6		0.48	5.6
Ethylbenzene		<5.6		0.71	5.6
2-Hexanone		<11		1.5	11
Methylene Chloride		6.7		0.43	5.6
methyl isobutyl ketone		<11		1.4	11
Styrene		<5.6		0.38	5.6
1,1,2,2-Tetrachloroethane		<5.6		1.2	5.6
Tetrachloroethene		<5.6		1.4	5.6
Toluene		0.92	J	0.86	5.6
trans-1,2-Dichloroethene		<5.6		0.61	5.6
trans-1,3-Dichloropropene		<5.6		0.67	5.6
1,1,1-Trichloroethane		<5.6		0.77	5.6
1,1,2-Trichloroethane		<5.6		1.7	5.6
Trichloroethene		130		0.89	5.6
Vinyl acetate		<5.6		0.51	5.6
Vinyl chloride		<5.6		1.6	5.6
Xylenes, Total		<11		1.9	11

Surrogate	%Rec		Acceptance Limits
4-Bromofluorobenzene (Surr)	132		68 - 134
1,2-Dichloroethane-d4 (Surr)	131	X	80 - 124
Toluene-d8 (Surr)	86		83 - 113

Client: Burns & McDonnell | Job Number: 510-17978-1

Client Sample ID: 17 B 08B / 4-6'

Lab Sample ID: 510-17978-3 | Date Sampled: 09/10/2007 0950
Client Matrix: Solid | % Moisture: 10.5 | Date Received: 09/11/2007 1015

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23177 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8687.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/18/2007 2232 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		35		1.5	11
Benzene		<5.6	*	1.3	5.6
Bromoform		<5.6		1.3	5.6
Bromomethane		<5.6		2.0	5.6
2-Butanone (MEK)		<11		3.2	11
Carbon disulfide		3.2	J	1.2	5.6
Carbon tetrachloride		<5.6		0.50	5.6
Chlorobenzene		<5.6	*	0.76	5.6
Chlorodibromomethane		<5.6		0.94	5.6
Chloroethane		<5.6		1.2	5.6
Chloroform		<5.6		0.83	5.6
Chloromethane		<5.6		1.1	5.6
cis-1,2-Dichloroethene		8.8		0.81	5.6
cis-1,3-Dichloropropene		<5.6		0.84	5.6
Dichlorobromomethane		<5.6		0.62	5.6
1,1-Dichloroethane		<5.6		0.70	5.6
1,2-Dichloroethane		<5.6		0.57	5.6
1,1-Dichloroethene		<5.6	*	0.62	5.6
1,2-Dichloropropane		<5.6		0.48	5.6
Ethylbenzene		6.8		0.71	5.6
2-Hexanone		<11		1.5	11
Methylene Chloride		5.9	B	0.43	5.6
methyl isobutyl ketone		<11		1.4	11
Styrene		<5.6		0.38	5.6
1,1,2,2-Tetrachloroethane		<5.6		1.2	5.6
Tetrachloroethene		<5.6	*	1.5	5.6
Toluene		1.6	J *	0.86	5.6
trans-1,2-Dichloroethene		<5.6	*	0.62	5.6
trans-1,3-Dichloropropene		<5.6		0.67	5.6
1,1,1-Trichloroethane		<5.6		0.77	5.6
1,1,2-Trichloroethane		<5.6		1.7	5.6
Trichloroethene		82		0.90	5.6
Vinyl acetate		<5.6		0.51	5.6
Vinyl chloride		<5.6		1.6	5.6
Xylenes, Total		16		1.9	11

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	105	68 - 134
1,2-Dichloroethane-d4 (Surr)	104	80 - 124
Toluene-d8 (Surr)	100	83 - 113

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 09 B 01 / 0-6"

Lab Sample ID:	510-17978-4		Date Sampled: 09/10/2007 1110
Client Matrix:	Solid	% Moisture: 6.0	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0078 g
Date Analyzed:	09/13/2007 1812			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.3		0.014	0.26
Lead		43		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 09 B 01 / 6-12"

Lab Sample ID:	510-17978-5		Date Sampled: 09/10/2007 1110
Client Matrix:	Solid	% Moisture: 7.1	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0126 g
Date Analyzed:	09/13/2007 1818			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		2.5		0.015	0.27
Lead		110		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 09 G 04 / 0-6"

Lab Sample ID:	510-17978-6		Date Sampled: 09/10/2007 1200
Client Matrix:	Solid	% Moisture: 5.9	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0124 g
Date Analyzed:	09/13/2007 1823			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		2.4		0.014	0.26
Lead		150		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 09 G 04 / 6-12"

Lab Sample ID:	510-17978-7		Date Sampled: 09/10/2007 1202
Client Matrix:	Solid	% Moisture: 5.4	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0224 g
Date Analyzed:	09/13/2007 1828		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.8		0.014	0.26
Lead		120		0.054	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 03 A / 0-6"

Lab Sample ID:	510-17978-8		Date Sampled: 09/10/2007 1215
Client Matrix:	Solid	% Moisture: 8.8	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0131 g
Date Analyzed:	09/13/2007 1834			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		19		0.015	0.27
Lead		630		0.056	0.14

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 03 A / 6-12"

Lab Sample ID:	510-17978-9		Date Sampled: 09/10/2007 1217
Client Matrix:	Solid	% Moisture: 7.9	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0077 g
Date Analyzed:	09/13/2007 1839		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		35		0.015	0.27
Lead		940		0.056	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 02 A / 0-6"

Lab Sample ID:	510-17978-10		Date Sampled: 09/10/2007 1222
Client Matrix:	Solid	% Moisture: 7.6	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0026 g
Date Analyzed:	09/13/2007 1844			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		9.8		0.015	0.27
Lead		360		0.056	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 02 A / 6-12"

Lab Sample ID:	510-17978-11		Date Sampled: 09/10/2007 1224
Client Matrix:	Solid	% Moisture: 5.2	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0171 g
Date Analyzed:	09/13/2007 1900			Final Weight/Volume:	50 mL
Date Prepared:	09/12/2007 1040				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		40		0.014	0.26
Lead		1000		0.054	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 01 A / 0-6"

Lab Sample ID:	510-17978-12		Date Sampled: 09/10/2007 1230
Client Matrix:	Solid	% Moisture: 10.8	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0132 g
Date Analyzed:	09/13/2007 1905		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		5.3		0.015	0.28
Lead		290		0.058	0.14

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 07 B 01 A / 6-12"

Lab Sample ID:	510-17978-13		Date Sampled: 09/10/2007 1232
Client Matrix:	Solid	% Moisture: 7.4	Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0234 g
Date Analyzed:	09/13/2007 1911		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		8.6		0.014	0.26
Lead		290		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-17978-1

Client Sample ID: 09 G 04 / RINSATE

Lab Sample ID: 510-17978-14
Client Matrix: Water

Date Sampled: 09/10/2007 1530
Date Received: 09/11/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3010A
Dilution: 1.0
Date Analyzed: 09/16/2007 2202
Date Prepared: 09/14/2007 0900

Analysis Batch: 510-23032
Prep Batch: 510-22934

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	2.2		0.21	0.50

General Chemistry

Client Sample ID: 17 B 08B / 0-2'

Lab Sample ID: 510-17978-1 Date Sampled: 09/10/2007 0940
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				
Percent Solids	85		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				

Client Sample ID: 17 B 08B / 2-4'

Lab Sample ID: 510-17978-2 Date Sampled: 09/10/2007 0945
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				

Client Sample ID: 17 B 08B / 4-6'

Lab Sample ID: 510-17978-3 Date Sampled: 09/10/2007 0950
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				

Client Sample ID: 09 B 01 / 0-6"

Lab Sample ID: 510-17978-4 Date Sampled: 09/10/2007 1110
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	6.0		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				
Percent Solids	94		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434				

General Chemistry

Client Sample ID: 09 B 01 / 6-12"

Lab Sample ID: 510-17978-5 Date Sampled: 09/10/2007 1110
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.1		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	93		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 09 G 04 / 0-6"

Lab Sample ID: 510-17978-6 Date Sampled: 09/10/2007 1200
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	5.9		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	94		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 09 G 04 / 6-12"

Lab Sample ID: 510-17978-7 Date Sampled: 09/10/2007 1202
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	5.4		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	95		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 07 B 03 A / 0-6"

Lab Sample ID: 510-17978-8 Date Sampled: 09/10/2007 1215
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	8.8		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	91		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

General Chemistry

Client Sample ID: 07 B 03 A / 6-12"

Lab Sample ID: 510-17978-9 Date Sampled: 09/10/2007 1217
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.9		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 07 B 02 A / 0-6"

Lab Sample ID: 510-17978-10 Date Sampled: 09/10/2007 1222
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.6		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 07 B 02 A / 6-12"

Lab Sample ID: 510-17978-11 Date Sampled: 09/10/2007 1224
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	5.2		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	95		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

Client Sample ID: 07 B 01 A / 0-6"

Lab Sample ID: 510-17978-12 Date Sampled: 09/10/2007 1230
Client Matrix: Solid Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	11		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	89		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

General Chemistry

Client Sample ID: 07 B 01 A / 6-12"

Lab Sample ID: 510-17978-13
Client Matrix: Solid

Date Sampled: 09/10/2007 1232
Date Received: 09/11/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.4		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					
Percent Solids	93		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23309	Date Analyzed	09/21/2007 1434					

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-17978-1

Lab Section	Qualifier	Description
GC/MS VOA		
	B	Compound was found in the blank and sample.
	*	LCS or LCSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	X	Surrogate exceeds the control limits
Metals		
	F	MS or MSD exceeds the control limits

Client: Burns & McDonnell

Job Number: 510-17978-1

Method Blank - Batch: 510-23177

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23177/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1807
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8679.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	2.5	J	0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	108	68 - 134
1,2-Dichloroethane-d4 (Surr)	99	80 - 124
Toluene-d8 (Surr)	95	83 - 113

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23177/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1701
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8677.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23177/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1734
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8678.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	115	100	57 - 117	14	30		
Benzene	124	120	81 - 116	3	30	*	*
Bromoform	102	103	74 - 122	1	30		
Bromomethane	101	97	10 - 212	5	30		
2-Butanone (MEK)	112	106	57 - 171	5	30		
Carbon disulfide	123	126	66 - 126	2	30		
Carbon tetrachloride	123	121	81 - 124	2	30		
Chlorobenzene	117	115	80 - 112	2	30	*	*
Chlorodibromomethane	117	108	83 - 130	8	30		
Chloroethane	102	108	10 - 208	6	30		
Chloroform	112	116	77 - 124	4	30		
Chloromethane	95	99	10 - 189	5	30		
cis-1,2-Dichloroethene	115	120	81 - 122	4	30		
cis-1,3-Dichloropropene	104	104	61 - 127	0	30		
Dichlorobromomethane	115	116	72 - 132	1	30		
1,1-Dichloroethane	122	122	80 - 123	0	30		
1,2-Dichloroethane	109	107	72 - 130	2	30		
1,1-Dichloroethene	119	117	76 - 117	2	30	*	
1,2-Dichloropropane	111	109	77 - 122	2	30		
Ethylbenzene	112	111	84 - 124	1	30		
2-Hexanone	112	102	67 - 119	10	30		
Methylene Chloride	111	111	62 - 130	0	30		
methyl isobutyl ketone	105	101	42 - 181	4	30		
Styrene	110	107	80 - 116	2	30		
1,1,2,2-Tetrachloroethane	105	97	61 - 131	7	30		
Tetrachloroethene	131	122	82 - 127	7	30	*	
Toluene	124	118	77 - 117	6	30	*	*
trans-1,2-Dichloroethene	131	127	82 - 129	3	30	*	
trans-1,3-Dichloropropene	107	103	63 - 133	4	30		
1,1,1-Trichloroethane	125	125	78 - 125	0	30		
1,1,2-Trichloroethane	116	113	70 - 127	2	30		
Trichloroethene	117	117	81 - 122	1	30		

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23177/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1701
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8677.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23177/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1734
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8678.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	120	111	80 - 141	8	30		
Vinyl chloride	105	110	10 - 203	5	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	102	97	68 - 134
1,2-Dichloroethane-d4 (Surr)	98	99	80 - 124
Toluene-d8 (Surr)	101	101	83 - 113

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Method Blank - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-22825/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/13/2007 1653
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-22926
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<0.25		0.014	0.25
Lead	<0.13		0.052	0.13

Lab Control Spike - Batch: 510-22825

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-22825/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/13/2007 1659
Date Prepared: 09/12/2007 1040

Analysis Batch: 510-22926
Prep Batch: 510-22825
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0006 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	77.3	73.5	95	78 - 121	
Lead	106	106	100	81 - 118	

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-22825

Method: 6020
Preparation: 3050B
Total/NA

MS Lab Sample ID:	510-17978-D-1-B MS	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Client Matrix:	Solid	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0051 g
Date Analyzed:	09/13/2007 1741		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

MSD Lab Sample ID:	510-17978-D-1-C MSD	Analysis Batch: 510-22926	Instrument ID: TE ICPMS
Client Matrix:	Solid	Prep Batch: 510-22825	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0210 g
Date Analyzed:	09/13/2007 1757		Final Weight/Volume: 50 mL
Date Prepared:	09/12/2007 1040		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	94	91	75 - 125	5	20		
Lead	128	101	75 - 125	6	20	F	

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Method Blank - Batch: 510-22934

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-22934/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/16/2007 2152
Date Prepared: 09/14/2007 0900

Analysis Batch: 510-23032
Prep Batch: 510-22934
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Lab Control Spike - Batch: 510-22934

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-22934/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/16/2007 2157
Date Prepared: 09/14/2007 0900

Analysis Batch: 510-23032
Prep Batch: 510-22934
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	200	201	101	80 - 120	
Lead	200	209	104	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-17978-1

Method Blank - Batch: 510-23309

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23309/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 1434
Date Prepared: N/A

Analysis Batch: 510-23309
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

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

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

2.7°C
TA KC Cooler

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Tim Stecher	Lab PM: Byrnes, Adrienne R	Carrier Tracking No(s):	COC No: 510-2357.1
Client Contact: Ms. Sharon Shelton	Phone:	E-Mail: adrienne.byrnes@testamericainc.com		Page: Page ~~Turn~~ 1 OF 2
Company: Burns & McDonnell				STL Job #:
Address: 9400 Ward Parkway	Due Date Requested:			Analysis Requested
City: Kansas City	TAT Requested (days):			Preservation Codes:
State, Zip: MO, 64114	PO #: Purchase Order not requir			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Phone:	WO #:			Other:
Email: sshelton@burnsmcd.com	Project #: 51001006			
Project Name: SWMU 7 / SWMU 9 / SWMU 17	SSOW#:			
Site:				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020/3050B - (MOD) RCRA Metals by 6020	VOCs 8260 (3 40mL VOAs)	Moisture Content	Total Number of containers	Special Instructions/Note:
Preservation Code:					N	N					
17B08B / 0-2' 17978-1	9/6/07	0940	G	Solid	N		X	X		4	VOC SAMPLES COLLECTED
17B08B / 2-4' -2		0945	G	Solid	N		X	X		4	W/ ENCORE SAMPLER
17B08B / 4-6' -3		0950	G	Solid	N		X	X		4	
09B01 / 0-6" -4		1110	G	Solid	N	X				6	
09B01 / 6-12" -5		1110	G	Solid	N	X				1	
09G04 / 0-6" -6		1200	C	Solid	N	X				1	
09G04 / 6-12" -7		1202	C	Solid	N	X				1	
07B03A / 0-6" -8		1215	G	"		X				1	
07B03A / 6-12" -9		1217	G	"		X				1	
07B02A / 0-6" -10		1222	G	"		X				1	
07B02A / 6-12" -11		1224	G	"		X				1	

17978

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Tim Stecher	Date/Time: 9/10/07 1625	Company: TA	Received by: [signature]	Date/Time: 9/10/07 1625	Company: TA
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 9/11/2007 1015	Company: TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

2.7°C
TA KC Cooler

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: TIM STECHER	Lab PM: Byrnes, Adrienne R	Carrier Tracking No(s):	COC No: 510-2377.1
Client Contact: Ms. Sharon Shelton	Phone:	E-Mail: adrienne.byrnes@testamericainc.com		Page: Page ~~1 of 1~~ 2 of 2
Company: Burns & McDonnell				STL Job #:
Address: 9400 Ward Parkway	Due Date Requested:			
City: Kansas City	TAT Requested (days):			
State, Zip: MO, 64114				
Phone:	PO #: Purchase Order not requir			
Email: sshelton@burnsmcd.com	WO #:			
Project Name: ~~SWMU 17~~ SWMU 7	Project #: 51001006			
Site: Missouri	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	~~8260B~~ TS N	~~8260B~~ ~~Moisture~~ TS N	6020/3050B - (MOD) RCPA METALS by 6020	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
07B01A / 0-6" 17978-12	9/10/07	1230	G	Solid					X	1	
07B01A / 6-12" -13		1232	G	Solid					X	1	
~~07B01A / RINSATE~~		~~1530~~	~~G~~	~~Solid~~ Liquid					~~X~~	1	~~H2NO3 Preserved~~
~~09G04~~ 09G04 / RINSATE -14	9/10/07	1530	G	~~Solid~~ Liquid					X	1	HNO3 Preserved

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: TIM STECHER	Date/Time: 9/10/07 / 1625	Company: BMCD	Received by: [signature]	Date/Time: 9/10/07 1625	Company: TA
Relinquished by:	Date/Time:	Company:	Received by: [signature]	Date/Time: 9/11/2007 1015	Company: TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

17978

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-17978-1

Login Number: 17978
List Source: TestAmerica Valparaiso
Creator: Wesson, Pete J
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

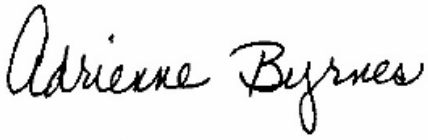
ANALYTICAL REPORT

Job Number: 510-18045-1

Job Description: AK Steel Kansas City Facility RCRA Suppl

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/07/2007
Revision: 1

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Job Narrative
510-J18045-1

Comments
This report has been revised to correct reporting errors.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) for analytical batch 23177 exceeded control limits for the following analytes: 1,1-Dichloroethene; Benzene; Chlorobenzene; Tetrachloroethene; Toluene, and trans-1,2-Dichloroethene. Similarly, the laboratory control standard duplicate (LCSD) had high recoveries for Benzene, Chlorobenzene, and Toluene These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data has been reported.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23290 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; 2-Hexanone; Acetone; Benzene; Carbon Tetrachloride; Chlorobenzene; Toluene; and Vinyl Acetate. Likewise the laboratory control standard duplicate (LCSD) exceeded control limits for 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; Benzene; Carbon Disulfide; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Isopropyl Benzene; Toluene, and Vinyl Acetate; These analytes were biased high in the LCS/LCSD and were not detected in the associated samples; therefore, the data have been reported. Any result for any of the target compounds that exceeds the reporting limit has been rejected and will be reanlyzed.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18045-1. The sample(s) shows evidence of matrix interference. TALS batch 23290.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18045-1. Evidence of matrix interference is present based on reproducibility; therefore, re-extraction and/or re-analysis was not performed. LIMS batch 23290.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23550 exceeded control limits for the following analyte: Vinyl Acetate. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Reanalysis of the sample was performed outside of the analytical holding time due to QC failures.: 510-18045-1. TALS batch 23550, method 8260b.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18045-1. The sample(s) shows evidence of matrix interference based on the reproducibility of the occurence. TALS batch 23550.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18045-1. Evidence of matrix interference is present based on the reproducibility of the occurence; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23550.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method 8270C: The blank and LCS for preparation batch 55409 had the surrogate 2-fluorophenol recover slightly above the upper control limit. All the spike compounds passed criteria; therefore, re-extraction was preformed,

No other analytical or quality issues were noted.

GC VOA
No analytical or quality issues were noted.

GC Semi VOA
Method OA-2: Due to the level of dilution required for the following sample(s), surrogate recoveries are not reported: .

No other analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

VOA Prep

No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18045-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Closed System Purge & Trap/Frozen Water	TAL VAL		SW846 5035
GRO by 8015M	TAL PEN	SW846 8015M	
Closed System Purge & Trap/Field Preservation	TAL PEN		SW846 5035
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	TAL PEN	SW846 8270C	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Iowa - Extractable Petroleum Products	TAL PEN	Iowa DNR OA-2	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Chromium, Hexavalent (Colorimetric)	TAL SAV	SW846 7196A	
Alkaline Digestion for CrVI on Solids	TAL SAV		SW846 3060A

Lab References:

TAL PEN = TestAmerica Pensacola

TAL SAV = TestAmerica Savannah

TAL VAL = TestAmerica Valparaiso

Method References:

Iowa DNR = Iowa Department of Natural Resources

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18045-1

Method	Analyst	Analyst ID
SW846 8260B	Hobart, Wes E	WEH
SW846 8270C	Wingo, Rita	RW
SW846 8015M	Potts, Charles	CP
Iowa DNR OA-2	Ayers, Kim	KA
SW846 6020	Hamner, Barb J	BJH
SW846 7196A	Ross, Jon	JR
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18045-1	12B01A 0-2'	Solid	09/11/2007 1405	09/12/2007 1020
510-18045-2	12B01A 2-4'	Solid	09/11/2007 1415	09/12/2007 1020
510-18045-3	12B01A 2-4'	Solid	09/11/2007 1415	09/12/2007 1020
510-18045-4	12B01A 4-6'	Solid	09/11/2007 1430	09/12/2007 1020
510-18045-5	12B01A 6-8'	Solid	09/11/2007 1445	09/12/2007 1020

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID: 510-18045-1 | Date Sampled: 09/11/2007 1405
Client Matrix: Solid | % Moisture: 18.4 | Date Received: 09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23445 | Lab File ID: L8723.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/20/2007 2248 | Final Weight/Volume: 5 mL
Date Prepared: 09/12/2007 0923

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.5	*	1.0	7.5
1,1,2,2-Tetrachloroethane		<7.5		1.7	7.5
1,1,2-Trichloroethane		<7.5		2.3	7.5
1,1-Dichloroethane		<7.5	*	0.94	7.5
1,1-Dichloroethene		<7.5	*	0.83	7.5
1,2-Dichloroethane		<7.5		0.77	7.5
2-Butanone (MEK)		<15		4.3	15
1,2-Dichloropropane		<7.5		0.65	7.5
2-Hexanone		<15	*	2.1	15
methyl isobutyl ketone		<15		1.9	15
Benzene		5.3	J *	1.7	7.5
Dichlorobromomethane		<7.5		0.83	7.5
Bromoform		<7.5		1.8	7.5
Bromomethane		<7.5		2.6	7.5
Carbon disulfide		7.0	J *	1.6	7.5
Carbon tetrachloride		<7.5	*	0.68	7.5
Chlorobenzene		<7.5	*	1.0	7.5
Chloroethane		<7.5		1.6	7.5
Chloroform		<7.5		1.1	7.5
Chloromethane		<7.5		1.5	7.5
cis-1,2-Dichloroethene		<7.5	*	1.1	7.5
cis-1,3-Dichloropropene		<7.5		1.1	7.5
Chlorodibromomethane		<7.5		1.3	7.5
Ethylbenzene		9.9		0.96	7.5
Methylene Chloride		4.7	J	0.58	7.5
Styrene		<7.5		0.51	7.5
Tetrachloroethene		<7.5		2.0	7.5
Toluene		7.3	J *	1.2	7.5
trans-1,2-Dichloroethene		<7.5		0.83	7.5
trans-1,3-Dichloropropene		<7.5		0.90	7.5
Trichloroethene		<7.5		1.2	7.5
Vinyl acetate		<7.5	*	0.69	7.5
Vinyl chloride		<7.5		2.1	7.5
Xylenes, Total		14	J	2.6	15

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	145	X	80 - 124
Toluene-d8 (Surr)	78	X	83 - 113
4-Bromofluorobenzene (Surr)	167	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8833.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2342	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		<12	H	1.7	12

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8833.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/26/2007 2342	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	93		80 - 124
Toluene-d8 (Surr)	80	X	83 - 113
4-Bromofluorobenzene (Surr)	196	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23177		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23255		Lab File ID:	L8689.D
Dilution:	1.0			Initial Weight/Volume:	31.702 g
Date Analyzed:	09/18/2007 2338			Final Weight/Volume:	36.4907 g
Date Prepared:	09/12/2007 1558				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<8.2		1.1	8.2
1,1,2,2-Tetrachloroethane		<8.2		1.8	8.2
1,1,2-Trichloroethane		<8.2		2.6	8.2
1,1-Dichloroethane		<8.2		1.0	8.2
1,1-Dichloroethene		<8.2	*	0.91	8.2
1,2-Dichloroethane		<8.2		0.84	8.2
2-Butanone (MEK)		<16		4.7	16
1,2-Dichloropropane		<8.2		0.71	8.2
2-Hexanone		<16		2.3	16
methyl isobutyl ketone		<16		2.1	16
Acetone		54		2.3	16
Benzene		4.7	J *	1.9	8.2
Dichlorobromomethane		<8.2		0.91	8.2
Bromoform		<8.2		1.9	8.2
Bromomethane		<8.2		2.9	8.2
Carbon disulfide		3.9	J	1.7	8.2
Carbon tetrachloride		<8.2		0.74	8.2
Chlorobenzene		<8.2	*	1.1	8.2
Chloroethane		<8.2		1.8	8.2
Chloroform		<8.2		1.2	8.2
Chloromethane		<8.2		1.6	8.2
cis-1,2-Dichloroethene		<8.2		1.2	8.2
cis-1,3-Dichloropropene		<8.2		1.2	8.2
Chlorodibromomethane		<8.2		1.4	8.2
Ethylbenzene		10		1.1	8.2
Methylene Chloride		11	B	0.64	8.2
Styrene		<8.2		0.56	8.2
Tetrachloroethene		<8.2	*	2.1	8.2
Toluene		7.2	J *	1.3	8.2
trans-1,2-Dichloroethene		<8.2	*	0.91	8.2
trans-1,3-Dichloropropene		<8.2		0.99	8.2
Trichloroethene		<8.2		1.3	8.2
Vinyl acetate		<8.2		0.76	8.2
Vinyl chloride		<8.2		2.3	8.2
Xylenes, Total		15	J	2.9	16

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	123	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-3			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	29.0	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23177		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23255		Lab File ID:	L8690.D
Dilution:	1.0			Initial Weight/Volume:	31.723 g
Date Analyzed:	09/19/2007 0011			Final Weight/Volume:	37.4677 g
Date Prepared:	09/12/2007 1558				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<8.3		1.2	8.3
1,1,2,2-Tetrachloroethane		<8.3		1.8	8.3
1,1,2-Trichloroethane		<8.3		2.6	8.3
1,1-Dichloroethane		<8.3		1.0	8.3
1,1-Dichloroethene		<8.3	*	0.92	8.3
1,2-Dichloroethane		<8.3		0.85	8.3
2-Butanone (MEK)		17		4.8	17
1,2-Dichloropropane		<8.3		0.72	8.3
2-Hexanone		<17		2.3	17
methyl isobutyl ketone		<17		2.1	17
Acetone		63		2.3	17
Benzene		3.5	J *	1.9	8.3
Dichlorobromomethane		<8.3		0.92	8.3
Bromoform		<8.3		2.0	8.3
Bromomethane		<8.3		2.9	8.3
Carbon disulfide		4.8	J	1.7	8.3
Carbon tetrachloride		<8.3		0.75	8.3
Chlorobenzene		<8.3	*	1.1	8.3
Chloroethane		<8.3		1.8	8.3
Chloroform		<8.3		1.2	8.3
Chloromethane		<8.3		1.6	8.3
cis-1,2-Dichloroethene		<8.3		1.2	8.3
cis-1,3-Dichloropropene		<8.3		1.3	8.3
Chlorodibromomethane		<8.3		1.4	8.3
Ethylbenzene		9.1		1.1	8.3
Methylene Chloride		14	B	0.65	8.3
Styrene		<8.3		0.57	8.3
Tetrachloroethene		<8.3	*	2.2	8.3
Toluene		2.1	J *	1.3	8.3
trans-1,2-Dichloroethene		<8.3	*	0.92	8.3
trans-1,3-Dichloropropene		<8.3		1.0	8.3
Trichloroethene		<8.3		1.3	8.3
Vinyl acetate		<8.3		0.77	8.3
Vinyl chloride		<8.3		2.4	8.3
Xylenes, Total		<17		2.9	17

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	111	80 - 124
Toluene-d8 (Surr)	94	83 - 113
4-Bromofluorobenzene (Surr)	96	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23177		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23255		Lab File ID:	L8691.D
Dilution:	1.0			Initial Weight/Volume:	31.846 g
Date Analyzed:	09/19/2007 0044			Final Weight/Volume:	37.6887 g
Date Prepared:	09/12/2007 1558				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.0		0.97	7.0
1,1,2,2-Tetrachloroethane		<7.0		1.5	7.0
1,1,2-Trichloroethane		<7.0		2.2	7.0
1,1-Dichloroethane		<7.0		0.88	7.0
1,1-Dichloroethene		<7.0	*	0.77	7.0
1,2-Dichloroethane		<7.0		0.72	7.0
2-Butanone (MEK)		<14		4.0	14
1,2-Dichloropropane		<7.0		0.61	7.0
2-Hexanone		<14		1.9	14
methyl isobutyl ketone		<14		1.8	14
Acetone		34		1.9	14
Benzene		<7.0	*	1.6	7.0
Dichlorobromomethane		<7.0		0.78	7.0
Bromoform		<7.0		1.7	7.0
Bromomethane		<7.0		2.5	7.0
Carbon disulfide		2.0	J	1.5	7.0
Carbon tetrachloride		<7.0		0.63	7.0
Chlorobenzene		<7.0	*	0.96	7.0
Chloroethane		<7.0		1.5	7.0
Chloroform		<7.0		1.0	7.0
Chloromethane		<7.0		1.4	7.0
cis-1,2-Dichloroethene		<7.0		1.0	7.0
cis-1,3-Dichloropropene		<7.0		1.1	7.0
Chlorodibromomethane		<7.0		1.2	7.0
Ethylbenzene		<7.0		0.90	7.0
Methylene Chloride		13	B	0.54	7.0
Styrene		<7.0		0.48	7.0
Tetrachloroethene		<7.0	*	1.8	7.0
Toluene		1.5	J *	1.1	7.0
trans-1,2-Dichloroethene		<7.0	*	0.77	7.0
trans-1,3-Dichloropropene		<7.0		0.84	7.0
Trichloroethene		<7.0		1.1	7.0
Vinyl acetate		<7.0		0.65	7.0
Vinyl chloride		<7.0		2.0	7.0
Xylenes, Total		<14		2.4	14

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	80 - 124
Toluene-d8 (Surr)	97	83 - 113
4-Bromofluorobenzene (Surr)	107	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23177		Instrument ID:	Agilent 5975 GC/MS
Preparation:	5035	Prep Batch: 510-23255		Lab File ID:	L8692.D
Dilution:	1.0			Initial Weight/Volume:	31.959 g
Date Analyzed:	09/19/2007 0117			Final Weight/Volume:	35.1737 g
Date Prepared:	09/12/2007 1558				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<6.6		0.91	6.6
1,1,2,2-Tetrachloroethane		<6.6		1.4	6.6
1,1,2-Trichloroethane		<6.6		2.0	6.6
1,1-Dichloroethane		<6.6		0.82	6.6
1,1-Dichloroethene		<6.6	*	0.73	6.6
1,2-Dichloroethane		<6.6		0.67	6.6
2-Butanone (MEK)		<13		3.8	13
1,2-Dichloropropane		<6.6		0.57	6.6
2-Hexanone		<13		1.8	13
methyl isobutyl ketone		<13		1.7	13
Acetone		28		1.8	13
Benzene		<6.6	*	1.5	6.6
Dichlorobromomethane		<6.6		0.73	6.6
Bromoform		<6.6		1.6	6.6
Bromomethane		<6.6		2.3	6.6
Carbon disulfide		<6.6		1.4	6.6
Carbon tetrachloride		<6.6		0.60	6.6
Chlorobenzene		<6.6	*	0.90	6.6
Chloroethane		<6.6		1.4	6.6
Chloroform		<6.6		0.98	6.6
Chloromethane		<6.6		1.3	6.6
cis-1,2-Dichloroethene		<6.6		0.96	6.6
cis-1,3-Dichloropropene		<6.6		0.99	6.6
Chlorodibromomethane		<6.6		1.1	6.6
Ethylbenzene		7.5		0.84	6.6
Methylene Chloride		12	B	0.51	6.6
Styrene		<6.6		0.45	6.6
Tetrachloroethene		<6.6	*	1.7	6.6
Toluene		2.6	J *	1.0	6.6
trans-1,2-Dichloroethene		<6.6	*	0.73	6.6
trans-1,3-Dichloropropene		<6.6		0.79	6.6
Trichloroethene		<6.6		1.1	6.6
Vinyl acetate		<6.6		0.61	6.6
Vinyl chloride		<6.6		1.9	6.6
Xylenes, Total		11	J	2.3	13

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	121	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	105	68 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G1R.D
Dilution:	1.0			Initial Weight/Volume:	30.09 g
Date Analyzed:	09/26/2007 2119			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<2000		200	2000
1,2-Dichlorobenzene		<2000		200	2000
1,3-Dichlorobenzene		<2000		200	2000
1,4-Dichlorobenzene		<2000		200	2000
2,2'-oxybis(2-chloropropane)		<2000		200	2000
2,4,5-Trichlorophenol		<10000		200	10000
2,4-Dichlorophenol		<2000		200	2000
2,4-Dimethylphenol		<2000		200	2000
2,4-Dinitrophenol		<10000		920	10000
2,4-Dinitrotoluene		<2000		200	2000
2,6-Dinitrotoluene		<2000		200	2000
2-Chloronaphthalene		<2000		200	2000
2-Chlorophenol		<2000		200	2000
2-Methylnaphthalene		9700		200	2000
2-Methylphenol		<2000		200	2000
2-Nitroaniline		<2000		200	2000
2-Nitrophenol		<2000		200	2000
3 & 4 Methylphenol		<4000		200	4000
3,3'-Dichlorobenzidine		<10000		200	10000
3-Nitroaniline		<2000		200	2000
4,6-Dinitro-2-methylphenol		<10000		200	10000
4-Bromophenyl phenyl ether		<2000		200	2000
4-Chloro-3-methylphenol		<2000		200	2000
4-Chloroaniline		<2000		200	2000
4-Chlorophenyl phenyl ether		<2000		200	2000
4-Nitroaniline		<2000		200	2000
4-Nitrophenol		<10000		230	10000
Acenaphthene		<2000		200	2000
Acenaphthylene		<2000		200	2000
Anthracene		370	J	200	2000
Benzo[a]anthracene		3700		200	2000
Benzo[a]pyrene		17000		200	2000
Benzo[g,h,i]perylene		7800		200	2000
Benzoic acid		<10000		1700	10000
Benzyl alcohol		<2000		200	2000
Bis(2-chloroethoxy)methane		<2000		200	2000
Bis(2-chloroethyl)ether		<2000		200	2000
Bis(2-ethylhexyl) phthalate		<2000		200	2000
Butyl benzyl phthalate		<2000		200	2000
Chrysene		17000		200	2000
Dibenz(a,h)anthracene		7300		200	2000
Dibenzofuran		510	J	200	2000
Diethyl phthalate		<2000		200	2000
Dimethyl phthalate		<2000		200	2000

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G1R.D
Dilution:	1.0			Initial Weight/Volume:	30.09 g
Date Analyzed:	09/26/2007 2119			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Di-n-butyl phthalate		<2000		200	2000
Di-n-octyl phthalate		<2000		200	2000
Fluoranthene		<2000		200	2000
Fluorene		<2000		200	2000
Hexachlorobenzene		<2000		200	2000
Hexachlorobutadiene		<2000		200	2000
Hexachlorocyclopentadiene		<2000		200	2000
Hexachloroethane		<2000		260	2000
Indeno[1,2,3-cd]pyrene		2700		200	2000
Isophorone		<2000		200	2000
Naphthalene		5800		200	2000
Nitrobenzene		<2000		200	2000
N-Nitrosodi-n-propylamine		<2000		200	2000
N-Nitrosodiphenylamine		<2000		200	2000
Pentachlorophenol		<10000		200	10000
Phenanthrene		1500	J	200	2000
Phenol		<2000		200	2000
Pyrene		4500		200	2000

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	77	24 - 111
2-Fluorobiphenyl	94	41 - 94
Nitrobenzene-d5	86	22 - 94
Phenol-d5	76	28 - 84

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G1X.D
Dilution:	10			Initial Weight/Volume:	30.09 g
Date Analyzed:	09/25/2007 1826			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Benzo[b]fluoranthene		15000	J	2000	20000
Benzo[k]fluoranthene		3300	J	2000	20000

Surrogate	%Rec	Acceptance Limits
2-Fluorophenol	65	22 - 73
Terphenyl-d14	87	53 - 96

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G2.D
Dilution:	1.0			Initial Weight/Volume:	30.17 g
Date Analyzed:	09/25/2007 1442			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<470		47	470
1,2-Dichlorobenzene		<470		47	470
1,3-Dichlorobenzene		<470		47	470
1,4-Dichlorobenzene		<470		47	470
2,2'-oxybis(2-chloropropane)		<470		47	470
2,4,5-Trichlorophenol		<2400		47	2400
2,4-Dichlorophenol		<470		47	470
2,4-Dimethylphenol		<470		47	470
2,4-Dinitrophenol		<2400		210	2400
2,4-Dinitrotoluene		<470		47	470
2,6-Dinitrotoluene		<470		47	470
2-Chloronaphthalene		<470		47	470
2-Chlorophenol		<470		47	470
2-Methylnaphthalene		<470		47	470
2-Methylphenol		<470		47	470
2-Nitroaniline		<470		47	470
2-Nitrophenol		<470		47	470
3 & 4 Methylphenol		<940		47	940
3,3'-Dichlorobenzidine		<2400		47	2400
3-Nitroaniline		<470		47	470
4,6-Dinitro-2-methylphenol		<2400		47	2400
4-Bromophenyl phenyl ether		<470		47	470
4-Chloro-3-methylphenol		<470		47	470
4-Chloroaniline		<470		47	470
4-Chlorophenyl phenyl ether		<470		47	470
4-Nitroaniline		<470		47	470
4-Nitrophenol		<2400		53	2400
Acenaphthene		<470		47	470
Acenaphthylene		<470		47	470
Anthracene		<470		47	470
Benzo[a]anthracene		<470		47	470
Benzo[a]pyrene		<470		47	470
Benzo[b]fluoranthene		<470		47	470
Benzo[g,h,i]perylene		<470		47	470
Benzo[k]fluoranthene		<470		47	470
Benzoic acid		<2400		400	2400
Benzyl alcohol		<470		47	470
Bis(2-chloroethoxy)methane		<470		47	470
Bis(2-chloroethyl)ether		<470		47	470
Bis(2-ethylhexyl) phthalate		<470		47	470
Butyl benzyl phthalate		<470		47	470
Chrysene		<470		47	470
Dibenz(a,h)anthracene		<470		47	470
Dibenzofuran		<470		47	470

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G2.D
Dilution:	1.0			Initial Weight/Volume:	30.17 g
Date Analyzed:	09/25/2007 1442			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<470		47	470
Dimethyl phthalate		<470		47	470
Di-n-butyl phthalate		<470		47	470
Di-n-octyl phthalate		<470		47	470
Fluoranthene		<470		47	470
Fluorene		<470		47	470
Hexachlorobenzene		<470		47	470
Hexachlorobutadiene		<470		47	470
Hexachlorocyclopentadiene		<470		47	470
Hexachloroethane		<470		60	470
Indeno[1,2,3-cd]pyrene		<470		47	470
Isophorone		<470		47	470
Naphthalene		<470		47	470
Nitrobenzene		<470		47	470
N-Nitrosodi-n-propylamine		<470		47	470
N-Nitrosodiphenylamine		<470		47	470
Pentachlorophenol		<2400		47	2400
Phenanthrene		<470		47	470
Phenol		<470		47	470
Pyrene		<470		47	470

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	67	24 - 111
2-Fluorobiphenyl	74	41 - 94
2-Fluorophenol	59	22 - 73
Nitrobenzene-d5	63	22 - 94
Phenol-d5	63	28 - 84
Terphenyl-d14	80	53 - 96

Client: Burns & McDonnell Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID: 510-18045-3 Date Sampled: 09/11/2007 1415
Client Matrix: Solid % Moisture: 29.0 Date Received: 09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C Analysis Batch: 400-55654 Instrument ID: GC/MSD
Preparation: 3550B Prep Batch: 400-55409 Lab File ID: 18045G3.D
Dilution: 1.0 Initial Weight/Volume: 30.46 g
Date Analyzed: 09/25/2007 1930 Final Weight/Volume: 1.0 mL
Date Prepared: 09/18/2007 0916 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<460		46	460
1,2-Dichlorobenzene		<460		46	460
1,3-Dichlorobenzene		<460		46	460
1,4-Dichlorobenzene		<460		46	460
2,2'-oxybis(2-chloropropane)		<460		46	460
2,4,5-Trichlorophenol		<2400		46	2400
2,4-Dichlorophenol		<460		46	460
2,4-Dimethylphenol		<460		46	460
2,4-Dinitrophenol		<2400		210	2400
2,4-Dinitrotoluene		<460		46	460
2,6-Dinitrotoluene		<460		46	460
2-Chloronaphthalene		<460		46	460
2-Chlorophenol		<460		46	460
2-Methylnaphthalene		1000		46	460
2-Methylphenol		<460		46	460
2-Nitroaniline		<460		46	460
2-Nitrophenol		<460		46	460
3 & 4 Methylphenol		<920		46	920
3,3'-Dichlorobenzidine		<2400		46	2400
3-Nitroaniline		<460		46	460
4,6-Dinitro-2-methylphenol		<2400		46	2400
4-Bromophenyl phenyl ether		<460		46	460
4-Chloro-3-methylphenol		<460		46	460
4-Chloroaniline		<460		46	460
4-Chlorophenyl phenyl ether		<460		46	460
4-Nitroaniline		<460		46	460
4-Nitrophenol		<2400		51	2400
Acenaphthene		<460		46	460
Acenaphthylene		<460		46	460
Anthracene		<460		46	460
Benzo[a]anthracene		210	J	46	460
Benzo[a]pyrene		530		46	460
Benzo[b]fluoranthene		530		46	460
Benzo[g,h,i]perylene		1100		46	460
Benzo[k]fluoranthene		140	J	46	460
Benzoic acid		<2400		390	2400
Benzyl alcohol		<460		46	460
Bis(2-chloroethoxy)methane		<460		46	460
Bis(2-chloroethyl)ether		<460		46	460
Bis(2-ethylhexyl) phthalate		<460		46	460
Butyl benzyl phthalate		<460		46	460
Chrysene		500		46	460
Dibenz(a,h)anthracene		550		46	460
Dibenzofuran		<460		46	460

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-3			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	29.0	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G3.D
Dilution:	1.0			Initial Weight/Volume:	30.46 g
Date Analyzed:	09/25/2007 1930			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<460		46	460
Dimethyl phthalate		<460		46	460
Di-n-butyl phthalate		<460		46	460
Di-n-octyl phthalate		<460		46	460
Fluoranthene		<460		46	460
Fluorene		<460		46	460
Hexachlorobenzene		<460		46	460
Hexachlorobutadiene		<460		46	460
Hexachlorocyclopentadiene		<460		46	460
Hexachloroethane		<460		58	460
Indeno[1,2,3-cd]pyrene		270	J	46	460
Isophorone		<460		46	460
Naphthalene		620		46	460
Nitrobenzene		<460		46	460
N-Nitrosodi-n-propylamine		<460		46	460
N-Nitrosodiphenylamine		<460		46	460
Pentachlorophenol		<2400		46	2400
Phenanthrene		<460		46	460
Phenol		<460		46	460
Pyrene		240	J	46	460

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	57	24 - 111
2-Fluorobiphenyl	65	41 - 94
2-Fluorophenol	52	22 - 73
Nitrobenzene-d5	58	22 - 94
Phenol-d5	56	28 - 84
Terphenyl-d14	68	53 - 96

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G4.D
Dilution:	1.0			Initial Weight/Volume:	30.27 g
Date Analyzed:	09/25/2007 1514			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<390		39	390
1,2-Dichlorobenzene		<390		39	390
1,3-Dichlorobenzene		<390		39	390
1,4-Dichlorobenzene		<390		39	390
2,2'-oxybis(2-chloropropane)		<390		39	390
2,4,5-Trichlorophenol		<2000		39	2000
2,4-Dichlorophenol		<390		39	390
2,4-Dimethylphenol		<390		39	390
2,4-Dinitrophenol		<2000		180	2000
2,4-Dinitrotoluene		<390		39	390
2,6-Dinitrotoluene		<390		39	390
2-Chloronaphthalene		<390		39	390
2-Chlorophenol		<390		39	390
2-Methylnaphthalene		<390		39	390
2-Methylphenol		<390		39	390
2-Nitroaniline		<390		39	390
2-Nitrophenol		<390		39	390
3 & 4 Methylphenol		<780		39	780
3,3'-Dichlorobenzidine		<2000		39	2000
3-Nitroaniline		<390		39	390
4,6-Dinitro-2-methylphenol		<2000		39	2000
4-Bromophenyl phenyl ether		<390		39	390
4-Chloro-3-methylphenol		<390		39	390
4-Chloroaniline		<390		39	390
4-Chlorophenyl phenyl ether		<390		39	390
4-Nitroaniline		<390		39	390
4-Nitrophenol		<2000		43	2000
Acenaphthene		<390		39	390
Acenaphthylene		<390		39	390
Anthracene		<390		39	390
Benzo[a]anthracene		<390		39	390
Benzo[a]pyrene		<390		39	390
Benzo[b]fluoranthene		<390		39	390
Benzo[g,h,i]perylene		<390		39	390
Benzo[k]fluoranthene		<390		39	390
Benzoic acid		<2000		330	2000
Benzyl alcohol		<390		39	390
Bis(2-chloroethoxy)methane		<390		39	390
Bis(2-chloroethyl)ether		<390		39	390
Bis(2-ethylhexyl) phthalate		<390		39	390
Butyl benzyl phthalate		<390		39	390
Chrysene		<390		39	390
Dibenz(a,h)anthracene		<390		39	390
Dibenzofuran		<390		39	390

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045G4.D
Dilution:	1.0			Initial Weight/Volume:	30.27 g
Date Analyzed:	09/25/2007 1514			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<390		39	390
Dimethyl phthalate		<390		39	390
Di-n-butyl phthalate		<390		39	390
Di-n-octyl phthalate		<390		39	390
Fluoranthene		<390		39	390
Fluorene		<390		39	390
Hexachlorobenzene		<390		39	390
Hexachlorobutadiene		<390		39	390
Hexachlorocyclopentadiene		<390		39	390
Hexachloroethane		<390		49	390
Indeno[1,2,3-cd]pyrene		<390		39	390
Isophorone		<390		39	390
Naphthalene		<390		39	390
Nitrobenzene		<390		39	390
N-Nitrosodi-n-propylamine		<390		39	390
N-Nitrosodiphenylamine		<390		39	390
Pentachlorophenol		<2000		39	2000
Phenanthrene		<390		39	390
Phenol		<390		39	390
Pyrene		<390		39	390

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	42	24 - 111
2-Fluorobiphenyl	56	41 - 94
2-Fluorophenol	45	22 - 73
Nitrobenzene-d5	52	22 - 94
Phenol-d5	51	28 - 84
Terphenyl-d14	64	53 - 96

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045F5.D
Dilution:	1.0			Initial Weight/Volume:	30.42 g
Date Analyzed:	09/25/2007 1546			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<390		39	390
1,2-Dichlorobenzene		<390		39	390
1,3-Dichlorobenzene		<390		39	390
1,4-Dichlorobenzene		<390		39	390
2,2'-oxybis(2-chloropropane)		<390		39	390
2,4,5-Trichlorophenol		<2000		39	2000
2,4-Dichlorophenol		<390		39	390
2,4-Dimethylphenol		<390		39	390
2,4-Dinitrophenol		<2000		180	2000
2,4-Dinitrotoluene		<390		39	390
2,6-Dinitrotoluene		<390		39	390
2-Chloronaphthalene		<390		39	390
2-Chlorophenol		<390		39	390
2-Methylnaphthalene		<390		39	390
2-Methylphenol		<390		39	390
2-Nitroaniline		<390		39	390
2-Nitrophenol		<390		39	390
3 & 4 Methylphenol		<780		39	780
3,3'-Dichlorobenzidine		<2000		39	2000
3-Nitroaniline		<390		39	390
4,6-Dinitro-2-methylphenol		<2000		39	2000
4-Bromophenyl phenyl ether		<390		39	390
4-Chloro-3-methylphenol		<390		39	390
4-Chloroaniline		<390		39	390
4-Chlorophenyl phenyl ether		<390		39	390
4-Nitroaniline		<390		39	390
4-Nitrophenol		<2000		44	2000
Acenaphthene		<390		39	390
Acenaphthylene		<390		39	390
Anthracene		<390		39	390
Benzo[a]anthracene		81	J	39	390
Benzo[a]pyrene		71	J	39	390
Benzo[b]fluoranthene		75	J	39	390
Benzo[g,h,i]perylene		54	J	39	390
Benzo[k]fluoranthene		<390		39	390
Benzoic acid		<2000		330	2000
Benzyl alcohol		<390		39	390
Bis(2-chloroethoxy)methane		<390		39	390
Bis(2-chloroethyl)ether		<390		39	390
Bis(2-ethylhexyl) phthalate		<390		39	390
Butyl benzyl phthalate		<390		39	390
Chrysene		76	J	39	390
Dibenz(a,h)anthracene		<390		39	390
Dibenzofuran		<390		39	390

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18045F5.D
Dilution:	1.0			Initial Weight/Volume:	30.42 g
Date Analyzed:	09/25/2007 1546			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<390		39	390
Dimethyl phthalate		<390		39	390
Di-n-butyl phthalate		<390		39	390
Di-n-octyl phthalate		<390		39	390
Fluoranthene		<390		39	390
Fluorene		<390		39	390
Hexachlorobenzene		<390		39	390
Hexachlorobutadiene		<390		39	390
Hexachlorocyclopentadiene		<390		39	390
Hexachloroethane		<390		50	390
Indeno[1,2,3-cd]pyrene		<390		39	390
Isophorone		<390		39	390
Naphthalene		<390		39	390
Nitrobenzene		<390		39	390
N-Nitrosodi-n-propylamine		<390		39	390
N-Nitrosodiphenylamine		<390		39	390
Pentachlorophenol		<2000		39	2000
Phenanthrene		<390		39	390
Phenol		<390		39	390
Pyrene		<390		39	390

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	54	24 - 111
2-Fluorobiphenyl	63	41 - 94
2-Fluorophenol	53	22 - 73
Nitrobenzene-d5	55	22 - 94
Phenol-d5	56	28 - 84
Terphenyl-d14	70	53 - 96

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092120.D
Dilution:	1.0			Initial Weight/Volume:	5.03 g
Date Analyzed:	09/22/2007 0446			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<120		40	120

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	92	60 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092121.D
Dilution:	1.0			Initial Weight/Volume:	5.00 g
Date Analyzed:	09/22/2007 0546			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<140		47	140

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-3			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	29.0	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092122.D
Dilution:	1.0			Initial Weight/Volume:	4.99 g
Date Analyzed:	09/22/2007 0645			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<140		47	140

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	92	60 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55929		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55927		Lab File ID:	B092123.D
Dilution:	1.0			Initial Weight/Volume:	5.02 g
Date Analyzed:	09/22/2007 0745			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<120		39	120

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Client: Burns & McDonnell Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55957		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55956		Lab File ID:	B092126.D
Dilution:	1.0			Initial Weight/Volume:	4.99 g
Date Analyzed:	09/22/2007 1043			Final Weight/Volume:	5 g
Date Prepared:	09/22/2007 0844			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<120		40	120

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4501045.D
Dilution:	50			Initial Weight/Volume:	30.24 g
Date Analyzed:	09/21/2007 1741			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<180		24	180
Fuel Oil		<180		24	180
Hydraulic Fluid		<180		24	180
Kerosene		<180		24	180
Mineral Spirits		<180		24	180
Motor Oil		<180		24	180
Unknown Hydrocarbons		13000		150	180

Surrogate	%Rec		Acceptance Limits
o-Terphenyl	0	X	39 - 159

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4601046.D
Dilution:	1.0			Initial Weight/Volume:	30.03 g
Date Analyzed:	09/21/2007 1747			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<4.3		0.56	4.3
Fuel Oil		<4.3		0.56	4.3
Hydraulic Fluid		<4.3		0.56	4.3
Kerosene		<4.3		0.56	4.3
Mineral Spirits		<4.3		0.56	4.3
Motor Oil		<4.3		0.56	4.3
Unknown Hydrocarbons		26		3.6	4.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	55	39 - 159

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-3			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	29.0	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4701047.D
Dilution:	10			Initial Weight/Volume:	30.06 g
Date Analyzed:	09/21/2007 1752			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<42		5.5	42
Fuel Oil		<42		5.5	42
Hydraulic Fluid		<42		5.5	42
Kerosene		<42		5.5	42
Mineral Spirits		<42		5.5	42
Motor Oil		<42		5.5	42
Unknown Hydrocarbons		1100		35	42

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	40	39 - 159

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4801048.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/21/2007 1757			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.5		0.46	3.5
Fuel Oil		<3.5		0.46	3.5
Hydraulic Fluid		<3.5		0.46	3.5
Kerosene		<3.5		0.46	3.5
Mineral Spirits		<3.5		0.46	3.5
Motor Oil		<3.5		0.46	3.5
Unknown Hydrocarbons		22		3.0	3.5

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	50	39 - 159

Client: Burns & McDonnell | Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4901049.D
Dilution:	1.0			Initial Weight/Volume:	30.02 g
Date Analyzed:	09/21/2007 1802			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.6		0.47	3.6
Fuel Oil		<3.6		0.47	3.6
Hydraulic Fluid		<3.6		0.47	3.6
Kerosene		<3.6		0.47	3.6
Mineral Spirits		<3.6		0.47	3.6
Motor Oil		<3.6		0.47	3.6
Unknown Hydrocarbons		18		3.0	3.6

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	60	39 - 159

Client: Burns & McDonnell

Job Number: 510-18045-1

Client Sample ID: **12B01A 0-2'**

Lab Sample ID:	510-18045-1			Date Sampled:	09/11/2007 1405
Client Matrix:	Solid	% Moisture:	18.4	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0526 g
Date Analyzed:	09/17/2007 2048			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		1100		0.029	0.29
Lead		4400		0.061	0.15

Client: Burns & McDonnell

Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID:	510-18045-2			Date Sampled:	09/11/2007 1415
Client Matrix:	Solid	% Moisture:	30.1	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0563 g
Date Analyzed:	09/17/2007 2053			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		52		0.034	0.34
Lead		250		0.070	0.17

Client: Burns & McDonnell

Job Number: 510-18045-1

Client Sample ID: **12B01A 2-4'**

Lab Sample ID: 510-18045-3
Client Matrix: Solid
% Moisture: 29.0
Date Sampled: 09/11/2007 1415
Date Received: 09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/17/2007 2058
Date Prepared: 09/17/2007 0910
Analysis Batch: 510-23100
Prep Batch: 510-23002
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.1290 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		22		0.031	0.31
Lead		74		0.065	0.16

Client: Burns & McDonnell

Job Number: 510-18045-1

Client Sample ID: **12B01A 4-6'**

Lab Sample ID:	510-18045-4			Date Sampled:	09/11/2007 1430
Client Matrix:	Solid	% Moisture:	15.6	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.1299 g
Date Analyzed:	09/17/2007 2104			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		16		0.026	0.26
Lead		22		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-18045-1

Client Sample ID: **12B01A 6-8'**

Lab Sample ID:	510-18045-5			Date Sampled:	09/11/2007 1445
Client Matrix:	Solid	% Moisture:	16.5	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0659 g
Date Analyzed:	09/17/2007 2109			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		7.2		0.028	0.28
Lead		10		0.058	0.14

General Chemistry

Client Sample ID: 12B01A 0-2'

Lab Sample ID: 510-18045-1 Date Sampled: 09/11/2007 1405
Client Matrix: Solid % Moisture: 18.4 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.1		mg/Kg	0.25	1.1	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 1715		DryWt Corrected: Y	
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			

Client Sample ID: 12B01A 2-4'

Lab Sample ID: 510-18045-2 Date Sampled: 09/11/2007 1415
Client Matrix: Solid % Moisture: 30.1 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.2		mg/Kg	0.29	1.2	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 1715		DryWt Corrected: Y	
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	30		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			
Percent Solids	70		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			

General Chemistry

Client Sample ID: 12B01A 2-4'

Lab Sample ID: 510-18045-3 Date Sampled: 09/11/2007 1415
Client Matrix: Solid % Moisture: 29.0 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.4		mg/Kg	0.31	1.4	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 1715			DryWt Corrected: Y
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	29		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			
Percent Solids	71		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			

Client Sample ID: 12B01A 4-6'

Lab Sample ID: 510-18045-4 Date Sampled: 09/11/2007 1430
Client Matrix: Solid % Moisture: 15.6 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.1		mg/Kg	0.26	1.1	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 1715			DryWt Corrected: Y
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed		09/19/2007 1830			

General Chemistry

Client Sample ID: **12B01A 6-8'**

Lab Sample ID: 510-18045-5 Date Sampled: 09/11/2007 1445
Client Matrix: Solid % Moisture: 16.5 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.1		mg/Kg	0.25	1.1	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed	09/24/2007 1715			DryWt Corrected: Y	
	Prep Batch: 680-85805	Date Prepared:	09/19/2007 0817				

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed	09/19/2007 1830				
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23242	Date Analyzed	09/19/2007 1830				

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18045-1

Lab Section	Qualifier	Description
GC/MS VOA		
	B	Compound was found in the blank and sample.
	*	LCS or LCSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	H	Sample was prepped or analyzed beyond the specified holding time
	X	Surrogate exceeds the control limits
GC/MS Semi VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	X	Surrogate exceeds the control limits
GC Semi VOA		
	X	Surrogate exceeds the control limits

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 510-23177

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23177/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/18/2007 1807
Date Prepared: N/A

Analysis Batch: 510-23177
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8679.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	2.5	J	0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	99	80 - 124
Toluene-d8 (Surr)	95	83 - 113
4-Bromofluorobenzene (Surr)	108	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23177/1	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8677.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1701			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23177/2	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8678.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1734			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1-Trichloroethane	125	125	78 - 125	0	30		
1,1,2,2-Tetrachloroethane	105	97	61 - 131	7	30		
1,1,2-Trichloroethane	116	113	70 - 127	2	30		
1,1-Dichloroethane	122	122	80 - 123	0	30		
1,1-Dichloroethene	119	117	76 - 117	2	30	*	
1,2-Dichloroethane	109	107	72 - 130	2	30		
2-Butanone (MEK)	112	106	57 - 171	5	30		
1,2-Dichloropropane	111	109	77 - 122	2	30		
2-Hexanone	112	102	67 - 119	10	30		
methyl isobutyl ketone	105	101	42 - 181	4	30		
Acetone	115	100	57 - 117	14	30		
Benzene	124	120	81 - 116	3	30	*	*
Dichlorobromomethane	115	116	72 - 132	1	30		
Bromoform	102	103	74 - 122	1	30		
Bromomethane	101	97	10 - 212	5	30		
Carbon disulfide	123	126	66 - 126	2	30		
Carbon tetrachloride	123	121	81 - 124	2	30		
Chlorobenzene	117	115	80 - 112	2	30	*	*
Chloroethane	102	108	10 - 208	6	30		
Chloroform	112	116	77 - 124	4	30		
Chloromethane	95	99	10 - 189	5	30		
cis-1,2-Dichloroethene	115	120	81 - 122	4	30		
cis-1,3-Dichloropropene	104	104	61 - 127	0	30		
Chlorodibromomethane	117	108	83 - 130	8	30		
Ethylbenzene	112	111	84 - 124	1	30		
Methylene Chloride	111	111	62 - 130	0	30		
Styrene	110	107	80 - 116	2	30		
Tetrachloroethene	131	122	82 - 127	7	30	*	
Toluene	124	118	77 - 117	6	30	*	*
trans-1,2-Dichloroethene	131	127	82 - 129	3	30	*	
trans-1,3-Dichloropropene	107	103	63 - 133	4	30		
Trichloroethene	117	117	81 - 122	1	30		

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23177

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23177/1	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8677.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1701			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23177/2	Analysis Batch:	510-23177	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8678.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/18/2007 1734			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	120	111	80 - 141	8	30		
Vinyl chloride	105	110	10 - 203	5	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98	99	80 - 124
Toluene-d8 (Surr)	101	101	83 - 113
4-Bromofluorobenzene (Surr)	102	97	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 510-23290

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23290/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1931
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8717.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	117	80 - 124
Toluene-d8 (Surr)	99	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1-Trichloroethane	131	131	78 - 125	0	30	*	*
1,1,2,2-Tetrachloroethane	108	95	61 - 131	13	30		
1,1,2-Trichloroethane	125	127	70 - 127	1	30		
1,1-Dichloroethane	132	132	80 - 123	0	30	*	*
1,1-Dichloroethene	127	129	76 - 117	1	30	*	*
1,2-Dichloroethane	130	129	72 - 130	0	30		
2-Butanone (MEK)	125	99	57 - 171	23	30		
1,2-Dichloropropane	118	119	77 - 122	1	30		
2-Hexanone	137	112	67 - 119	20	30	*	
methyl isobutyl ketone	130	121	42 - 181	7	30		
Acetone	118	100	57 - 117	17	30	*	
Benzene	123	127	81 - 116	3	30	*	*
Dichlorobromomethane	129	127	72 - 132	2	30		
Bromoform	111	104	74 - 122	6	30		
Bromomethane	91	94	10 - 212	4	30		
Carbon disulfide	124	127	66 - 126	2	30		*
Carbon tetrachloride	131	129	81 - 124	2	30	*	*
Chlorobenzene	121	120	80 - 112	1	30	*	*
Chloroethane	110	112	10 - 208	2	30		
Chloroform	124	121	77 - 124	3	30		
Chloromethane	109	110	10 - 189	1	30		
cis-1,2-Dichloroethene	121	128	81 - 122	5	30		*
cis-1,3-Dichloropropene	111	112	61 - 127	1	30		
Chlorodibromomethane	116	119	83 - 130	3	30		
Ethylbenzene	115	118	84 - 124	2	30		
Methylene Chloride	113	107	62 - 130	5	30		
Styrene	114	116	80 - 116	2	30		
Tetrachloroethene	119	111	82 - 127	7	30		
Toluene	122	124	77 - 117	2	30	*	*
trans-1,2-Dichloroethene	124	123	82 - 129	1	30		
trans-1,3-Dichloropropene	115	115	63 - 133	0	30		
Trichloroethene	109	109	81 - 122	0	30		

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	146	144	80 - 141	2	30	*	*
Vinyl chloride	110	113	10 - 203	3	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	122	116	80 - 124
Toluene-d8 (Surr)	104	105	83 - 113
4-Bromofluorobenzene (Surr)	98	96	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23550/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 2024
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8827.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
2-Butanone (MEK)	<10		2.9	10
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
methyl isobutyl ketone	<10		1.3	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Dichlorobromomethane	<5.0		0.55	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Ethylbenzene	<5.0		0.64	5.0
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23550/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 1951
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8826.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	54.8	110	78 - 125	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	61 - 131	
1,1,2-Trichloroethane	50.0	47.9	96	70 - 127	
1,1-Dichloroethane	50.0	55.6	111	80 - 123	
1,1-Dichloroethene	50.0	51.1	102	76 - 117	
1,2-Dichloroethane	50.0	49.4	99	72 - 130	
2-Butanone (MEK)	50.0	49.6	99	57 - 171	
1,2-Dichloropropane	50.0	50.7	101	77 - 122	
2-Hexanone	50.0	47.2	94	67 - 119	
methyl isobutyl ketone	50.0	47.4	95	42 - 181	
Acetone	50.0	43.8	88	57 - 117	
Benzene	50.0	51.7	103	81 - 116	
Dichlorobromomethane	50.0	52.9	106	72 - 132	
Bromoform	50.0	48.4	97	74 - 122	
Bromomethane	50.2	45.6	91	10 - 212	
Carbon disulfide	50.0	50.0	100	66 - 126	
Carbon tetrachloride	50.0	55.2	110	81 - 124	
Chlorobenzene	50.0	52.7	105	80 - 112	
Chloroethane	50.2	44.9	89	10 - 208	
Chloroform	50.0	53.4	107	77 - 124	
Chloromethane	50.2	41.2	82	10 - 189	
cis-1,2-Dichloroethene	50.0	50.3	101	81 - 122	
cis-1,3-Dichloropropene	50.0	49.9	100	61 - 127	
Chlorodibromomethane	50.0	52.9	106	83 - 130	
Ethylbenzene	50.0	52.3	105	84 - 124	
Methylene Chloride	50.0	51.9	104	62 - 130	
Styrene	50.0	51.4	103	80 - 116	
Tetrachloroethene	50.0	51.6	103	82 - 127	
Toluene	50.0	52.5	105	77 - 117	
trans-1,2-Dichloroethene	50.0	56.7	113	82 - 129	
trans-1,3-Dichloropropene	50.0	49.2	98	63 - 133	
Trichloroethene	50.0	54.1	108	81 - 122	
Vinyl acetate	50.0	111	221	80 - 141	*
Vinyl chloride	50.2	43.2	86	10 - 203	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	80 - 124
Toluene-d8 (Surr)	102	83 - 113
4-Bromofluorobenzene (Surr)	101	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55409/18-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1321
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
1,2,4-Trichlorobenzene	<330		33	330
1,2-Dichlorobenzene	<330		33	330
1,3-Dichlorobenzene	<330		33	330
1,4-Dichlorobenzene	<330		33	330
2,2'-oxybis(2-chloropropane)	<330		33	330
2,4,5-Trichlorophenol	<1700		33	1700
2,4-Dichlorophenol	<330		33	330
2,4-Dimethylphenol	<330		33	330
2,4-Dinitrophenol	<1700		150	1700
2,4-Dinitrotoluene	<330		33	330
2,6-Dinitrotoluene	<330		33	330
2-Chloronaphthalene	<330		33	330
2-Chlorophenol	<330		33	330
2-Methylnaphthalene	<330		33	330
2-Methylphenol	<330		33	330
2-Nitroaniline	<330		33	330
2-Nitrophenol	<330		33	330
3 & 4 Methylphenol	<660		33	660
3,3'-Dichlorobenzidine	<1700		33	1700
3-Nitroaniline	<330		33	330
4,6-Dinitro-2-methylphenol	<1700		33	1700
4-Bromophenyl phenyl ether	<330		33	330
4-Chloro-3-methylphenol	<330		33	330
4-Chloroaniline	<330		33	330
4-Chlorophenyl phenyl ether	<330		33	330
4-Nitroaniline	<330		33	330
4-Nitrophenol	<1700		37	1700
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Benzoic acid	<1700		280	1700
Benzyl alcohol	<330		33	330
Bis(2-chloroethoxy)methane	<330		33	330
Bis(2-chloroethyl)ether	<330		33	330
Bis(2-ethylhexyl) phthalate	<330		33	330
Butyl benzyl phthalate	<330		33	330

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55409/18-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1321
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Dibenzofuran	<330		33	330
Diethyl phthalate	<330		33	330
Dimethyl phthalate	<330		33	330
Di-n-butyl phthalate	<330		33	330
Di-n-octyl phthalate	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Hexachlorobenzene	<330		33	330
Hexachlorobutadiene	<330		33	330
Hexachlorocyclopentadiene	<330		33	330
Hexachloroethane	<330		42	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Isophorone	<330		33	330
Naphthalene	<330		33	330
Nitrobenzene	<330		33	330
N-Nitrosodi-n-propylamine	<330		33	330
N-Nitrosodiphenylamine	<330		33	330
Pentachlorophenol	<1700		33	1700
Phenanthrene	<330		33	330
Phenol	<330		33	330
Pyrene	<330		33	330

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	75		24 - 111
2-Fluorobiphenyl	79		41 - 94
2-Fluorophenol	75	X	22 - 73
Nitrobenzene-d5	72		22 - 94
Phenol-d5	75		28 - 84
Terphenyl-d14	90		53 - 96

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

Lab Control Spike - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55409/17-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1353
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LC55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,2,4-Trichlorobenzene	1670	1220	73	44 - 112	
1,2-Dichlorobenzene	1670	1300	78	46 - 102	
1,3-Dichlorobenzene	1670	1250	75	45 - 100	
1,4-Dichlorobenzene	1670	1270	76	45 - 100	
2,2'-oxybis(2-chloropropane)	1670	1150	69	39 - 119	
2,4,5-Trichlorophenol	1670	1330	80	56 - 119	J
2,4-Dichlorophenol	1670	1400	84	45 - 115	
2,4-Dimethylphenol	1670	1220	73	39 - 109	
2,4-Dinitrophenol	1670	1270	76	28 - 167	J
2,4-Dinitrotoluene	1670	1450	87	65 - 126	
2,6-Dinitrotoluene	1670	1370	82	64 - 116	
2-Chloronaphthalene	1670	1210	73	44 - 106	
2-Chlorophenol	1670	1320	79	47 - 100	
2-Methylnaphthalene	1670	1340	80	48 - 118	
2-Methylphenol	1670	1320	79	44 - 105	
2-Nitroaniline	1670	1350	81	56 - 121	
2-Nitrophenol	1670	1320	79	41 - 109	
3 & 4 Methylphenol	3330	2950	89	43 - 122	
3,3'-Dichlorobenzidine	1670	1090	65	43 - 104	J
3-Nitroaniline	1670	1180	71	50 - 108	
4,6-Dinitro-2-methylphenol	1670	1340	80	30 - 107	J
4-Bromophenyl phenyl ether	1670	1250	75	59 - 117	
4-Chloro-3-methylphenol	1670	1360	81	50 - 116	
4-Chloroaniline	1670	1180	71	40 - 100	
4-Chlorophenyl phenyl ether	1670	1350	81	55 - 126	
4-Nitroaniline	1670	1240	74	42 - 109	
4-Nitrophenol	1670	1290	77	49 - 115	J
Acenaphthene	1670	1330	80	54 - 118	
Acenaphthylene	1670	1300	78	58 - 124	
Anthracene	1670	1370	82	56 - 120	
Benzo[a]anthracene	1670	1390	84	65 - 118	
Benzo[a]pyrene	1670	1440	86	66 - 114	
Benzo[b]fluoranthene	1670	1330	80	60 - 110	
Benzo[g,h,i]perylene	1670	1350	81	47 - 130	
Benzo[k]fluoranthene	1670	1630	98	68 - 128	
Benzoic acid	1670	2090	126	5 - 149	
Benzyl alcohol	1670	1300	78	44 - 110	
Bis(2-chloroethoxy)methane	1670	1250	75	42 - 113	
Bis(2-chloroethyl)ether	1670	1250	75	45 - 107	
Bis(2-ethylhexyl) phthalate	1670	1540	93	68 - 133	
Butyl benzyl phthalate	1670	1490	89	67 - 121	

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Lab Control Spike - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55409/17-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1353
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LC55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chrysene	1670	1420	85	66 - 120	
Dibenz(a,h)anthracene	1670	1780	107	30 - 177	
Dibenzofuran	1670	1380	83	59 - 119	
Diethyl phthalate	1670	1470	88	67 - 126	
Dimethyl phthalate	1670	1360	82	63 - 116	
Di-n-butyl phthalate	1670	1450	87	68 - 124	
Di-n-octyl phthalate	1670	1420	85	65 - 123	
Fluoranthene	1670	1440	86	69 - 125	
Fluorene	1670	1340	81	58 - 124	
Hexachlorobenzene	1670	1310	78	63 - 121	
Hexachlorobutadiene	1670	1280	77	39 - 117	
Hexachlorocyclopentadiene	1670	1380	83	24 - 169	
Hexachloroethane	1670	1290	77	41 - 104	
Indeno[1,2,3-cd]pyrene	1670	1360	82	60 - 117	
Isophorone	1670	1470	88	50 - 124	
Naphthalene	1670	1280	77	44 - 112	
Nitrobenzene	1670	1270	76	43 - 110	
N-Nitrosodi-n-propylamine	1670	1430	86	48 - 122	
N-Nitrosodiphenylamine	1670	697	42	32 - 62	
Pentachlorophenol	1670	1520	91	49 - 136	J
Phenanthrene	1670	1400	84	63 - 122	
Phenol	1670	1260	75	44 - 104	
Pyrene	1670	1460	88	62 - 124	

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	78		24 - 111
2-Fluorobiphenyl	83		41 - 94
2-Fluorophenol	78	X	22 - 73
Nitrobenzene-d5	75		22 - 94
Phenol-d5	78		28 - 84
Terphenyl-d14	89		53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 400-55927

Method: 8015M
Preparation: 5035

Lab Sample ID: MB 400-55927/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 2150
Date Prepared: 09/21/2007 0937

Analysis Batch: 400-55929
Prep Batch: 400-55927
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092113.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline Range Organics (GRO)-C6-C10	<100		33	100

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Lab Control Spike - Batch: 400-55927

Method: 8015M
Preparation: 5035

Lab Sample ID: LCS 400-55927/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 0937
Date Prepared: 09/21/2007 0937

Analysis Batch: 400-55929
Prep Batch: 400-55927
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092101.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Gasoline Range Organics (GRO)-C6-C10	1000	1060	106	75 - 124	

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55927

Method: 8015M
Preparation: 5035

MS Lab Sample ID:	510-18045-3	Analysis Batch:	400-55929	Instrument ID:	GC/PID/FID
Client Matrix:	Solid	Prep Batch:	400-55927	Lab File ID:	B092127.D
Dilution:	1.0			Initial Weight/Volume:	4.98 g
Date Analyzed:	09/22/2007 1142			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

MSD Lab Sample ID:	510-18045-3	Analysis Batch:	400-55929	Instrument ID:	GC/PID/FID
Client Matrix:	Solid	Prep Batch:	400-55927	Lab File ID:	B092128.D
Dilution:	1.0			Initial Weight/Volume:	5.05 g
Date Analyzed:	09/22/2007 1242			Final Weight/Volume:	5 g
Date Prepared:	09/21/2007 0937			Injection Volume:	
				Column ID:	PRIMARY

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Gasoline Range Organics (GRO)-C6-C10	56	53	35 - 167	6	21		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	92	95	60 - 134

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

Method Blank - Batch: 400-55956

Method: 8015M
Preparation: 5035

Lab Sample ID: MB 400-55956/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 0943
Date Prepared: 09/22/2007 0844

Analysis Batch: 400-55957
Prep Batch: 400-55956
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092125.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline Range Organics (GRO)-C6-C10	<100		33	100

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Lab Control Spike - Batch: 400-55956

Method: 8015M
Preparation: 5035

Lab Sample ID: LCS 400-55956/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 0844
Date Prepared: 09/22/2007 0844

Analysis Batch: 400-55957
Prep Batch: 400-55956
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092124.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Gasoline Range Organics (GRO)-C6-C10	1000	996	100	75 - 124	

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55956

Method: 8015M
Preparation: 5035

MS Lab Sample ID:	510-18045-5	Analysis Batch: 400-55957	Instrument ID: GC/PID/FID
Client Matrix:	Solid	Prep Batch: 400-55956	Lab File ID: B092406.D
Dilution:	1.0		Initial Weight/Volume: 4.99 g
Date Analyzed:	09/24/2007 1548		Final Weight/Volume: 5 g
Date Prepared:	09/22/2007 0844		Injection Volume:
			Column ID: PRIMARY

MSD Lab Sample ID:	510-18045-5	Analysis Batch: 400-55957	Instrument ID: GC/PID/FID
Client Matrix:	Solid	Prep Batch: 400-55956	Lab File ID: B092407.D
Dilution:	1.0		Initial Weight/Volume: 4.99 g
Date Analyzed:	09/24/2007 1647		Final Weight/Volume: 5 g
Date Prepared:	09/22/2007 0844		Injection Volume:
			Column ID: PRIMARY

	% Rec.					
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Gasoline Range Organics (GRO)-C6-C10	85	95	35 - 167	11	21		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	89	88	60 - 134

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 400-55515

Method: OA-2
Preparation: 3550B

Lab Sample ID: MB 400-55515/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1647
Date Prepared: 09/19/2007 1048

Analysis Batch: 400-55802
Prep Batch: 400-55515
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 2101021.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Diesel	0.00		0.39	3.0
Fuel Oil	0.00		0.39	3.0
Hydraulic Fluid	0.00		0.39	3.0
Kerosene	0.00		0.39	3.0
Mineral Spirits	0.00		0.39	3.0
Motor Oil	0.00		0.39	3.0
Unknown Hydrocarbons	0.0		2.5	3.0

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	79	39 - 159

Lab Control Spike - Batch: 400-55515

Method: OA-2
Preparation: 3550B

Lab Sample ID: LCS 400-55515/12-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 1701
Date Prepared: 09/19/2007 1048

Analysis Batch: 400-55802
Prep Batch: 400-55515
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 3701037.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Diesel	335	219	65	33 - 156	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	83	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23002/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1934
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Chromium	<0.25		0.025	0.25
Lead	<0.13		0.052	0.13

Lab Control Spike - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23002/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1939
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 0.9466 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium	129	122	95	80 - 119	
Lead	106	107	101	81 - 118	

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 680-85805

Method: 7196A
Preparation: 3060A

Lab Sample ID: MB 680-85805/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1715
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805
Units: mg/Kg

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Chromium, hexavalent	<1.0		0.23	1.0

Lab Control Spike - Batch: 680-85805

Method: 7196A
Preparation: 3060A

Lab Sample ID: LCS 680-85805/14-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1715
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805
Units: mg/Kg

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium, hexavalent	20.0	20.0	100	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18045-1

Method Blank - Batch: 510-23242

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23242/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1830
Date Prepared: N/A

Analysis Batch: 510-23242
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

Duplicate - Batch: 510-23242

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 510-18045-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1830
Date Prepared: N/A

Analysis Batch: 510-23242
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	18	18.4	0	20	
Percent Solids	82	81.6	0	20	

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

18045

Burns & McDonnell SINCE 1898

090705 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: SHARON SHELTON

Laboratory: TEST AMERICA - VALPARAISO
Address: 2400 CUMBERLAND DR
City/State/Zip: VALPARAISO, IN 46383
Telephone:

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK STEEL - KANSAS CITY, MO

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: VOCs	Analysis: Hexavalent Chromium	Analysis: Total Cr, Pb, pH	Analysis: SVOCs	Analysis: Volatile TPH	Analysis: Extractable TPH	Remarks
AK STEEL	12B01A	0-2'					9/11/07	1405		X		8	X	X	X	X	X	X	18045-1
↓	12B01A	2-4'					↓	1415		X		8	X	X	X	X	X	X	-2
	12B01A	2-4'						1415		X		8	X	X	X	X	X	X	-3
	12B01A	4-6'						1430		X		8	X	X	X	X	X	X	-4
	12B01A	6-8'						1445		X		8	X	X	X	X	X	X	-5

Sampler (signature): Tim Stecher

Sampler (signature):

Special Instructions:

Relinquished By (signature): 1 [signature] Date/Time 9-11-07 14:30

Relinquished By (signature): Date/Time

Ice Present in Container: Yes ☑ No ☐

Temperature Upon Receipt: 0.5°C

Relinquished By (signature): Received 8 [signature] Date/Time 9/12/07 1030

Relinquished By (signature): Date/Time

Laboratory Comments:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18045-1

Login Number: 18045

List Source: TestAmerica Valparaiso

Creator: Cavanaugh, Tim P

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

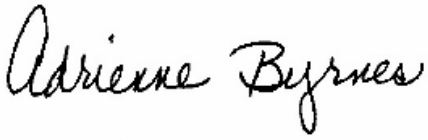
ANALYTICAL REPORT

Job Number: 510-18106-1

Job Description: AK Steel - Kansas City

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/15/2007
Revision: 2

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Comments
This report has been revised to correct reporting errors.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) for analytical batch 23290 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; 2-Hexanone; Acetone; Benzene; Carbon Tetrachloride; Chlorobenzene; Toluene; and Vinyl Acetate. Likewise the laboratory control standard duplicate (LCSD) exceeded control limits for 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; Benzene; Carbon Disulfide; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Isopropyl Benzene; Toluene, and Vinyl Acetate; These analytes were biased high in the LCS/LCSD and were not detected in the associated samples; therefore, the data have been reported. Any result for any of the target compounds that exceeds the reporting limit has been rejected and will be reanlyzed.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18106-3. The sample(s) shows evidence of matrix interference. TALS batch 23290.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18106-2, 510-18106-3, 510-18106-5, 510-18106-6. Evidence of matrix interference is present based on reproducibility; therefore, re-extraction and/or re-analysis was not performed. LIMS batch 23290.

Method 8260B: The laboratory control standard duplicate (LCSD) for analytical batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene. These analytes were biased high in the LCSD and were not detected in the associated samples; therefore, the data have been reported.

Method 8260B: The %RPD of the laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for analytical batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18106-2, 510-18106-3, 510-18106-4, 510-18106-5, 510-18106-6. Evidence of matrix interference is present based on reproducibility; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23456.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18106-2, 510-18106-3, 510-18106-4, 510-18106-5, 510-18106-6. The sample(s) shows evidence of matrix interference based on the reproducibility of the occurrence. TALS batch 23456.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23550 exceeded control limits for the following analyte: Vinyl Acetate. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Reanalysis of the sample was performed outside of the analytical holding time due to QC failures.: 510-18106-1, 510-18106-2, 510-18106-3, 510-18106-4, 510-18106-5, 510-18106-6. TALS batch 23550.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18106-3, 510-18106-5, 510-18106-6. The sample(s) shows evidence of matrix interference based on the reproducibility of the occurence. TALS batch 23550.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18106-3, 510-18106-5, 510-18106-6. Evidence of matrix interference is present based on the reproducibility of the occurence; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23550.

No other analytical or quality issues were noted.

GC/MS Semi VOA
Method 8270C: The blank and LCS for preparation batch 55409 had the surrogate 2-fluorophenol recover slightly above the upper control limit. All the spike compounds passed criteria; therefore, re-extraction was preformed,

No other analytical or quality issues were noted.

GC VOA
No analytical or quality issues were noted.

GC Semi VOA
Method OA-2: Due to the level of dilution required for the following sample(s), surrogate recoveries are not reported: .

No other analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

General Chemistry
Method 9045C: The pH analysis requested on the COC for samples 18106-3 through 18106-6 were cancelled at the request of the client.

Organic Prep
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18106-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge and Trap for Solids	TAL VAL		SW846 5030B
Closed System Purge & Trap/Frozen Water	TAL VAL		SW846 5035
GRO by 8015M	TAL PEN	SW846 8015M	
Closed System Purge & Trap/Field Preservation	TAL PEN		SW846 5035
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	TAL PEN	SW846 8270C	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Iowa - Extractable Petroleum Products	TAL PEN	Iowa DNR OA-2	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Chromium, Hexavalent (Colorimetric)	TAL SAV	SW846 7196A	
Alkaline Digestion for CrVI on Solids	TAL SAV		SW846 3060A

Lab References:

TAL PEN = TestAmerica Pensacola

TAL SAV = TestAmerica Savannah

TAL VAL = TestAmerica Valparaiso

Method References:

Iowa DNR = Iowa Department of Natural Resources

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18106-1

Method	Analyst	Analyst ID
SW846 8260B	Hobart, Wes E	WEH
SW846 8270C	Wingo, Rita	RW
SW846 8015M	Potts, Charles	CP
Iowa DNR OA-2	Ayers, Kim	KA
SW846 6020	Hamner, Barb J	BJH
SW846 7196A	Ross, Jon	JR
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18106-1	17B 08B 4-6'	Solid	09/11/2007 0850	09/12/2007 1020
510-18106-2	17B 08B 6-8'	Solid	09/11/2007 0900	09/12/2007 1020
510-18106-3	12B 03A 0-2'	Solid	09/11/2007 1050	09/12/2007 1020
510-18106-3MS	12B 03A 0-2'	Solid	09/12/2007 1050	09/12/2007 1020
510-18106-3MSD	12B 03A 0-2'	Solid	09/12/2007 1050	09/12/2007 1020
510-18106-4	12B 03A 2-4'	Solid	09/11/2007 1100	09/12/2007 1020
510-18106-5	12B 03A 4-6'	Solid	09/11/2007 1115	09/12/2007 1020
510-18106-6	12B 03A 6-8'	Solid	09/11/2007 1140	09/12/2007 1020

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **17B 08B 4-6'**

Lab Sample ID: 510-18106-1 | Date Sampled: 09/11/2007 0850
Client Matrix: Solid | % Moisture: 12.1 | Date Received: 09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8842.D
Dilution: 5.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0437 | Final Weight/Volume: 5 mL
Date Prepared: 09/27/2007 0437

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1 Trichloroethane		<28	H	3.9	28
1,1,2,2-Tetrachloroethane		<28	H	6.3	28
1,1,2-Trichloroethane		<28	H	8.8	28
1,1-Dichloroethane		<28	H	3.6	28
1,1-Dichloroethene		<28	H	3.1	28
1,2-Dichloroethane		<28	H	2.9	28
1,2-Dichloropropane		<28	H	2.5	28
2-Hexanone		<57	H	7.8	57
4-Methyl-2-pentanone		<57	H	7.3	57
Acetone		52	J H	7.8	57
Benzene		<28	H	6.5	28
Bromoform		<28	H	6.7	28
Bromomethane		<28	H	10	28
Carbon disulfide		<28	H	6.0	28
Carbon tetrachloride		<28	H	2.6	28
Chlorobenzene		<28	H	3.9	28
Chlorodibromomethane		<28	H	4.8	28
Chloroethane		<28	H	6.2	28
Chloroform		<28	H	4.2	28
Chloromethane		<28	H	5.5	28
cis-1,2-Dichloroethene		27	J H	4.1	28
cis-1,3-Dichloropropene		<28	H	4.3	28
Dichlorobromomethane		<28	H	3.2	28
Ethylbenzene		<28	H	3.6	28
Methyl ethyl ketone (MEK)		<57	H	16	57
Methylene Chloride		310	H	2.2	28
Styrene		<28	H	1.9	28
Tetrachloroethene		<28	H	7.4	28
Toluene		<28	H	4.4	28
trans-1,2-Dichloroethene		<28	H	3.1	28
trans-1,3-Dichloropropene		<28	H	3.4	28
Trichloroethene		650	H	4.6	28
Vinyl acetate		<28	H *	2.6	28
Vinyl chloride		<28	H	8.1	28
Xylenes, Total		<57	H	9.9	57

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	80 - 124
4-Bromofluorobenzene (Surr)	124	68 - 134
Toluene-d8 (Surr)	92	83 - 113

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **17B 08B 6-8'**

Lab Sample ID:	510-18106-2			Date Sampled:	09/11/2007 0900
Client Matrix:	Solid	% Moisture:	29.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23290		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A	Prep Batch: 510-23441		Lab File ID:	L8724.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 2321			Final Weight/Volume:	5 mL
Date Prepared:	09/12/2007 0905				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<8.5	*	1.2	8.5
1,1,2,2-Tetrachloroethane		<8.5		1.9	8.5
1,1,2-Trichloroethane		<8.5		2.6	8.5
1,1-Dichloroethane		<8.5	*	1.1	8.5
1,1-Dichloroethene		1.6	J *	0.94	8.5
1,2-Dichloroethane		<8.5		0.87	8.5
1,2-Dichloropropane		<8.5		0.74	8.5
2-Butanone (MEK)		<17		4.9	17
2-Hexanone		<17	*	2.3	17
Benzene		<8.5	*	1.9	8.5
Bromoform		<8.5		2.0	8.5
Bromomethane		<8.5		3.0	8.5
Carbon disulfide		1.9	J *	1.8	8.5
Carbon tetrachloride		<8.5	*	0.77	8.5
Chlorobenzene		<8.5	*	1.2	8.5
Chlorodibromomethane		<8.5		1.4	8.5
Chloroethane		<8.5		1.9	8.5
Chloroform		<8.5		1.3	8.5
Chloromethane		<8.5		1.6	8.5
cis-1,3-Dichloropropene		<8.5		1.3	8.5
Dichlorobromomethane		<8.5		0.94	8.5
Ethylbenzene		<8.5		1.1	8.5
methyl isobutyl ketone		<17		2.2	17
Methylene Chloride		<8.5		0.66	8.5
Styrene		<8.5		0.58	8.5
Tetrachloroethene		<8.5		2.2	8.5
Toluene		<8.5	*	1.3	8.5
trans-1,2-Dichloroethene		3.3	J	0.94	8.5
trans-1,3-Dichloropropene		<8.5		1.0	8.5
Trichloroethene		180		1.4	8.5
Vinyl acetate		<8.5	*	0.78	8.5
Vinyl chloride		4.4	J	2.4	8.5
Xylenes, Total		<17		3.0	17

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	125	X	80 - 124
Toluene-d8 (Surr)	93		83 - 113
4-Bromofluorobenzene (Surr)	97		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **17B 08B 6-8'**

Lab Sample ID:	510-18106-2			Date Sampled:	09/11/2007 0900
Client Matrix:	Solid	% Moisture:	29.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8834.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0015	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		17	H	1.9	14
cis-1,2-Dichloroethene		52	H	1.0	7.0

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8834.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0015	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	82	80 - 124
Toluene-d8 (Surr)	96	83 - 113
4-Bromofluorobenzene (Surr)	112	68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **17B 08B 6-8'**

Lab Sample ID:	510-18106-2			Date Sampled:	09/11/2007 0900
Client Matrix:	Solid	% Moisture:	29.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8751.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2152	Run Type:	RADL	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	127	X	80 - 124
Toluene-d8 (Surr)	94		83 - 113
4-Bromofluorobenzene (Surr)	119		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID: 510-18106-3 | Date Sampled: 09/11/2007 1050
Client Matrix: Solid | % Moisture: 15.1 | Date Received: 09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23441 | Lab File ID: L8725.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/20/2007 2354 | Final Weight/Volume: 5 mL
Date Prepared: 09/12/2007 0905

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<6.8	*	0.94	6.8
1,1,2,2-Tetrachloroethane		<6.8		1.5	6.8
1,1,2-Trichloroethane		<6.8		2.1	6.8
1,1-Dichloroethane		<6.8	*	0.85	6.8
1,1-Dichloroethene		<6.8	*	0.75	6.8
1,2-Dichloroethane		<6.8		0.69	6.8
1,2-Dichloropropane		<6.8		0.59	6.8
2-Butanone (MEK)		110		3.9	14
2-Hexanone		<14	*	1.9	14
Benzene		11	*	1.6	6.8
Bromoform		<6.8		1.6	6.8
Bromomethane		<6.8		2.4	6.8
Carbon tetrachloride		<6.8	*	0.61	6.8
Chlorobenzene		<6.8	*	0.93	6.8
Chlorodibromomethane		<6.8		1.1	6.8
Chloroethane		<6.8		1.5	6.8
Chloroform		<6.8		1.0	6.8
Chloromethane		<6.8		1.3	6.8
cis-1,2-Dichloroethene		<6.8	*	0.99	6.8
cis-1,3-Dichloropropene		<6.8		1.0	6.8
Dichlorobromomethane		<6.8		0.75	6.8
Ethylbenzene		9.3		0.87	6.8
methyl isobutyl ketone		<14		1.7	14
Methylene Chloride		8.7		0.53	6.8
Styrene		<6.8		0.47	6.8
Tetrachloroethene		<6.8		1.8	6.8
trans-1,2-Dichloroethene		<6.8		0.75	6.8
trans-1,3-Dichloropropene		<6.8		0.81	6.8
Trichloroethene		<6.8		1.1	6.8
Vinyl acetate		<6.8	*	0.63	6.8
Vinyl chloride		<6.8		1.9	6.8
Xylenes, Total		13	J	2.4	14

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	129	X	80 - 124
Toluene-d8 (Surr)	81	X	83 - 113
4-Bromofluorobenzene (Surr)	122		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8835.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0047	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		<12	H	1.6	12

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8835.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0047	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	93		80 - 124
Toluene-d8 (Surr)	72	X	83 - 113
4-Bromofluorobenzene (Surr)	188	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8752.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2225	Run Type:	RADL	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		<29	*	6.2	29
Toluene		<29	*	4.6	29

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8752.D
Dilution:	5.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2225	Run Type:	RADL	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	127	X	80 - 124
Toluene-d8 (Surr)	83		83 - 113
4-Bromofluorobenzene (Surr)	148	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23290		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A	Prep Batch: 510-23441		Lab File ID:	L8726.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 0027			Final Weight/Volume:	5 mL
Date Prepared:	09/12/2007 0905				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.8	*	1.1	7.8
1,1,2,2-Tetrachloroethane		<7.8		1.7	7.8
1,1,2-Trichloroethane		<7.8		2.4	7.8
1,1-Dichloroethane		<7.8	*	0.98	7.8
1,1-Dichloroethene		<7.8	*	0.86	7.8
1,2-Dichloroethane		<7.8		0.80	7.8
1,2-Dichloropropane		<7.8		0.68	7.8
2-Butanone (MEK)		<16		4.5	16
2-Hexanone		<16	*	2.1	16
Benzene		3.7	J *	1.8	7.8
Bromoform		<7.8		1.8	7.8
Bromomethane		<7.8		2.7	7.8
Carbon tetrachloride		<7.8	*	0.71	7.8
Chlorobenzene		<7.8	*	1.1	7.8
Chlorodibromomethane		<7.8		1.3	7.8
Chloroethane		<7.8		1.7	7.8
Chloroform		<7.8		1.2	7.8
Chloromethane		<7.8		1.5	7.8
cis-1,2-Dichloroethene		<7.8	*	1.1	7.8
cis-1,3-Dichloropropene		<7.8		1.2	7.8
Dichlorobromomethane		<7.8		0.87	7.8
Ethylbenzene		8.9		1.0	7.8
methyl isobutyl ketone		<16		2.0	16
Methylene Chloride		19		0.61	7.8
Styrene		<7.8		0.54	7.8
Tetrachloroethene		<7.8		2.0	7.8
Toluene		5.0	J *	1.2	7.8
trans-1,2-Dichloroethene		<7.8		0.86	7.8
trans-1,3-Dichloropropene		<7.8		0.94	7.8
Trichloroethene		<7.8		1.3	7.8
Vinyl acetate		<7.8	*	0.72	7.8
Vinyl chloride		<7.8		2.2	7.8
Xylenes, Total		13	J	2.7	16

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	124	80 - 124
Toluene-d8 (Surr)	97	83 - 113
4-Bromofluorobenzene (Surr)	111	68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8753.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2258	Run Type:	RA	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		<6.6	*	1.4	6.6

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8753.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2258	Run Type:	RA	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	128	X	80 - 124
Toluene-d8 (Surr)	99		83 - 113
4-Bromofluorobenzene (Surr)	115		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8836.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0120	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		6.2	J H	1.8	13

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8836.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0120	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	81	80 - 124
Toluene-d8 (Surr)	95	83 - 113
4-Bromofluorobenzene (Surr)	116	68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID: 510-18106-5 | Date Sampled: 09/11/2007 1115
Client Matrix: Solid | % Moisture: 23.1 | Date Received: 09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23441 | Lab File ID: L8727.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/21/2007 0100 | Final Weight/Volume: 5 mL
Date Prepared: 09/12/2007 0905

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.6	*	1.1	7.6
1,1,2,2-Tetrachloroethane		<7.6		1.7	7.6
1,1,2-Trichloroethane		<7.6		2.4	7.6
1,1-Dichloroethane		<7.6	*	0.96	7.6
1,1-Dichloroethene		<7.6	*	0.84	7.6
1,2-Dichloroethane		<7.6		0.78	7.6
1,2-Dichloropropane		<7.6		0.66	7.6
2-Butanone (MEK)		<15		4.4	15
2-Hexanone		<15	*	2.1	15
Benzene		2.5	J *	1.7	7.6
Bromoform		<7.6		1.8	7.6
Bromomethane		<7.6		2.7	7.6
Carbon disulfide		<7.6	*	1.6	7.6
Carbon tetrachloride		<7.6	*	0.69	7.6
Chlorobenzene		<7.6	*	1.0	7.6
Chlorodibromomethane		<7.6		1.3	7.6
Chloroethane		<7.6		1.7	7.6
Chloroform		<7.6		1.1	7.6
Chloromethane		<7.6		1.5	7.6
cis-1,2-Dichloroethene		<7.6	*	1.1	7.6
cis-1,3-Dichloropropene		<7.6		1.2	7.6
Dichlorobromomethane		<7.6		0.85	7.6
Ethylbenzene		<7.6		0.98	7.6
methyl isobutyl ketone		<15		2.0	15
Methylene Chloride		12		0.59	7.6
Styrene		<7.6		0.52	7.6
Tetrachloroethene		<7.6		2.0	7.6
Toluene		2.9	J *	1.2	7.6
trans-1,2-Dichloroethene		<7.6		0.84	7.6
trans-1,3-Dichloropropene		<7.6		0.92	7.6
Trichloroethene		<7.6		1.2	7.6
Vinyl acetate		<7.6	*	0.70	7.6
Vinyl chloride		<7.6		2.2	7.6
Xylenes, Total		<15		2.7	15

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	132	X	80 - 124
Toluene-d8 (Surr)	100		83 - 113
4-Bromofluorobenzene (Surr)	108		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8754.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2331	Run Type:	RA	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	130	X	80 - 124
Toluene-d8 (Surr)	95		83 - 113
4-Bromofluorobenzene (Surr)	112		68 - 134

Client: Burns & McDonnell Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID: 510-18106-5 Date Sampled: 09/11/2007 1115
Client Matrix: Solid % Moisture: 23.1 Date Received: 09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B Analysis Batch: 510-23550 Instrument ID: Agilent 5975 GC/MS
Preparation: N/A Lab File ID: L8837.D
Dilution: 1.0 Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0153 Run Type: RA2 Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		22	H	1.8	13

Method: 8260B Analysis Batch: 510-23550 Instrument ID: Agilent 5975 GC/MS
Preparation: N/A Lab File ID: L8837.D
Dilution: 1.0 Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0153 Run Type: RA2 Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	78	X	80 - 124
Toluene-d8 (Surr)	94		83 - 113
4-Bromofluorobenzene (Surr)	117		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23290		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A	Prep Batch: 510-23441		Lab File ID:	L8728.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 0133			Final Weight/Volume:	5 mL
Date Prepared:	09/12/2007 0905				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,1,1-Trichloroethane		<7.9	*	1.1	7.9
1,1,2,2-Tetrachloroethane		<7.9		1.7	7.9
1,1,2-Trichloroethane		<7.9		2.5	7.9
1,1-Dichloroethane		<7.9	*	0.99	7.9
1,1-Dichloroethene		<7.9	*	0.88	7.9
1,2-Dichloroethane		<7.9		0.81	7.9
1,2-Dichloropropane		<7.9		0.69	7.9
2-Butanone (MEK)		<16		4.6	16
2-Hexanone		<16	*	2.2	16
Benzene		2.3	J *	1.8	7.9
Bromoform		<7.9		1.9	7.9
Bromomethane		<7.9		2.8	7.9
Carbon disulfide		<7.9	*	1.7	7.9
Carbon tetrachloride		<7.9	*	0.72	7.9
Chlorobenzene		<7.9	*	1.1	7.9
Chlorodibromomethane		<7.9		1.3	7.9
Chloroethane		<7.9		1.7	7.9
Chloroform		<7.9		1.2	7.9
Chloromethane		<7.9		1.5	7.9
cis-1,2-Dichloroethene		<7.9	*	1.2	7.9
cis-1,3-Dichloropropene		<7.9		1.2	7.9
Dichlorobromomethane		<7.9		0.88	7.9
Ethylbenzene		<7.9		1.0	7.9
methyl isobutyl ketone		<16		2.0	16
Methylene Chloride		13		0.62	7.9
Styrene		<7.9		0.54	7.9
Tetrachloroethene		<7.9		2.1	7.9
Toluene		3.2	J *	1.2	7.9
trans-1,2-Dichloroethene		<7.9		0.88	7.9
trans-1,3-Dichloropropene		<7.9		0.95	7.9
Trichloroethene		<7.9		1.3	7.9
Vinyl acetate		<7.9	*	0.73	7.9
Vinyl chloride		<7.9		2.3	7.9
Xylenes, Total		<16		2.8	16

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	133	X	80 - 124
Toluene-d8 (Surr)	96		83 - 113
4-Bromofluorobenzene (Surr)	109		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23456		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8755.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/22/2007 0004	Run Type:	RA	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	130	X	80 - 124
Toluene-d8 (Surr)	95		83 - 113
4-Bromofluorobenzene (Surr)	133		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8838.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0226	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		21	H	1.8	13

Method:	8260B	Analysis Batch: 510-23550		Instrument ID:	Agilent 5975 GC/MS
Preparation:	N/A			Lab File ID:	L8838.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	09/27/2007 0226	Run Type:	RA2	Final Weight/Volume:	5 mL
Date Prepared:	N/A				

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	79	X	80 - 124
Toluene-d8 (Surr)	93		83 - 113
4-Bromofluorobenzene (Surr)	116		68 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID: 510-18106-3 | Date Sampled: 09/11/2007 1050
Client Matrix: Solid | % Moisture: 15.1 | Date Received: 09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-55654 | Instrument ID: GC/MSD
Preparation: 3550B | Prep Batch: 400-55409 | Lab File ID: 18106G3.D
Dilution: 1.0 | Initial Weight/Volume: 30.14 g
Date Analyzed: 09/25/2007 2106 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/18/2007 0916 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<390		39	390
1,2-Dichlorobenzene		<390		39	390
1,3-Dichlorobenzene		<390		39	390
1,4-Dichlorobenzene		<390		39	390
2,2'-oxybis(2-chloropropane)		<390		39	390
2,4,5-Trichlorophenol		<2000		39	2000
2,4-Dichlorophenol		<390		39	390
2,4-Dimethylphenol		<390		39	390
2,4-Dinitrophenol		<2000		180	2000
2,4-Dinitrotoluene		<390		39	390
2,6-Dinitrotoluene		<390		39	390
2-Chloronaphthalene		<390		39	390
2-Chlorophenol		<390		39	390
2-Methylnaphthalene		1100		39	390
2-Methylphenol		<390		39	390
2-Nitroaniline		<390		39	390
2-Nitrophenol		<390		39	390
3 & 4 Methylphenol		<770		39	770
3,3'-Dichlorobenzidine		<2000		39	2000
3-Nitroaniline		<390		39	390
4,6-Dinitro-2-methylphenol		<2000		39	2000
4-Bromophenyl phenyl ether		<390		39	390
4-Chloro-3-methylphenol		<390		39	390
4-Chloroaniline		<390		39	390
4-Chlorophenyl phenyl ether		<390		39	390
4-Nitroaniline		<390		39	390
4-Nitrophenol		<2000		43	2000
Acenaphthene		<390		39	390
Acenaphthylene		<390		39	390
Anthracene		43	J	39	390
Benzo[a]anthracene		450		39	390
Benzoic acid		<2000		330	2000
Benzyl alcohol		<390		39	390
Bis(2-chloroethoxy)methane		<390		39	390
Bis(2-chloroethyl)ether		<390		39	390
Bis(2-ethylhexyl) phthalate		<390		39	390
Butyl benzyl phthalate		<390		39	390
Chrysene		990		39	390
Dibenzofuran		<390		39	390
Diethyl phthalate		<390		39	390
Dimethyl phthalate		<390		39	390
Di-n-butyl phthalate		<390		39	390
Di-n-octyl phthalate		<390		39	390
Fluoranthene		<390		39	390

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G3.D
Dilution:	1.0			Initial Weight/Volume:	30.14 g
Date Analyzed:	09/25/2007 2106			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Fluorene		<390		39	390
Hexachlorobenzene		<390		39	390
Hexachlorobutadiene		<390		39	390
Hexachlorocyclopentadiene		<390		39	390
Hexachloroethane		<390		49	390
Isophorone		<390		39	390
Naphthalene		550		39	390
Nitrobenzene		<390		39	390
N-Nitrosodi-n-propylamine		<390		39	390
N-Nitrosodiphenylamine		<390		39	390
Pentachlorophenol		<2000		39	2000
Phenanthrene		180	J	39	390
Phenol		<390		39	390
Pyrene		580		39	390

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	76	24 - 111
2-Fluorobiphenyl	81	41 - 94
2-Fluorophenol	66	22 - 73
Nitrobenzene-d5	75	22 - 94
Phenol-d5	71	28 - 84

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G3X.D
Dilution:	5.0			Initial Weight/Volume:	30.14 g
Date Analyzed:	09/26/2007 2047			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Benzo[a]pyrene		3100		190	1900
Benzo[b]fluoranthene		2700		190	1900
Benzo[g,h,i]perylene		2900		190	1900
Benzo[k]fluoranthene		520	J	190	1900
Dibenz(a,h)anthracene		2100		190	1900
Indeno[1,2,3-cd]pyrene		1100	J	190	1900

Surrogate	%Rec	Acceptance Limits
Terphenyl-d14	82	53 - 96

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G4.D
Dilution:	1.0			Initial Weight/Volume:	30.01 g
Date Analyzed:	09/25/2007 1618			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<430		43	430
1,2-Dichlorobenzene		<430		43	430
1,3-Dichlorobenzene		<430		43	430
1,4-Dichlorobenzene		<430		43	430
2,2'-oxybis(2-chloropropane)		<430		43	430
2,4,5-Trichlorophenol		<2200		43	2200
2,4-Dichlorophenol		<430		43	430
2,4-Dimethylphenol		<430		43	430
2,4-Dinitrophenol		<2200		200	2200
2,4-Dinitrotoluene		<430		43	430
2,6-Dinitrotoluene		<430		43	430
2-Chloronaphthalene		<430		43	430
2-Chlorophenol		<430		43	430
2-Methylnaphthalene		<430		43	430
2-Methylphenol		<430		43	430
2-Nitroaniline		<430		43	430
2-Nitrophenol		<430		43	430
3 & 4 Methylphenol		<870		43	870
3,3'-Dichlorobenzidine		<2200		43	2200
3-Nitroaniline		<430		43	430
4,6-Dinitro-2-methylphenol		<2200		43	2200
4-Bromophenyl phenyl ether		<430		43	430
4-Chloro-3-methylphenol		<430		43	430
4-Chloroaniline		<430		43	430
4-Chlorophenyl phenyl ether		<430		43	430
4-Nitroaniline		<430		43	430
4-Nitrophenol		<2200		49	2200
Acenaphthene		<430		43	430
Acenaphthylene		<430		43	430
Anthracene		<430		43	430
Benzo[a]anthracene		<430		43	430
Benzo[a]pyrene		61	J	43	430
Benzo[b]fluoranthene		62	J	43	430
Benzo[g,h,i]perylene		180	J	43	430
Benzo[k]fluoranthene		<430		43	430
Benzoic acid		<2200		370	2200
Benzyl alcohol		<430		43	430
Bis(2-chloroethoxy)methane		<430		43	430
Bis(2-chloroethyl)ether		<430		43	430
Bis(2-ethylhexyl) phthalate		<430		43	430
Butyl benzyl phthalate		<430		43	430
Chrysene		71	J	43	430
Dibenz(a,h)anthracene		63	J	43	430
Dibenzofuran		<430		43	430

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G4.D
Dilution:	1.0			Initial Weight/Volume:	30.01 g
Date Analyzed:	09/25/2007 1618			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<430		43	430
Dimethyl phthalate		<430		43	430
Di-n-butyl phthalate		<430		43	430
Di-n-octyl phthalate		<430		43	430
Fluoranthene		<430		43	430
Fluorene		<430		43	430
Hexachlorobenzene		<430		43	430
Hexachlorobutadiene		<430		43	430
Hexachlorocyclopentadiene		<430		43	430
Hexachloroethane		<430		55	430
Indeno[1,2,3-cd]pyrene		45	J	43	430
Isophorone		<430		43	430
Naphthalene		<430		43	430
Nitrobenzene		<430		43	430
N-Nitrosodi-n-propylamine		<430		43	430
N-Nitrosodiphenylamine		<430		43	430
Pentachlorophenol		<2200		43	2200
Phenanthrene		<430		43	430
Phenol		<430		43	430
Pyrene		<430		43	430

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	60	24 - 111
2-Fluorobiphenyl	58	41 - 94
2-Fluorophenol	45	22 - 73
Nitrobenzene-d5	48	22 - 94
Phenol-d5	50	28 - 84
Terphenyl-d14	73	53 - 96

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G5.D
Dilution:	1.0			Initial Weight/Volume:	30.34 g
Date Analyzed:	09/25/2007 1650			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<420		42	420
1,2-Dichlorobenzene		<420		42	420
1,3-Dichlorobenzene		<420		42	420
1,4-Dichlorobenzene		<420		42	420
2,2'-oxybis(2-chloropropane)		<420		42	420
2,4,5-Trichlorophenol		<2200		42	2200
2,4-Dichlorophenol		<420		42	420
2,4-Dimethylphenol		<420		42	420
2,4-Dinitrophenol		<2200		190	2200
2,4-Dinitrotoluene		<420		42	420
2,6-Dinitrotoluene		<420		42	420
2-Chloronaphthalene		<420		42	420
2-Chlorophenol		<420		42	420
2-Methylnaphthalene		<420		42	420
2-Methylphenol		<420		42	420
2-Nitroaniline		<420		42	420
2-Nitrophenol		<420		42	420
3 & 4 Methylphenol		<850		42	850
3,3'-Dichlorobenzidine		<2200		42	2200
3-Nitroaniline		<420		42	420
4,6-Dinitro-2-methylphenol		<2200		42	2200
4-Bromophenyl phenyl ether		<420		42	420
4-Chloro-3-methylphenol		<420		42	420
4-Chloroaniline		<420		42	420
4-Chlorophenyl phenyl ether		<420		42	420
4-Nitroaniline		<420		42	420
4-Nitrophenol		<2200		48	2200
Acenaphthene		<420		42	420
Acenaphthylene		<420		42	420
Anthracene		<420		42	420
Benzo[a]anthracene		<420		42	420
Benzo[a]pyrene		<420		42	420
Benzo[b]fluoranthene		<420		42	420
Benzo[g,h,i]perylene		<420		42	420
Benzo[k]fluoranthene		<420		42	420
Benzoic acid		<2200		360	2200
Benzyl alcohol		<420		42	420
Bis(2-chloroethoxy)methane		<420		42	420
Bis(2-chloroethyl)ether		<420		42	420
Bis(2-ethylhexyl) phthalate		<420		42	420
Butyl benzyl phthalate		<420		42	420
Chrysene		<420		42	420
Dibenz(a,h)anthracene		<420		42	420
Dibenzofuran		<420		42	420

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G5.D
Dilution:	1.0			Initial Weight/Volume:	30.34 g
Date Analyzed:	09/25/2007 1650			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<420		42	420
Dimethyl phthalate		<420		42	420
Di-n-butyl phthalate		<420		42	420
Di-n-octyl phthalate		<420		42	420
Fluoranthene		<420		42	420
Fluorene		<420		42	420
Hexachlorobenzene		<420		42	420
Hexachlorobutadiene		<420		42	420
Hexachlorocyclopentadiene		<420		42	420
Hexachloroethane		<420		54	420
Indeno[1,2,3-cd]pyrene		<420		42	420
Isophorone		<420		42	420
Naphthalene		<420		42	420
Nitrobenzene		<420		42	420
N-Nitrosodi-n-propylamine		<420		42	420
N-Nitrosodiphenylamine		<420		42	420
Pentachlorophenol		<2200		42	2200
Phenanthrene		<420		42	420
Phenol		<420		42	420
Pyrene		<420		42	420

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	60	24 - 111
2-Fluorobiphenyl	64	41 - 94
2-Fluorophenol	55	22 - 73
Nitrobenzene-d5	58	22 - 94
Phenol-d5	59	28 - 84
Terphenyl-d14	73	53 - 96

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G6.D
Dilution:	1.0			Initial Weight/Volume:	30.39 g
Date Analyzed:	09/25/2007 1722			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1,2,4-Trichlorobenzene		<430		43	430
1,2-Dichlorobenzene		<430		43	430
1,3-Dichlorobenzene		<430		43	430
1,4-Dichlorobenzene		<430		43	430
2,2'-oxybis(2-chloropropane)		<430		43	430
2,4,5-Trichlorophenol		<2200		43	2200
2,4-Dichlorophenol		<430		43	430
2,4-Dimethylphenol		<430		43	430
2,4-Dinitrophenol		<2200		200	2200
2,4-Dinitrotoluene		<430		43	430
2,6-Dinitrotoluene		<430		43	430
2-Chloronaphthalene		<430		43	430
2-Chlorophenol		<430		43	430
2-Methylnaphthalene		<430		43	430
2-Methylphenol		<430		43	430
2-Nitroaniline		<430		43	430
2-Nitrophenol		<430		43	430
3 & 4 Methylphenol		<870		43	870
3,3'-Dichlorobenzidine		<2200		43	2200
3-Nitroaniline		<430		43	430
4,6-Dinitro-2-methylphenol		<2200		43	2200
4-Bromophenyl phenyl ether		<430		43	430
4-Chloro-3-methylphenol		<430		43	430
4-Chloroaniline		<430		43	430
4-Chlorophenyl phenyl ether		<430		43	430
4-Nitroaniline		<430		43	430
4-Nitrophenol		<2200		49	2200
Acenaphthene		<430		43	430
Acenaphthylene		<430		43	430
Anthracene		<430		43	430
Benzo[a]anthracene		<430		43	430
Benzo[a]pyrene		<430		43	430
Benzo[b]fluoranthene		<430		43	430
Benzo[g,h,i]perylene		<430		43	430
Benzo[k]fluoranthene		<430		43	430
Benzoic acid		<2200		370	2200
Benzyl alcohol		<430		43	430
Bis(2-chloroethoxy)methane		<430		43	430
Bis(2-chloroethyl)ether		<430		43	430
Bis(2-ethylhexyl) phthalate		<430		43	430
Butyl benzyl phthalate		<430		43	430
Chrysene		<430		43	430
Dibenz(a,h)anthracene		<430		43	430
Dibenzofuran		<430		43	430

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-55654		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55409		Lab File ID:	18106G6.D
Dilution:	1.0			Initial Weight/Volume:	30.39 g
Date Analyzed:	09/25/2007 1722			Final Weight/Volume:	1.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Diethyl phthalate		<430		43	430
Dimethyl phthalate		<430		43	430
Di-n-butyl phthalate		<430		43	430
Di-n-octyl phthalate		<430		43	430
Fluoranthene		<430		43	430
Fluorene		<430		43	430
Hexachlorobenzene		<430		43	430
Hexachlorobutadiene		<430		43	430
Hexachlorocyclopentadiene		<430		43	430
Hexachloroethane		<430		55	430
Indeno[1,2,3-cd]pyrene		<430		43	430
Isophorone		<430		43	430
Naphthalene		<430		43	430
Nitrobenzene		<430		43	430
N-Nitrosodi-n-propylamine		<430		43	430
N-Nitrosodiphenylamine		<430		43	430
Pentachlorophenol		<2200		43	2200
Phenanthrene		<430		43	430
Phenol		<430		43	430
Pyrene		<430		43	430

Surrogate	%Rec	Acceptance Limits
2,4,6-Tribromophenol	72	24 - 111
2-Fluorobiphenyl	74	41 - 94
2-Fluorophenol	61	22 - 73
Nitrobenzene-d5	65	22 - 94
Phenol-d5	65	28 - 84
Terphenyl-d14	82	53 - 96

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55957		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55956		Lab File ID:	B092131.D
Dilution:	1.0			Initial Weight/Volume:	5.02 g
Date Analyzed:	09/22/2007 1540			Final Weight/Volume:	5 g
Date Prepared:	09/22/2007 0844			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<120		39	120

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	97	60 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55957		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55956		Lab File ID:	B092132.D
Dilution:	1.0			Initial Weight/Volume:	5.07 g
Date Analyzed:	09/22/2007 1640			Final Weight/Volume:	5 g
Date Prepared:	09/22/2007 0844			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<130		43	130

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	96	60 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55957		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55956		Lab File ID:	B092133.D
Dilution:	1.0			Initial Weight/Volume:	4.96 g
Date Analyzed:	09/22/2007 1739			Final Weight/Volume:	5 g
Date Prepared:	09/22/2007 0844			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<130		43	130

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

8015M GRO by 8015M

Method:	8015M	Analysis Batch: 400-55957		Instrument ID:	GC/PID/FID
Preparation:	5035	Prep Batch: 400-55956		Lab File ID:	B092134.D
Dilution:	1.0			Initial Weight/Volume:	4.96 g
Date Analyzed:	09/22/2007 1838			Final Weight/Volume:	5 g
Date Prepared:	09/22/2007 0844			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Gasoline Range Organics (GRO)-C6-C10		<130		44	130

Surrogate	%Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	93	60 - 134

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4101041.D
Dilution:	50			Initial Weight/Volume:	30.14 g
Date Analyzed:	09/21/2007 1721			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<180		23	180
Fuel Oil		<180		23	180
Hydraulic Fluid		<180		23	180
Kerosene		<180		23	180
Mineral Spirits		<180		23	180
Motor Oil		<180		23	180
Unknown Hydrocarbons		10000		150	180

Surrogate	%Rec		Acceptance Limits
o-Terphenyl	0	X	39 - 159

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4201042.D
Dilution:	1.0			Initial Weight/Volume:	30.30 g
Date Analyzed:	09/21/2007 1726			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.9		0.51	3.9
Fuel Oil		<3.9		0.51	3.9
Hydraulic Fluid		<3.9		0.51	3.9
Kerosene		<3.9		0.51	3.9
Mineral Spirits		<3.9		0.51	3.9
Motor Oil		<3.9		0.51	3.9
Unknown Hydrocarbons		71		3.2	3.9

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	75	39 - 159

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4301043.D
Dilution:	1.0			Initial Weight/Volume:	30.08 g
Date Analyzed:	09/21/2007 1731			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.9		0.51	3.9
Fuel Oil		<3.9		0.51	3.9
Hydraulic Fluid		<3.9		0.51	3.9
Kerosene		<3.9		0.51	3.9
Mineral Spirits		<3.9		0.51	3.9
Motor Oil		<3.9		0.51	3.9
Unknown Hydrocarbons		58		3.2	3.9

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	76	39 - 159

Client: Burns & McDonnell | Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-55802		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55515		Lab File ID:	4401044.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/21/2007 1736			Final Weight/Volume:	1.0 mL
Date Prepared:	09/19/2007 1048			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<4.0		0.52	4.0
Fuel Oil		<4.0		0.52	4.0
Hydraulic Fluid		<4.0		0.52	4.0
Kerosene		<4.0		0.52	4.0
Mineral Spirits		<4.0		0.52	4.0
Motor Oil		<4.0		0.52	4.0
Unknown Hydrocarbons		23		3.3	4.0

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	60	39 - 159

Client: Burns & McDonnell

Job Number: 510-18106-1

Client Sample ID: **12B 03A 0-2'**

Lab Sample ID:	510-18106-3			Date Sampled:	09/11/2007 1050
Client Matrix:	Solid	% Moisture:	15.1	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0759 g
Date Analyzed:	09/17/2007 1944			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		860		0.027	0.27
Lead		3700		0.057	0.14

Client: Burns & McDonnell

Job Number: 510-18106-1

Client Sample ID: **12B 03A 2-4'**

Lab Sample ID:	510-18106-4			Date Sampled:	09/11/2007 1100
Client Matrix:	Solid	% Moisture:	23.7	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0164 g
Date Analyzed:	09/17/2007 2021			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		12		0.032	0.32
Lead		17		0.067	0.16

Client: Burns & McDonnell

Job Number: 510-18106-1

Client Sample ID: **12B 03A 4-6'**

Lab Sample ID:	510-18106-5			Date Sampled:	09/11/2007 1115
Client Matrix:	Solid	% Moisture:	23.1	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0030 g
Date Analyzed:	09/17/2007 2037			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		34		0.032	0.32
Lead		110		0.067	0.16

Client: Burns & McDonnell

Job Number: 510-18106-1

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID:	510-18106-6			Date Sampled:	09/11/2007 1140
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/12/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0618 g
Date Analyzed:	09/17/2007 2042			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		13		0.031	0.31
Lead		11		0.065	0.16

General Chemistry

Client Sample ID: 17B 08B 4-6'

Lab Sample ID: 510-18106-1 Date Sampled: 09/11/2007 0850
Client Matrix: Solid Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			
Percent Solids	88		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			

Client Sample ID: 17B 08B 6-8'

Lab Sample ID: 510-18106-2 Date Sampled: 09/11/2007 0900
Client Matrix: Solid Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	29		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			
Percent Solids	71		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			

Client Sample ID: 12B 03A 0-2'

Lab Sample ID: 510-18106-3 Date Sampled: 09/11/2007 1050
Client Matrix: Solid % Moisture: 15.1 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.1		mg/Kg	0.25	1.1	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 1715			DryWt Corrected: Y
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			
Percent Solids	85		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			

General Chemistry

Client Sample ID: 12B 03A 2-4'

Lab Sample ID: 510-18106-4 Date Sampled: 09/11/2007 1100
Client Matrix: Solid % Moisture: 23.7 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.2		mg/Kg	0.28	1.2	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 0954			DryWt Corrected: Y
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	24		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			
Percent Solids	76		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			

Client Sample ID: 12B 03A 4-6'

Lab Sample ID: 510-18106-5 Date Sampled: 09/11/2007 1115
Client Matrix: Solid % Moisture: 23.1 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.2		mg/Kg	0.27	1.2	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed		09/24/2007 0954			DryWt Corrected: Y
	Prep Batch: 680-85805	Date Prepared:		09/19/2007 0817			

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	23		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			
Percent Solids	77		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed		09/22/2007 1850			

General Chemistry

Client Sample ID: **12B 03A 6-8'**

Lab Sample ID: 510-18106-6 Date Sampled: 09/11/2007 1140
Client Matrix: Solid % Moisture: 24.9 Date Received: 09/12/2007 1020

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Chromium, hexavalent	<1.3		mg/Kg	0.29	1.3	1.0	7196A
	Anly Batch: 680-86374	Date Analyzed	09/24/2007 0954			DryWt Corrected: Y	
	Prep Batch: 680-85805	Date Prepared:	09/19/2007 0817				

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	25		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed	09/17/2007 2000				
Percent Solids	75		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23085	Date Analyzed	09/17/2007 2000				

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18106-1

Lab Section	Qualifier	Description
GC/MS VOA		
	*	LCS or LCSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	*	RPD of the LCS and LCSD exceeds the control limits
	H	Sample was prepped or analyzed beyond the specified holding time
	X	Surrogate exceeds the control limits
GC/MS Semi VOA		
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	RPD of the MS and MSD exceeds the control limits
	X	Surrogate exceeds the control limits
GC VOA		
	F	MS or MSD exceeds the control limits
GC Semi VOA		
	F	MS or MSD exceeds the control limits
	X	Surrogate exceeds the control limits
Metals		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
General Chemistry		
	F	MS or MSD exceeds the control limits

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23290

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23290/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1931
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8717.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
methyl isobutyl ketone	<10		1.3	10
Dichlorobromomethane	<5.0		0.55	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Butanone (MEK)	<10		2.9	10
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	117	80 - 124
Toluene-d8 (Surr)	99	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,1-Trichloroethane	131	131	78 - 125	0	30	*	*
1,1,2,2-Tetrachloroethane	108	95	61 - 131	13	30		
1,1,2-Trichloroethane	125	127	70 - 127	1	30		
1,1-Dichloroethane	132	132	80 - 123	0	30	*	*
1,1-Dichloroethene	127	129	76 - 117	1	30	*	*
1,2-Dichloroethane	130	129	72 - 130	0	30		
1,2-Dichloropropane	118	119	77 - 122	1	30		
2-Hexanone	137	112	67 - 119	20	30	*	
Acetone	118	100	57 - 117	17	30	*	
Benzene	123	127	81 - 116	3	30	*	*
Bromoform	111	104	74 - 122	6	30		
Bromomethane	91	94	10 - 212	4	30		
Carbon disulfide	124	127	66 - 126	2	30		*
Carbon tetrachloride	131	129	81 - 124	2	30	*	*
Chlorobenzene	121	120	80 - 112	1	30	*	*
Chlorodibromomethane	116	119	83 - 130	3	30		
Chloroethane	110	112	10 - 208	2	30		
Chloroform	124	121	77 - 124	3	30		
Chloromethane	109	110	10 - 189	1	30		
cis-1,2-Dichloroethene	121	128	81 - 122	5	30		*
cis-1,3-Dichloropropene	111	112	61 - 127	1	30		
methyl isobutyl ketone	130	121	42 - 181	7	30		
Dichlorobromomethane	129	127	72 - 132	2	30		
Ethylbenzene	115	118	84 - 124	2	30		
2-Butanone (MEK)	125	99	57 - 171	23	30		
Methylene Chloride	113	107	62 - 130	5	30		
Styrene	114	116	80 - 116	2	30		
Tetrachloroethene	119	111	82 - 127	7	30		
Toluene	122	124	77 - 117	2	30	*	*
trans-1,2-Dichloroethene	124	123	82 - 129	1	30		
trans-1,3-Dichloropropene	115	115	63 - 133	0	30		
Trichloroethene	109	109	81 - 122	0	30		

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23290/1	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8715.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1824			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23290/2	Analysis Batch:	510-23290	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8716.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/20/2007 1857			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	146	144	80 - 141	2	30	*	*
Vinyl chloride	110	113	10 - 203	3	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	122	116	80 - 124
Toluene-d8 (Surr)	104	105	83 - 113
4-Bromofluorobenzene (Surr)	98	96	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23456

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23456/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 2046
Date Prepared: N/A

Analysis Batch: 510-23456
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8749.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
methyl isobutyl ketone	<10		1.3	10
Dichlorobromomethane	<5.0		0.55	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Butanone (MEK)	<10		2.9	10
Methylene Chloride	<5.0		0.39	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	102	80 - 124
Toluene-d8 (Surr)	94	83 - 113
4-Bromofluorobenzene (Surr)	116	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23456

Method: 8260B
Preparation: N/A

LCS Lab Sample ID:	LCS 510-23456/1	Analysis Batch:	510-23456	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8747.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 1940			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

LCSD Lab Sample ID:	LCSD 510-23456/2	Analysis Batch:	510-23456	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Solid	Prep Batch:	N/A	Lab File ID:	L8748.D
Dilution:	1.0	Units:	ug/Kg	Initial Weight/Volume:	5 mL
Date Analyzed:	09/21/2007 2013			Final Weight/Volume:	5 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Carbon disulfide	81	154	66 - 126	63	30		*
cis-1,2-Dichloroethene	90	137	81 - 122	41	30		*
Toluene	88	147	77 - 117	50	30		*

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	115	105	80 - 124
Toluene-d8 (Surr)	102	98	83 - 113
4-Bromofluorobenzene (Surr)	100	95	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23550/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 2024
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8827.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1 Trichloroethane	<5.0		0.69	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
2-Hexanone	<10		1.4	10
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
4-Methyl-2-pentanone	<10		1.3	10
methyl isobutyl ketone	<10		1.3	10
Dichlorobromomethane	<5.0		0.55	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Butanone (MEK)	<10		2.9	10
Methyl ethyl ketone (MEK)	<10		2.9	10
Methylene Chloride	<5.0		0.39	5.0
m-Xylene & p-Xylene	<5.0		1.1	5.0
o-Xylene	<5.0		0.61	5.0
Styrene	<5.0		0.34	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23550/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 1951
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8826.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1 Trichloroethane	50.0	54.8	110	78 - 125	
1,1,1-Trichloroethane	50.0	54.8	110	78 - 125	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	61 - 131	
1,1,2-Trichloroethane	50.0	47.9	96	70 - 127	
1,1-Dichloroethane	50.0	55.6	111	80 - 123	
1,1-Dichloroethene	50.0	51.1	102	76 - 117	
1,2-Dichloroethane	50.0	49.4	99	72 - 130	
1,2-Dichloropropane	50.0	50.7	101	77 - 122	
2-Hexanone	50.0	47.2	94	67 - 119	
Acetone	50.0	43.8	88	57 - 117	
Benzene	50.0	51.7	103	81 - 116	
Bromoform	50.0	48.4	97	74 - 122	
Bromomethane	50.2	45.6	91	10 - 212	
Carbon disulfide	50.0	50.0	100	66 - 126	
Carbon tetrachloride	50.0	55.2	110	81 - 124	
Chlorobenzene	50.0	52.7	105	80 - 112	
Chlorodibromomethane	50.0	52.9	106	83 - 130	
Chloroethane	50.2	44.9	89	10 - 208	
Chloroform	50.0	53.4	107	77 - 124	
Chloromethane	50.2	41.2	82	10 - 189	
cis-1,2-Dichloroethene	50.0	50.3	101	81 - 122	
cis-1,3-Dichloropropene	50.0	49.9	100	61 - 127	
4-Methyl-2-pentanone	50.0	47.4	95	42 - 181	
methyl isobutyl ketone	50.0	47.4	95	42 - 181	
Dichlorobromomethane	50.0	52.9	106	72 - 132	
Ethylbenzene	50.0	52.3	105	84 - 124	
2-Butanone (MEK)	50.0	49.6	99	57 - 171	
Methyl ethyl ketone (MEK)	50.0	49.6	99	57 - 171	
Methylene Chloride	50.0	51.9	104	62 - 130	
m-Xylene & p-Xylene	100	107	107	83 - 122	
o-Xylene	50.0	52.2	104	80 - 120	
Styrene	50.0	51.4	103	80 - 116	
Tetrachloroethene	50.0	51.6	103	82 - 127	
Toluene	50.0	52.5	105	77 - 117	
trans-1,2-Dichloroethene	50.0	56.7	113	82 - 129	
trans-1,3-Dichloropropene	50.0	49.2	98	63 - 133	
Trichloroethene	50.0	54.1	108	81 - 122	
Vinyl acetate	50.0	111	221	80 - 141	*
Vinyl chloride	50.2	43.2	86	10 - 203	

Surrogate	% Rec	Acceptance Limits

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	80 - 124
Toluene-d8 (Surr)	102	83 - 113
4-Bromofluorobenzene (Surr)	101	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55409/18-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1321
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
1,2,4-Trichlorobenzene	<330		33	330
1,2-Dichlorobenzene	<330		33	330
1,3-Dichlorobenzene	<330		33	330
1,4-Dichlorobenzene	<330		33	330
2,2'-oxybis(2-chloropropane)	<330		33	330
2,4,5-Trichlorophenol	<1700		33	1700
2,4-Dichlorophenol	<330		33	330
2,4-Dimethylphenol	<330		33	330
2,4-Dinitrophenol	<1700		150	1700
2,4-Dinitrotoluene	<330		33	330
2,6-Dinitrotoluene	<330		33	330
2-Chloronaphthalene	<330		33	330
2-Chlorophenol	<330		33	330
2-Methylnaphthalene	<330		33	330
2-Methylphenol	<330		33	330
2-Nitroaniline	<330		33	330
2-Nitrophenol	<330		33	330
3 & 4 Methylphenol	<660		33	660
3,3'-Dichlorobenzidine	<1700		33	1700
3-Nitroaniline	<330		33	330
4,6-Dinitro-2-methylphenol	<1700		33	1700
4-Bromophenyl phenyl ether	<330		33	330
4-Chloro-3-methylphenol	<330		33	330
4-Chloroaniline	<330		33	330
4-Chlorophenyl phenyl ether	<330		33	330
4-Nitroaniline	<330		33	330
4-Nitrophenol	<1700		37	1700
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Benzoic acid	<1700		280	1700
Benzyl alcohol	<330		33	330
Bis(2-chloroethoxy)methane	<330		33	330
Bis(2-chloroethyl)ether	<330		33	330
Bis(2-ethylhexyl) phthalate	<330		33	330
Butyl benzyl phthalate	<330		33	330

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55409/18-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1321
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Dibenzofuran	<330		33	330
Diethyl phthalate	<330		33	330
Dimethyl phthalate	<330		33	330
Di-n-butyl phthalate	<330		33	330
Di-n-octyl phthalate	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Hexachlorobenzene	<330		33	330
Hexachlorobutadiene	<330		33	330
Hexachlorocyclopentadiene	<330		33	330
Hexachloroethane	<330		42	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Isophorone	<330		33	330
Naphthalene	<330		33	330
Nitrobenzene	<330		33	330
N-Nitrosodi-n-propylamine	<330		33	330
N-Nitrosodiphenylamine	<330		33	330
Pentachlorophenol	<1700		33	1700
Phenanthrene	<330		33	330
Phenol	<330		33	330
Pyrene	<330		33	330

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	75		24 - 111
2-Fluorobiphenyl	79		41 - 94
2-Fluorophenol	75	X	22 - 73
Nitrobenzene-d5	72		22 - 94
Phenol-d5	75		28 - 84
Terphenyl-d14	90		53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55409/17-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1353
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LC55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,2,4-Trichlorobenzene	1670	1220	73	44 - 112	
1,2-Dichlorobenzene	1670	1300	78	46 - 102	
1,3-Dichlorobenzene	1670	1250	75	45 - 100	
1,4-Dichlorobenzene	1670	1270	76	45 - 100	
2,2'-oxybis(2-chloropropane)	1670	1150	69	39 - 119	
2,4,5-Trichlorophenol	1670	1330	80	56 - 119	J
2,4-Dichlorophenol	1670	1400	84	45 - 115	
2,4-Dimethylphenol	1670	1220	73	39 - 109	
2,4-Dinitrophenol	1670	1270	76	28 - 167	J
2,4-Dinitrotoluene	1670	1450	87	65 - 126	
2,6-Dinitrotoluene	1670	1370	82	64 - 116	
2-Chloronaphthalene	1670	1210	73	44 - 106	
2-Chlorophenol	1670	1320	79	47 - 100	
2-Methylnaphthalene	1670	1340	80	48 - 118	
2-Methylphenol	1670	1320	79	44 - 105	
2-Nitroaniline	1670	1350	81	56 - 121	
2-Nitrophenol	1670	1320	79	41 - 109	
3 & 4 Methylphenol	3330	2950	89	43 - 122	
3,3'-Dichlorobenzidine	1670	1090	65	43 - 104	J
3-Nitroaniline	1670	1180	71	50 - 108	
4,6-Dinitro-2-methylphenol	1670	1340	80	30 - 107	J
4-Bromophenyl phenyl ether	1670	1250	75	59 - 117	
4-Chloro-3-methylphenol	1670	1360	81	50 - 116	
4-Chloroaniline	1670	1180	71	40 - 100	
4-Chlorophenyl phenyl ether	1670	1350	81	55 - 126	
4-Nitroaniline	1670	1240	74	42 - 109	
4-Nitrophenol	1670	1290	77	49 - 115	J
Acenaphthene	1670	1330	80	54 - 118	
Acenaphthylene	1670	1300	78	58 - 124	
Anthracene	1670	1370	82	56 - 120	
Benzo[a]anthracene	1670	1390	84	65 - 118	
Benzo[a]pyrene	1670	1440	86	66 - 114	
Benzo[b]fluoranthene	1670	1330	80	60 - 110	
Benzo[g,h,i]perylene	1670	1350	81	47 - 130	
Benzo[k]fluoranthene	1670	1630	98	68 - 128	
Benzoic acid	1670	2090	126	5 - 149	
Benzyl alcohol	1670	1300	78	44 - 110	
Bis(2-chloroethoxy)methane	1670	1250	75	42 - 113	
Bis(2-chloroethyl)ether	1670	1250	75	45 - 107	
Bis(2-ethylhexyl) phthalate	1670	1540	93	68 - 133	
Butyl benzyl phthalate	1670	1490	89	67 - 121	

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Lab Control Spike - Batch: 400-55409

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55409/17-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1353
Date Prepared: 09/18/2007 0916

Analysis Batch: 400-55654
Prep Batch: 400-55409
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LC55409S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chrysene	1670	1420	85	66 - 120	
Dibenz(a,h)anthracene	1670	1780	107	30 - 177	
Dibenzofuran	1670	1380	83	59 - 119	
Diethyl phthalate	1670	1470	88	67 - 126	
Dimethyl phthalate	1670	1360	82	63 - 116	
Di-n-butyl phthalate	1670	1450	87	68 - 124	
Di-n-octyl phthalate	1670	1420	85	65 - 123	
Fluoranthene	1670	1440	86	69 - 125	
Fluorene	1670	1340	81	58 - 124	
Hexachlorobenzene	1670	1310	78	63 - 121	
Hexachlorobutadiene	1670	1280	77	39 - 117	
Hexachlorocyclopentadiene	1670	1380	83	24 - 169	
Hexachloroethane	1670	1290	77	41 - 104	
Indeno[1,2,3-cd]pyrene	1670	1360	82	60 - 117	
Isophorone	1670	1470	88	50 - 124	
Naphthalene	1670	1280	77	44 - 112	
Nitrobenzene	1670	1270	76	43 - 110	
N-Nitrosodi-n-propylamine	1670	1430	86	48 - 122	
N-Nitrosodiphenylamine	1670	697	42	32 - 62	
Pentachlorophenol	1670	1520	91	49 - 136	J
Phenanthrene	1670	1400	84	63 - 122	
Phenol	1670	1260	75	44 - 104	
Pyrene	1670	1460	88	62 - 124	

Surrogate	% Rec		Acceptance Limits
2,4,6-Tribromophenol	78		24 - 111
2-Fluorobiphenyl	83		41 - 94
2-Fluorophenol	78	X	22 - 73
Nitrobenzene-d5	75		22 - 94
Phenol-d5	78		28 - 84
Terphenyl-d14	89		53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55409

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MS55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.20 g
Date Analyzed:	09/25/2007 2002			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

MSD Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MD55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/25/2007 2034			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,2,4-Trichlorobenzene	81	77	42 - 97	5	26	J	J
1,2-Dichlorobenzene	83	77	44 - 86	8	23	J	J
1,3-Dichlorobenzene	82	76	42 - 84	8	26	J	J
1,4-Dichlorobenzene	82	77	42 - 85	6	25	J	J
2,2'-oxybis(2-chloropropane)	70	65	38 - 99	7	24	J	J
2,4,5-Trichlorophenol	68	72	43 - 105	6	28	J	J
2,4-Dichlorophenol	83	82	39 - 101	1	25	J	J
2,4-Dimethylphenol	75	78	32 - 98	5	27	J	J
2,4-Dinitrophenol	0	0	10 - 154	NC	24	F	F
2,4-Dinitrotoluene	69	69	54 - 114	1	24	J	J
2,6-Dinitrotoluene	72	70	56 - 105	3	25	J	J
2-Chloronaphthalene	77	75	39 - 96	3	26	J	J
2-Chlorophenol	79	75	43 - 86	5	27	J	J
2-Methylnaphthalene	78	99	43 - 105	15	28		
2-Methylphenol	76	78	41 - 89	2	28	J	J
2-Nitroaniline	75	81	51 - 106	8	28	J	J
2-Nitrophenol	55	55	35 - 95	0	30	J	J
3 & 4 Methylphenol	64	61	38 - 104	4	26	J	J
3,3'-Dichlorobenzidine	27	28	1 - 112	2	136	J	J
3-Nitroaniline	63	60	40 - 101	6	32	J	J
4,6-Dinitro-2-methylphenol	0	4	8 - 97	NC	34	F	F
4-Bromophenyl phenyl ether	80	82	50 - 109	3	23	J	J
4-Chloro-3-methylphenol	86	87	46 - 99	2	26	J	J
4-Chloroaniline	47	42	1 - 96	12	107	J	J
4-Chlorophenyl phenyl ether	68	65	48 - 114	3	25	J	J
4-Nitroaniline	87	78	35 - 101	11	26	J	J
4-Nitrophenol	54	55	36 - 95	1	35	J	J
Acenaphthene	83	82	46 - 110	0	24	J	J
Acenaphthylene	83	79	49 - 114	4	24	J	J

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55409

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MS55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.20 g
Date Analyzed:	09/25/2007 2002			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

MSD Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MD55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/25/2007 2034			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Anthracene	71	83	53 - 105	15	23	J	J
Benzo[a]anthracene	79	98	57 - 110	17	20		
Benzo[a]pyrene	-11	58	55 - 104	35	21	F	F
Benzo[b]fluoranthene	-35	38	49 - 105	40	24	F	F
Benzo[g,h,i]perylene	63	136	41 - 119	39	26		F
Benzo[k]fluoranthene	92	143	58 - 116	39	23		F
Benzoic acid	0	0	1 - 149	NC	53	F	F
Benzyl alcohol	72	71	41 - 92	2	25	J	J
Bis(2-chloroethoxy)methane	83	81	40 - 99	2	27	J	J
Bis(2-chloroethyl)ether	83	78	43 - 90	6	25	J	J
Bis(2-ethylhexyl) phthalate	105	108	53 - 134	3	18		
Butyl benzyl phthalate	101	101	57 - 113	1	22		
Chrysene	70	142	56 - 113	46	21		F
Dibenz(a,h)anthracene	65	103	29 - 159	24	25		
Dibenzofuran	70	74	52 - 108	5	23	J	J
Diethyl phthalate	89	91	56 - 116	3	24	J	J
Dimethyl phthalate	81	80	53 - 106	1	24	J	J
Di-n-butyl phthalate	76	79	57 - 116	5	22	J	J
Di-n-octyl phthalate	92	93	58 - 113	1	21	J	J
Fluoranthene	72	71	59 - 116	2	24	J	J
Fluorene	63	66	51 - 113	5	24	J	J
Hexachlorobenzene	86	85	55 - 111	1	22	J	J
Hexachlorobutadiene	89	86	37 - 101	3	27	J	J
Hexachlorocyclopentadiene	59	57	1 - 200	3	44	J	J
Hexachloroethane	76	59	38 - 88	24	62	J	J
Indeno[1,2,3-cd]pyrene	59	75	52 - 107	16	24	J	
Isophorone	90	89	44 - 110	0	27	J	J
Naphthalene	79	89	40 - 100	10	28		
Nitrobenzene	78	73	41 - 96	6	26	J	J

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55409

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MS55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.20 g
Date Analyzed:	09/25/2007 2002			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

MSD Lab Sample ID:	510-18106-3	Analysis Batch:	400-55654	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55409	Lab File ID:	MD55409S.D
Dilution:	1.0			Initial Weight/Volume:	30.10 g
Date Analyzed:	09/25/2007 2034			Final Weight/Volume:	5.0 mL
Date Prepared:	09/18/2007 0916			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
N-Nitrosodi-n-propylamine	90	86	43 - 105	4	76	J	J
N-Nitrosodiphenylamine	21	26	26 - 60	21	23	J F	J
Pentachlorophenol	42	43	18 - 125	1	37	J	J
Phenanthrene	72	74	52 - 115	3	20	J	J
Phenol	78	78	41 - 86	0	28	J	J
Pyrene	83	116	51 - 120	26	21		F

Surrogate	MS % Rec	MSD % Rec		Acceptance Limits
2,4,6-Tribromophenol	75	78		24 - 111
2-Fluorobiphenyl	86	89		41 - 94
2-Fluorophenol	71	72		22 - 73
Nitrobenzene-d5	82	81		22 - 94
Phenol-d5	80	79		28 - 84
Terphenyl-d14	95	105	X	53 - 96

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

Method Blank - Batch: 400-55956

Method: 8015M
Preparation: 5035

Lab Sample ID: MB 400-55956/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 0943
Date Prepared: 09/22/2007 0844

Analysis Batch: 400-55957
Prep Batch: 400-55956
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092125.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Gasoline Range Organics (GRO)-C6-C10	<100		33	100

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	95	60 - 134

Lab Control Spike - Batch: 400-55956

Method: 8015M
Preparation: 5035

Lab Sample ID: LCS 400-55956/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 0844
Date Prepared: 09/22/2007 0844

Analysis Batch: 400-55957
Prep Batch: 400-55956
Units: ug/Kg

Instrument ID: GC/PID/FID
Lab File ID: B092124.D
Initial Weight/Volume: 5 g
Final Weight/Volume: 5 g
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Gasoline Range Organics (GRO)-C6-C10	1000	996	100	75 - 124	

Surrogate	% Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	94	60 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55956

Method: 8015M
Preparation: 5035

MS Lab Sample ID:	510-18106-3	Analysis Batch: 400-55957	Instrument ID: GC/PID/FID
Client Matrix:	Solid	Prep Batch: 400-55956	Lab File ID: B092129.D
Dilution:	1.0		Initial Weight/Volume: 5.02 g
Date Analyzed:	09/22/2007 1341		Final Weight/Volume: 5 g
Date Prepared:	09/22/2007 0844		Injection Volume:
			Column ID: PRIMARY

MSD Lab Sample ID:	510-18106-3	Analysis Batch: 400-55957	Instrument ID: GC/PID/FID
Client Matrix:	Solid	Prep Batch: 400-55956	Lab File ID: B092130.D
Dilution:	1.0		Initial Weight/Volume: 5.07 g
Date Analyzed:	09/22/2007 1441		Final Weight/Volume: 5 g
Date Prepared:	09/22/2007 0844		Injection Volume:
			Column ID: PRIMARY

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Gasoline Range Organics (GRO)-C6-C10	19	23	35 - 167	15	21	F	F

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
a,a,a-Trifluorotoluene (fid)	91	91	60 - 134

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 400-55515

Method: OA-2
Preparation: 3550B

Lab Sample ID: MB 400-55515/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1647
Date Prepared: 09/19/2007 1048

Analysis Batch: 400-55802
Prep Batch: 400-55515
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 2101021.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Diesel	0.00		0.39	3.0
Fuel Oil	0.00		0.39	3.0
Hydraulic Fluid	0.00		0.39	3.0
Kerosene	0.00		0.39	3.0
Mineral Spirits	0.00		0.39	3.0
Motor Oil	0.00		0.39	3.0
Unknown Hydrocarbons	0.0		2.5	3.0

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	79	39 - 159

Lab Control Spike - Batch: 400-55515

Method: OA-2
Preparation: 3550B

Lab Sample ID: LCS 400-55515/12-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 1701
Date Prepared: 09/19/2007 1048

Analysis Batch: 400-55802
Prep Batch: 400-55515
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 3701037.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Diesel	335	219	65	33 - 156	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	83	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55515

Method: OA-2
Preparation: 3550B

MS Lab Sample ID:	510-18106-3	Analysis Batch: 400-55802	Instrument ID: GC/FID
Client Matrix:	Solid	Prep Batch: 400-55515	Lab File ID: 3801038.D
Dilution:	50		Initial Weight/Volume: 30.11 g
Date Analyzed:	09/21/2007 1706		Final Weight/Volume: 1.0 mL
Date Prepared:	09/19/2007 1048		Injection Volume:

MSD Lab Sample ID:	510-18106-3	Analysis Batch: 400-55802	Instrument ID: GC/FID
Client Matrix:	Solid	Prep Batch: 400-55515	Lab File ID: 4001040.D
Dilution:	50		Initial Weight/Volume: 30.18 g
Date Analyzed:	09/21/2007 1716		Final Weight/Volume: 1.0 mL
Date Prepared:	09/19/2007 1048		Injection Volume:

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Diesel	719	1030	33 - 133	35	60	F	F

Surrogate	MS % Rec		MSD % Rec		Acceptance Limits
o-Terphenyl	0	X	0	X	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23002/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1934
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Chromium	<0.25		0.025	0.25
Lead	<0.13		0.052	0.13

Lab Control Spike - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23002/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1939
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 0.9466 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium	129	122	95	80 - 119	
Lead	106	107	101	81 - 118	

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23002

Method: 6020
Preparation: 3050B

MS Lab Sample ID:	510-18106-3	Analysis Batch: 510-23100	Instrument ID: TE ICPMS
Client Matrix:	Solid	Prep Batch: 510-23002	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0400 g
Date Analyzed:	09/17/2007 2000		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0910		

MSD Lab Sample ID:	510-18106-3	Analysis Batch: 510-23100	Instrument ID: TE ICPMS
Client Matrix:	Solid	Prep Batch: 510-23002	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0272 g
Date Analyzed:	09/17/2007 2006		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0910		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Chromium	548	1030	75 - 125	21	20	4	4
Lead	2920	4680	75 - 125	17	20	4	4

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 680-85805

Method: 7196A
Preparation: 3060A

Lab Sample ID: MB 680-85805/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1715
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805
Units: mg/Kg

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Chromium, hexavalent	<1.0		0.23	1.0

Lab Control Spike - Batch: 680-85805

Method: 7196A
Preparation: 3060A

Lab Sample ID: LCS 680-85805/14-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1715
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805
Units: mg/Kg

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.00 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium, hexavalent	20.0	20.0	100	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 680-85805

Method: 7196A
Preparation: 3060A

MS Lab Sample ID: 510-18106-3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1719
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

MSD Lab Sample ID: 510-18106-3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1719
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Chromium, hexavalent	0	0	80 - 120	NC	30	F	F

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Duplicate - Batch: 680-85805

Method: 7196A
Preparation: 3060A

Lab Sample ID: 510-18106-3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/24/2007 1719
Date Prepared: 09/19/2007 0817

Analysis Batch: 680-86374
Prep Batch: 680-85805
Units: mg/Kg

Instrument ID: KoneLab2
Lab File ID: N/A
Initial Weight/Volume: 1.09 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chromium, hexavalent	<1.1	-0.130	NC	30	

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23085

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23085/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 2000
Date Prepared: N/A

Analysis Batch: 510-23085
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

Duplicate - Batch: 510-23085

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 510-18106-6
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/17/2007 2000
Date Prepared: N/A

Analysis Batch: 510-23085
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	25	24.8	0	20	
Percent Solids	75	75.2	0	20	

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

Client: Burns & McDonnell

Job Number: 510-18106-1

Method Blank - Batch: 510-23347

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23347/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 1850
Date Prepared: N/A

Analysis Batch: 510-23347
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

Duplicate - Batch: 510-23347

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 510-18106-4
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 1850
Date Prepared: N/A

Analysis Batch: 510-23347
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	24	23.3	2	20	
Percent Solids	76	76.7	1	20	

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

Burns & McDonnell SINCE 1898

090705 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

18106

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: SHARON SHELTON

Laboratory: TEST AMERICA
Address: 2400 CUMBERLAND DR
City/State/Zip: VALPARAISO, IN 46383
Telephone:

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK STEEL - KANSAS CITY, MO

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: VOCs	Analysis: Hexavalent Chromium	Analysis: Total Cr, Pb, pH	Analysis: SVOCs	Analysis: Volatile-TPH	Analysis: Extractable TPH	Remarks
AK STEEL	17B08B	4-6'					9/11/07	0850		X		4	X						18106-1
	17B08B	6-8'						0900		X		4	X						-2
	12B03A	0-2'						1050		X		8	X	X	X	X	X	X	-3
	12B03A	2-4'						1100		X		8	X	X	X	X	X	X	-4
	12B03A	4-6'						1115		X		8	X	X	X	X	X	X	-5
	12B03A	6-8'						1140		X		8	X	X	X	X	X	X	-8

Sampler (signature): TIM STECHER

Sampler (signature):

Special Instructions:

Relinquished By (signature): 1. [signature] Date/Time 9-11-07 430

Relinquished By (signature): Date/Time

Ice Present in Container: Yes ☑ No ☐

Temperature Upon Receipt: 0.4°C 48 gt

Relinquished By (signature): 2. [signature] Date/Time 9/12/07 1020

Relinquished By (signature): Date/Time

Laboratory Comments:

Burns & McDonnell SINCE 1898

090705 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: SHARON SHELTON

Laboratory: TEST AMERICA - VALPORAISO
Address: 2400 CUMBERLAND DR
City/State/Zip: VALPORAISO, IN 46383
Telephone:

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK STEEL - KANSAS CITY, MO

Sample Type

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	~~Sample Event: Round~~	~~Sample Event: Year~~	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: VOCs	Analysis: HEXAVALENT CHROMIUM	Analysis: TOTAL CR, Pb, pH	Analysis: SVOCs	Analysis: VOLATILE TPH	Analysis: EXTRACTABLE TPH	Remarks
AK STEEL	12B03A	0-2MS	18/06-3		0	2	9/12/07	1515		X		9	X	X	X	X	X	X	PLEASE USE 12B03A/0-2'
AK STEEL	12B03A	0-2MSD	↓		0	2	9/12/07	1515		X		9	X	X	X	X	X	X	SAMPLE COLLECTED ON
																			9/11/07 AS "PARENT"
																			SAMPLE FOR MS/MSD

Sampler (signature): TIM STECHER

Sampler (signature):

Special Instructions:

Relinquished By (signature): 1. Tim Stecher — Date/Time 9/12/07 1615

Relinquished By (signature): Received By (TC) — Date/Time 09/13/07 1040

Ice Present in Container: Yes [X] No [ ]

Temperature Upon Receipt: 0.1 °C

Relinquished By (signature): 2. [signature] — Date/Time 9/12/07 1415

Relinquished By (signature): — Date/Time

Laboratory Comments: 510-28-063

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18106-1

Login Number: 18106

List Source: TestAmerica Valparaiso

Creator: Cavanaugh, Tim P

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

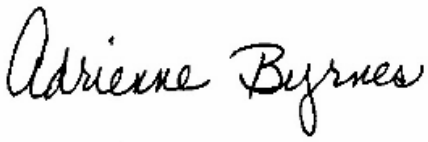
ANALYTICAL REPORT

Job Number: 510-18114-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
09/28/2007

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

TestAmerica Laboratories, Inc.
TestAmerica Valparaiso 2400 Cumberland Drive, Valparaiso, IN 46383
Tel (219) 464-2389 Fax (219) 462-2953 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Job Narrative
510-J18114-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) for batch 23358 exceeded control limits for the following analytes: Carbon Disulfide. These analytes were biased high in the LCS and were not detected above the reporting limit in the associated samples; therefore, the data have been reported.

Method 8260B: Surrogate recovery for the following sample was outside control limits: 510-18114-6. Sample is a matrix spike duplicate for batch 23358 and must be reported for quality control purposes. LCS and Matrix spike had acceptable surrogate recoveries.

Method 8260B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for Carbon Disulfide were above control limits. The associated laboratory control standard (LCS) met acceptance criteria. Batch 23358.

Method 8260B: The laboratory control standard (LCS) and duplicate (LCSD) for analytical batch 23465 exceeded control limits for the following analyte: Carbon Disulfide. This analyte was biased high in the LCS and LCSD and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18114-4. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23465.

Method 8260B: The target compound Chloromethane was low in the laboratory control sample; however, it had an acceptable recovery in the laboratory control sample duplicate. No further corrective action can take place as the sample is now exhausted. TALS batch 23465.

No other analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18114-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge-and-Trap	TAL VAL		SW846 5030B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD

Lab References:

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18114-1

Method	Analyst	Analyst ID
SW846 8260B	Hall, Jennifer L	JLH
SW846 8260B	Hobart, Wes E	WEH
SW846 6020	Hamner, Barb J	BJH
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-18114-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18114-1	Trip Blank	Water	09/12/2007 0000	09/13/2007 1040
510-18114-2	02B-18 DW1	Water	09/12/2007 0835	09/13/2007 1040
510-18114-3	02B-21 DW1	Water	09/12/2007 1015	09/13/2007 1040
510-18114-4	02B-21 DW1 D	Water	09/12/2007 1015	09/13/2007 1040
510-18114-5	02B-19 DW1	Water	09/12/2007 1100	09/13/2007 1040
510-18114-6	02B-20 DW1	Water	09/12/2007 1140	09/13/2007 1040
510-18114-6MS	02B-20 DW1	Water	09/12/2007 1140	09/13/2007 1040
510-18114-6MSD	02B-20 DW1	Water	09/12/2007 1140	09/13/2007 1040
510-18114-7	A08 B49 SB1	Solid	09/12/2007 1350	09/13/2007 1040
510-18114-8	A08 B49 SB2	Solid	09/12/2007 1355	09/13/2007 1040
510-18114-9	AO8 B26A SB1	Solid	09/12/2007 1430	09/13/2007 1040
510-18114-10	AO8 B26A SB2	Solid	09/12/2007 1435	09/13/2007 1040
510-18114-11	AO8 B50 SB1	Solid	09/12/2007 1450	09/13/2007 1040
510-18114-12	AO8 B50 SB2	Solid	09/12/2007 1455	09/13/2007 1040

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: **Trip Blank**

Lab Sample ID: 510-18114-1 | Date Sampled: 09/12/2007 0000
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23295 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A8876.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/20/2007 1448 | Final Weight/Volume: 5 mL
Date Prepared: 09/20/2007 1448

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
methyl isobutyl ketone	0.78	J	0.61	10
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
2-Butanone (MEK)	<10		2.3	10
2-Hexanone	<10		1.0	10
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Dichlorobromomethane	<5.0		0.32	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Ethylbenzene	<5.0		0.17	5.0
Methylene Chloride	<5.0		2.1	5.0
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	87 - 120
Toluene-d8 (Surr)	93	89 - 106
4-Bromofluorobenzene (Surr)	94	89 - 120

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: 02B-18 DW1

Lab Sample ID: 510-18114-2 | Date Sampled: 09/12/2007 0835
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23465 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8772.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/24/2007 2056 | Final Weight/Volume: 5 mL
Date Prepared: 09/24/2007 2056

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0	*	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10	*	0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	105	87 - 120
Toluene-d8 (Surr)	94	89 - 106
4-Bromofluorobenzene (Surr)	116	89 - 120

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: 02B-21 DW1

Lab Sample ID: 510-18114-3 | Date Sampled: 09/12/2007 1015
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23465 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8774.D
Dilution: 20 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/24/2007 2157 | Final Weight/Volume: 5 mL
Date Prepared: 09/24/2007 2157

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<200		60	200
Benzene	7.0	J	2.4	100
Bromoform	<100		12	100
Bromomethane	<200		12	200
2-Butanone (MEK)	<200		46	200
Carbon disulfide	<100	*	4.8	100
Carbon tetrachloride	<100		7.4	100
Chlorobenzene	<100		4.8	100
Chlorodibromomethane	<100		9.0	100
Chloroethane	<200	*	12	200
Chloroform	<100		4.8	100
Chloromethane	<200		13	200
cis-1,2-Dichloroethene	<100		14	100
cis-1,3-Dichloropropene	<100		6.2	100
Dichlorobromomethane	<100		6.4	100
1,1-Dichloroethane	<100		5.6	100
1,2-Dichloroethane	<100		7.4	100
1,1-Dichloroethene	<100		11	100
1,2-Dichloropropane	<100		3.8	100
Ethylbenzene	830		3.4	100
2-Hexanone	<200		20	200
Methylene Chloride	<100		42	100
methyl isobutyl ketone	<200		12	200
Styrene	<100		3.0	100
1,1,2,2-Tetrachloroethane	<100		3.2	100
Tetrachloroethene	<100		4.8	100
Toluene	180		4.6	100
trans-1,2-Dichloroethene	<100		32	100
trans-1,3-Dichloropropene	<100		6.0	100
1,1,1-Trichloroethane	<100		5.0	100
1,1,2-Trichloroethane	<100		10	100
Trichloroethene	<100		5.0	100
Vinyl acetate	<100		15	100
Vinyl chloride	<40		8.4	40
Xylenes, Total	3200		6.6	200

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	87 - 120
Toluene-d8 (Surr)	96	89 - 106
4-Bromofluorobenzene (Surr)	120	89 - 120

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: 02B-21 DW1 D

Lab Sample ID: 510-18114-4 | Date Sampled: 09/12/2007 1015
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23465 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8775.D
Dilution: 20 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/24/2007 2227 | Final Weight/Volume: 5 mL
Date Prepared: 09/24/2007 2227

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<200		60	200
Benzene	<100		2.4	100
Bromoform	<100		12	100
Bromomethane	<200		12	200
2-Butanone (MEK)	<200		46	200
Carbon disulfide	<100	*	4.8	100
Carbon tetrachloride	<100		7.4	100
Chlorobenzene	<100		4.8	100
Chlorodibromomethane	<100		9.0	100
Chloroethane	<200	*	12	200
Chloroform	<100		4.8	100
Chloromethane	<200		13	200
cis-1,2-Dichloroethene	<100		14	100
cis-1,3-Dichloropropene	<100		6.2	100
Dichlorobromomethane	<100		6.4	100
1,1-Dichloroethane	<100		5.6	100
1,2-Dichloroethane	<100		7.4	100
1,1-Dichloroethene	<100		11	100
1,2-Dichloropropane	<100		3.8	100
Ethylbenzene	880		3.4	100
2-Hexanone	<200		20	200
Methylene Chloride	<100		42	100
methyl isobutyl ketone	<200		12	200
Styrene	<100		3.0	100
1,1,2,2-Tetrachloroethane	<100		3.2	100
Tetrachloroethene	<100		4.8	100
Toluene	190		4.6	100
trans-1,2-Dichloroethene	<100		32	100
trans-1,3-Dichloropropene	<100		6.0	100
1,1,1-Trichloroethane	<100		5.0	100
1,1,2-Trichloroethane	<100		10	100
Trichloroethene	<100		5.0	100
Vinyl acetate	<100		15	100
Vinyl chloride	<40		8.4	40
Xylenes, Total	3300		6.6	200

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	107		87 - 120
Toluene-d8 (Surr)	96		89 - 106
4-Bromofluorobenzene (Surr)	128	X	89 - 120

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: 02B-19 DW1

Lab Sample ID: 510-18114-5 | Date Sampled: 09/12/2007 1100
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23465 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8773.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/24/2007 2127 | Final Weight/Volume: 5 mL
Date Prepared: 09/24/2007 2127

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	50		3.0	10
Benzene	1.2	J	0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	1.7	J *	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10	*	0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	1.4	J	0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	28		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	8.9		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	17		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	180		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	87 - 120
Toluene-d8 (Surr)	94	89 - 106
4-Bromofluorobenzene (Surr)	112	89 - 120

Client: Burns & McDonnell | Job Number: 510-18114-1

Client Sample ID: 02B-20 DW1

Lab Sample ID: 510-18114-6 | Date Sampled: 09/12/2007 1140
Client Matrix: Water | Date Received: 09/13/2007 1040

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23358 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A8901.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/21/2007 1702 | Final Weight/Volume: 5 mL
Date Prepared: 09/21/2007 1702

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	0.29	J *	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	0.55	J	0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	0.31	J	0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	2.0	J	0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	88	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	105	89 - 120

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: 02B-18 DW1

Lab Sample ID: 510-18114-2
Client Matrix: Water

Date Sampled: 09/12/2007 0835
Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/24/2007 1927
Date Prepared: N/A

Analysis Batch: 510-23454

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: 02B-21 DW1

Lab Sample ID: 510-18114-3
Client Matrix: Water

Date Sampled: 09/12/2007 1015
Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/24/2007 1930
Date Prepared: N/A

Analysis Batch: 510-23454

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	57		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: 02B-21 DW1 D

Lab Sample ID: 510-18114-4
Client Matrix: Water

Date Sampled: 09/12/2007 1015
Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/24/2007 1934
Date Prepared: N/A

Analysis Batch: 510-23454

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	21		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: 02B-19 DW1

Lab Sample ID: 510-18114-5
Client Matrix: Water

Date Sampled: 09/12/2007 1100
Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/24/2007 1937
Date Prepared: N/A

Analysis Batch: 510-23454

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	12		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: 02B-20 DW1

Lab Sample ID: 510-18114-6
Client Matrix: Water

Date Sampled: 09/12/2007 1140
Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/24/2007 1940
Date Prepared: N/A

Analysis Batch: 510-23454

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: A08 B49 SB1

Lab Sample ID:	510-18114-7		Date Sampled: 09/12/2007 1350
Client Matrix:	Solid	% Moisture: 18.4	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0082 g
Date Analyzed:	09/17/2007 2114			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		53		0.063	0.15

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: A08 B49 SB2

Lab Sample ID:	510-18114-8		Date Sampled: 09/12/2007 1355
Client Matrix:	Solid	% Moisture: 14.7	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0354 g
Date Analyzed:	09/17/2007 2130			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		76		0.059	0.14

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: AO8 B26A SB1

Lab Sample ID:	510-18114-9		Date Sampled: 09/12/2007 1430
Client Matrix:	Solid	% Moisture: 15.1	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0699 g
Date Analyzed:	09/17/2007 2135		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0910		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		150		0.057	0.14

Client: Burns & McDonnell Job Number: 510-18114-1

Client Sample ID: AO8 B26A SB2

Lab Sample ID:	510-18114-10		Date Sampled: 09/12/2007 1435
Client Matrix:	Solid	% Moisture: 13.1	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0698 g
Date Analyzed:	09/17/2007 2141		Final Weight/Volume: 50 mL
Date Prepared:	09/17/2007 0910		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		200		0.056	0.13

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: AO8 B50 SB1

Lab Sample ID:	510-18114-11		Date Sampled: 09/12/2007 1450
Client Matrix:	Solid	% Moisture: 18.0	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.1456 g
Date Analyzed:	09/17/2007 2146			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		31		0.055	0.13

Client: Burns & McDonnell

Job Number: 510-18114-1

Client Sample ID: AO8 B50 SB2

Lab Sample ID:	510-18114-12		Date Sampled: 09/12/2007 1455
Client Matrix:	Solid	% Moisture: 18.2	Date Received: 09/13/2007 1040

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23100		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23002		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0667 g
Date Analyzed:	09/17/2007 2151			Final Weight/Volume:	50 mL
Date Prepared:	09/17/2007 0910				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		43		0.060	0.14

General Chemistry

Client Sample ID: A08 B49 SB1

Lab Sample ID: 510-18114-7 Date Sampled: 09/12/2007 1350
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

Client Sample ID: A08 B49 SB2

Lab Sample ID: 510-18114-8 Date Sampled: 09/12/2007 1355
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				
Percent Solids	85		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				

Client Sample ID: AO8 B26A SB1

Lab Sample ID: 510-18114-9 Date Sampled: 09/12/2007 1430
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				
Percent Solids	85		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				

Client Sample ID: AO8 B26A SB2

Lab Sample ID: 510-18114-10 Date Sampled: 09/12/2007 1435
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	13		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				
Percent Solids	87		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				

General Chemistry

Client Sample ID: AO8 B50 SB1

Lab Sample ID: 510-18114-11 Date Sampled: 09/12/2007 1450
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				

Client Sample ID: AO8 B50 SB2

Lab Sample ID: 510-18114-12 Date Sampled: 09/12/2007 1455
Client Matrix: Solid Date Received: 09/13/2007 1040

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23347	Date Analyzed	09/22/2007 1850				

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18114-1

Lab Section	Qualifier	Description
GC/MS VOA		
	*	LCS or LCSD exceeds the control limits
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	X	Surrogate exceeds the control limits

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23295

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-23295/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/20/2007 0925
Date Prepared: 09/20/2007 0925

Analysis Batch: 510-23295
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A8864.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
2-Butanone (MEK)	<10		2.3	10
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
Carbon disulfide	<5.0		0.24	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
Carbon tetrachloride	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
Chlorobenzene	<5.0		0.24	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
2-Hexanone	<10		1.0	10
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
methyl isobutyl ketone	<10		0.61	10
Chlorodibromomethane	<5.0		0.45	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Ethylbenzene	<5.0		0.17	5.0
Methylene Chloride	<5.0		2.1	5.0
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	95	87 - 120
Toluene-d8 (Surr)	94	89 - 106
4-Bromofluorobenzene (Surr)	98	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Lab Control Spike - Batch: 510-23295

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 510-23295/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/20/2007 0820
Date Prepared: 09/20/2007 0820

Analysis Batch: 510-23295
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A8862.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2-Butanone (MEK)	50.0	45.6	91	66 - 126	
Acetone	50.0	63.5	127	33 - 136	
Benzene	50.0	43.8	88	78 - 117	
Bromoform	50.0	42.8	86	75 - 126	
Bromomethane	50.2	42.2	84	84 - 131	
Dichlorobromomethane	50.0	44.8	90	79 - 131	
1,1-Dichloroethane	50.0	42.4	85	80 - 125	
Carbon disulfide	50.0	40.0	80	64 - 120	
1,2-Dichloroethane	50.0	40.9	82	75 - 131	
Carbon tetrachloride	50.0	43.4	87	73 - 131	
1,1-Dichloroethene	50.0	39.8	80	71 - 123	
Chlorobenzene	50.0	44.6	89	76 - 112	
1,2-Dichloropropane	50.0	43.6	87	81 - 124	
Chloroethane	50.2	48.8	97	85 - 131	
Chloroform	50.0	42.7	85	77 - 125	
2-Hexanone	50.0	43.9	88	59 - 125	
Chloromethane	50.2	45.6	91	64 - 125	
cis-1,2-Dichloroethene	50.0	43.2	86	82 - 123	
cis-1,3-Dichloropropene	50.0	43.3	87	74 - 122	
methyl isobutyl ketone	50.0	42.2	84	72 - 117	
Chlorodibromomethane	50.0	45.1	90	87 - 127	
1,1,2,2-Tetrachloroethane	50.0	43.2	86	78 - 131	
Ethylbenzene	50.0	46.9	94	78 - 125	
Methylene Chloride	50.0	38.9	78	67 - 117	
Styrene	50.0	44.3	89	74 - 115	
Tetrachloroethene	50.0	46.2	92	77 - 123	
Toluene	50.0	44.4	89	76 - 114	
1,1,1-Trichloroethane	50.0	43.0	86	76 - 130	
trans-1,2-Dichloroethene	50.0	42.6	85	74 - 136	
1,1,2-Trichloroethane	50.0	43.6	87	80 - 122	
trans-1,3-Dichloropropene	50.0	43.8	88	76 - 125	
Trichloroethene	50.0	44.3	89	80 - 122	
Vinyl acetate	50.0	42.1	84	84 - 136	
Vinyl chloride	50.2	49.2	98	76 - 131	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	93	87 - 120
Toluene-d8 (Surr)	101	89 - 106
4-Bromofluorobenzene (Surr)	103	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23358

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-23358/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/21/2007 1541
Date Prepared: 09/21/2007 1541

Analysis Batch: 510-23358
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A8898.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
2-Butanone (MEK)	<10		2.3	10
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
Carbon disulfide	<5.0		0.24	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
Carbon tetrachloride	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
Chlorobenzene	<5.0		0.24	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
2-Hexanone	<10		1.0	10
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
methyl isobutyl ketone	<10		0.61	10
Chlorodibromomethane	<5.0		0.45	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Ethylbenzene	<5.0		0.17	5.0
Methylene Chloride	<5.0		2.1	5.0
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97	87 - 120
Toluene-d8 (Surr)	96	89 - 106
4-Bromofluorobenzene (Surr)	101	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Lab Control Spike - Batch: 510-23358

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 510-23358/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/21/2007 1447
Date Prepared: 09/21/2007 1447

Analysis Batch: 510-23358
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A8896.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2-Butanone (MEK)	50.0	48.9	98	66 - 126	
Acetone	50.0	49.2	98	33 - 136	
Benzene	50.0	52.8	106	78 - 117	
Bromoform	50.0	54.4	109	75 - 126	
Bromomethane	50.2	50.1	100	84 - 131	
Dichlorobromomethane	50.0	55.7	111	79 - 131	
1,1-Dichloroethane	50.0	52.0	104	80 - 125	
Carbon disulfide	50.0	69.3	139	64 - 120	*
1,2-Dichloroethane	50.0	53.5	107	75 - 131	
Carbon tetrachloride	50.0	54.2	108	73 - 131	
1,1-Dichloroethene	50.0	52.1	104	71 - 123	
Chlorobenzene	50.0	52.1	104	76 - 112	
1,2-Dichloropropane	50.0	54.0	108	81 - 124	
Chloroethane	50.2	48.0	96	85 - 131	
Chloroform	50.0	51.4	103	77 - 125	
2-Hexanone	50.0	53.5	107	59 - 125	
Chloromethane	50.2	42.2	84	64 - 125	
cis-1,2-Dichloroethene	50.0	51.3	103	82 - 123	
cis-1,3-Dichloropropene	50.0	58.0	116	74 - 122	
methyl isobutyl ketone	50.0	52.8	106	72 - 117	
Chlorodibromomethane	50.0	59.2	118	87 - 127	
1,1,2,2-Tetrachloroethane	50.0	50.5	101	78 - 131	
Ethylbenzene	50.0	53.6	107	78 - 125	
Methylene Chloride	50.0	49.6	99	67 - 117	
Styrene	50.0	51.5	103	74 - 115	
Tetrachloroethene	50.0	55.7	111	77 - 123	
Toluene	50.0	54.2	108	76 - 114	
1,1,1-Trichloroethane	50.0	52.8	106	76 - 130	
trans-1,2-Dichloroethene	50.0	52.8	106	74 - 136	
1,1,2-Trichloroethane	50.0	55.1	110	80 - 122	
trans-1,3-Dichloropropene	50.0	58.2	116	76 - 125	
Trichloroethene	50.0	55.1	110	80 - 122	
Vinyl acetate	50.0	54.2	108	84 - 136	
Vinyl chloride	50.2	44.9	89	76 - 131	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	99	87 - 120
Toluene-d8 (Surr)	102	89 - 106
4-Bromofluorobenzene (Surr)	102	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23358

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 510-18114-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/21/2007 1729
Date Prepared: 09/21/2007 1729

Analysis Batch: 510-23358
Prep Batch: N/A

Instrument ID: Volatiles GC/MS A
Lab File ID: A8902.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 510-18114-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/21/2007 1756
Date Prepared: 09/21/2007 1756

Analysis Batch: 510-23358
Prep Batch: N/A

Instrument ID: Volatiles GC/MS A
Lab File ID: A8903.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acetone	69	65	33 - 136	6	30		
Benzene	103	105	78 - 117	2	30		
Bromoform	87	83	75 - 126	5	30		
Bromomethane	88	92	84 - 131	4	30		
2-Butanone (MEK)	79	70	66 - 126	13	30		
Carbon disulfide	137	136	64 - 120	1	30	F	F
Carbon tetrachloride	105	107	73 - 131	2	30		
Chlorobenzene	99	102	76 - 112	4	30		
Chlorodibromomethane	103	100	87 - 127	3	30		
Chloroethane	95	96	85 - 131	1	30		
Chloroform	101	100	77 - 125	0	30		
Chloromethane	76	77	64 - 125	1	30		
cis-1,2-Dichloroethene	98	99	82 - 123	1	30		
cis-1,3-Dichloropropene	102	102	74 - 122	0	30		
Dichlorobromomethane	102	101	79 - 131	1	30		
1,1-Dichloroethane	103	105	80 - 125	3	30		
1,2-Dichloroethane	94	92	75 - 131	2	30		
1,1-Dichloroethene	101	99	71 - 123	2	30		
1,2-Dichloropropane	104	102	81 - 124	2	30		
Ethylbenzene	105	109	78 - 125	4	30		
2-Hexanone	91	80	59 - 125	13	30		
Methylene Chloride	92	90	67 - 117	3	30		
methyl isobutyl ketone	89	80	72 - 117	11	30		
Styrene	98	100	74 - 115	2	30		
1,1,2,2-Tetrachloroethane	88	86	78 - 131	2	30		
Tetrachloroethene	106	112	77 - 123	5	30		
Toluene	105	108	76 - 114	3	30		
trans-1,2-Dichloroethene	103	103	74 - 136	0	30		
trans-1,3-Dichloropropene	102	99	76 - 125	3	30		

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23358

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-18114-6	Analysis Batch: 510-23358	Instrument ID: Volatiles GC/MS A
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: A8902.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	09/21/2007 1729		Final Weight/Volume: 5 mL
Date Prepared:	09/21/2007 1729		

MSD Lab Sample ID:	510-18114-6	Analysis Batch: 510-23358	Instrument ID: Volatiles GC/MS A
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: A8903.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	09/21/2007 1756		Final Weight/Volume: 5 mL
Date Prepared:	09/21/2007 1756		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,1,1-Trichloroethane	104	105	76 - 130	1	30		
1,1,2-Trichloroethane	92	90	80 - 122	2	30		
Trichloroethene	101	107	80 - 122	6	30		
Vinyl acetate	96	92	84 - 136	4	30		
Vinyl chloride	87	87	76 - 131	0	30		

Surrogate	MS % Rec	MSD % Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	86	X	87 - 120
Toluene-d8 (Surr)	103	101		89 - 106
4-Bromofluorobenzene (Surr)	102	105		89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23465

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-23465/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/24/2007 2026
Date Prepared: 09/24/2007 2026

Analysis Batch: 510-23465
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8771.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
2-Butanone (MEK)	<10		2.3	10
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
Carbon disulfide	<5.0		0.24	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
Carbon tetrachloride	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
Chlorobenzene	<5.0		0.24	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
2-Hexanone	<10		1.0	10
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
methyl isobutyl ketone	<10		0.61	10
Chlorodibromomethane	<5.0		0.45	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Ethylbenzene	<5.0		0.17	5.0
Methylene Chloride	<5.0		2.1	5.0
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	87 - 120
Toluene-d8 (Surr)	97	89 - 106
4-Bromofluorobenzene (Surr)	113	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23465

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-23465/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/24/2007 1924
Date Prepared: 09/24/2007 1924

Analysis Batch: 510-23465
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8769.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23465/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/24/2007 1955
Date Prepared: 09/24/2007 1955

Analysis Batch: 510-23465
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8770.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
2-Butanone (MEK)	101	111	66 - 126	9	30		
Acetone	86	114	33 - 136	29	30		
Benzene	95	107	78 - 117	12	30		
Bromoform	90	102	75 - 126	13	30		
Bromomethane	84	93	84 - 131	10	30		
Dichlorobromomethane	94	104	79 - 131	10	30		
1,1-Dichloroethane	96	100	80 - 125	5	30		
Carbon disulfide	129	146	64 - 120	12	30	*	*
1,2-Dichloroethane	86	99	75 - 131	14	30		
Carbon tetrachloride	99	108	73 - 131	8	30		
1,1-Dichloroethene	96	106	71 - 123	10	30		
Chlorobenzene	89	99	76 - 112	10	30		
1,2-Dichloropropane	87	98	81 - 124	12	30		
Chloroethane	78	94	85 - 131	20	30	*	
Chloroform	90	102	77 - 125	12	30		
2-Hexanone	88	101	59 - 125	14	30		
Chloromethane	77	88	64 - 125	14	30		
cis-1,2-Dichloroethene	98	109	82 - 123	11	30		
cis-1,3-Dichloropropene	83	94	74 - 122	12	30		
methyl isobutyl ketone	85	100	72 - 117	16	30		
Chlorodibromomethane	97	110	87 - 127	12	30		
1,1,2,2-Tetrachloroethane	84	102	78 - 131	19	30		
Ethylbenzene	90	103	78 - 125	13	30		
Methylene Chloride	95	104	67 - 117	9	30		
Styrene	87	95	74 - 115	9	30		
Tetrachloroethene	95	99	77 - 123	5	30		
Toluene	90	101	76 - 114	11	30		
1,1,1-Trichloroethane	95	103	76 - 130	8	30		
trans-1,2-Dichloroethene	94	98	74 - 136	4	30		
1,1,2-Trichloroethane	85	93	80 - 122	8	30		
trans-1,3-Dichloropropene	88	94	76 - 125	7	30		
Trichloroethene	88	104	80 - 122	16	30		

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23465

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 510-23465/2	Analysis Batch:	510-23465	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	L8769.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	09/24/2007 1924			Final Weight/Volume:	5 mL
Date Prepared:	09/24/2007 1924				

LCSD Lab Sample ID:	LCSD 510-23465/3	Analysis Batch:	510-23465	Instrument ID:	Agilent 5975 GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	L8770.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	09/24/2007 1955			Final Weight/Volume:	5 mL
Date Prepared:	09/24/2007 1955				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	97	111	84 - 136	13	30		
Vinyl chloride	78	88	76 - 131	11	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	96	95	87 - 120
Toluene-d8 (Surr)	98	98	89 - 106
4-Bromofluorobenzene (Surr)	99	102	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23002/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1934
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.13		0.052	0.13

Lab Control Spike - Batch: 510-23002

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23002/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/17/2007 1939
Date Prepared: 09/17/2007 0910

Analysis Batch: 510-23100
Prep Batch: 510-23002
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 0.9466 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	106	107	101	81 - 118	

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23454

Method: 6020
Preparation: N/A

Lab Sample ID: MB 510-23454/12
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/24/2007 1921
Date Prepared: N/A

Analysis Batch: 510-23454
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result	Qual	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Lab Control Spike - Batch: 510-23454

Method: 6020
Preparation: N/A

Lab Sample ID: LCS 510-23454/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/24/2007 1924
Date Prepared: N/A

Analysis Batch: 510-23454
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	200	215	108	80 - 120	
Lead	200	203	102	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23454

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18114-6	Analysis Batch: 510-23454	Instrument ID: TE ICPMS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: mL
Date Analyzed:	09/24/2007 1946		Final Weight/Volume: 25 mL
Date Prepared:	N/A		

MSD Lab Sample ID:	510-18114-6	Analysis Batch: 510-23454	Instrument ID: TE ICPMS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: mL
Date Analyzed:	09/24/2007 1950		Final Weight/Volume: 25 mL
Date Prepared:	N/A		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	103	103	75 - 125	0	20		
Lead	97	99	75 - 125	3	20		

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23347

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23347/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/22/2007 1850
Date Prepared: N/A

Analysis Batch: 510-23347
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

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

Client: Burns & McDonnell

Job Number: 510-18114-1

Method Blank - Batch: 510-23461

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23461/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1320
Date Prepared: N/A

Analysis Batch: 510-23461
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

Duplicate - Batch: 510-23461

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 510-18114-7
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1320
Date Prepared: N/A

Analysis Batch: 510-23461
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	18	18.8	2	20	
Percent Solids	82	81.2	0	20	

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

Burns & McDonnell SINCE 1898

090705 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

5.6°C 50 gt Coleman

18114

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: SHARON SHELTON

Laboratory: TEST AMERICA - VALPARAISO
Address: 2400 CUMBERLAND DR
City/State/Zip: VALPARAISO, IN 46383
Telephone:

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK STEEL - KANSAS CITY, MO

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	~~Sample Event: Round~~	~~Sample Event: Year~~	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: VOCs	Analysis: Tot. Dissolved Lead & Cadmium	Analysis: Total Lead	Remarks
AK STEEL	TRIP BLANK		18114	-1			9/12/07	0800	X			3	X			
	02B18	DW1		-2	24	28		0835	X			4	X	X		DISSOLVED LEAD & CADMIUM
	02B21	DW1		-3	16	20		1015	X			4	X	X		FILTERED IN FIELD
	02B21	DW1D		-4	16	20		1015	X			4	X	X		
	02B19	DW1		-5	14	18		1100	X			4	X	X		
	02B20	DW1		-6	22	26		1140	X			4	X	X		
	02B20	DW1 MS	18114	~~-7~~ -6	22	26		1140	X			4	X	X		
	02B20	DW1 MSD		~~-8~~ -6	22	26		1140	X			4	X	X		
	A08B49	SB1		-7	0	6"		1350		X		1			X	
	A08B49	SB2		-8	6"	2'		1355		X		1			X	
	A08B26	SB1		-9	0	6"		1430		X		1			X	
	A08B26	SB2		-10	6"	2'		1435		X		1			X	
	A08B50	SB1		~~-11~~ -11	0	6"		1450		X		1			X	
	A08B50	SB2		~~-12~~ -12	6"	2"		1455		X		1			X	

Sampler (signature): TIM STECHER

Sampler (signature):

Special Instructions:

Relinquished By (signature):	Date/Time	Relinquished By (signature):	Date/Time
1. Tim Stecher	9/12/07 1615	RECEIVED	
2. M Johnson	9/12/07	~~Relinquished~~ By (signature): 1040 [signature] TA 9/13/2007	

Ice Present in Container: Yes ☐ No ☐

Temperature Upon Receipt:

Laboratory Comments:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18114-1

Login Number: 18114
List Source: TestAmerica Valparaiso
Creator: Wesson, Pete J
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

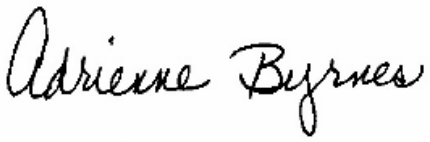
ANALYTICAL REPORT

Job Number: 510-18156-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/02/2007
Revision: 1

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Job Narrative
510-J18156-1

Comments
This report has been revised to include this narrative and the LCS.

Receipt
All samples were received in good condition within temperature requirements.

Metals
No analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18156-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD

Lab References:

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18156-1

Method	Analyst	Analyst ID
SW846 6020	Hamner, Barb J	BJH

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-18156-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18156-1	03B08A/DW1	Water	09/13/2007 1350	09/14/2007 1010
510-18156-2	03B08A/DW1D	Water	09/13/2007 1350	09/14/2007 1010

Client: Burns & McDonnell

Job Number: 510-18156-1

Client Sample ID: 03B08A/DW1

Lab Sample ID: 510-18156-1
Client Matrix: Water

Date Sampled: 09/13/2007 1350
Date Received: 09/14/2007 1010

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/20/2007 1134
Date Prepared: N/A

Analysis Batch: 510-23250

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18156-1

Client Sample ID: 03B08A/DW1D

Lab Sample ID: 510-18156-2
Client Matrix: Water

Date Sampled: 09/13/2007 1350
Date Received: 09/14/2007 1010

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 09/20/2007 1155
Date Prepared: N/A

Analysis Batch: 510-23250

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Cadmium	1.4		0.055	1.0
Lead	<0.50		0.21	0.50

Client: Burns & McDonnell

Job Number: 510-18156-1

Method Blank - Batch: 510-23250

Method: 6020
Preparation: N/A

Lab Sample ID: MB 510-23250/19
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/20/2007 1123
Date Prepared: N/A

Analysis Batch: 510-23250
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result	Qual	MDL	RL
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50

Lab Control Spike - Batch: 510-23250

Method: 6020
Preparation: N/A

Lab Sample ID: LCS 510-23250/20
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/20/2007 1128
Date Prepared: N/A

Analysis Batch: 510-23250
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	200	215	107	80 - 120	
Lead	200	204	102	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18156-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23250

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18156-1	Analysis Batch:	510-23250	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	09/20/2007 1144			Final Weight/Volume:	100 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-18156-1	Analysis Batch:	510-23250	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	09/20/2007 1149			Final Weight/Volume:	100 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	101	102	75 - 125	1	20		
Lead	101	100	75 - 125	1	20		

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

510-28-061 3.1'c

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: SAM Woodland	Lab PM: Byrnes, Adrienne R	Carrier Tracking No(s):	COC No: 510-2358.1
Client Contact: Ms. Sharon Shelton	Phone:	E-Mail: adrienne.byrnes@testamericainc.com		Page: Page 1 of 1
Company: Burns & McDonnell				STL Job #:

Address: 9400 Ward Parkway	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Kansas City	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: MO, 64114			
Phone:	PO #: Purchase Order not requir		Other:
Email: sshelton@burnsmcd.com	WO #:		
Project Name: SWMU 3	Project #: 51001006		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020/FIELD_FLTRD - (MOD) RCRA Metals by 6020	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D		
03B08A/DW1 18156-1	9-13-07	1350		Water	Y	N	X		*Samples Were ~~MUST~~ TO be field filtered
03B08A/DW1D ↓ -2	9-13-07	1350		Water	Y	N	X		
				Water		N			
				Water		N			
				Water		N			
				Water		N			
				Water		N			

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Woodland	9-13-07 1700	BMcD		9/14/07 1010	TA
Relinquished By:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

18156

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18156-1

Login Number: 18156
List Source: TestAmerica Valparaiso
Creator: Richter, Debbie D
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

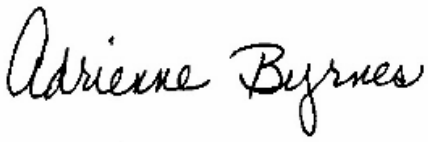
ANALYTICAL REPORT

Job Number: 510-18284-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
10/15/2007

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Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: The laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for analytical batch 23188 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; Benzene; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Tetrachloroethane; Toluene; and trans-1,2-Dichloroethene. Furthermore, the LCSD had Trichloroethene with a high recovery. These analytes were biased high in the LCS and LCSD and were not detected in the associated samples; therefore, the data have been reported.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18284-1, 510-18284-3, 510-18284-4. Evidence of matrix interference is present based on reproducibility; therefore, re-extraction and/or re-analysis was not performed. TALs batch 23290.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23290 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; 2-Hexanone; Acetone; Benzene; Carbon Tetrachloride; Chlorobenzene; Toluene; and Vinyl Acetate. Likewise the laboratory control standard duplicate (LCSD) exceeded control limits for 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; Benzene; Carbon Disulfide; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Isopropyl Benzene; Toluene, and Vinyl Acetate; These analytes were biased high in the LCS/LCSD and were not detected in the associated samples; therefore, the data have been reported. Any result for any of the target compounds that exceeds the reporting limit has been rejected and will be reanlyzed.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23290 exceeded control limits for the following analytes: 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; 2-Hexanone; Acetone; Benzene; Carbon Tetrachloride; Chlorobenzene; Toluene; and Vinyl Acetate. Likewise the laboratory control standard duplicate (LCSD) exceeded control limits for 1,1,1-Trichloroethane; 1,1-Dichloroethane; 1,1-Dichloroethene; Benzene; Carbon Disulfide; Carbon Tetrachloride; Chlorobenzene; cis-1,2-Dichloroethene; Isopropyl Benzene; Toluene, and Vinyl Acetate; These analytes were biased high in the LCS/LCSD and were not detected in the associated samples; therefore, the data have been reported. Any result for any of the target compounds that exceeds the reporting limit has been rejected and will be reanlyzed.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18284-1, 510-18284-3, 510-18284-4. The sample(s) shows evidence of matrix interference based on the reproducibility of the occurrence. TALS batch 23290.

Method 8260B: The laboratory control standard duplicate (LCSD) for analytical batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene. These analytes were biased high in the LCSD and were not detected in the associated samples; therefore, the data have been reported.

Method 8260B: The laboratory control standard duplicate (LCSD) for analytical batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene. These analytes were biased high in the LCSD and were not detected in the associated samples; therefore, the data have been reported.

Method 8260B: The third internal standard, 1,4-Dichlorobenzene-d4, had a peak area less than 50% of that in the continuing calibration. No target compounds that quantitate based on this deficient internal standard were reported from this analytical run, and a reanalysis will occur. TALS batch 23456.

Method 8260B: Surrogate recovery for the following sample(s) was outside the upper control limit: 510-18284-1, 510-18284-3, 510-18284-4. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23456.

Method 8260B: The %RPD of the laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for preparation batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene.

Method 8260B: The %RPD of the laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for analytical batch 23456 exceeded control limits for the following analytes: Carbon Disulfide; cis-1,2-Dichloroethene; and Toluene.

Method 8260B: Surrogate recovery for the following sample(s) was outside the upper control limit: 510-18284-11. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23500.

Method 8260B: The laboratory control standard (LCS) and duplicate (LCSD) for analytical batch 23500 exceeded control limits for the following analyte: Carbon Disulfide. This analyte was biased high in the LCS and LCSD and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: The laboratory control standard (LCS) for analytical batch 23550 exceeded control limits for the following analyte: Vinyl

Acetate. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported.

Method 8260B: Surrogate recovery for the following sample(s) was outside control limits: 510-18284-5, 510-18284-7, 510-18284-8, 510-18284-9. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed. TALS batch 23579.

Method 8260B: Internal standard responses were outside of acceptance limits for the following sample(s): 510-18284-7, 510-18284-8, 510-18284-9. The sample(s) shows evidence of matrix interference. TALS batch 23579.

Method 8260B: The laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) for analytical batch 23579 exceeded control limits for the following analyte: Vinyl Acetate. This analyte was biased high in the LCS and LCSD and was not detected in the associated samples; therefore, the data has been reported.

No other analytical or quality issues were noted.

GC/MS Semi VOA
No analytical or quality issues were noted.

GC Semi VOA
No analytical or quality issues were noted.

Metals
Method 6020: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 23463 were outside control limits for arsenic, barium, chromium, lead, and selenium. The associated laboratory control standard (LCS) met acceptance criteria. A post digestion spike was performed and passed QC reuirements. Data is acceptable.
510-18284-1, 510-18284-2, 510-18284-3, 510-18284-4, 510-18284-5, 510-18284-7, 510-18284-8, 510-18284-9, 510-18284-10

Method 6020: The continuing calibration verification (CCV) for cadmium recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.
510-18284-4, 510-18284-5, 510-18284-7, 510-18284-8, 510-18284-10

Method 7471A: The matrix spike recovery for batch 23370 was outside control limits for mercury. The associated laboratory control standard (LCS) met acceptance criteria. The matrix spike duplicate and %RPD were within QC required limits. Data is acceptable.
510-18284-9

No other analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18284-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Closed System Purge & Trap/Frozen Water	TAL VAL		SW846 5035
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	TAL PEN	SW846 8270C	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Iowa - Extractable Petroleum Products	TAL PEN	Iowa DNR OA-2	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B
Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)	TAL VAL	SW846 7471A	
Mercury in Solid or Semi-Solid Waste (Manual Cold	TAL VAL		SW846 7471A
Soil and Waste pH	TAL VAL	SW846 9045C	
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge-and-Trap	TAL VAL		SW846 5030B

Lab References:

TAL PEN = TestAmerica Pensacola

TAL VAL = TestAmerica Valparaiso

Method References:

Iowa DNR = Iowa Department of Natural Resources

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18284-1

Method	Analyst	Analyst ID
SW846 8260B	Hobart, Wes E	WEH
SW846 8270C	Schumann, Jane	JS
Iowa DNR OA-2	Ayers, Kim	KA
SW846 6020	Hamner, Barb J	BJH
SW846 6020	Thomas, Deidra	DT
SW846 7471A	Hoham, Chris H	CHH
SW846 9045C	Boyd, Dan W	DWB
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-18284-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18284-1	24 B11-SB1	Solid	09/17/2007 1405	09/18/2007 0940
510-18284-2	24 B11-SB2	Solid	09/17/2007 1410	09/18/2007 0940
510-18284-3	24 B11-SB2D	Solid	09/17/2007 1410	09/18/2007 0940
510-18284-4	24 B11-SB3	Solid	09/17/2007 1415	09/18/2007 0940
510-18284-5	24 B11-SB4	Solid	09/17/2007 1420	09/18/2007 0940
510-18284-6	24 B11-DW1	Water	09/17/2007 1555	09/18/2007 0940
510-18284-7	24 B12-SB1	Solid	09/17/2007 1625	09/18/2007 0940
510-18284-8	24 B12-SB2	Solid	09/17/2007 1630	09/18/2007 0940
510-18284-9	24 B12-SB3	Solid	09/17/2007 1635	09/18/2007 0940
510-18284-9MS	24 B12-SB3	Solid	09/17/2007 1635	09/18/2007 0940
510-18284-9MSD	24 B12-SB3	Solid	09/17/2007 1635	09/18/2007 0940
510-18284-10	24 B12-SB4	Solid	09/17/2007 1640	09/18/2007 0940
510-18284-11	24 B12-DW1	Water	09/17/2007 1710	09/18/2007 0940
510-18284-12	TRIP BLANK	Water	09/17/2007 1500	09/18/2007 0940

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 | Date Sampled: 09/17/2007 1405
Client Matrix: Solid | % Moisture: 7.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23443 | Lab File ID: L8729.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/21/2007 0206 | Final Weight/Volume: 5 mL
Date Prepared: 09/18/2007 0913

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Benzene		1.7	J *	1.4	6.2
Bromoform		<6.2		1.5	6.2
Bromomethane		<6.2		2.2	6.2
2-Butanone (MEK)		<12		3.5	12
Carbon tetrachloride		<6.2	*	0.56	6.2
Chlorobenzene		<6.2	*	0.84	6.2
Chlorodibromomethane		<6.2		1.0	6.2
Chloroethane		<6.2		1.3	6.2
Chloroform		<6.2		0.92	6.2
Chloromethane		<6.2		1.2	6.2
cis-1,3-Dichloropropene		<6.2		0.93	6.2
Dichlorobromomethane		<6.2		0.68	6.2
1,1-Dichloroethane		<6.2	*	0.77	6.2
1,2-Dichloroethane		<6.2		0.63	6.2
1,1-Dichloroethene		<6.2	*	0.68	6.2
1,2-Dichloropropane		<6.2		0.53	6.2
Ethylbenzene		<6.2		0.79	6.2
2-Hexanone		<12	*	1.7	12
Methylene Chloride		10		0.48	6.2
methyl isobutyl ketone		<12		1.6	12
Styrene		<6.2		0.42	6.2
1,1,2,2-Tetrachloroethane		<6.2		1.4	6.2
Tetrachloroethene		<6.2		1.6	6.2
trans-1,2-Dichloroethene		<6.2		0.68	6.2
trans-1,3-Dichloropropene		<6.2		0.74	6.2
1,1,1-Trichloroethane		<6.2	*	0.85	6.2
1,1,2-Trichloroethane		<6.2		1.9	6.2
Trichloroethene		<6.2		0.99	6.2
Vinyl acetate		<6.2	*	0.57	6.2
Vinyl chloride		<6.2		1.8	6.2
Xylenes, Total		<12		2.1	12

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	140	X	80 - 124
Toluene-d8 (Surr)	94		83 - 113
4-Bromofluorobenzene (Surr)	111		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 | Date Sampled: 09/17/2007 1405
Client Matrix: Solid | % Moisture: 7.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8756.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0037 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		3.9	J *	1.1	5.4
cis-1,2-Dichloroethene		<5.4	*	0.78	5.4
Toluene		<5.4	*	0.84	5.4

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8756.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0037 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	132	X	80 - 124
Toluene-d8 (Surr)	94		83 - 113
4-Bromofluorobenzene (Surr)	107		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 | Date Sampled: 09/17/2007 1405
Client Matrix: Solid | % Moisture: 7.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8839.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0259 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		<11		1.5	11

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8839.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0259 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	81	80 - 124
Toluene-d8 (Surr)	92	83 - 113
4-Bromofluorobenzene (Surr)	112	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2

Lab Sample ID: 510-18284-2 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.7 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23188 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23263 | Lab File ID: L8705.D
Dilution: 1.0 | Initial Weight/Volume: 31.841 g
Date Analyzed: 09/19/2007 1826 | Final Weight/Volume: 36.0478 g
Date Prepared: 09/18/2007 1631

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		38		1.7	13
Benzene		<6.3	*	1.4	6.3
Bromoform		<6.3		1.5	6.3
Bromomethane		<6.3		2.2	6.3
2-Butanone (MEK)		<13		3.6	13
Carbon disulfide		12		1.3	6.3
Carbon tetrachloride		<6.3	*	0.57	6.3
Chlorobenzene		<6.3	*	0.85	6.3
Chlorodibromomethane		<6.3		1.1	6.3
Chloroethane		<6.3		1.4	6.3
Chloroform		<6.3		0.94	6.3
Chloromethane		<6.3		1.2	6.3
cis-1,2-Dichloroethene		<6.3	*	0.91	6.3
cis-1,3-Dichloropropene		<6.3		0.95	6.3
Dichlorobromomethane		<6.3		0.69	6.3
1,1-Dichloroethane		<6.3	*	0.78	6.3
1,2-Dichloroethane		<6.3		0.64	6.3
1,1-Dichloroethene		<6.3		0.69	6.3
1,2-Dichloropropane		<6.3		0.54	6.3
Ethylbenzene		<6.3		0.80	6.3
2-Hexanone		<13		1.7	13
Methylene Chloride		12	B	0.49	6.3
methyl isobutyl ketone		<13		1.6	13
Styrene		<6.3	*	0.43	6.3
1,1,2,2-Tetrachloroethane		<6.3		1.4	6.3
Tetrachloroethene		<6.3	*	1.6	6.3
Toluene		1.3	J *	0.97	6.3
trans-1,2-Dichloroethene		<6.3	*	0.69	6.3
trans-1,3-Dichloropropene		<6.3		0.75	6.3
1,1,1-Trichloroethane		<6.3	*	0.87	6.3
1,1,2-Trichloroethane		<6.3		1.9	6.3
Trichloroethene		<6.3	*	1.0	6.3
Vinyl acetate		<6.3		0.58	6.3
Vinyl chloride		<6.3		1.8	6.3
Xylenes, Total		<13		2.2	13

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	122	80 - 124
Toluene-d8 (Surr)	96	83 - 113
4-Bromofluorobenzene (Surr)	123	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23443 | Lab File ID: L8730.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/21/2007 0239 | Final Weight/Volume: 5 mL
Date Prepared: 09/18/2007 0913

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Benzene		<6.2	*	1.4	6.2
Bromoform		<6.2		1.5	6.2
Bromomethane		<6.2		2.2	6.2
2-Butanone (MEK)		<12		3.6	12
Carbon tetrachloride		<6.2	*	0.56	6.2
Chlorobenzene		<6.2	*	0.85	6.2
Chlorodibromomethane		<6.2		1.1	6.2
Chloroethane		<6.2		1.4	6.2
Chloroform		<6.2		0.93	6.2
Chloromethane		<6.2		1.2	6.2
cis-1,3-Dichloropropene		<6.2		0.94	6.2
Dichlorobromomethane		<6.2		0.69	6.2
1,1-Dichloroethane		<6.2	*	0.78	6.2
1,2-Dichloroethane		<6.2		0.64	6.2
1,1-Dichloroethene		<6.2	*	0.69	6.2
1,2-Dichloropropane		<6.2		0.54	6.2
Ethylbenzene		<6.2		0.80	6.2
2-Hexanone		<12	*	1.7	12
Methylene Chloride		13		0.48	6.2
methyl isobutyl ketone		<12		1.6	12
Styrene		<6.2		0.43	6.2
1,1,2,2-Tetrachloroethane		<6.2		1.4	6.2
Tetrachloroethene		<6.2		1.6	6.2
trans-1,2-Dichloroethene		<6.2		0.69	6.2
trans-1,3-Dichloropropene		<6.2		0.75	6.2
1,1,1-Trichloroethane		<6.2	*	0.86	6.2
1,1,2-Trichloroethane		<6.2		1.9	6.2
Trichloroethene		<6.2		1.0	6.2
Vinyl acetate		<6.2	*	0.57	6.2
Vinyl chloride		<6.2		1.8	6.2
Xylenes, Total		<12		2.2	12

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	149	X	80 - 124
Toluene-d8 (Surr)	93		83 - 113
4-Bromofluorobenzene (Surr)	112		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8757.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0110 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		2.5	J *	1.2	5.5
cis-1,2-Dichloroethene		<5.5	*	0.80	5.5
Toluene		<5.5	*	0.86	5.5

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8757.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0110 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	128	X	80 - 124
Toluene-d8 (Surr)	92		83 - 113
4-Bromofluorobenzene (Surr)	111		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8840.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0332 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		7.2	J	1.5	11

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8840.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0332 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	113	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 | Date Sampled: 09/17/2007 1415
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23290 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Prep Batch: 510-23443 | Lab File ID: L8731.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/21/2007 0312 | Final Weight/Volume: 5 mL
Date Prepared: 09/18/2007 0913

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Benzene		1.6	J *	1.5	6.5
Bromoform		<6.5		1.5	6.5
Bromomethane		<6.5		2.3	6.5
2-Butanone (MEK)		<13		3.7	13
Carbon tetrachloride		<6.5	*	0.59	6.5
Chlorobenzene		<6.5	*	0.89	6.5
Chlorodibromomethane		<6.5		1.1	6.5
Chloroethane		<6.5		1.4	6.5
Chloroform		<6.5		0.97	6.5
Chloromethane		<6.5		1.3	6.5
cis-1,3-Dichloropropene		<6.5		0.99	6.5
Dichlorobromomethane		<6.5		0.72	6.5
1,1-Dichloroethane		<6.5	*	0.82	6.5
1,2-Dichloroethane		<6.5		0.67	6.5
1,1-Dichloroethene		<6.5	*	0.72	6.5
1,2-Dichloropropane		<6.5		0.56	6.5
Ethylbenzene		<6.5		0.83	6.5
2-Hexanone		<13	*	1.8	13
Methylene Chloride		8.7		0.51	6.5
methyl isobutyl ketone		<13		1.7	13
Styrene		<6.5		0.45	6.5
1,1,2,2-Tetrachloroethane		<6.5		1.4	6.5
Tetrachloroethene		<6.5		1.7	6.5
Toluene		1.7	J *	1.0	6.5
trans-1,2-Dichloroethene		<6.5		0.72	6.5
trans-1,3-Dichloropropene		<6.5		0.78	6.5
1,1,1-Trichloroethane		<6.5	*	0.90	6.5
1,1,2-Trichloroethane		<6.5		2.0	6.5
Trichloroethene		<6.5		1.0	6.5
Vinyl acetate		<6.5	*	0.60	6.5
Vinyl chloride		<6.5		1.9	6.5
Xylenes, Total		<13		2.3	13

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	160	X	80 - 124
Toluene-d8 (Surr)	99		83 - 113
4-Bromofluorobenzene (Surr)	92		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 | Date Sampled: 09/17/2007 1415
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8758.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0142 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Carbon disulfide		3.7	J *	1.2	5.6
cis-1,2-Dichloroethene		<5.6	*	0.81	5.6

Method: 8260B | Analysis Batch: 510-23456 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8758.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/22/2007 0142 | Run Type: RA | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	132	X	80 - 124
Toluene-d8 (Surr)	94		83 - 113
4-Bromofluorobenzene (Surr)	107		68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 | Date Sampled: 09/17/2007 1415
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8841.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0405 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		13		1.5	11

Method: 8260B | Analysis Batch: 510-23550 | Instrument ID: Agilent 5975 GC/MS
Preparation: N/A | Lab File ID: L8841.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/27/2007 0405 | Run Type: RA2 | Final Weight/Volume: 5 mL
Date Prepared: N/A

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	80 - 124
Toluene-d8 (Surr)	92	83 - 113
4-Bromofluorobenzene (Surr)	99	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB4

Lab Sample ID: 510-18284-5 | Date Sampled: 09/17/2007 1420
Client Matrix: Solid | % Moisture: 15.7 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23579 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23590 | Lab File ID: L8851.D
Dilution: 1.0 | Initial Weight/Volume: 31.777 g
Date Analyzed: 09/27/2007 1258 | Final Weight/Volume: 37.5680 g
Date Prepared: 09/18/2007 1539

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		37	B	1.9	14
Benzene		<7.0		1.6	7.0
Bromoform		<7.0		1.7	7.0
Bromomethane		<7.0		2.5	7.0
2-Butanone (MEK)		<14		4.0	14
Carbon disulfide		<7.0		1.5	7.0
Carbon tetrachloride		<7.0		0.63	7.0
Chlorobenzene		<7.0		0.95	7.0
Chlorodibromomethane		<7.0		1.2	7.0
Chloroethane		<7.0		1.5	7.0
Chloroform		<7.0		1.0	7.0
Chloromethane		<7.0		1.4	7.0
cis-1,2-Dichloroethene		<7.0		1.0	7.0
cis-1,3-Dichloropropene		<7.0		1.1	7.0
Dichlorobromomethane		<7.0		0.78	7.0
1,1-Dichloroethane		<7.0		0.88	7.0
1,2-Dichloroethane		<7.0		0.72	7.0
1,1-Dichloroethene		<7.0		0.77	7.0
1,2-Dichloropropane		<7.0		0.61	7.0
Ethylbenzene		<7.0		0.90	7.0
2-Hexanone		<14		1.9	14
Methylene Chloride		3.3	J B	0.54	7.0
methyl isobutyl ketone		<14		1.8	14
Styrene		<7.0		0.48	7.0
1,1,2,2-Tetrachloroethane		<7.0		1.5	7.0
Tetrachloroethene		<7.0		1.8	7.0
Toluene		<7.0		1.1	7.0
trans-1,2-Dichloroethene		<7.0		0.77	7.0
trans-1,3-Dichloropropene		<7.0		0.84	7.0
1,1,1-Trichloroethane		<7.0		0.97	7.0
1,1,2-Trichloroethane		<7.0		2.2	7.0
Trichloroethene		<7.0		1.1	7.0
Vinyl acetate		<7.0	*	0.65	7.0
Vinyl chloride		<7.0		2.0	7.0
Xylenes, Total		<14		2.4	14

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92		80 - 124
Toluene-d8 (Surr)	95		83 - 113
4-Bromofluorobenzene (Surr)	135	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-DW1

Lab Sample ID: 510-18284-6 | Date Sampled: 09/17/2007 1555
Client Matrix: Water | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23500 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8792.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/25/2007 1905 | Final Weight/Volume: 5 mL
Date Prepared: 09/25/2007 1905

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0	*	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	115	87 - 120
Toluene-d8 (Surr)	96	89 - 106
4-Bromofluorobenzene (Surr)	111	89 - 120

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB1

Lab Sample ID: 510-18284-7 | Date Sampled: 09/17/2007 1625
Client Matrix: Solid | % Moisture: 9.1 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23579 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23590 | Lab File ID: L8852.D
Dilution: 1.0 | Initial Weight/Volume: 31.747 g
Date Analyzed: 09/27/2007 1331 | Final Weight/Volume: 33.9611 g
Date Prepared: 09/18/2007 1539

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		22	B	1.6	12
Benzene		2.4	J	1.3	5.9
Bromoform		<5.9		1.4	5.9
Bromomethane		<5.9		2.1	5.9
2-Butanone (MEK)		<12		3.4	12
Carbon disulfide		<5.9		1.2	5.9
Carbon tetrachloride		<5.9		0.53	5.9
Chlorobenzene		<5.9		0.80	5.9
Chlorodibromomethane		<5.9		0.99	5.9
Chloroethane		<5.9		1.3	5.9
Chloroform		<5.9		0.88	5.9
Chloromethane		<5.9		1.1	5.9
cis-1,2-Dichloroethene		<5.9		0.85	5.9
cis-1,3-Dichloropropene		<5.9		0.89	5.9
Dichlorobromomethane		<5.9		0.65	5.9
1,1-Dichloroethane		<5.9		0.74	5.9
1,2-Dichloroethane		<5.9		0.60	5.9
1,1-Dichloroethene		<5.9		0.65	5.9
1,2-Dichloropropane		<5.9		0.51	5.9
Ethylbenzene		<5.9		0.75	5.9
2-Hexanone		<12		1.6	12
Methylene Chloride		5.4	J B	0.46	5.9
methyl isobutyl ketone		<12		1.5	12
Styrene		<5.9		0.40	5.9
1,1,2,2-Tetrachloroethane		<5.9		1.3	5.9
Tetrachloroethene		<5.9		1.5	5.9
Toluene		1.7	J	0.91	5.9
trans-1,2-Dichloroethene		<5.9		0.65	5.9
trans-1,3-Dichloropropene		<5.9		0.70	5.9
1,1,1-Trichloroethane		<5.9		0.82	5.9
1,1,2-Trichloroethane		<5.9		1.8	5.9
Trichloroethene		<5.9		0.94	5.9
Vinyl acetate		<5.9	*	0.54	5.9
Vinyl chloride		<5.9		1.7	5.9
Xylenes, Total		<12		2.0	12

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	101		80 - 124
Toluene-d8 (Surr)	91		83 - 113
4-Bromofluorobenzene (Surr)	153	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB2

Lab Sample ID: 510-18284-8 | Date Sampled: 09/17/2007 1630
Client Matrix: Solid | % Moisture: 5.5 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23579 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23590 | Lab File ID: L8853.D
Dilution: 1.0 | Initial Weight/Volume: 31.950 g
Date Analyzed: 09/27/2007 1403 | Final Weight/Volume: 34.6357 g
Date Prepared: 09/18/2007 1539

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		21	B	1.6	11
Benzene		1.9	J	1.3	5.7
Bromoform		<5.7		1.4	5.7
Bromomethane		<5.7		2.0	5.7
2-Butanone (MEK)		<11		3.3	11
Carbon disulfide		2.5	J	1.2	5.7
Carbon tetrachloride		<5.7		0.52	5.7
Chlorobenzene		<5.7		0.78	5.7
Chlorodibromomethane		<5.7		0.97	5.7
Chloroethane		<5.7		1.3	5.7
Chloroform		<5.7		0.86	5.7
Chloromethane		<5.7		1.1	5.7
cis-1,2-Dichloroethene		<5.7		0.83	5.7
cis-1,3-Dichloropropene		<5.7		0.87	5.7
Dichlorobromomethane		<5.7		0.64	5.7
1,1-Dichloroethane		<5.7		0.72	5.7
1,2-Dichloroethane		<5.7		0.59	5.7
1,1-Dichloroethene		<5.7		0.63	5.7
1,2-Dichloropropane		<5.7		0.50	5.7
Ethylbenzene		<5.7		0.73	5.7
2-Hexanone		<11		1.6	11
Methylene Chloride		2.8	J B	0.45	5.7
methyl isobutyl ketone		<11		1.5	11
Styrene		<5.7		0.39	5.7
1,1,2,2-Tetrachloroethane		<5.7		1.3	5.7
Tetrachloroethene		<5.7		1.5	5.7
Toluene		1.6	J	0.89	5.7
trans-1,2-Dichloroethene		<5.7		0.63	5.7
trans-1,3-Dichloropropene		<5.7		0.69	5.7
1,1,1-Trichloroethane		<5.7		0.80	5.7
1,1,2-Trichloroethane		<5.7		1.8	5.7
Trichloroethene		<5.7		0.92	5.7
Vinyl acetate		<5.7	*	0.53	5.7
Vinyl chloride		<5.7		1.6	5.7
Xylenes, Total		<11		2.0	11

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98		80 - 124
Toluene-d8 (Surr)	85		83 - 113
4-Bromofluorobenzene (Surr)	150	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB3

Lab Sample ID: 510-18284-9 | Date Sampled: 09/17/2007 1635
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23579 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23590 | Lab File ID: L8854.D
Dilution: 1.0 | Initial Weight/Volume: 31.804 g
Date Analyzed: 09/27/2007 1436 | Final Weight/Volume: 35.4219 g
Date Prepared: 09/18/2007 1539

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		18	B	1.7	12
Benzene		5.8	J	1.4	6.1
Bromoform		<6.1		1.4	6.1
Bromomethane		<6.1		2.1	6.1
2-Butanone (MEK)		<12		3.5	12
Carbon disulfide		2.5	J	1.3	6.1
Carbon tetrachloride		<6.1		0.55	6.1
Chlorobenzene		<6.1		0.84	6.1
Chlorodibromomethane		<6.1		1.0	6.1
Chloroethane		<6.1		1.3	6.1
Chloroform		<6.1		0.92	6.1
Chloromethane		<6.1		1.2	6.1
cis-1,2-Dichloroethene		<6.1		0.89	6.1
cis-1,3-Dichloropropene		<6.1		0.93	6.1
Dichlorobromomethane		<6.1		0.68	6.1
1,1-Dichloroethane		<6.1		0.77	6.1
1,2-Dichloroethane		<6.1		0.63	6.1
1,1-Dichloroethene		<6.1		0.68	6.1
1,2-Dichloropropane		<6.1		0.53	6.1
Ethylbenzene		1.4	J	0.78	6.1
2-Hexanone		<12		1.7	12
Methylene Chloride		1.8	J B	0.48	6.1
methyl isobutyl ketone		<12		1.6	12
Styrene		<6.1		0.42	6.1
1,1,2,2-Tetrachloroethane		<6.1		1.4	6.1
Tetrachloroethene		<6.1		1.6	6.1
Toluene		5.0	J	0.95	6.1
trans-1,2-Dichloroethene		<6.1		0.68	6.1
trans-1,3-Dichloropropene		<6.1		0.74	6.1
1,1,1-Trichloroethane		<6.1		0.85	6.1
1,1,2-Trichloroethane		<6.1		1.9	6.1
Trichloroethene		<6.1		0.98	6.1
Vinyl acetate		<6.1	*	0.56	6.1
Vinyl chloride		<6.1		1.7	6.1
Xylenes, Total		<12		2.1	12

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98		80 - 124
Toluene-d8 (Surr)	80	X	83 - 113
4-Bromofluorobenzene (Surr)	166	X	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB4

Lab Sample ID: 510-18284-10 | Date Sampled: 09/17/2007 1640
Client Matrix: Solid | % Moisture: 11.5 | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23579 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5035 | Prep Batch: 510-23590 | Lab File ID: L8855.D
Dilution: 1.0 | Initial Weight/Volume: 31.939 g
Date Analyzed: 09/27/2007 1509 | Final Weight/Volume: 37.0459 g
Date Prepared: 09/18/2007 1539

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acetone		18	B	1.8	13
Benzene		2.2	J	1.5	6.6
Bromoform		<6.6		1.5	6.6
Bromomethane		<6.6		2.3	6.6
2-Butanone (MEK)		<13		3.8	13
Carbon disulfide		5.0	J	1.4	6.6
Carbon tetrachloride		<6.6		0.59	6.6
Chlorobenzene		<6.6		0.89	6.6
Chlorodibromomethane		<6.6		1.1	6.6
Chloroethane		<6.6		1.4	6.6
Chloroform		<6.6		0.98	6.6
Chloromethane		<6.6		1.3	6.6
cis-1,2-Dichloroethene		<6.6		0.95	6.6
cis-1,3-Dichloropropene		<6.6		0.99	6.6
Dichlorobromomethane		<6.6		0.73	6.6
1,1-Dichloroethane		<6.6		0.82	6.6
1,2-Dichloroethane		<6.6		0.67	6.6
1,1-Dichloroethene		<6.6		0.72	6.6
1,2-Dichloropropane		<6.6		0.57	6.6
Ethylbenzene		<6.6		0.84	6.6
2-Hexanone		<13		1.8	13
Methylene Chloride		3.6	J B	0.51	6.6
methyl isobutyl ketone		<13		1.7	13
Styrene		<6.6		0.45	6.6
1,1,2,2-Tetrachloroethane		<6.6		1.4	6.6
Tetrachloroethene		<6.6		1.7	6.6
Toluene		1.5	J	1.0	6.6
trans-1,2-Dichloroethene		<6.6		0.72	6.6
trans-1,3-Dichloropropene		<6.6		0.79	6.6
1,1,1-Trichloroethane		<6.6		0.91	6.6
1,1,2-Trichloroethane		<6.6		2.0	6.6
Trichloroethene		<6.6		1.1	6.6
Vinyl acetate		<6.6	*	0.60	6.6
Vinyl chloride		<6.6		1.9	6.6
Xylenes, Total		<13		2.3	13

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	91	80 - 124
Toluene-d8 (Surr)	92	83 - 113
4-Bromofluorobenzene (Surr)	123	68 - 134

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-DW1

Lab Sample ID: 510-18284-11 | Date Sampled: 09/17/2007 1710
Client Matrix: Water | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23500 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8793.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/25/2007 1936 | Final Weight/Volume: 5 mL
Date Prepared: 09/25/2007 1936

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0	*	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	121	X	87 - 120
Toluene-d8 (Surr)	94		89 - 106
4-Bromofluorobenzene (Surr)	122	X	89 - 120

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: **TRIP BLANK**

Lab Sample ID: 510-18284-12 | Date Sampled: 09/17/2007 1500
Client Matrix: Water | Date Received: 09/18/2007 0940

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-23500 | Instrument ID: Agilent 5975 GC/MS
Preparation: 5030B | Lab File ID: L8794.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 09/25/2007 2006 | Final Weight/Volume: 5 mL
Date Prepared: 09/25/2007 2006

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0	*	0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113	87 - 120
Toluene-d8 (Surr)	91	89 - 106
4-Bromofluorobenzene (Surr)	114	89 - 120

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 | Date Sampled: 09/17/2007 1405
Client Matrix: Solid | % Moisture: 7.3 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G1.D
Dilution:	1.0		Initial Weight/Volume: 30.10 g
Date Analyzed:	09/28/2007 1458		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		<350		35	350
Benzo[a]anthracene		<350		35	350
Benzo[a]pyrene		78	J	35	350
Benzo[b]fluoranthene		57	J	35	350
Benzo[g,h,i]perylene		76	J	35	350
Benzo[k]fluoranthene		<350		35	350
Chrysene		89	J	35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		78	J	35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		39	J	35	350
Naphthalene		<350		35	350
Phenanthrene		<350		35	350
Pyrene		160	J	35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	75	41 - 94
Nitrobenzene-d5	78	22 - 94
Terphenyl-d14	85	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2

Lab Sample ID: 510-18284-2 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.7 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-56250 | Instrument ID: GC/MS
Preparation: 3550B | Prep Batch: 400-55889 | Lab File ID: 18284G2.D
Dilution: 1.0 | Initial Weight/Volume: 30.43 g
Date Analyzed: 09/28/2007 1527 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 0824 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		<360		36	360
Benzo[a]pyrene		<360		36	360
Benzo[b]fluoranthene		<360		36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		<360		36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		<360		36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360		36	360
Phenanthrene		<360		36	360
Pyrene		43	J	36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	72	41 - 94
Nitrobenzene-d5	76	22 - 94
Terphenyl-d14	81	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G3.D
Dilution:	1.0		Initial Weight/Volume: 30.47 g
Date Analyzed:	09/28/2007 1557		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		<360		36	360
Benzo[a]pyrene		52	J	36	360
Benzo[b]fluoranthene		46	J	36	360
Benzo[g,h,i]perylene		43	J	36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		61	J	36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		52	J	36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360		36	360
Phenanthrene		<360		36	360
Pyrene		73	J	36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	71	41 - 94
Nitrobenzene-d5	74	22 - 94
Terphenyl-d14	84	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 | Date Sampled: 09/17/2007 1415
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G4.D
Dilution:	1.0		Initial Weight/Volume: 30.03 g
Date Analyzed:	09/28/2007 1626		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		200	J	37	370
Benzo[a]pyrene		180	J	37	370
Benzo[b]fluoranthene		230	J	37	370
Benzo[g,h,i]perylene		160	J	37	370
Benzo[k]fluoranthene		100	J	37	370
Chrysene		210	J	37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		340	J	37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		110	J	37	370
Naphthalene		<370		37	370
Phenanthrene		160	J	37	370
Pyrene		290	J	37	370
1-Methylnaphthalene		<370		37	370
2-Methylnaphthalene		<370		37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	63	41 - 94
Nitrobenzene-d5	66	22 - 94
Terphenyl-d14	74	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB4

Lab Sample ID: 510-18284-5 | Date Sampled: 09/17/2007 1420
Client Matrix: Solid | % Moisture: 15.7 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-56250 | Instrument ID: GC/MS
Preparation: 3550B | Prep Batch: 400-55889 | Lab File ID: 18284G5.D
Dilution: 1.0 | Initial Weight/Volume: 30.46 g
Date Analyzed: 09/28/2007 1655 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 0824 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<390		39	390
Acenaphthylene		<390		39	390
Anthracene		58	J	39	390
Benzo[a]anthracene		210	J	39	390
Benzo[a]pyrene		160	J	39	390
Benzo[b]fluoranthene		220	J	39	390
Benzo[g,h,i]perylene		96	J	39	390
Benzo[k]fluoranthene		94	J	39	390
Chrysene		190	J	39	390
Dibenz(a,h)anthracene		<390		39	390
Fluoranthene		400		39	390
Fluorene		<390		39	390
Indeno[1,2,3-cd]pyrene		79	J	39	390
Naphthalene		78	J	39	390
Phenanthrene		370	J	39	390
Pyrene		320	J	39	390
1-Methylnaphthalene		130	J	39	390
2-Methylnaphthalene		170	J	39	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	67	41 - 94
Nitrobenzene-d5	66	22 - 94
Terphenyl-d14	75	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB1

Lab Sample ID: 510-18284-7 | Date Sampled: 09/17/2007 1625
Client Matrix: Solid | % Moisture: 9.1 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G7.D
Dilution:	1.0		Initial Weight/Volume: 30.01 g
Date Analyzed:	09/28/2007 1724		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		<360		36	360
Benzo[a]pyrene		<360		36	360
Benzo[b]fluoranthene		<360		36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		<360		36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		<360		36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360		36	360
Phenanthrene		72	J	36	360
Pyrene		<360		36	360
1-Methylnaphthalene		46	J	36	360
2-Methylnaphthalene		50	J	36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	64	41 - 94
Nitrobenzene-d5	65	22 - 94
Terphenyl-d14	76	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB2

Lab Sample ID: 510-18284-8 | Date Sampled: 09/17/2007 1630
Client Matrix: Solid | % Moisture: 5.5 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C | Analysis Batch: 400-56250 | Instrument ID: GC/MS
Preparation: 3550B | Prep Batch: 400-55889 | Lab File ID: 18284G8.D
Dilution: 1.0 | Initial Weight/Volume: 30.12 g
Date Analyzed: 09/28/2007 1753 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 0824 | Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		94	J	35	350
Benzo[a]anthracene		240	J	35	350
Benzo[a]pyrene		170	J	35	350
Benzo[b]fluoranthene		230	J	35	350
Benzo[g,h,i]perylene		100	J	35	350
Benzo[k]fluoranthene		110	J	35	350
Chrysene		200	J	35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		630		35	350
Fluorene		36	J	35	350
Indeno[1,2,3-cd]pyrene		88	J	35	350
Naphthalene		<350		35	350
Phenanthrene		500		35	350
Pyrene		480		35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	57	41 - 94
Nitrobenzene-d5	57	22 - 94
Terphenyl-d14	70	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB3

Lab Sample ID: 510-18284-9 | Date Sampled: 09/17/2007 1635
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G9.D
Dilution:	1.0		Initial Weight/Volume: 30.00 g
Date Analyzed:	09/28/2007 1823		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		82	J	36	360
Benzo[a]anthracene		290	J	36	360
Benzo[a]pyrene		210	J	36	360
Benzo[b]fluoranthene		300	J	36	360
Benzo[g,h,i]perylene		120	J	36	360
Benzo[k]fluoranthene		120	J	36	360
Chrysene		270	J	36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		680		36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		96	J	36	360
Naphthalene		180	J	36	360
Phenanthrene		620		36	360
Pyrene		520		36	360
1-Methylnaphthalene		310	J	36	360
2-Methylnaphthalene		380		36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	68	41 - 94
Nitrobenzene-d5	69	22 - 94
Terphenyl-d14	83	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB4

Lab Sample ID: 510-18284-10 | Date Sampled: 09/17/2007 1640
Client Matrix: Solid | % Moisture: 11.5 | Date Received: 09/18/2007 0940

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56250	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55889	Lab File ID: 18284G10.D
Dilution:	1.0		Initial Weight/Volume: 30.14 g
Date Analyzed:	09/28/2007 1852		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		57	J	37	370
Benzo[a]pyrene		<370		37	370
Benzo[b]fluoranthene		48	J	37	370
Benzo[g,h,i]perylene		<370		37	370
Benzo[k]fluoranthene		<370		37	370
Chrysene		65	J	37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		100	J	37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		<370		37	370
Naphthalene		120	J	37	370
Phenanthrene		290	J	37	370
Pyrene		84	J	37	370
1-Methylnaphthalene		250	J	37	370
2-Methylnaphthalene		270	J	37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	66	41 - 94
Nitrobenzene-d5	71	22 - 94
Terphenyl-d14	75	53 - 96

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 | Date Sampled: 09/17/2007 1405
Client Matrix: Solid | % Moisture: 7.3 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 4601046.D
Dilution: 5.0 | Initial Weight/Volume: 30.18 g
Date Analyzed: 09/28/2007 1945 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<16		2.1	16
Fuel Oil		<16		2.1	16
Hydraulic Fluid		<16		2.1	16
Kerosene		<16		2.1	16
Mineral Spirits		<16		2.1	16
Motor Oil		<16		2.1	16
Unknown Hydrocarbons		320		13	16

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	78	39 - 159

Client: Burns & McDonnell

Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2

Lab Sample ID: 510-18284-2
Client Matrix: Solid
% Moisture: 9.7
Date Sampled: 09/17/2007 1410
Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2
Preparation: 3550B
Dilution: 1.0
Date Analyzed: 09/27/2007 1220
Date Prepared: 09/25/2007 1016
Analysis Batch: 400-56126
Prep Batch: 400-55911
Instrument ID: GC/FID
Lab File ID: 6301063.D
Initial Weight/Volume: 30.12 g
Final Weight/Volume: 1.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.3		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		230		2.8	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	92	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6401064.D
Dilution: 1.0 | Initial Weight/Volume: 30.35 g
Date Analyzed: 09/27/2007 1224 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		120		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		250		2.7	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	72	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 | Date Sampled: 09/17/2007 1415
Client Matrix: Solid | % Moisture: 10.3 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6501065.D
Dilution: 1.0 | Initial Weight/Volume: 30.35 g
Date Analyzed: 09/27/2007 1229 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.3		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		120		2.8	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	87	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB4

Lab Sample ID: 510-18284-5 | Date Sampled: 09/17/2007 1420
Client Matrix: Solid | % Moisture: 15.7 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6601066.D
Dilution: 50 | Initial Weight/Volume: 30.44 g
Date Analyzed: 09/27/2007 1233 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<180		23	180
Fuel Oil		<180		23	180
Hydraulic Fluid		<180		23	180
Kerosene		<180		23	180
Mineral Spirits		<180		23	180
Motor Oil		<180		23	180
Unknown Hydrocarbons		700		150	180

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	106	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB1

Lab Sample ID: 510-18284-7 | Date Sampled: 09/17/2007 1625
Client Matrix: Solid | % Moisture: 9.1 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6701067.D
Dilution: 1.0 | Initial Weight/Volume: 30.36 g
Date Analyzed: 09/27/2007 1238 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		10		0.42	3.3
Fuel Oil		<3.3		0.42	3.3
Hydraulic Fluid		<3.3		0.42	3.3
Kerosene		<3.3		0.42	3.3
Mineral Spirits		<3.3		0.42	3.3
Motor Oil		<3.3		0.42	3.3
Unknown Hydrocarbons		29		2.7	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	104	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB2

Lab Sample ID: 510-18284-8 | Date Sampled: 09/17/2007 1630
Client Matrix: Solid | % Moisture: 5.5 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6801068.D
Dilution: 1.0 | Initial Weight/Volume: 30.09 g
Date Analyzed: 09/27/2007 1242 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		8.6		0.41	3.2
Fuel Oil		<3.2		0.41	3.2
Hydraulic Fluid		<3.2		0.41	3.2
Kerosene		<3.2		0.41	3.2
Mineral Spirits		<3.2		0.41	3.2
Motor Oil		<3.2		0.41	3.2
Unknown Hydrocarbons		21		2.6	3.2

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	92	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB3

Lab Sample ID: 510-18284-9 | Date Sampled: 09/17/2007 1635
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 6901069.D
Dilution: 1.0 | Initial Weight/Volume: 30.28 g
Date Analyzed: 09/27/2007 1247 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.3		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		130		2.7	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	100	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB4

Lab Sample ID: 510-18284-10 | Date Sampled: 09/17/2007 1640
Client Matrix: Solid | % Moisture: 11.5 | Date Received: 09/18/2007 0940

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56126 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55911 | Lab File ID: 7001070.D
Dilution: 1.0 | Initial Weight/Volume: 30.09 g
Date Analyzed: 09/27/2007 1251 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/25/2007 1016 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.4		0.44	3.4
Fuel Oil		<3.4		0.44	3.4
Hydraulic Fluid		<3.4		0.44	3.4
Kerosene		<3.4		0.44	3.4
Mineral Spirits		<3.4		0.44	3.4
Motor Oil		<3.4		0.44	3.4
Unknown Hydrocarbons		99		2.8	3.4

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	91	39 - 159

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB1

Lab Sample ID:	510-18284-1		Date Sampled: 09/17/2007 1405
Client Matrix:	Solid	% Moisture: 7.3	Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.1368 g
Date Analyzed:	09/24/2007 1028		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		<0.47		0.050	0.47
Barium		<0.12		0.037	0.12
Cadmium		<0.24		0.013	0.24
Lead		<0.12		0.049	0.12
Selenium		0.053	J	0.044	0.24

Method:	6020	Analysis Batch: 510-23490	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.1368 g
Date Analyzed:	09/25/2007 1648		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		710		0.024	0.24

Method:	6020	Analysis Batch: 510-23555	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23508	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0028 g
Date Analyzed:	09/26/2007 1757		Final Weight/Volume: 50 mL
Date Prepared:	09/26/2007 1010		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.69		0.013	0.27

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23370	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23341	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5076 g
Date Analyzed:	09/23/2007 1937		Final Weight/Volume: 50 mL
Date Prepared:	09/23/2007 1351		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.0078	J	0.0050	0.021

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2

Lab Sample ID:	510-18284-2	Date Sampled:	09/17/2007 1410
Client Matrix:	Solid % Moisture: 9.7	Date Received:	09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0231 g
Date Analyzed:	09/24/2007 1031		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		<0.54		0.057	0.54
Barium		<0.14		0.042	0.14
Cadmium		<0.27		0.015	0.27
Lead		<0.14		0.056	0.14
Selenium		0.064	J	0.050	0.27

Method:	6020	Analysis Batch: 510-23490	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0231 g
Date Analyzed:	09/25/2007 1651		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		940		0.027	0.27

Method:	6020	Analysis Batch: 510-23555	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23508	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0129 g
Date Analyzed:	09/26/2007 1801		Final Weight/Volume: 50 mL
Date Prepared:	09/26/2007 1010		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		1.1		0.013	0.27

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23370	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23341	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5482 g
Date Analyzed:	09/23/2007 1939		Final Weight/Volume: 50 mL
Date Prepared:	09/23/2007 1351		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.010	J	0.0047	0.020

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 | Date Sampled: 09/17/2007 1410
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 | Analysis Batch: 510-23463 | Instrument ID: TE ICPMS
Preparation: 3050B | Prep Batch: 510-23319 | Lab File ID: N/A
Dilution: 5.0 | Initial Weight/Volume: 1.1828 g
Date Analyzed: 09/24/2007 1034 | Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		0.064	J B	0.049	0.47
Barium		<0.12		0.036	0.12
Cadmium		<0.23		0.013	0.23
Lead		<0.12		0.049	0.12
Selenium		0.080	J	0.044	0.23

Method: 6020 | Analysis Batch: 510-23490 | Instrument ID: TE ICPMS
Preparation: 3050B | Prep Batch: 510-23319 | Lab File ID: N/A
Dilution: 5.0 | Initial Weight/Volume: 1.1828 g
Date Analyzed: 09/25/2007 1654 | Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		840		0.023	0.23

Method: 6020 | Analysis Batch: 510-23555 | Instrument ID: TE ICPMS
Preparation: 3050B | Prep Batch: 510-23508 | Lab File ID: N/A
Dilution: 5.0 | Initial Weight/Volume: 1.0110 g
Date Analyzed: 09/26/2007 1804 | Final Weight/Volume: 50 mL
Date Prepared: 09/26/2007 1010

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		1.2		0.013	0.27

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A | Analysis Batch: 510-23370 | Instrument ID: Leeman Hydra AA
Preparation: 7471A | Prep Batch: 510-23341 | Lab File ID: N/A
Dilution: 1.0 | Initial Weight/Volume: 0.5280 g
Date Analyzed: 09/23/2007 1941 | Final Weight/Volume: 50 mL
Date Prepared: 09/23/2007 1351

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.021	J	0.0049	0.021

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B11-SB3

Lab Sample ID:	510-18284-4		Date Sampled: 09/17/2007 1415
Client Matrix:	Solid	% Moisture: 10.3	Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0840 g
Date Analyzed:	09/24/2007 1044		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		<0.51		0.054	0.51
Barium		<0.13		0.040	0.13
Cadmium		<0.26	^	0.014	0.26
Lead		<0.13		0.053	0.13
Selenium		0.12	J	0.048	0.26

Method:	6020	Analysis Batch: 510-23490	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0840 g
Date Analyzed:	09/25/2007 1703		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		1300		0.026	0.26

Method:	6020	Analysis Batch: 510-23555	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23508	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0012 g
Date Analyzed:	09/26/2007 1808		Final Weight/Volume: 50 mL
Date Prepared:	09/26/2007 1010		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.81		0.013	0.28

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23370	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23341	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5367 g
Date Analyzed:	09/23/2007 1943		Final Weight/Volume: 50 mL
Date Prepared:	09/23/2007 1351		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.011	J	0.0049	0.021

Client: Burns & McDonnell Job Number: 510-18284-1

Client Sample ID: 24 B11-SB4

Lab Sample ID: 510-18284-5 Date Sampled: 09/17/2007 1420
Client Matrix: Solid % Moisture: 15.7 Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23463 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.1925 g
Date Analyzed: 09/24/2007 1047 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		<0.50		0.052	0.50
Barium		<0.12		0.038	0.12
Cadmium		<0.25	^	0.014	0.25
Lead		<0.12		0.052	0.12
Selenium		0.14	J	0.046	0.25

Method: 6020 Analysis Batch: 510-23490 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.1925 g
Date Analyzed: 09/25/2007 1707 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		11		0.025	0.25

Method: 6020 Analysis Batch: 510-23555 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23508 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0216 g
Date Analyzed: 09/26/2007 1811 Final Weight/Volume: 50 mL
Date Prepared: 09/26/2007 1010

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.20	J	0.014	0.29

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A Analysis Batch: 510-23370 Instrument ID: Leeman Hydra AA
Preparation: 7471A Prep Batch: 510-23341 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 0.5477 g
Date Analyzed: 09/23/2007 1945 Final Weight/Volume: 50 mL
Date Prepared: 09/23/2007 1351

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.14		0.0051	0.022

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB1

Lab Sample ID:	510-18284-7		Date Sampled: 09/17/2007 1625
Client Matrix:	Solid	% Moisture: 9.1	Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0040 g
Date Analyzed:	09/24/2007 1050		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		0.077	J B	0.058	0.55
Barium		<0.14		0.042	0.14
Cadmium		<0.27	^	0.015	0.27
Lead		<0.14		0.057	0.14
Selenium		0.12	J	0.051	0.27

Method:	6020	Analysis Batch: 510-23490	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0040 g
Date Analyzed:	09/25/2007 1710		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		27		0.027	0.27

Method:	6020	Analysis Batch: 510-23555	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23508	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0162 g
Date Analyzed:	09/26/2007 1815		Final Weight/Volume: 50 mL
Date Prepared:	09/26/2007 1010		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.084	J	0.013	0.27

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23370	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23341	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5265 g
Date Analyzed:	09/23/2007 2012		Final Weight/Volume: 50 mL
Date Prepared:	09/23/2007 1351		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.054		0.0049	0.021

Client: Burns & McDonnell Job Number: 510-18284-1

Client Sample ID: 24 B12-SB2

Lab Sample ID: 510-18284-8 Date Sampled: 09/17/2007 1630
Client Matrix: Solid % Moisture: 5.5 Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23463 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0746 g
Date Analyzed: 09/24/2007 1054 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		0.080	J B	0.052	0.49
Barium		<0.12		0.038	0.12
Cadmium		<0.25	^	0.013	0.25
Lead		<0.12		0.051	0.12
Selenium		0.18	J	0.046	0.25

Method: 6020 Analysis Batch: 510-23490 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0746 g
Date Analyzed: 09/25/2007 1713 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		23		0.025	0.25

Method: 6020 Analysis Batch: 510-23555 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23508 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0217 g
Date Analyzed: 09/26/2007 1819 Final Weight/Volume: 50 mL
Date Prepared: 09/26/2007 1010

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.088	J	0.012	0.26

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A Analysis Batch: 510-23370 Instrument ID: Leeman Hydra AA
Preparation: 7471A Prep Batch: 510-23341 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 0.5003 g
Date Analyzed: 09/23/2007 2014 Final Weight/Volume: 50 mL
Date Prepared: 09/23/2007 1351

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.039		0.0050	0.021

Client: Burns & McDonnell | Job Number: 510-18284-1

Client Sample ID: 24 B12-SB3

Lab Sample ID:	510-18284-9		Date Sampled: 09/17/2007 1635
Client Matrix:	Solid	% Moisture: 9.3	Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0644 g
Date Analyzed:	09/24/2007 1012		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		11	B	0.054	0.52
Barium		110		0.040	0.13
Cadmium		1.7		0.014	0.26
Chromium		31		0.026	0.26
Lead		110		0.054	0.13
Selenium		0.68		0.048	0.26

Method:	6020	Analysis Batch: 510-23555	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23508	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0128 g
Date Analyzed:	09/26/2007 1822		Final Weight/Volume: 50 mL
Date Prepared:	09/26/2007 1010		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.15	J	0.013	0.27

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method:	7471A	Analysis Batch: 510-23370	Instrument ID: Leeman Hydra AA
Preparation:	7471A	Prep Batch: 510-23341	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 0.5006 g
Date Analyzed:	09/23/2007 1931		Final Weight/Volume: 50 mL
Date Prepared:	09/23/2007 1351		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.080		0.0052	0.022

Client: Burns & McDonnell Job Number: 510-18284-1

Client Sample ID: 24 B12-SB4

Lab Sample ID: 510-18284-10 Date Sampled: 09/17/2007 1640
Client Matrix: Solid % Moisture: 11.5 Date Received: 09/18/2007 0940

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23463 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.1255 g
Date Analyzed: 09/24/2007 1057 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		<0.50		0.053	0.50
Barium		<0.13		0.039	0.13
Cadmium		<0.25	^	0.014	0.25
Lead		<0.13		0.052	0.13
Selenium		0.13	J	0.047	0.25

Method: 6020 Analysis Batch: 510-23490 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.1255 g
Date Analyzed: 09/25/2007 1716 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Chromium		21		0.025	0.25

Method: 6020 Analysis Batch: 510-23555 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23508 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0203 g
Date Analyzed: 09/26/2007 1847 Final Weight/Volume: 50 mL
Date Prepared: 09/26/2007 1010

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Silver		0.23	J	0.013	0.28

7471A Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)

Method: 7471A Analysis Batch: 510-23370 Instrument ID: Leeman Hydra AA
Preparation: 7471A Prep Batch: 510-23341 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 0.5821 g
Date Analyzed: 09/23/2007 2016 Final Weight/Volume: 50 mL
Date Prepared: 09/23/2007 1351

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.020		0.0046	0.019

General Chemistry

Client Sample ID: 24 B11-SB1

Lab Sample ID: 510-18284-1 Date Sampled: 09/17/2007 1405
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	11.3		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed		09/25/2007 1740		DryWt Corrected: N	
Percent Moisture	7.3		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			
Percent Solids	93		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			

Client Sample ID: 24 B11-SB2

Lab Sample ID: 510-18284-2 Date Sampled: 09/17/2007 1410
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	11.8		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed		09/25/2007 1740		DryWt Corrected: N	
Percent Moisture	9.7		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			

Client Sample ID: 24 B11-SB2D

Lab Sample ID: 510-18284-3 Date Sampled: 09/17/2007 1410
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	11.9		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed		09/25/2007 1740		DryWt Corrected: N	
Percent Moisture	9.6		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed		09/25/2007 1320			

General Chemistry

Client Sample ID: 24 B11-SB3

Lab Sample ID: 510-18284-4 Date Sampled: 09/17/2007 1415
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	12.0		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	10		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

Client Sample ID: 24 B11-SB4

Lab Sample ID: 510-18284-5 Date Sampled: 09/17/2007 1420
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	9.02		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

Client Sample ID: 24 B12-SB1

Lab Sample ID: 510-18284-7 Date Sampled: 09/17/2007 1625
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	8.84		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	9.1		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	91		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

General Chemistry

Client Sample ID: 24 B12-SB2

Lab Sample ID: 510-18284-8 Date Sampled: 09/17/2007 1630
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	8.37		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	5.5		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	94		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

Client Sample ID: 24 B12-SB3

Lab Sample ID: 510-18284-9 Date Sampled: 09/17/2007 1635
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	8.21		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	9.3		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	91		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

Client Sample ID: 24 B12-SB4

Lab Sample ID: 510-18284-10 Date Sampled: 09/17/2007 1640
Client Matrix: Solid Date Received: 09/18/2007 0940

Analyte	Result	Qual	Units	RL	RL	Dil	Method
pH	7.91		SU	0.0100	0.0100	1.0	9045C
	Anly Batch: 510-23510	Date Analyzed	09/25/2007 1740			DryWt Corrected: N	
Percent Moisture	12		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				
Percent Solids	88		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23461	Date Analyzed	09/25/2007 1320				

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18284-1

Lab Section	Qualifier	Description
GC/MS VOA		
	B	Compound was found in the blank and sample.
	*	LCS or LCSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	*	RPD of the LCS and LCSD exceeds the control limits
	X	Surrogate exceeds the control limits
GC/MS Semi VOA		
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Metals		
	B	Compound was found in the blank and sample.
	^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA or MRL standard: Instrument related QC exceeds the control limits.
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	RPD of the MS and MSD exceeds the control limits

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23188

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23188/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1400
Date Prepared: N/A

Analysis Batch: 510-23188
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8697.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	2.0	J	0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97	80 - 124
Toluene-d8 (Surr)	95	83 - 113
4-Bromofluorobenzene (Surr)	98	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23188

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23188/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1250
Date Prepared: N/A

Analysis Batch: 510-23188
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8695.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23188/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1323
Date Prepared: N/A

Analysis Batch: 510-23188
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8696.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	109	86	57 - 117	23	30		
Benzene	122	123	81 - 116	1	30	*	*
Bromoform	108	111	74 - 122	2	30		
Bromomethane	98	95	10 - 212	3	30		
2-Butanone (MEK)	133	115	57 - 171	14	30		
Carbon disulfide	125	126	66 - 126	1	30		
Carbon tetrachloride	126	125	81 - 124	0	30	*	*
Chlorobenzene	126	124	80 - 112	2	30	*	*
Chlorodibromomethane	121	117	83 - 130	4	30		
Chloroethane	101	102	10 - 208	1	30		
Chloroform	119	116	77 - 124	2	30		
Chloromethane	86	85	10 - 189	1	30		
cis-1,2-Dichloroethene	127	129	81 - 122	2	30	*	*
cis-1,3-Dichloropropene	110	106	61 - 127	3	30		
Dichlorobromomethane	121	116	72 - 132	4	30		
1,1-Dichloroethane	125	124	80 - 123	0	30	*	*
1,2-Dichloroethane	108	106	72 - 130	2	30		
1,1-Dichloroethene	115	117	76 - 117	2	30		
1,2-Dichloropropane	112	109	77 - 122	3	30		
Ethylbenzene	117	119	84 - 124	2	30		
2-Hexanone	106	94	67 - 119	12	30		
Methylene Chloride	116	113	62 - 130	2	30		
methyl isobutyl ketone	101	97	42 - 181	4	30		
Styrene	116	117	80 - 116	1	30		*
1,1,2,2-Tetrachloroethane	103	97	61 - 131	6	30		
Tetrachloroethene	132	133	82 - 127	0	30	*	*
Toluene	127	127	77 - 117	0	30	*	*
trans-1,2-Dichloroethene	136	133	82 - 129	2	30	*	*
trans-1,3-Dichloropropene	105	106	63 - 133	1	30		
1,1,1-Trichloroethane	126	128	78 - 125	2	30	*	*
1,1,2-Trichloroethane	124	119	70 - 127	5	30		
Trichloroethene	118	123	81 - 122	4	30		*

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23188

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23188/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1250
Date Prepared: N/A

Analysis Batch: 510-23188
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8695.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23188/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/19/2007 1323
Date Prepared: N/A

Analysis Batch: 510-23188
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8696.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	114	111	80 - 141	2	30		
Vinyl chloride	98	100	10 - 203	2	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	94	91	80 - 124
Toluene-d8 (Surr)	101	99	83 - 113
4-Bromofluorobenzene (Surr)	95	96	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23290

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23290/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1931
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8717.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	<5.0		0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	117	80 - 124
Toluene-d8 (Surr)	99	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23290/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1824
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8715.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23290/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1857
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8716.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	118	100	57 - 117	17	30	*	
Benzene	123	127	81 - 116	3	30	*	*
Bromoform	111	104	74 - 122	6	30		
Bromomethane	91	94	10 - 212	4	30		
2-Butanone (MEK)	125	99	57 - 171	23	30		
Carbon disulfide	124	127	66 - 126	2	30		*
Carbon tetrachloride	131	129	81 - 124	2	30	*	*
Chlorobenzene	121	120	80 - 112	1	30	*	*
Chlorodibromomethane	116	119	83 - 130	3	30		
Chloroethane	110	112	10 - 208	2	30		
Chloroform	124	121	77 - 124	3	30		
Chloromethane	109	110	10 - 189	1	30		
cis-1,2-Dichloroethene	121	128	81 - 122	5	30		*
cis-1,3-Dichloropropene	111	112	61 - 127	1	30		
Dichlorobromomethane	129	127	72 - 132	2	30		
1,1-Dichloroethane	132	132	80 - 123	0	30	*	*
1,2-Dichloroethane	130	129	72 - 130	0	30		
1,1-Dichloroethene	127	129	76 - 117	1	30	*	*
1,2-Dichloropropane	118	119	77 - 122	1	30		
Ethylbenzene	115	118	84 - 124	2	30		
2-Hexanone	137	112	67 - 119	20	30	*	
Methylene Chloride	113	107	62 - 130	5	30		
methyl isobutyl ketone	130	121	42 - 181	7	30		
Styrene	114	116	80 - 116	2	30		
1,1,2,2-Tetrachloroethane	108	95	61 - 131	13	30		
Tetrachloroethene	119	111	82 - 127	7	30		
Toluene	122	124	77 - 117	2	30	*	*
trans-1,2-Dichloroethene	124	123	82 - 129	1	30		
trans-1,3-Dichloropropene	115	115	63 - 133	0	30		
1,1,1-Trichloroethane	131	131	78 - 125	0	30	*	*
1,1,2-Trichloroethane	125	127	70 - 127	1	30		
Trichloroethene	109	109	81 - 122	0	30		

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23290

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23290/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1824
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8715.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23290/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/20/2007 1857
Date Prepared: N/A

Analysis Batch: 510-23290
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8716.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	146	144	80 - 141	2	30	*	*
Vinyl chloride	110	113	10 - 203	3	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	122	116	80 - 124
Toluene-d8 (Surr)	104	105	83 - 113
4-Bromofluorobenzene (Surr)	98	96	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23456

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23456/3
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 2046
Date Prepared: N/A

Analysis Batch: 510-23456
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8749.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	<5.0		0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	102	80 - 124
Toluene-d8 (Surr)	94	83 - 113
4-Bromofluorobenzene (Surr)	116	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23456

Method: 8260B
Preparation: N/A

LCS Lab Sample ID: LCS 510-23456/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 1940
Date Prepared: N/A

Analysis Batch: 510-23456
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8747.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23456/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/21/2007 2013
Date Prepared: N/A

Analysis Batch: 510-23456
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8748.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Carbon disulfide	81	154	66 - 126	63	30		*
cis-1,2-Dichloroethene	90	137	81 - 122	41	30		*
Toluene	88	147	77 - 117	50	30		*

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	115	105	80 - 124
Toluene-d8 (Surr)	102	98	83 - 113
4-Bromofluorobenzene (Surr)	100	95	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23500

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-23500/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/25/2007 1603
Date Prepared: 09/25/2007 1603

Analysis Batch: 510-23500
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8786.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	110	87 - 120
Toluene-d8 (Surr)	92	89 - 106
4-Bromofluorobenzene (Surr)	111	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23500

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-23500/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/25/2007 1501
Date Prepared: 09/25/2007 1501

Analysis Batch: 510-23500
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8784.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23500/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/25/2007 1532
Date Prepared: 09/25/2007 1532

Analysis Batch: 510-23500
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8785.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	97	115	33 - 136	16	30		
Benzene	101	96	78 - 117	6	30		
Bromoform	85	96	75 - 126	12	30		
Bromomethane	94	90	84 - 131	4	30		
2-Butanone (MEK)	89	109	66 - 126	20	30		
Carbon disulfide	132	130	64 - 120	1	30	*	*
Carbon tetrachloride	113	102	73 - 131	10	30		
Chlorobenzene	97	93	76 - 112	4	30		
Chlorodibromomethane	101	107	87 - 127	5	30		
Chloroethane	101	94	85 - 131	7	30		
Chloroform	101	91	77 - 125	10	30		
Chloromethane	97	88	64 - 125	10	30		
cis-1,2-Dichloroethene	106	96	82 - 123	9	30		
cis-1,3-Dichloropropene	88	85	74 - 122	4	30		
Dichlorobromomethane	103	100	79 - 131	3	30		
1,1-Dichloroethane	104	100	80 - 125	3	30		
1,2-Dichloroethane	95	100	75 - 131	5	30		
1,1-Dichloroethene	108	102	71 - 123	5	30		
1,2-Dichloropropane	95	95	81 - 124	1	30		
Ethylbenzene	98	93	78 - 125	5	30		
2-Hexanone	78	100	59 - 125	24	30		
Methylene Chloride	91	90	67 - 117	1	30		
methyl isobutyl ketone	80	98	72 - 117	19	30		
Styrene	93	89	74 - 115	5	30		
1,1,2,2-Tetrachloroethane	94	113	78 - 131	19	30		
Tetrachloroethene	99	98	77 - 123	1	30		
Toluene	100	95	76 - 114	5	30		
trans-1,2-Dichloroethene	95	90	74 - 136	5	30		
trans-1,3-Dichloropropene	91	94	76 - 125	3	30		
1,1,1-Trichloroethane	107	102	76 - 130	5	30		
1,1,2-Trichloroethane	90	95	80 - 122	6	30		
Trichloroethene	93	90	80 - 122	4	30		

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-23500

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-23500/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/25/2007 1501
Date Prepared: 09/25/2007 1501

Analysis Batch: 510-23500
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8784.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-23500/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 09/25/2007 1532
Date Prepared: 09/25/2007 1532

Analysis Batch: 510-23500
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8785.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl acetate	105	111	84 - 136	5	30		
Vinyl chloride	96	91	76 - 131	6	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	95	103	87 - 120
Toluene-d8 (Surr)	102	99	89 - 106
4-Bromofluorobenzene (Surr)	111	114	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23550/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 2024
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8827.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	<5.0		0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	80 - 124
Toluene-d8 (Surr)	93	83 - 113
4-Bromofluorobenzene (Surr)	114	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike - Batch: 510-23550

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23550/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/26/2007 1951
Date Prepared: N/A

Analysis Batch: 510-23550
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8826.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acetone	50.0	43.8	88	57 - 117	
Benzene	50.0	51.7	103	81 - 116	
Bromoform	50.0	48.4	97	74 - 122	
Bromomethane	50.2	45.6	91	10 - 212	
2-Butanone (MEK)	50.0	49.6	99	57 - 171	
Carbon disulfide	50.0	50.0	100	66 - 126	
Carbon tetrachloride	50.0	55.2	110	81 - 124	
Chlorobenzene	50.0	52.7	105	80 - 112	
Chlorodibromomethane	50.0	52.9	106	83 - 130	
Chloroethane	50.2	44.9	89	10 - 208	
Chloroform	50.0	53.4	107	77 - 124	
Chloromethane	50.2	41.2	82	10 - 189	
cis-1,2-Dichloroethene	50.0	50.3	101	81 - 122	
cis-1,3-Dichloropropene	50.0	49.9	100	61 - 127	
Dichlorobromomethane	50.0	52.9	106	72 - 132	
1,1-Dichloroethane	50.0	55.6	111	80 - 123	
1,2-Dichloroethane	50.0	49.4	99	72 - 130	
1,1-Dichloroethene	50.0	51.1	102	76 - 117	
1,2-Dichloropropane	50.0	50.7	101	77 - 122	
Ethylbenzene	50.0	52.3	105	84 - 124	
2-Hexanone	50.0	47.2	94	67 - 119	
Methylene Chloride	50.0	51.9	104	62 - 130	
methyl isobutyl ketone	50.0	47.4	95	42 - 181	
Styrene	50.0	51.4	103	80 - 116	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	61 - 131	
Tetrachloroethene	50.0	51.6	103	82 - 127	
Toluene	50.0	52.5	105	77 - 117	
trans-1,2-Dichloroethene	50.0	56.7	113	82 - 129	
trans-1,3-Dichloropropene	50.0	49.2	98	63 - 133	
1,1,1-Trichloroethane	50.0	54.8	110	78 - 125	
1,1,2-Trichloroethane	50.0	47.9	96	70 - 127	
Trichloroethene	50.0	54.1	108	81 - 122	
Vinyl acetate	50.0	111	221	80 - 141	*
Vinyl chloride	50.2	43.2	86	10 - 203	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	80 - 124
Toluene-d8 (Surr)	102	83 - 113
4-Bromofluorobenzene (Surr)	101	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23579

Method: 8260B
Preparation: N/A

Lab Sample ID: MB 510-23579/2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1045
Date Prepared: N/A

Analysis Batch: 510-23579
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8847.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	5.4	J	1.4	10
Benzene	<5.0		1.1	5.0
Bromoform	<5.0		1.2	5.0
Bromomethane	<5.0		1.8	5.0
2-Butanone (MEK)	<10		2.9	10
Carbon disulfide	<5.0		1.1	5.0
Carbon tetrachloride	<5.0		0.45	5.0
Chlorobenzene	<5.0		0.68	5.0
Chlorodibromomethane	<5.0		0.85	5.0
Chloroethane	<5.0		1.1	5.0
Chloroform	<5.0		0.75	5.0
Chloromethane	<5.0		0.97	5.0
cis-1,2-Dichloroethene	<5.0		0.73	5.0
cis-1,3-Dichloropropene	<5.0		0.76	5.0
Dichlorobromomethane	<5.0		0.55	5.0
1,1-Dichloroethane	<5.0		0.63	5.0
1,2-Dichloroethane	<5.0		0.51	5.0
1,1-Dichloroethene	<5.0		0.55	5.0
1,2-Dichloropropane	<5.0		0.43	5.0
Ethylbenzene	<5.0		0.64	5.0
2-Hexanone	<10		1.4	10
Methylene Chloride	4.2	J	0.39	5.0
methyl isobutyl ketone	<10		1.3	10
Styrene	<5.0		0.34	5.0
1,1,2,2-Tetrachloroethane	<5.0		1.1	5.0
Tetrachloroethene	<5.0		1.3	5.0
Toluene	<5.0		0.77	5.0
trans-1,2-Dichloroethene	<5.0		0.55	5.0
trans-1,3-Dichloropropene	<5.0		0.60	5.0
1,1,1-Trichloroethane	<5.0		0.69	5.0
1,1,2-Trichloroethane	<5.0		1.6	5.0
Trichloroethene	<5.0		0.80	5.0
Vinyl acetate	<5.0		0.46	5.0
Vinyl chloride	<5.0		1.4	5.0
Xylenes, Total	<10		1.7	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	86	80 - 124
Toluene-d8 (Surr)	96	83 - 113
4-Bromofluorobenzene (Surr)	113	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike - Batch: 510-23579

Method: 8260B
Preparation: N/A

Lab Sample ID: LCS 510-23579/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 0826
Date Prepared: N/A

Analysis Batch: 510-23579
Prep Batch: N/A
Units: ug/Kg

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8846.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acetone	50.0	47.7	95	57 - 117	
Benzene	50.0	45.3	91	81 - 116	
Bromoform	50.0	48.0	96	74 - 122	
Bromomethane	50.2	44.7	89	10 - 212	
2-Butanone (MEK)	50.0	48.1	96	57 - 171	
Carbon disulfide	50.0	46.1	92	66 - 126	
Carbon tetrachloride	50.0	43.8	88	81 - 124	
Chlorobenzene	50.0	47.2	94	80 - 112	
Chlorodibromomethane	50.0	49.4	99	83 - 130	
Chloroethane	50.2	39.6	79	10 - 208	
Chloroform	50.0	44.3	89	77 - 124	
Chloromethane	50.2	26.9	54	10 - 189	
cis-1,2-Dichloroethene	50.0	46.9	94	81 - 122	
cis-1,3-Dichloropropene	50.0	42.9	86	61 - 127	
Dichlorobromomethane	50.0	44.1	88	72 - 132	
1,1-Dichloroethane	50.0	44.6	89	80 - 123	
1,2-Dichloroethane	50.0	37.5	75	72 - 130	
1,1-Dichloroethene	50.0	41.4	83	76 - 117	
1,2-Dichloropropane	50.0	39.9	80	77 - 122	
Ethylbenzene	50.0	44.1	88	84 - 124	
2-Hexanone	50.0	35.4	71	67 - 119	
Methylene Chloride	50.0	56.5	113	62 - 130	
methyl isobutyl ketone	50.0	33.9	68	42 - 181	
Styrene	50.0	46.5	93	80 - 116	
1,1,2,2-Tetrachloroethane	50.0	41.6	83	61 - 131	
Tetrachloroethene	50.0	49.1	98	82 - 127	
Toluene	50.0	45.5	91	77 - 117	
trans-1,2-Dichloroethene	50.0	52.5	105	82 - 129	
trans-1,3-Dichloropropene	50.0	41.3	83	63 - 133	
1,1,1-Trichloroethane	50.0	43.0	86	78 - 125	
1,1,2-Trichloroethane	50.0	44.5	89	70 - 127	
Trichloroethene	50.0	47.9	96	81 - 122	
Vinyl acetate	50.0	81.6	163	80 - 141	*
Vinyl chloride	50.2	34.2	68	10 - 203	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	86	80 - 124
Toluene-d8 (Surr)	101	83 - 113
4-Bromofluorobenzene (Surr)	97	68 - 134

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 400-55889

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55889/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1400
Date Prepared: 09/25/2007 0824

Analysis Batch: 400-56250
Prep Batch: 400-55889
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: MB55889S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Naphthalene	<330		33	330
Phenanthrene	<330		33	330
Pyrene	<330		33	330
1-Methylnaphthalene	<330		33	330
2-Methylnaphthalene	<330		33	330

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	72	41 - 94
Nitrobenzene-d5	77	22 - 94
Terphenyl-d14	78	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike - Batch: 400-55889

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55889/12-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1429
Date Prepared: 09/25/2007 0824

Analysis Batch: 400-56250
Prep Batch: 400-55889
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: LC55889S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1670	1150	69	54 - 118	
Acenaphthylene	1670	1160	69	58 - 124	
Anthracene	1670	1230	74	56 - 120	
Benzo[a]anthracene	1670	1350	81	65 - 118	
Benzo[a]pyrene	1670	1240	74	66 - 114	
Benzo[b]fluoranthene	1670	1110	67	60 - 110	
Benzo[g,h,i]perylene	1670	1150	69	47 - 130	
Benzo[k]fluoranthene	1670	1450	87	68 - 128	
Chrysene	1670	1340	80	66 - 120	
Dibenz(a,h)anthracene	1670	1530	92	30 - 177	
Fluoranthene	1670	1340	81	69 - 125	
Fluorene	1670	1230	74	58 - 124	
Indeno[1,2,3-cd]pyrene	1670	1150	69	60 - 117	
Naphthalene	1670	1160	70	44 - 112	
Phenanthrene	1670	1220	73	63 - 122	
Pyrene	1670	1320	79	62 - 124	
1-Methylnaphthalene	1670	1280	77	47 - 122	
2-Methylnaphthalene	1670	1200	72	48 - 118	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	73	41 - 94
Nitrobenzene-d5	79	22 - 94
Terphenyl-d14	84	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55889

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18284-9	Analysis Batch: 400-56250	Instrument ID: GC/MS
Client Matrix:	Solid	Prep Batch: 400-55889	Lab File ID: MS55889S.D
Dilution:	1.0		Initial Weight/Volume: 30.14 g
Date Analyzed:	10/02/2007 2250		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

MSD Lab Sample ID:	510-18284-9	Analysis Batch: 400-56250	Instrument ID: GC/MS
Client Matrix:	Solid	Prep Batch: 400-55889	Lab File ID: MD55889S.D
Dilution:	1.0		Initial Weight/Volume: 30.36 g
Date Analyzed:	10/02/2007 2319		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 0824		Injection Volume:

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	74	76	46 - 110	2	24		
Acenaphthylene	74	74	49 - 114	0	24		
Anthracene	73	74	53 - 105	1	23		
Benzo[a]anthracene	68	70	57 - 110	2	20		
Benzo[a]pyrene	67	66	55 - 104	3	21		
Benzo[b]fluoranthene	64	58	49 - 105	8	24		
Benzo[g,h,i]perylene	53	47	41 - 119	11	26		
Benzo[k]fluoranthene	78	84	58 - 116	6	23		
Chrysene	68	70	56 - 113	1	21		
Dibenz(a,h)anthracene	86	80	29 - 159	8	25		
Fluoranthene	58	48	59 - 116	11	24	F	F
Fluorene	78	79	51 - 113	0	24		
Indeno[1,2,3-cd]pyrene	57	50	52 - 107	12	24		F
Naphthalene	66	67	40 - 100	0	28		
Phenanthrene	50	53	52 - 115	2	20	F	
Pyrene	57	60	51 - 120	3	21		
1-Methylnaphthalene	65	67	43 - 107	2	26		
2-Methylnaphthalene	58	59	43 - 105	1	28		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
2-Fluorobiphenyl	75	77	41 - 94
Nitrobenzene-d5	80	82	22 - 94
Terphenyl-d14	85	90	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 400-55911

Method: OA-2
Preparation: 3550B

Lab Sample ID: MB 400-55911/13-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1941
Date Prepared: 09/25/2007 1016

Analysis Batch: 400-56126
Prep Batch: 400-55911
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 4501045.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Diesel	<3.0		0.39	3.0
Fuel Oil	<3.0		0.39	3.0
Hydraulic Fluid	<3.0		0.39	3.0
Kerosene	<3.0		0.39	3.0
Mineral Spirits	<3.0		0.39	3.0
Motor Oil	<3.0		0.39	3.0
Unknown Hydrocarbons	<3.0		2.5	3.0

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	93	39 - 159

Lab Control Spike - Batch: 400-55911

Method: OA-2
Preparation: 3550B

Lab Sample ID: LCS 400-55911/12-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1158
Date Prepared: 09/25/2007 1016

Analysis Batch: 400-56126
Prep Batch: 400-55911
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 5801058.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Diesel	335	297	89	33 - 156	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	90	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55911

Method: OA-2
Preparation: 3550B

MS Lab Sample ID:	510-18284-9	Analysis Batch: 400-56126	Instrument ID: GC/FID
Client Matrix:	Solid	Prep Batch: 400-55911	Lab File ID: 5901059.D
Dilution:	1.0		Initial Weight/Volume: 30.04 g
Date Analyzed:	09/27/2007 1202		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 1016		Injection Volume:

MSD Lab Sample ID:	510-18284-9	Analysis Batch: 400-56126	Instrument ID: GC/FID
Client Matrix:	Solid	Prep Batch: 400-55911	Lab File ID: 6001060.D
Dilution:	1.0		Initial Weight/Volume: 30.19 g
Date Analyzed:	09/27/2007 1207		Final Weight/Volume: 1.0 mL
Date Prepared:	09/25/2007 1016		Injection Volume:

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Diesel	115	84	33 - 133	31	60		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
o-Terphenyl	105	85	39 - 159

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

Method Blank - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23319/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/24/2007 1006
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23463
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	0.055	J	0.053	0.50
Barium	<0.13		0.039	0.13
Cadmium	<0.25		0.014	0.25
Chromium	<0.25		0.025	0.25
Lead	<0.13		0.052	0.13
Selenium	<0.25		0.047	0.25

Method Blank - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23319/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/25/2007 1626
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23490
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Chromium	<0.25		0.025	0.25

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Lab Control Spike - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23319/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/24/2007 1009
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23463
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0939 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	197	177	90	80 - 120	
Barium	645	660	102	82 - 117	
Cadmium	77.3	73.3	95	78 - 121	
Chromium	129	118	92	80 - 119	
Lead	106	106	100	81 - 118	
Selenium	104	86.9	84	77 - 122	

Lab Control Spike - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23319/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/25/2007 1630
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23490
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0939 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium	129	124	96	80 - 119	

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23319

Method: 6020
Preparation: 3050B

MS Lab Sample ID:	510-18284-9	Analysis Batch:	510-23463	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23319	Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0841 g
Date Analyzed:	09/24/2007 1022			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

MSD Lab Sample ID:	510-18284-9	Analysis Batch:	510-23463	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23319	Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0253 g
Date Analyzed:	09/24/2007 1025			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	-22	-21	75 - 125	18	20	J B F	J B F
Barium	-216	-204	75 - 125	NC	20	F	F
Cadmium	-3	-3	75 - 125	NC	20	F	F
Chromium	-62	-59	75 - 125	NC	20	F	F
Lead	-207	-195	75 - 125	NC	20	F	F
Selenium	-1	-1	75 - 125	30	20	J F	J F

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23508

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23508/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/26/2007 1750
Date Prepared: 09/26/2007 1010

Analysis Batch: 510-23555
Prep Batch: 510-23508
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Silver	<0.25		0.012	0.25

Lab Control Spike - Batch: 510-23508

Method: 6020
Preparation: 3050B

Lab Sample ID: LCS 510-23508/2-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/26/2007 1754
Date Prepared: 09/26/2007 1010

Analysis Batch: 510-23555
Prep Batch: 510-23508
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0025 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Silver	155	165	106	66 - 133	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23508

Method: 6020
Preparation: 3050B

MS Lab Sample ID: 510-18284-9
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/26/2007 1840
Date Prepared: 09/26/2007 1010

Analysis Batch: 510-23555
Prep Batch: 510-23508

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0076 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 510-18284-9
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/26/2007 1843
Date Prepared: 09/26/2007 1010

Analysis Batch: 510-23555
Prep Batch: 510-23508

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0322 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Silver	98	99	75 - 125	1	20		

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23341

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 510-23341/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/23/2007 1927
Date Prepared: 09/23/2007 1351

Analysis Batch: 510-23370
Prep Batch: 510-23341
Units: mg/Kg

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<0.020		0.0047	0.020

Lab Control Spike - Batch: 510-23341

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 510-23341/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/23/2007 1929
Date Prepared: 09/23/2007 1351

Analysis Batch: 510-23370
Prep Batch: 510-23341
Units: mg/Kg

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.1128 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	3.90	4.37	112	66 - 133	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23341

Method: 7471A
Preparation: 7471A

MS Lab Sample ID: 510-18284-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/23/2007 1933
Date Prepared: 09/23/2007 1351

Analysis Batch: 510-23370
Prep Batch: 510-23341

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5276 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 510-18284-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/23/2007 1935
Date Prepared: 09/23/2007 1351

Analysis Batch: 510-23370
Prep Batch: 510-23341

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 0.5021 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	147	122	75 - 125	12	25		

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

Client: Burns & McDonnell Job Number: 510-18284-1

Lab Control Spike - Batch: 510-23510

Method: 9045C
Preparation: N/A

Lab Sample ID: LCS 510-23510/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1740
Date Prepared: N/A

Analysis Batch: 510-23510
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	12.0	11.97	100	97 - 103	

Lab Control Spike - Batch: 510-23510

Method: 9045C
Preparation: N/A

Lab Sample ID: LCS 510-23510/12
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1740
Date Prepared: N/A

Analysis Batch: 510-23510
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 40 mL
Final Weight/Volume: 40 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	7.00	7.030	100	97 - 103	

Duplicate - Batch: 510-23510

Method: 9045C
Preparation: N/A

Lab Sample ID: 510-18284-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1740
Date Prepared: N/A

Analysis Batch: 510-23510
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 20.06 mL
Final Weight/Volume: 20 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
pH	11.3	11.36	1	20	

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

Client: Burns & McDonnell

Job Number: 510-18284-1

Method Blank - Batch: 510-23461

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23461/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/25/2007 1320
Date Prepared: N/A

Analysis Batch: 510-23461
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

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

510-48-056 4.1°C 510-50-016 3.8°C 510-28-060 5.3°C

Burns & McDonnell SINCE 1898

090705 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

1 OF 1

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: SHARON SHELTON

Laboratory: TEST AMERICA - VALPARAISO
Address: 2400 CUMBERLAND DRIVE
City/State/Zip: VALPARAISO, IN
Telephone:

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK STEEL - KANSAS CITY, MO

Sample Type

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: VOCs	Analysis: PAHs	Analysis: Extractable TPH	Analysis: RCRA Metals (pH)			Remarks
~~24B~~ AK STEEL	24B11	SB1	18284	-1	0	2	9/17/07	1405		X		7	X	X	X	X			
	24B11	SB2		-2	2	4		1410		X		7	X	X	X	X			
	24B11	SB2D		-3	2	4		1410		X		7	X	X	X	X			
	24B11	SB3		-4	4	6		1415		X		7	X	X	X	X			
	24B11	SB4		-5	6	8		1420		X		7	X	X	X	X			
	24B11	DW1		-6	30	35		1555	X			3	X						
	24B12	SB1		-7	0	2		1625		X		7	X	X	X	X			
	24B12	SB2		-8	2	4		1630		X		7	X	X	X	X			
	24B12	SB3		-9	4	6		1635		X		7	X	X	X	X			
	24B12	SB3 MS		~~-10~~ -9	4	6		1635		X		7	X	X	X	X			
	24B12	SB3 MSD		~~-11~~ -9	4	6		1635		X		7	X	X	X	X			
	24B12	SB4		~~-12~~ -10	6	8		1640		X		7	X	X	X	X			
	24B12	DW1		~~-13~~ -11	30	35		1710	X			3	X						Headspace in all vials
	TRIP BLANK			~~-14~~ -12				1500	X			3	X						

Sampler (signature): TIM STECHER

Sampler (signature):

Special Instructions: SHIPPED IN 3 COOLERS

Relinquished By (signature): 1. [signature] Date/Time 9/17/07 1815

~~Relinquished~~ Bevel By (signature): [signature] Date/Time 9/18/07 9:40

Ice Present in Container: Yes ☐ No ☐

Temperature Upon Receipt:

Relinquished By (signature): 2. Date/Time

Relinquished By (signature): Date/Time

Laboratory Comments:

18284

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18284-1

Login Number: 18284
List Source: TestAmerica Valparaiso
Creator: Richter, Debbie D
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	False	One sample has headspace in all three vials
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

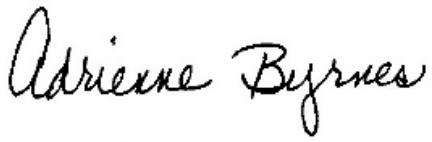
ANALYTICAL REPORT

Job Number: 510-18356-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/19/2007
Revision: 1

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Job Narrative
510-J18356-1

Comments
This report has been revised to provide additional quality control information and remove the multiple data.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS Semi VOA
Method 8270C: The LCS for prep batch 55766 had naphthalene recover below the lower control limit and the surrogate terphenyl-d14 recover above the upper control limit. The associated samples, ,were not re-extracted except for sample 400-24849-1 and 510-18356-23 which had surrogate recoveries that were below the lower control limits. The other samples were not re-extracted per the project managers.

Method 8270C: Surrogate recovery was outside control limits for the following sample: . Please re-extract sample.

Re-extract 10/2/07.
The sample was re-extracted and all the QC meet requirements. Both sets of data were reported.

Method 8270C: The MSD for prep batch had surrogate terphenyl-d14 recover high.

Method 8270C: Sample 510-18356-24 had the surrogate terphenyl-d14 recover above limits.

Method 8270C: Surrogate recovery for the following method blank for extraction batch 55766 was outside the upper control limit: The blank did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8270C: Surrogate recovery for the following sample was outside the upper control limit: . This sample contained only one target analyte and it was below the RL; therefore, re-extraction and/or re-analysis was not performed.

Method 8270C: The matrix spike / matrix spike duplicate (MS/MSD) precision for batch 55764 was outside control limits. The associated laboratory control standard (LCS) met acceptance criteria. The data was reported.

No other analytical or quality issues were noted.

GC Semi VOA
No analytical or quality issues were noted.

Metals
Method 6020: The continuing calibration verification (CCV) for cadmium recovered above the upper control limit. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.
510-18356-1

No other analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18356-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	TAL PEN	SW846 8270C	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Iowa - Extractable Petroleum Products	TAL PEN	Iowa DNR OA-2	
Ultrasonic Extraction	TAL PEN		SW846 3550B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Sediments, Sludges, and Soils	TAL VAL		SW846 3050B

Lab References:

TAL PEN = TestAmerica Pensacola

TAL VAL = TestAmerica Valparaiso

Method References:

Iowa DNR = Iowa Department of Natural Resources

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18356-1

Method	Analyst	Analyst ID
SW846 8270C	Schumann, Jane	JS
SW846 8270C	Wingo, Rita	RW
Iowa DNR OA-2	Ayers, Kim	KA
SW846 6020	Hamner, Barb J	BJH
SW846 6020	Thomas, Deidra	DT
EPA PercentMoisture	Bultema, Harvey	HB

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-18356-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18356-1	06B17 / SB1	Solid	09/18/2007 0730	09/19/2007 1015
510-18356-2	06B17 / SB2	Solid	09/18/2007 0735	09/19/2007 1015
510-18356-3	06B17 / SB2 D	Solid	09/18/2007 0735	09/19/2007 1015
510-18356-4	06B15 / SB1	Solid	09/18/2007 0740	09/19/2007 1015
510-18356-5	06B15 / SB2	Solid	09/18/2007 0745	09/19/2007 1015
510-18356-6	06B16 / SB1	Solid	09/18/2007 0755	09/19/2007 1015
510-18356-7	06B16 / SB2	Solid	09/18/2007 0800	09/19/2007 1015
510-18356-8	06B18 / SB1	Solid	09/18/2007 0810	09/19/2007 1015
510-18356-9	06B18 / SB2	Solid	09/18/2007 0815	09/19/2007 1015
510-18356-10	06B20 / SB1	Solid	09/18/2007 0835	09/19/2007 1015
510-18356-11	06B20 / SB2	Solid	09/18/2007 0840	09/19/2007 1015
510-18356-12	06B21 / SB1	Solid	09/18/2007 0845	09/19/2007 1015
510-18356-13	06B21 / SB2	Solid	09/18/2007 0850	09/19/2007 1015
510-18356-14	06B19 / SB1	Solid	09/18/2007 0900	09/19/2007 1015
510-18356-15	06B19 / SB2	Solid	09/18/2007 0905	09/19/2007 1015
510-18356-16	A04B07 / SB1	Solid	09/18/2007 0920	09/19/2007 1015
510-18356-17	A04B07 / SB2	Solid	09/18/2007 0925	09/19/2007 1015
510-18356-18	A04B05 / SB1	Solid	09/18/2007 0940	09/19/2007 1015
510-18356-19	A04B05 / SB2	Solid	09/18/2007 0945	09/19/2007 1015
510-18356-20	A04B05 / SB2 MS	Solid	09/18/2007 0945	09/19/2007 1015
510-18356-21	A04B05 / SB2 MSD	Solid	09/18/2007 0945	09/19/2007 1015
510-18356-22	A04B06 / SB1	Solid	09/18/2007 1015	09/19/2007 1015
510-18356-23	A04B06 / SB2	Solid	09/18/2007 1020	09/19/2007 1015
510-18356-24	06B23 / SB1	Solid	09/18/2007 1030	09/19/2007 1015
510-18356-25	06B23 / SB2	Solid	09/18/2007 1035	09/19/2007 1015
510-18356-26	06B22 / SB1	Solid	09/18/2007 1055	09/19/2007 1015
510-18356-27	06B22 / SB2	Solid	09/18/2007 1100	09/19/2007 1015

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB1**

Lab Sample ID:	510-18356-1			Date Sampled:	09/18/2007 0730
Client Matrix:	Solid	% Moisture:	21.3	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B1.D
Dilution:	1.0			Initial Weight/Volume:	30.20 g
Date Analyzed:	09/28/2007 1231			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<420		42	420
Acenaphthylene		<420		42	420
Anthracene		<420		42	420
Benzo[a]anthracene		70	J	42	420
Benzo[a]pyrene		70	J	42	420
Benzo[b]fluoranthene		99	J	42	420
Benzo[g,h,i]perylene		72	J	42	420
Benzo[k]fluoranthene		45	J	42	420
Chrysene		89	J	42	420
Dibenz(a,h)anthracene		<420		42	420
Fluoranthene		110	J	42	420
Fluorene		<420		42	420
Indeno[1,2,3-cd]pyrene		<420		42	420
Naphthalene		<420		42	420
Phenanthrene		84	J	42	420
Pyrene		130	J	42	420
1-Methylnaphthalene		<420		42	420
2-Methylnaphthalene		<420		42	420

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	67	41 - 94
Nitrobenzene-d5	63	22 - 94
Terphenyl-d14	72	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2**

Lab Sample ID:	510-18356-2			Date Sampled:	09/18/2007 0735
Client Matrix:	Solid	% Moisture:	12.0	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B2.D
Dilution:	1.0			Initial Weight/Volume:	30.29 g
Date Analyzed:	09/28/2007 1303			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		<370		37	370
Benzo[a]pyrene		<370		37	370
Benzo[b]fluoranthene		<370		37	370
Benzo[g,h,i]perylene		<370		37	370
Benzo[k]fluoranthene		<370		37	370
Chrysene		<370		37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		<370		37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		<370		37	370
Naphthalene		65	J	37	370
Phenanthrene		84	J	37	370
Pyrene		<370		37	370
1-Methylnaphthalene		100	J	37	370
2-Methylnaphthalene		140	J	37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	78	41 - 94
Nitrobenzene-d5	73	22 - 94
Terphenyl-d14	83	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2 D**

Lab Sample ID:	510-18356-3			Date Sampled:	09/18/2007 0735
Client Matrix:	Solid	% Moisture:	10.8	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B3.D
Dilution:	1.0			Initial Weight/Volume:	30.35 g
Date Analyzed:	09/28/2007 1336			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		94	J	37	370
Benzo[a]pyrene		85	J	37	370
Benzo[b]fluoranthene		120	J	37	370
Benzo[g,h,i]perylene		75	J	37	370
Benzo[k]fluoranthene		56	J	37	370
Chrysene		98	J	37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		150	J	37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		48	J	37	370
Naphthalene		<370		37	370
Phenanthrene		120	J	37	370
Pyrene		160	J	37	370
1-Methylnaphthalene		51	J	37	370
2-Methylnaphthalene		55	J	37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	73	41 - 94
Nitrobenzene-d5	66	22 - 94
Terphenyl-d14	75	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B15 / SB1**

Lab Sample ID:	510-18356-4			Date Sampled:	09/18/2007 0740
Client Matrix:	Solid	% Moisture:	7.0	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B4.D
Dilution:	1.0			Initial Weight/Volume:	30.13 g
Date Analyzed:	10/01/2007 2107			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		<350		35	350
Benzo[a]anthracene		96	J	35	350
Benzo[a]pyrene		90	J	35	350
Benzo[b]fluoranthene		130	J	35	350
Benzo[g,h,i]perylene		63	J	35	350
Benzo[k]fluoranthene		54	J	35	350
Chrysene		110	J	35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		190	J	35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		49	J	35	350
Naphthalene		<350		35	350
Phenanthrene		140	J	35	350
Pyrene		170	J	35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	73	41 - 94
Nitrobenzene-d5	68	22 - 94
Terphenyl-d14	80	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B15 / SB2**

Lab Sample ID:	510-18356-5			Date Sampled:	09/18/2007 0745
Client Matrix:	Solid	% Moisture:	5.4	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B5.D
Dilution:	1.0			Initial Weight/Volume:	30.04 g
Date Analyzed:	09/28/2007 1408			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		<350		35	350
Benzo[a]anthracene		<350		35	350
Benzo[a]pyrene		<350		35	350
Benzo[b]fluoranthene		<350		35	350
Benzo[g,h,i]perylene		<350		35	350
Benzo[k]fluoranthene		<350		35	350
Chrysene		<350		35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		<350		35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		<350		35	350
Naphthalene		54	J	35	350
Phenanthrene		55	J	35	350
Pyrene		<350		35	350
1-Methylnaphthalene		100	J	35	350
2-Methylnaphthalene		120	J	35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	73	41 - 94
Nitrobenzene-d5	68	22 - 94
Terphenyl-d14	80	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B16 / SB1**

Lab Sample ID:	510-18356-6			Date Sampled:	09/18/2007 0755
Client Matrix:	Solid	% Moisture:	12.0	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B6.D
Dilution:	1.0			Initial Weight/Volume:	30.12 g
Date Analyzed:	09/28/2007 1440			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		<370		37	370
Benzo[a]pyrene		<370		37	370
Benzo[b]fluoranthene		<370		37	370
Benzo[g,h,i]perylene		<370		37	370
Benzo[k]fluoranthene		<370		37	370
Chrysene		<370		37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		53	J	37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		<370		37	370
Naphthalene		<370		37	370
Phenanthrene		<370		37	370
Pyrene		58	J	37	370
1-Methylnaphthalene		<370		37	370
2-Methylnaphthalene		<370		37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	73	41 - 94
Nitrobenzene-d5	69	22 - 94
Terphenyl-d14	79	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B16 / SB2**

Lab Sample ID:	510-18356-7			Date Sampled:	09/18/2007 0800
Client Matrix:	Solid	% Moisture:	19.4	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B7.D
Dilution:	1.0			Initial Weight/Volume:	30.35 g
Date Analyzed:	09/28/2007 1512			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<400		40	400
Acenaphthylene		<400		40	400
Anthracene		<400		40	400
Benzo[a]anthracene		<400		40	400
Benzo[a]pyrene		<400		40	400
Benzo[b]fluoranthene		<400		40	400
Benzo[g,h,i]perylene		<400		40	400
Benzo[k]fluoranthene		<400		40	400
Chrysene		<400		40	400
Dibenz(a,h)anthracene		<400		40	400
Fluoranthene		<400		40	400
Fluorene		<400		40	400
Indeno[1,2,3-cd]pyrene		<400		40	400
Naphthalene		<400		40	400
Phenanthrene		47	J	40	400
Pyrene		<400		40	400
1-Methylnaphthalene		<400		40	400
2-Methylnaphthalene		<400		40	400

Surrogate	%Rec		Acceptance Limits
2-Fluorobiphenyl	86		41 - 94
Nitrobenzene-d5	82		22 - 94
Terphenyl-d14	97	X	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B18 / SB1**

Lab Sample ID:	510-18356-8			Date Sampled:	09/18/2007 0810
Client Matrix:	Solid	% Moisture:	6.0	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B8.D
Dilution:	1.0			Initial Weight/Volume:	30.07 g
Date Analyzed:	10/01/2007 2210			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		130	J	35	350
Benzo[a]anthracene		810		35	350
Benzo[a]pyrene		820		35	350
Benzo[b]fluoranthene		1200		35	350
Benzo[g,h,i]perylene		340	J	35	350
Benzo[k]fluoranthene		480		35	350
Chrysene		800		35	350
Dibenz(a,h)anthracene		150	J	35	350
Fluoranthene		1600		35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		340	J	35	350
Naphthalene		<350		35	350
Phenanthrene		440		35	350
Pyrene		1500		35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	62	41 - 94
Nitrobenzene-d5	57	22 - 94
Terphenyl-d14	64	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B18 / SB2**

Lab Sample ID:	510-18356-9			Date Sampled:	09/18/2007 0815
Client Matrix:	Solid	% Moisture:	11.6	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B9.D
Dilution:	1.0			Initial Weight/Volume:	30.23 g
Date Analyzed:	10/02/2007 2108			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		57	J	37	370
Benzo[a]anthracene		350	J	37	370
Benzo[a]pyrene		390		37	370
Benzo[b]fluoranthene		490		37	370
Benzo[g,h,i]perylene		250	J	37	370
Benzo[k]fluoranthene		230	J	37	370
Chrysene		400		37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		630		37	370
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		170	J	37	370
Naphthalene		<370		37	370
Phenanthrene		330	J	37	370
Pyrene		720		37	370
1-Methylnaphthalene		<370		37	370
2-Methylnaphthalene		<370		37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	90	41 - 94
Nitrobenzene-d5	80	22 - 94
Terphenyl-d14	95	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B20 / SB1**

Lab Sample ID:	510-18356-10			Date Sampled:	09/18/2007 0835
Client Matrix:	Solid	% Moisture:	8.5	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B10.D
Dilution:	1.0			Initial Weight/Volume:	30.33 g
Date Analyzed:	09/28/2007 1544			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		83	J	36	360
Acenaphthylene		<360		36	360
Anthracene		190	J	36	360
Benzo[a]anthracene		640		36	360
Benzo[a]pyrene		550		36	360
Benzo[b]fluoranthene		750		36	360
Benzo[g,h,i]perylene		270	J	36	360
Benzo[k]fluoranthene		320	J	36	360
Chrysene		640		36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		1400		36	360
Fluorene		61	J	36	360
Indeno[1,2,3-cd]pyrene		260	J	36	360
Naphthalene		<360		36	360
Phenanthrene		800		36	360
Pyrene		1100		36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	67	41 - 94
Nitrobenzene-d5	62	22 - 94
Terphenyl-d14	73	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B20 / SB2**

Lab Sample ID:	510-18356-11			Date Sampled:	09/18/2007 0840
Client Matrix:	Solid	% Moisture:	16.3	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B11.D
Dilution:	1.0			Initial Weight/Volume:	30.37 g
Date Analyzed:	09/28/2007 1616			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<390		39	390
Acenaphthylene		56	J	39	390
Anthracene		64	J	39	390
Benzo[a]anthracene		280	J	39	390
Benzo[a]pyrene		240	J	39	390
Benzo[b]fluoranthene		330	J	39	390
Benzo[g,h,i]perylene		110	J	39	390
Benzo[k]fluoranthene		150	J	39	390
Chrysene		290	J	39	390
Dibenz(a,h)anthracene		58	J	39	390
Fluoranthene		470		39	390
Fluorene		<390		39	390
Indeno[1,2,3-cd]pyrene		94	J	39	390
Naphthalene		340	J	39	390
Phenanthrene		680		39	390
Pyrene		430		39	390
1-Methylnaphthalene		620		39	390
2-Methylnaphthalene		720		39	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	68	41 - 94
Nitrobenzene-d5	61	22 - 94
Terphenyl-d14	73	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B21 / SB1**

Lab Sample ID:	510-18356-12			Date Sampled:	09/18/2007 0845
Client Matrix:	Solid	% Moisture:	13.6	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B12.D
Dilution:	1.0			Initial Weight/Volume:	30.04 g
Date Analyzed:	09/28/2007 1648			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<380		38	380
Acenaphthylene		<380		38	380
Anthracene		54	J	38	380
Benzo[a]anthracene		330	J	38	380
Benzo[a]pyrene		300	J	38	380
Benzo[b]fluoranthene		460		38	380
Benzo[g,h,i]perylene		160	J	38	380
Benzo[k]fluoranthene		210	J	38	380
Chrysene		340	J	38	380
Dibenz(a,h)anthracene		<380		38	380
Fluoranthene		540		38	380
Fluorene		<380		38	380
Indeno[1,2,3-cd]pyrene		140	J	38	380
Naphthalene		83	J	38	380
Phenanthrene		400		38	380
Pyrene		520		38	380
1-Methylnaphthalene		170	J	38	380
2-Methylnaphthalene		180	J	38	380

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	85	41 - 94
Nitrobenzene-d5	78	22 - 94
Terphenyl-d14	95	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B21 / SB2**

Lab Sample ID:	510-18356-13			Date Sampled:	09/18/2007 0850
Client Matrix:	Solid	% Moisture:	16.1	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B13.D
Dilution:	1.0			Initial Weight/Volume:	30.26 g
Date Analyzed:	10/01/2007 2138			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<390		39	390
Acenaphthylene		<390		39	390
Anthracene		46	J	39	390
Benzo[a]anthracene		230	J	39	390
Benzo[a]pyrene		240	J	39	390
Benzo[b]fluoranthene		310	J	39	390
Benzo[g,h,i]perylene		170	J	39	390
Benzo[k]fluoranthene		130	J	39	390
Chrysene		270	J	39	390
Dibenz(a,h)anthracene		67	J	39	390
Fluoranthene		390		39	390
Fluorene		<390		39	390
Indeno[1,2,3-cd]pyrene		110	J	39	390
Naphthalene		280	J	39	390
Phenanthrene		490		39	390
Pyrene		380	J	39	390
1-Methylnaphthalene		420		39	390
2-Methylnaphthalene		510		39	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	69	41 - 94
Nitrobenzene-d5	65	22 - 94
Terphenyl-d14	72	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B19 / SB1**

Lab Sample ID:	510-18356-14			Date Sampled:	09/18/2007 0900
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B14.D
Dilution:	1.0			Initial Weight/Volume:	30.18 g
Date Analyzed:	09/28/2007 1720			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		45	J	44	440
Acenaphthylene		<440		44	440
Anthracene		99	J	44	440
Benzo[a]anthracene		420	J	44	440
Benzo[a]pyrene		400	J	44	440
Benzo[b]fluoranthene		560		44	440
Benzo[g,h,i]perylene		200	J	44	440
Benzo[k]fluoranthene		220	J	44	440
Chrysene		410	J	44	440
Dibenz(a,h)anthracene		<440		44	440
Fluoranthene		850		44	440
Fluorene		<440		44	440
Indeno[1,2,3-cd]pyrene		180	J	44	440
Naphthalene		<440		44	440
Phenanthrene		470		44	440
Pyrene		750		44	440
1-Methylnaphthalene		<440		44	440
2-Methylnaphthalene		<440		44	440

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	71	41 - 94
Nitrobenzene-d5	63	22 - 94
Terphenyl-d14	77	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B19 / SB2**

Lab Sample ID:	510-18356-15			Date Sampled:	09/18/2007 0905
Client Matrix:	Solid	% Moisture:	7.1	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B15.D
Dilution:	1.0			Initial Weight/Volume:	30.19 g
Date Analyzed:	09/28/2007 1854			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		73	J	35	350
Benzo[a]anthracene		280	J	35	350
Benzo[a]pyrene		250	J	35	350
Benzo[b]fluoranthene		360		35	350
Benzo[g,h,i]perylene		110	J	35	350
Benzo[k]fluoranthene		130	J	35	350
Chrysene		260	J	35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		600		35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		98	J	35	350
Naphthalene		<350		35	350
Phenanthrene		350	J	35	350
Pyrene		510		35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	77	41 - 94
Nitrobenzene-d5	70	22 - 94
Terphenyl-d14	86	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB1**

Lab Sample ID:	510-18356-16			Date Sampled:	09/18/2007 0920
Client Matrix:	Solid	% Moisture:	13.4	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B16.D
Dilution:	1.0			Initial Weight/Volume:	30.39 g
Date Analyzed:	10/02/2007 2139			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		120	J	38	380
Acenaphthylene		<380		38	380
Anthracene		280	J	38	380
Benzo[a]anthracene		1800		38	380
Benzo[a]pyrene		1900		38	380
Benzo[b]fluoranthene		2600		38	380
Benzo[g,h,i]perylene		860		38	380
Benzo[k]fluoranthene		1100		38	380
Chrysene		1800		38	380
Dibenz(a,h)anthracene		<380		38	380
Fluoranthene		3500		38	380
Fluorene		82	J	38	380
Indeno[1,2,3-cd]pyrene		830		38	380
Naphthalene		<380		38	380
Phenanthrene		1200		38	380
Pyrene		2800		38	380
1-Methylnaphthalene		<380		38	380
2-Methylnaphthalene		<380		38	380

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	62	41 - 94
Nitrobenzene-d5	49	22 - 94
Terphenyl-d14	73	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB2**

Lab Sample ID:	510-18356-17			Date Sampled:	09/18/2007 0925
Client Matrix:	Solid	% Moisture:	14.4	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	8356B17X.D
Dilution:	10			Initial Weight/Volume:	30.44 g
Date Analyzed:	10/01/2007 2004			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		5900		380	3800
Acenaphthylene		<3800		380	3800
Anthracene		11000		380	3800
Benzo[a]anthracene		22000		380	3800
Benzo[a]pyrene		17000		380	3800
Benzo[b]fluoranthene		22000		380	3800
Benzo[g,h,i]perylene		8400		380	3800
Benzo[k]fluoranthene		8600		380	3800
Chrysene		18000		380	3800
Dibenz(a,h)anthracene		3900		380	3800
Fluoranthene		50000		380	3800
Fluorene		5900		380	3800
Indeno[1,2,3-cd]pyrene		8400		380	3800
Naphthalene		<3800		380	3800
Phenanthrene		38000		380	3800
Pyrene		35000		380	3800
1-Methylnaphthalene		1000	J	380	3800
2-Methylnaphthalene		1000	J	380	3800

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	69	41 - 94
Nitrobenzene-d5	56	22 - 94
Terphenyl-d14	65	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB1**

Lab Sample ID: 510-18356-18 | Date Sampled: 09/18/2007 0940
Client Matrix: Solid | % Moisture: 7.8 | Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B18.D
Dilution:	1.0			Initial Weight/Volume:	30.11 g
Date Analyzed:	09/28/2007 1925			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		45	J	36	360
Benzo[a]pyrene		38	J	36	360
Benzo[b]fluoranthene		61	J	36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		41	J	36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		100	J	36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360		36	360
Phenanthrene		160	J	36	360
Pyrene		81	J	36	360
1-Methylnaphthalene		51	J	36	360
2-Methylnaphthalene		52	J	36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	84	41 - 94
Nitrobenzene-d5	74	22 - 94
Terphenyl-d14	92	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB2**

Lab Sample ID:	510-18356-19			Date Sampled:	09/18/2007 0945
Client Matrix:	Solid	% Moisture:	15.5	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56248		Instrument ID:	GC/MSD
Preparation:	3550B	Prep Batch: 400-55764		Lab File ID:	18356B19.D
Dilution:	1.0			Initial Weight/Volume:	30.03 g
Date Analyzed:	10/02/2007 2211			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		60	J	39	390
Acenaphthylene		330	J	39	390
Anthracene		220	J	39	390
Benzo[a]anthracene		950		39	390
Benzo[a]pyrene		1100		39	390
Benzo[b]fluoranthene		1500		39	390
Benzo[g,h,i]perylene		490		39	390
Benzo[k]fluoranthene		710		39	390
Chrysene		1200		39	390
Dibenz(a,h)anthracene		<390		39	390
Fluoranthene		3000		39	390
Fluorene		210	J	39	390
Indeno[1,2,3-cd]pyrene		450		39	390
Naphthalene		110	J	39	390
Phenanthrene		2200		39	390
Pyrene		2600		39	390
1-Methylnaphthalene		190	J	39	390
2-Methylnaphthalene		200	J	39	390

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	59	41 - 94
Nitrobenzene-d5	48	22 - 94
Terphenyl-d14	67	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB1**

Lab Sample ID: 510-18356-22 | Date Sampled: 09/18/2007 1015
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56164	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55766	Lab File ID: 18356B22.D
Dilution:	1.0		Initial Weight/Volume: 30.48 g
Date Analyzed:	09/27/2007 1558		Final Weight/Volume: 1.0 mL
Date Prepared:	09/24/2007 0822		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		<360		36	360
Benzo[a]pyrene		<360		36	360
Benzo[b]fluoranthene		<360		36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		<360		36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		<360		36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360	*	36	360
Phenanthrene		37	J	36	360
Pyrene		<360		36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	69	41 - 94
Nitrobenzene-d5	69	22 - 94
Terphenyl-d14	84	53 - 96

Client: Burns & McDonnell Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB2**

Lab Sample ID: 510-18356-23 Date Sampled: 09/18/2007 1020
Client Matrix: Solid % Moisture: 10.3 Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C Analysis Batch: 400-56164 Instrument ID: GC/MS
Preparation: 3550B Prep Batch: 400-55766 Lab File ID: 18356B23.D
Dilution: 1.0 Initial Weight/Volume: 30.35 g
Date Analyzed: 09/27/2007 1627 Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0822 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		<360		36	360
Benzo[a]pyrene		<360		36	360
Benzo[b]fluoranthene		<360		36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		<360		36	360
Chrysene		45	J	36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		55	J	36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360	*	36	360
Phenanthrene		58	J	36	360
Pyrene		61	J	36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec		Acceptance Limits
2-Fluorobiphenyl	17	X	41 - 94
Nitrobenzene-d5	2	X	22 - 94
Terphenyl-d14	96		53 - 96

Method: 8270C Analysis Batch: 400-56631 Instrument ID: GC/MSD
Preparation: 3550B Prep Batch: 400-56333 Lab File ID: 8356C23R.D
Dilution: 1.0 Initial Weight/Volume: 30.06 g
Date Analyzed: 10/04/2007 2111 Final Weight/Volume: 1.0 mL
Date Prepared: 10/02/2007 0808 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<370		37	370
Acenaphthylene		<370		37	370
Anthracene		<370		37	370
Benzo[a]anthracene		40	J	37	370
Benzo[a]pyrene		<370		37	370
Benzo[b]fluoranthene		47	J	37	370
Benzo[g,h,i]perylene		<370		37	370
Benzo[k]fluoranthene		<370		37	370
Chrysene		59	J	37	370
Dibenz(a,h)anthracene		<370		37	370
Fluoranthene		67	J	37	370

Client: Burns & McDonnell Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB2**

Lab Sample ID: 510-18356-23 Date Sampled: 09/18/2007 1020
Client Matrix: Solid % Moisture: 10.3 Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method: 8270C Analysis Batch: 400-56631 Instrument ID: GC/MSD
Preparation: 3550B Prep Batch: 400-56333 Lab File ID: 8356C23R.D
Dilution: 1.0 Initial Weight/Volume: 30.06 g
Date Analyzed: 10/04/2007 2111 Final Weight/Volume: 1.0 mL
Date Prepared: 10/02/2007 0808 Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Fluorene		<370		37	370
Indeno[1,2,3-cd]pyrene		<370		37	370
Naphthalene		<370		37	370
Phenanthrene		66	J	37	370
Pyrene		78	J	37	370
1-Methylnaphthalene		<370		37	370
2-Methylnaphthalene		67	J	37	370

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	75	41 - 94
Nitrobenzene-d5	71	22 - 94
Terphenyl-d14	80	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B23 / SB1**

Lab Sample ID: 510-18356-24 | Date Sampled: 09/18/2007 1030
Client Matrix: Solid | % Moisture: 8.3 | Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56164	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55766	Lab File ID: 18356B24.D
Dilution:	1.0		Initial Weight/Volume: 30.22 g
Date Analyzed:	09/27/2007 1656		Final Weight/Volume: 1.0 mL
Date Prepared:	09/24/2007 0822		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<360		36	360
Acenaphthylene		<360		36	360
Anthracene		<360		36	360
Benzo[a]anthracene		150	J	36	360
Benzo[a]pyrene		<360		36	360
Benzo[b]fluoranthene		210	J	36	360
Benzo[g,h,i]perylene		<360		36	360
Benzo[k]fluoranthene		80	J	36	360
Chrysene		250	J	36	360
Dibenz(a,h)anthracene		<360		36	360
Fluoranthene		330	J	36	360
Fluorene		<360		36	360
Indeno[1,2,3-cd]pyrene		<360		36	360
Naphthalene		<360	*	36	360
Phenanthrene		210	J	36	360
Pyrene		430		36	360
1-Methylnaphthalene		<360		36	360
2-Methylnaphthalene		<360		36	360

Surrogate	%Rec		Acceptance Limits
2-Fluorobiphenyl	69		41 - 94
Nitrobenzene-d5	66		22 - 94
Terphenyl-d14	103	X	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B23 / SB2**

Lab Sample ID: 510-18356-25 | Date Sampled: 09/18/2007 1035
Client Matrix: Solid | % Moisture: 7.6 | Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56164	Instrument ID: GC/MS
Preparation:	3550B	Prep Batch: 400-55766	Lab File ID: 18356B25.D
Dilution:	1.0		Initial Weight/Volume: 30.31 g
Date Analyzed:	09/27/2007 1726		Final Weight/Volume: 1.0 mL
Date Prepared:	09/24/2007 0822		Injection Volume:

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<350		35	350
Acenaphthylene		<350		35	350
Anthracene		<350		35	350
Benzo[a]anthracene		100	J	35	350
Benzo[a]pyrene		<350		35	350
Benzo[b]fluoranthene		120	J	35	350
Benzo[g,h,i]perylene		<350		35	350
Benzo[k]fluoranthene		53	J	35	350
Chrysene		110	J	35	350
Dibenz(a,h)anthracene		<350		35	350
Fluoranthene		200	J	35	350
Fluorene		<350		35	350
Indeno[1,2,3-cd]pyrene		<350		35	350
Naphthalene		<350	*	35	350
Phenanthrene		140	J	35	350
Pyrene		190	J	35	350
1-Methylnaphthalene		<350		35	350
2-Methylnaphthalene		<350		35	350

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	76	41 - 94
Nitrobenzene-d5	74	22 - 94
Terphenyl-d14	91	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B22 / SB1**

Lab Sample ID: 510-18356-26 | Date Sampled: 09/18/2007 1055
Client Matrix: Solid | % Moisture: 15.7 | Date Received: 09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56164		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55766		Lab File ID:	8356B26X.D
Dilution:	10			Initial Weight/Volume:	30.44 g
Date Analyzed:	09/27/2007 1755			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0822			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<3900		390	3900
Acenaphthylene		<3900		390	3900
Anthracene		<3900		390	3900
Benzo[a]anthracene		650	J	390	3900
Benzo[a]pyrene		<3900		390	3900
Benzo[b]fluoranthene		640	J	390	3900
Benzo[g,h,i]perylene		<3900		390	3900
Benzo[k]fluoranthene		<3900		390	3900
Chrysene		570	J	390	3900
Dibenz(a,h)anthracene		<3900		390	3900
Fluoranthene		1100	J	390	3900
Fluorene		<3900		390	3900
Indeno[1,2,3-cd]pyrene		<3900		390	3900
Naphthalene		<3900	*	390	3900
Phenanthrene		830	J	390	3900
Pyrene		1100	J	390	3900
1-Methylnaphthalene		<3900		390	3900
2-Methylnaphthalene		<3900		390	3900

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	53	41 - 94
Nitrobenzene-d5	44	22 - 94
Terphenyl-d14	63	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B22 / SB2**

Lab Sample ID:	510-18356-27			Date Sampled:	09/18/2007 1100
Client Matrix:	Solid	% Moisture:	14.3	Date Received:	09/19/2007 1015

8270C Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

Method:	8270C	Analysis Batch: 400-56164		Instrument ID:	GC/MS
Preparation:	3550B	Prep Batch: 400-55766		Lab File ID:	18356B27.D
Dilution:	1.0			Initial Weight/Volume:	30.11 g
Date Analyzed:	09/27/2007 1430			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0822			Injection Volume:	

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Acenaphthene		<380		38	380
Acenaphthylene		<380		38	380
Anthracene		39	J	38	380
Benzo[a]anthracene		41	J	38	380
Benzo[a]pyrene		<380		38	380
Benzo[b]fluoranthene		82	J	38	380
Benzo[g,h,i]perylene		<380		38	380
Benzo[k]fluoranthene		<380		38	380
Chrysene		61	J	38	380
Dibenz(a,h)anthracene		<380		38	380
Fluoranthene		100	J	38	380
Fluorene		<380		38	380
Indeno[1,2,3-cd]pyrene		<380		38	380
Naphthalene		48	J *	38	380
Phenanthrene		120	J	38	380
Pyrene		150	J	38	380
1-Methylnaphthalene		130	J	38	380
2-Methylnaphthalene		130	J	38	380

Surrogate	%Rec	Acceptance Limits
2-Fluorobiphenyl	79	41 - 94
Nitrobenzene-d5	75	22 - 94
Terphenyl-d14	93	53 - 96

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB1**

Lab Sample ID:	510-18356-1			Date Sampled:	09/18/2007 0730
Client Matrix:	Solid	% Moisture:	21.3	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	2301023.D
Dilution:	1.0			Initial Weight/Volume:	30.36 g
Date Analyzed:	09/27/2007 0922			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.8		0.49	3.8
Fuel Oil		<3.8		0.49	3.8
Hydraulic Fluid		<3.8		0.49	3.8
Kerosene		<3.8		0.49	3.8
Mineral Spirits		<3.8		0.49	3.8
Motor Oil		<3.8		0.49	3.8
Unknown Hydrocarbons		150		3.1	3.8

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	87	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2**

Lab Sample ID:	510-18356-2			Date Sampled:	09/18/2007 0735
Client Matrix:	Solid	% Moisture:	12.0	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	2401024.D
Dilution:	1.0			Initial Weight/Volume:	30.43 g
Date Analyzed:	09/27/2007 0927			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.4		0.44	3.4
Fuel Oil		<3.4		0.44	3.4
Hydraulic Fluid		<3.4		0.44	3.4
Kerosene		<3.4		0.44	3.4
Mineral Spirits		<3.4		0.44	3.4
Motor Oil		<3.4		0.44	3.4
Unknown Hydrocarbons		48		2.8	3.4

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	112	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2 D**

Lab Sample ID: 510-18356-3 | Date Sampled: 09/18/2007 0735
Client Matrix: Solid | % Moisture: 10.8 | Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56122 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55769 | Lab File ID: 2501025.D
Dilution: 1.0 | Initial Weight/Volume: 30.02 g
Date Analyzed: 09/27/2007 0931 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0830 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.4		0.44	3.4
Fuel Oil		<3.4		0.44	3.4
Hydraulic Fluid		<3.4		0.44	3.4
Kerosene		<3.4		0.44	3.4
Mineral Spirits		<3.4		0.44	3.4
Motor Oil		<3.4		0.44	3.4
Unknown Hydrocarbons		150		2.8	3.4

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	77	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B15 / SB1**

Lab Sample ID: 510-18356-4 | Date Sampled: 09/18/2007 0740
Client Matrix: Solid | % Moisture: 7.0 | Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56122 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55769 | Lab File ID: 2601026.D
Dilution: 1.0 | Initial Weight/Volume: 30.26 g
Date Analyzed: 09/27/2007 0936 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0830 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.2		0.42	3.2
Fuel Oil		<3.2		0.42	3.2
Hydraulic Fluid		<3.2		0.42	3.2
Kerosene		<3.2		0.42	3.2
Mineral Spirits		<3.2		0.42	3.2
Motor Oil		<3.2		0.42	3.2
Unknown Hydrocarbons		89		2.7	3.2

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	99	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B15 / SB2**

Lab Sample ID:	510-18356-5			Date Sampled:	09/18/2007 0745
Client Matrix:	Solid	% Moisture:	5.4	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	2701027.D
Dilution:	1.0			Initial Weight/Volume:	30.24 g
Date Analyzed:	09/27/2007 0940			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.1		0.41	3.1
Fuel Oil		<3.1		0.41	3.1
Hydraulic Fluid		<3.1		0.41	3.1
Kerosene		<3.1		0.41	3.1
Mineral Spirits		<3.1		0.41	3.1
Motor Oil		<3.1		0.41	3.1
Unknown Hydrocarbons		44		2.6	3.1

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	92	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B16 / SB1**

Lab Sample ID:	510-18356-6			Date Sampled:	09/18/2007 0755
Client Matrix:	Solid	% Moisture:	12.0	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	2901029.D
Dilution:	1.0			Initial Weight/Volume:	30.27 g
Date Analyzed:	09/27/2007 0949			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.4		0.44	3.4
Fuel Oil		<3.4		0.44	3.4
Hydraulic Fluid		<3.4		0.44	3.4
Kerosene		<3.4		0.44	3.4
Mineral Spirits		<3.4		0.44	3.4
Motor Oil		<3.4		0.44	3.4
Unknown Hydrocarbons		170		2.8	3.4

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	93	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B16 / SB2**

Lab Sample ID:	510-18356-7			Date Sampled:	09/18/2007 0800
Client Matrix:	Solid	% Moisture:	19.4	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3001030.D
Dilution:	1.0			Initial Weight/Volume:	30.42 g
Date Analyzed:	09/27/2007 0953			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.7		0.48	3.7
Fuel Oil		<3.7		0.48	3.7
Hydraulic Fluid		<3.7		0.48	3.7
Kerosene		<3.7		0.48	3.7
Mineral Spirits		<3.7		0.48	3.7
Motor Oil		<3.7		0.48	3.7
Unknown Hydrocarbons		31		3.1	3.7

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	93	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B18 / SB1**

Lab Sample ID:	510-18356-8			Date Sampled:	09/18/2007 0810
Client Matrix:	Solid	% Moisture:	6.0	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3101031.D
Dilution:	50			Initial Weight/Volume:	30.04 g
Date Analyzed:	09/27/2007 0958			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<160		21	160
Fuel Oil		<160		21	160
Hydraulic Fluid		<160		21	160
Kerosene		<160		21	160
Mineral Spirits		<160		21	160
Motor Oil		<160		21	160
Unknown Hydrocarbons		310		130	160

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	102	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B18 / SB2**

Lab Sample ID:	510-18356-9			Date Sampled:	09/18/2007 0815
Client Matrix:	Solid	% Moisture:	11.6	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3201032.D
Dilution:	50			Initial Weight/Volume:	30.06 g
Date Analyzed:	09/27/2007 1002			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<170		22	170
Fuel Oil		<170		22	170
Hydraulic Fluid		<170		22	170
Kerosene		<170		22	170
Mineral Spirits		<170		22	170
Motor Oil		<170		22	170
Unknown Hydrocarbons		1100		140	170

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	87	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B20 / SB1**

Lab Sample ID:	510-18356-10			Date Sampled:	09/18/2007 0835
Client Matrix:	Solid	% Moisture:	8.5	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3301033.D
Dilution:	50			Initial Weight/Volume:	30.48 g
Date Analyzed:	09/27/2007 1007			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<160		21	160
Fuel Oil		<160		21	160
Hydraulic Fluid		<160		21	160
Kerosene		<160		21	160
Mineral Spirits		<160		21	160
Motor Oil		<160		21	160
Unknown Hydrocarbons		210		130	160

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	108	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B20 / SB2**

Lab Sample ID:	510-18356-11			Date Sampled:	09/18/2007 0840
Client Matrix:	Solid	% Moisture:	16.3	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3401034.D
Dilution:	10			Initial Weight/Volume:	30.37 g
Date Analyzed:	09/27/2007 1011			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<35		4.6	35
Fuel Oil		<35		4.6	35
Hydraulic Fluid		<35		4.6	35
Kerosene		<35		4.6	35
Mineral Spirits		<35		4.6	35
Motor Oil		<35		4.6	35
Unknown Hydrocarbons		350		30	35

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	86	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B21 / SB1**

Lab Sample ID:	510-18356-12			Date Sampled:	09/18/2007 0845
Client Matrix:	Solid	% Moisture:	13.6	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3501035.D
Dilution:	10			Initial Weight/Volume:	30.15 g
Date Analyzed:	09/27/2007 1016			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<35		4.5	35
Fuel Oil		<35		4.5	35
Hydraulic Fluid		<35		4.5	35
Kerosene		<35		4.5	35
Mineral Spirits		<35		4.5	35
Motor Oil		<35		4.5	35
Unknown Hydrocarbons		230		29	35

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	106	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B21 / SB2**

Lab Sample ID:	510-18356-13			Date Sampled:	09/18/2007 0850
Client Matrix:	Solid	% Moisture:	16.1	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3601036.D
Dilution:	10			Initial Weight/Volume:	30.44 g
Date Analyzed:	09/27/2007 1020			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<35		4.6	35
Fuel Oil		<35		4.6	35
Hydraulic Fluid		<35		4.6	35
Kerosene		<35		4.6	35
Mineral Spirits		<35		4.6	35
Motor Oil		<35		4.6	35
Unknown Hydrocarbons		240		29	35

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	97	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B19 / SB1**

Lab Sample ID:	510-18356-14			Date Sampled:	09/18/2007 0900
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3701037.D
Dilution:	10			Initial Weight/Volume:	30.17 g
Date Analyzed:	09/27/2007 1024			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<40		5.2	40
Fuel Oil		<40		5.2	40
Hydraulic Fluid		<40		5.2	40
Kerosene		<40		5.2	40
Mineral Spirits		<40		5.2	40
Motor Oil		<40		5.2	40
Unknown Hydrocarbons		81		33	40

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	98	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B19 / SB2**

Lab Sample ID:	510-18356-15			Date Sampled:	09/18/2007 0905
Client Matrix:	Solid	% Moisture:	7.1	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	3801038.D
Dilution:	10			Initial Weight/Volume:	30.33 g
Date Analyzed:	09/27/2007 1029			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<32		4.2	32
Fuel Oil		<32		4.2	32
Hydraulic Fluid		<32		4.2	32
Kerosene		<32		4.2	32
Mineral Spirits		<32		4.2	32
Motor Oil		<32		4.2	32
Unknown Hydrocarbons		150		27	32

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	97	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB1**

Lab Sample ID:	510-18356-16			Date Sampled:	09/18/2007 0920
Client Matrix:	Solid	% Moisture:	13.4	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	4001040.D
Dilution:	50			Initial Weight/Volume:	30.32 g
Date Analyzed:	09/27/2007 1038			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<170		22	170
Fuel Oil		<170		22	170
Hydraulic Fluid		<170		22	170
Kerosene		<170		22	170
Mineral Spirits		<170		22	170
Motor Oil		<170		22	170
Unknown Hydrocarbons		280		140	170

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	99	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB2**

Lab Sample ID:	510-18356-17			Date Sampled:	09/18/2007 0925
Client Matrix:	Solid	% Moisture:	14.4	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	4101041.D
Dilution:	1.0			Initial Weight/Volume:	30.07 g
Date Analyzed:	09/27/2007 1042			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.5		0.45	3.5
Fuel Oil		<3.5		0.45	3.5
Hydraulic Fluid		<3.5		0.45	3.5
Kerosene		<3.5		0.45	3.5
Mineral Spirits		<3.5		0.45	3.5
Motor Oil		<3.5		0.45	3.5
Unknown Hydrocarbons		190		2.9	3.5

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	86	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB1**

Lab Sample ID: 510-18356-18 | Date Sampled: 09/18/2007 0940
Client Matrix: Solid | % Moisture: 7.8 | Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56122 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55769 | Lab File ID: 4201042.D
Dilution: 1.0 | Initial Weight/Volume: 30.24 g
Date Analyzed: 09/27/2007 1047 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0830 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.2		0.42	3.2
Fuel Oil		<3.2		0.42	3.2
Hydraulic Fluid		<3.2		0.42	3.2
Kerosene		<3.2		0.42	3.2
Mineral Spirits		<3.2		0.42	3.2
Motor Oil		<3.2		0.42	3.2
Unknown Hydrocarbons		53		2.7	3.2

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	105	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB2**

Lab Sample ID:	510-18356-19			Date Sampled:	09/18/2007 0945
Client Matrix:	Solid	% Moisture:	15.5	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56122		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55769		Lab File ID:	4301043.D
Dilution:	50			Initial Weight/Volume:	30.07 g
Date Analyzed:	09/27/2007 1051			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<180		23	180
Fuel Oil		<180		23	180
Hydraulic Fluid		<180		23	180
Kerosene		<180		23	180
Mineral Spirits		<180		23	180
Motor Oil		<180		23	180
Unknown Hydrocarbons		620		150	180

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	111	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB1**

Lab Sample ID: 510-18356-22 | Date Sampled: 09/18/2007 1015
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56124 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55770 | Lab File ID: 5101051.D
Dilution: 1.0 | Initial Weight/Volume: 30.03 g
Date Analyzed: 09/27/2007 1127 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0836 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.3		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		90		2.8	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	95	39 - 159

Client: Burns & McDonnell Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB2**

Lab Sample ID: 510-18356-23 Date Sampled: 09/18/2007 1020
Client Matrix: Solid % Moisture: 10.3 Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 Analysis Batch: 400-56124 Instrument ID: GC/FID
Preparation: 3550B Prep Batch: 400-55770 Lab File ID: 5201052.D
Dilution: 1.0 Initial Weight/Volume: 30.23 g
Date Analyzed: 09/27/2007 1131 Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0836 Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<3.3		0.43	3.3
Fuel Oil		<3.3		0.43	3.3
Hydraulic Fluid		<3.3		0.43	3.3
Kerosene		<3.3		0.43	3.3
Mineral Spirits		<3.3		0.43	3.3
Motor Oil		<3.3		0.43	3.3
Unknown Hydrocarbons		170		2.8	3.3

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	99	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B23 / SB1**

Lab Sample ID: 510-18356-24 | Date Sampled: 09/18/2007 1030
Client Matrix: Solid | % Moisture: 8.3 | Date Received: 09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method: OA-2 | Analysis Batch: 400-56124 | Instrument ID: GC/FID
Preparation: 3550B | Prep Batch: 400-55770 | Lab File ID: 4701047.D
Dilution: 10 | Initial Weight/Volume: 30.34 g
Date Analyzed: 09/28/2007 1950 | Final Weight/Volume: 1.0 mL
Date Prepared: 09/24/2007 0836 | Injection Volume:
Column ID: PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<32		4.2	32
Fuel Oil		<32		4.2	32
Hydraulic Fluid		<32		4.2	32
Kerosene		<32		4.2	32
Mineral Spirits		<32		4.2	32
Motor Oil		<32		4.2	32
Unknown Hydrocarbons		1200		27	32

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	97	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B23 / SB2**

Lab Sample ID:	510-18356-25			Date Sampled:	09/18/2007 1035
Client Matrix:	Solid	% Moisture:	7.6	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56124		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55770		Lab File ID:	4801048.D
Dilution:	50			Initial Weight/Volume:	30.07 g
Date Analyzed:	09/28/2007 1954			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0836			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<160		21	160
Fuel Oil		<160		21	160
Hydraulic Fluid		<160		21	160
Kerosene		<160		21	160
Mineral Spirits		<160		21	160
Motor Oil		<160		21	160
Unknown Hydrocarbons		1400		130	160

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	116	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B22 / SB1**

Lab Sample ID:	510-18356-26			Date Sampled:	09/18/2007 1055
Client Matrix:	Solid	% Moisture:	15.7	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56124		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55770		Lab File ID:	5501055.D
Dilution:	50			Initial Weight/Volume:	30.31 g
Date Analyzed:	09/27/2007 1144			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0836			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<180		23	180
Fuel Oil		<180		23	180
Hydraulic Fluid		<180		23	180
Kerosene		<180		23	180
Mineral Spirits		<180		23	180
Motor Oil		<180		23	180
Unknown Hydrocarbons		8400		150	180

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	92	39 - 159

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B22 / SB2**

Lab Sample ID:	510-18356-27			Date Sampled:	09/18/2007 1100
Client Matrix:	Solid	% Moisture:	14.3	Date Received:	09/19/2007 1015

OA-2 Iowa - Extractable Petroleum Products

Method:	OA-2	Analysis Batch: 400-56124		Instrument ID:	GC/FID
Preparation:	3550B	Prep Batch: 400-55770		Lab File ID:	4901049.D
Dilution:	50			Initial Weight/Volume:	30.11 g
Date Analyzed:	09/28/2007 1959			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0836			Injection Volume:	
				Column ID:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Diesel		<170		23	170
Fuel Oil		<170		23	170
Hydraulic Fluid		<170		23	170
Kerosene		<170		23	170
Mineral Spirits		<170		23	170
Motor Oil		<170		23	170
Unknown Hydrocarbons		2500		150	170

Surrogate	%Rec	Acceptance Limits
o-Terphenyl	114	39 - 159

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B17 / SB1**

Lab Sample ID:	510-18356-1			Date Sampled:	09/18/2007 0730
Client Matrix:	Solid	% Moisture:	21.3	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0639 g
Date Analyzed:	09/24/2007 1100			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		<0.30	^	0.016	0.30
Lead		<0.15		0.062	0.15

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2**

Lab Sample ID:	510-18356-2	Date Sampled:	09/18/2007 0735
Client Matrix:	Solid % Moisture: 12.0	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0649 g
Date Analyzed:	09/24/2007 1103		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		8.4		0.055	0.13

Method:	6020	Analysis Batch: 510-23490	Instrument ID: TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319	Lab File ID: N/A
Dilution:	5.0		Initial Weight/Volume: 1.0649 g
Date Analyzed:	09/25/2007 1719		Final Weight/Volume: 50 mL
Date Prepared:	09/21/2007 1644		

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.42		0.015	0.27

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B17 / SB2 D**

Lab Sample ID: 510-18356-3
Client Matrix: Solid
% Moisture: 10.8
Date Sampled: 09/18/2007 0735
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/24/2007 1106
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23463
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0768 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		160		0.054	0.13

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/25/2007 1722
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23490
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0768 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		4.5		0.014	0.26

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B15 / SB1**

Lab Sample ID: 510-18356-4
Client Matrix: Solid
% Moisture: 7.0
Date Sampled: 09/18/2007 0740
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/24/2007 1109
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23463
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0184 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		89		0.055	0.13

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/25/2007 1725
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23490
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0184 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		2.5		0.014	0.26

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B15 / SB2**

Lab Sample ID:	510-18356-5	Date Sampled:	09/18/2007 0745
Client Matrix:	Solid % Moisture: 5.4	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0089 g
Date Analyzed:	09/24/2007 1113			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		38		0.054	0.13

Method:	6020	Analysis Batch: 510-23490		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0089 g
Date Analyzed:	09/25/2007 1728			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		2.1		0.014	0.26

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B16 / SB1**

Lab Sample ID: 510-18356-6
Client Matrix: Solid
% Moisture: 12.0
Date Sampled: 09/18/2007 0755
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/24/2007 1122
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23463
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0461 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		100		0.057	0.14

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/25/2007 1731
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23490
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0461 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		5.4		0.015	0.27

Client: Burns & McDonnell | Job Number: 510-18356-1

Client Sample ID: **06B16 / SB2**

Lab Sample ID:	510-18356-7			Date Sampled:	09/18/2007 0800
Client Matrix:	Solid	% Moisture:	19.4	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0023 g
Date Analyzed:	09/24/2007 1125			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		18		0.064	0.15

Method:	6020	Analysis Batch: 510-23490		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0023 g
Date Analyzed:	09/25/2007 1740			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.67		0.017	0.31

Client: Burns & McDonnell Job Number: 510-18356-1

Client Sample ID: **06B18 / SB1**

Lab Sample ID: 510-18356-8 Date Sampled: 09/18/2007 0810
Client Matrix: Solid % Moisture: 6.0 Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23463 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0511 g
Date Analyzed: 09/24/2007 1129 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		100		0.053	0.13

Method: 6020 Analysis Batch: 510-23490 Instrument ID: TE ICPMS
Preparation: 3050B Prep Batch: 510-23319 Lab File ID: N/A
Dilution: 5.0 Initial Weight/Volume: 1.0511 g
Date Analyzed: 09/25/2007 1744 Final Weight/Volume: 50 mL
Date Prepared: 09/21/2007 1644

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.9		0.014	0.25

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B18 / SB2**

Lab Sample ID: 510-18356-9
Client Matrix: Solid
% Moisture: 11.6
Date Sampled: 09/18/2007 0815
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/24/2007 1132
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23463
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0151 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		130		0.058	0.14

Method: 6020
Preparation: 3050B
Dilution: 5.0
Date Analyzed: 09/25/2007 1747
Date Prepared: 09/21/2007 1644
Analysis Batch: 510-23490
Prep Batch: 510-23319
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0151 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		4.1		0.015	0.28

Client: Burns & McDonnell Job Number: 510-18356-1

Client Sample ID: **06B20 / SB1**

Lab Sample ID:	510-18356-10			Date Sampled:	09/18/2007 0835
Client Matrix:	Solid	% Moisture:	8.5	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23463		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0121 g
Date Analyzed:	09/24/2007 1135			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Lead		71		0.056	0.14

Method:	6020	Analysis Batch: 510-23490		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23319		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0121 g
Date Analyzed:	09/25/2007 1750			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.6		0.015	0.27

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B20 / SB2**

Lab Sample ID:	510-18356-11			Date Sampled:	09/18/2007 0840
Client Matrix:	Solid	% Moisture:	16.3	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0061 g
Date Analyzed:	09/24/2007 2031			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		7.5		0.016	0.30
Lead		1300		0.062	0.15

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B21 / SB1**

Lab Sample ID:	510-18356-12			Date Sampled:	09/18/2007 0845
Client Matrix:	Solid	% Moisture:	13.6	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0467 g
Date Analyzed:	09/24/2007 2047			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.74		0.0030	0.055
Lead		75		0.012	0.028

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B21 / SB2**

Lab Sample ID:	510-18356-13			Date Sampled:	09/18/2007 0850
Client Matrix:	Solid	% Moisture:	16.1	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0098 g
Date Analyzed:	09/24/2007 2050			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.1		0.0032	0.059
Lead		97		0.012	0.030

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B19 / SB1**

Lab Sample ID:	510-18356-14			Date Sampled:	09/18/2007 0900
Client Matrix:	Solid	% Moisture:	24.9	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.1668 g
Date Analyzed:	09/24/2007 2053			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.34		0.0031	0.057
Lead		16		0.012	0.029

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B19 / SB2**

Lab Sample ID:	510-18356-15			Date Sampled:	09/18/2007 0905
Client Matrix:	Solid	% Moisture:	7.1	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.1072 g
Date Analyzed:	09/24/2007 2103			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.95		0.0027	0.049
Lead		37		0.010	0.024

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB1**

Lab Sample ID: 510-18356-16
Client Matrix: Solid
% Moisture: 13.4
Date Sampled: 09/18/2007 0920
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 09/24/2007 2106
Date Prepared: 09/24/2007 0925
Analysis Batch: 510-23454
Prep Batch: 510-23331
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0819 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		2.3		0.0029	0.053
Lead		130		0.011	0.027

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B07 / SB2**

Lab Sample ID: 510-18356-17
Client Matrix: Solid
% Moisture: 14.4
Date Sampled: 09/18/2007 0925
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 09/24/2007 2109
Date Prepared: 09/24/2007 0925
Analysis Batch: 510-23454
Prep Batch: 510-23331
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0013 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.2		0.0032	0.058
Lead		71		0.012	0.029

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB1**

Lab Sample ID: 510-18356-18
Client Matrix: Solid
% Moisture: 7.8
Date Sampled: 09/18/2007 0940
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 09/24/2007 2112
Date Prepared: 09/24/2007 0925
Analysis Batch: 510-23454
Prep Batch: 510-23331
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0583 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.16		0.0028	0.051
Lead		7.5		0.011	0.026

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B05 / SB2**

Lab Sample ID:	510-18356-19			Date Sampled:	09/18/2007 0945
Client Matrix:	Solid	% Moisture:	15.5	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0731 g
Date Analyzed:	09/24/2007 2115			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.5		0.0030	0.055
Lead		260		0.011	0.028

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB1**

Lab Sample ID: 510-18356-22
Client Matrix: Solid
% Moisture: 9.3
Date Sampled: 09/18/2007 1015
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 09/24/2007 2125
Date Prepared: 09/24/2007 0925
Analysis Batch: 510-23454
Prep Batch: 510-23331
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0066 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.14		0.0030	0.055
Lead		5.5		0.011	0.027

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **A04B06 / SB2**

Lab Sample ID: 510-18356-23
Client Matrix: Solid
% Moisture: 10.3
Date Sampled: 09/18/2007 1020
Date Received: 09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3050B
Dilution: 1.0
Date Analyzed: 09/24/2007 2128
Date Prepared: 09/24/2007 0925
Analysis Batch: 510-23454
Prep Batch: 510-23331
Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0653 g
Final Weight/Volume: 50 mL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.69		0.0029	0.052
Lead		190		0.011	0.026

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B23 / SB1**

Lab Sample ID:	510-18356-24			Date Sampled:	09/18/2007 1030
Client Matrix:	Solid	% Moisture:	8.3	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0756 g
Date Analyzed:	09/24/2007 2131			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		1.4		0.0028	0.051
Lead		75		0.011	0.025

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B23 / SB2**

Lab Sample ID:	510-18356-25			Date Sampled:	09/18/2007 1035
Client Matrix:	Solid	% Moisture:	7.6	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.1682 g
Date Analyzed:	09/24/2007 2015			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		5.5		0.013	0.23
Lead		310		0.048	0.12

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B22 / SB1**

Lab Sample ID:	510-18356-26			Date Sampled:	09/18/2007 1055
Client Matrix:	Solid	% Moisture:	15.7	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0343 g
Date Analyzed:	09/24/2007 2024			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		23		0.016	0.29
Lead		830		0.060	0.14

Client: Burns & McDonnell

Job Number: 510-18356-1

Client Sample ID: **06B22 / SB2**

Lab Sample ID:	510-18356-27			Date Sampled:	09/18/2007 1100
Client Matrix:	Solid	% Moisture:	14.3	Date Received:	09/19/2007 1015

6020 Inductively Coupled Plasma - Mass Spectrometry

Method:	6020	Analysis Batch: 510-23454		Instrument ID:	TE ICPMS
Preparation:	3050B	Prep Batch: 510-23331		Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0598 g
Date Analyzed:	09/24/2007 2028			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Cadmium		0.27	J	0.015	0.28
Lead		57		0.057	0.14

General Chemistry

Client Sample ID: **06B17 / SB1**

Lab Sample ID: 510-18356-1 Date Sampled: 09/18/2007 0730
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	21		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			
Percent Solids	79		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			

Client Sample ID: **06B17 / SB2**

Lab Sample ID: 510-18356-2 Date Sampled: 09/18/2007 0735
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			
Percent Solids	88		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			

Client Sample ID: **06B17 / SB2 D**

Lab Sample ID: 510-18356-3 Date Sampled: 09/18/2007 0735
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	11		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			
Percent Solids	89		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			

Client Sample ID: **06B15 / SB1**

Lab Sample ID: 510-18356-4 Date Sampled: 09/18/2007 0740
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.0		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			
Percent Solids	93		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed		09/27/2007 1435			

General Chemistry

Client Sample ID: 06B15 / SB2

Lab Sample ID: 510-18356-5 Date Sampled: 09/18/2007 0745
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	5.4		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	95		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B16 / SB1

Lab Sample ID: 510-18356-6 Date Sampled: 09/18/2007 0755
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	88		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B16 / SB2

Lab Sample ID: 510-18356-7 Date Sampled: 09/18/2007 0800
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	19		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	81		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B18 / SB1

Lab Sample ID: 510-18356-8 Date Sampled: 09/18/2007 0810
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	6.0		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	94		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

General Chemistry

Client Sample ID: 06B18 / SB2

Lab Sample ID: 510-18356-9 Date Sampled: 09/18/2007 0815
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	88		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B20 / SB1

Lab Sample ID: 510-18356-10 Date Sampled: 09/18/2007 0835
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	8.5		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	91		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B20 / SB2

Lab Sample ID: 510-18356-11 Date Sampled: 09/18/2007 0840
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

Client Sample ID: 06B21 / SB1

Lab Sample ID: 510-18356-12 Date Sampled: 09/18/2007 0845
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	14		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				
Percent Solids	86		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435				

General Chemistry

Client Sample ID: **06B21 / SB2**

Lab Sample ID: 510-18356-13 Date Sampled: 09/18/2007 0850
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					

Client Sample ID: **06B19 / SB1**

Lab Sample ID: 510-18356-14 Date Sampled: 09/18/2007 0900
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	25		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					
Percent Solids	75		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					

Client Sample ID: **06B19 / SB2**

Lab Sample ID: 510-18356-15 Date Sampled: 09/18/2007 0905
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.1		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					
Percent Solids	93		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					

Client Sample ID: **A04B07 / SB1**

Lab Sample ID: 510-18356-16 Date Sampled: 09/18/2007 0920
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	13		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					
Percent Solids	87		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					

General Chemistry

Client Sample ID: **A04B07 / SB2**

Lab Sample ID: 510-18356-17 Date Sampled: 09/18/2007 0925
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	14		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					
Percent Solids	86		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23584	Date Analyzed	09/27/2007 1435					

Client Sample ID: **A04B05 / SB1**

Lab Sample ID: 510-18356-18 Date Sampled: 09/18/2007 0940
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.8		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					

Client Sample ID: **A04B05 / SB2**

Lab Sample ID: 510-18356-19 Date Sampled: 09/18/2007 0945
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	15		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					
Percent Solids	85		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					

Client Sample ID: **A04B05 / SB2 MS**

Lab Sample ID: 510-18356-20 Date Sampled: 09/18/2007 0945
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	18		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					
Percent Solids	82		%	0.10	0.10	1.0	PercentMoisture
Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310					

General Chemistry

Client Sample ID: **A04B05 / SB2 MSD**

Lab Sample ID: 510-18356-21 Date Sampled: 09/18/2007 0945
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	11		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				
Percent Solids	89		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				

Client Sample ID: **A04B06 / SB1**

Lab Sample ID: 510-18356-22 Date Sampled: 09/18/2007 1015
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	9.3		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				
Percent Solids	91		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				

Client Sample ID: **A04B06 / SB2**

Lab Sample ID: 510-18356-23 Date Sampled: 09/18/2007 1020
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	10		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				
Percent Solids	90		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				

Client Sample ID: **06B23 / SB1**

Lab Sample ID: 510-18356-24 Date Sampled: 09/18/2007 1030
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	8.3		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed	09/28/2007 1310				

General Chemistry

Client Sample ID: **06B23 / SB2**

Lab Sample ID: 510-18356-25 Date Sampled: 09/18/2007 1035
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	7.6		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			
Percent Solids	92		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			

Client Sample ID: **06B22 / SB1**

Lab Sample ID: 510-18356-26 Date Sampled: 09/18/2007 1055
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	16		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			
Percent Solids	84		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			

Client Sample ID: **06B22 / SB2**

Lab Sample ID: 510-18356-27 Date Sampled: 09/18/2007 1100
Client Matrix: Solid Date Received: 09/19/2007 1015

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Percent Moisture	14		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			
Percent Solids	86		%	0.10	0.10	1.0	PercentMoisture
	Anly Batch: 510-23639	Date Analyzed		09/28/2007 1310			

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18356-1

Lab Section	Qualifier	Description
GC/MS Semi VOA		
	*	LCS or LCSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	RPD of the MS and MSD exceeds the control limits
	X	Surrogate exceeds the control limits
GC Semi VOA		
	B	Compound was found in the blank and sample.
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Metals		
	^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA or MRL standard: Instrument related QC exceeds the control limits.
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 400-55764

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55764/24-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1023
Date Prepared: 09/24/2007 0814

Analysis Batch: 400-56248
Prep Batch: 400-55764
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB55764S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Naphthalene	<330		33	330
Phenanthrene	<330		33	330
Pyrene	<330		33	330
1-Methylnaphthalene	<330		33	330
2-Methylnaphthalene	<330		33	330

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	81	41 - 94
Nitrobenzene-d5	79	22 - 94
Terphenyl-d14	83	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Lab Control Spike - Batch: 400-55764

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55764/23-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1055
Date Prepared: 09/24/2007 0814

Analysis Batch: 400-56248
Prep Batch: 400-55764
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LC55764S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1670	1450	87	54 - 118	
Acenaphthylene	1670	1460	88	58 - 124	
Anthracene	1670	1480	89	56 - 120	
Benzo[a]anthracene	1670	1540	93	65 - 118	
Benzo[a]pyrene	1670	1530	92	66 - 114	
Benzo[b]fluoranthene	1670	1420	85	60 - 110	
Benzo[g,h,i]perylene	1670	1610	97	47 - 130	
Benzo[k]fluoranthene	1670	1720	103	68 - 128	
Chrysene	1670	1550	93	66 - 120	
Dibenz(a,h)anthracene	1670	2070	124	30 - 177	
Fluoranthene	1670	1660	100	69 - 125	
Fluorene	1670	1490	89	58 - 124	
Indeno[1,2,3-cd]pyrene	1670	1580	95	60 - 117	
Naphthalene	1670	1400	84	44 - 112	
Phenanthrene	1670	1500	90	63 - 122	
Pyrene	1670	1490	89	62 - 124	
1-Methylnaphthalene	1670	1530	92	47 - 122	
2-Methylnaphthalene	1670	1420	85	48 - 118	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	88	41 - 94
Nitrobenzene-d5	85	22 - 94
Terphenyl-d14	96	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55764

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18356-1	Analysis Batch:	400-56248	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55764	Lab File ID:	MS55764S.D
Dilution:	1.0			Initial Weight/Volume:	30.15 g
Date Analyzed:	09/28/2007 1127			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

MSD Lab Sample ID:	510-18356-1	Analysis Batch:	400-56248	Instrument ID:	GC/MSD
Client Matrix:	Solid	Prep Batch:	400-55764	Lab File ID:	MD55764S.D
Dilution:	1.0			Initial Weight/Volume:	30.30 g
Date Analyzed:	09/28/2007 1159			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0814			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	61	87	46 - 110	34	24		F
Acenaphthylene	62	88	49 - 114	35	24		F
Anthracene	64	90	53 - 105	34	23		F
Benzo[a]anthracene	62	91	57 - 110	35	20		F
Benzo[a]pyrene	63	92	55 - 104	35	21		F
Benzo[b]fluoranthene	59	85	49 - 105	34	24		F
Benzo[g,h,i]perylene	60	76	41 - 119	22	26		
Benzo[k]fluoranthene	69	101	58 - 116	36	23		F
Chrysene	65	92	56 - 113	33	21		F
Dibenz(a,h)anthracene	80	109	29 - 159	30	25		F
Fluoranthene	68	96	59 - 116	31	24		F
Fluorene	63	90	51 - 113	34	24		F
Indeno[1,2,3-cd]pyrene	62	83	52 - 107	28	24		F
Naphthalene	58	84	40 - 100	36	28		F
Phenanthrene	65	94	52 - 115	34	20		F
Pyrene	59	89	51 - 120	37	21		F
1-Methylnaphthalene	63	92	43 - 107	37	26		F
2-Methylnaphthalene	60	87	43 - 105	37	28		F

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
2-Fluorobiphenyl	62	86	41 - 94
Nitrobenzene-d5	57	78	22 - 94
Terphenyl-d14	66	90	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 400-55766

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-55766/15-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1233
Date Prepared: 09/24/2007 0822

Analysis Batch: 400-56164
Prep Batch: 400-55766
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: MB55766S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Naphthalene	<330		33	330
Phenanthrene	<330		33	330
Pyrene	<330		33	330
1-Methylnaphthalene	<330		33	330
2-Methylnaphthalene	<330		33	330

Surrogate	% Rec		Acceptance Limits
2-Fluorobiphenyl	96	X	41 - 94
Nitrobenzene-d5	99	X	22 - 94
Terphenyl-d14	105	X	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Lab Control Spike - Batch: 400-55766

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-55766/14-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1302
Date Prepared: 09/24/2007 0822

Analysis Batch: 400-56164
Prep Batch: 400-55766
Units: ug/Kg

Instrument ID: GC/MS
Lab File ID: LS55766S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1670	1130	68	54 - 118	
Acenaphthylene	1670	1100	66	58 - 124	
Anthracene	1670	1300	78	56 - 120	
Benzo[a]anthracene	1670	1520	91	65 - 118	
Benzo[a]pyrene	1670	1370	82	66 - 114	
Benzo[b]fluoranthene	1670	1260	75	60 - 110	
Benzo[g,h,i]perylene	1670	1390	83	47 - 130	
Benzo[k]fluoranthene	1670	1590	95	68 - 128	
Chrysene	1670	1500	90	66 - 120	
Dibenz(a,h)anthracene	1670	1790	108	30 - 177	
Fluoranthene	1670	1630	98	69 - 125	
Fluorene	1670	1250	75	58 - 124	
Indeno[1,2,3-cd]pyrene	1670	1360	82	60 - 117	
Naphthalene	1670	586	35	44 - 112	*
Phenanthrene	1670	1310	79	63 - 122	
Pyrene	1670	1520	91	62 - 124	
1-Methylnaphthalene	1670	950	57	47 - 122	
2-Methylnaphthalene	1670	860	52	48 - 118	

Surrogate	% Rec		Acceptance Limits
2-Fluorobiphenyl	63		41 - 94
Nitrobenzene-d5	39		22 - 94
Terphenyl-d14	99	X	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55766

Method: 8270C
Preparation: 3550B

MS Lab Sample ID:	510-18356-27	Analysis Batch:	400-56164	Instrument ID:	GC/MS
Client Matrix:	Solid	Prep Batch:	400-55766	Lab File ID:	MS55766S.D
Dilution:	1.0			Initial Weight/Volume:	30.43 g
Date Analyzed:	09/27/2007 1331			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0822			Injection Volume:	

MSD Lab Sample ID:	510-18356-27	Analysis Batch:	400-56164	Instrument ID:	GC/MS
Client Matrix:	Solid	Prep Batch:	400-55766	Lab File ID:	MD55766S.D
Dilution:	1.0			Initial Weight/Volume:	30.28 g
Date Analyzed:	09/27/2007 1400			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0822			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acenaphthene	94	80	46 - 110	16	24		
Acenaphthylene	83	79	49 - 114	3	24		
Anthracene	84	78	53 - 105	7	23		
Benzo[a]anthracene	94	91	57 - 110	4	20		
Benzo[a]pyrene	86	84	55 - 104	1	21		
Benzo[b]fluoranthene	87	87	49 - 105	1	24		
Benzo[g,h,i]perylene	62	61	41 - 119	1	26		
Benzo[k]fluoranthene	97	88	58 - 116	9	23		
Chrysene	89	87	56 - 113	2	21		
Dibenz(a,h)anthracene	85	82	29 - 159	3	25		
Fluoranthene	98	87	59 - 116	12	24		
Fluorene	88	84	51 - 113	4	24		
Indeno[1,2,3-cd]pyrene	65	63	52 - 107	3	24		
Naphthalene	83	73	40 - 100	12	28		
Phenanthrene	97	87	52 - 115	10	20		
Pyrene	113	102	51 - 120	9	21		
1-Methylnaphthalene	101	86	43 - 107	15	26		
2-Methylnaphthalene	100	79	43 - 105	21	28		

Surrogate	MS % Rec	MSD % Rec		Acceptance Limits
2-Fluorobiphenyl	85	82		41 - 94
Nitrobenzene-d5	88	77		22 - 94
Terphenyl-d14	95	97	X	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 400-56333

Method: 8270C
Preparation: 3550B

Lab Sample ID: MB 400-56333/15-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/04/2007 1834
Date Prepared: 10/02/2007 0808

Analysis Batch: 400-56631
Prep Batch: 400-56333
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: MB56333S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Acenaphthene	<330		33	330
Acenaphthylene	<330		33	330
Anthracene	<330		33	330
Benzo[a]anthracene	<330		33	330
Benzo[a]pyrene	<330		33	330
Benzo[b]fluoranthene	<330		33	330
Benzo[g,h,i]perylene	<330		33	330
Benzo[k]fluoranthene	<330		33	330
Chrysene	<330		33	330
Dibenz(a,h)anthracene	<330		33	330
Fluoranthene	<330		33	330
Fluorene	<330		33	330
Indeno[1,2,3-cd]pyrene	<330		33	330
Naphthalene	<330		33	330
Phenanthrene	<330		33	330
Pyrene	<330		33	330
1-Methylnaphthalene	<330		33	330
2-Methylnaphthalene	<330		33	330

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	84	41 - 94
Nitrobenzene-d5	80	22 - 94
Terphenyl-d14	92	53 - 96

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Lab Control Spike - Batch: 400-56333

Method: 8270C
Preparation: 3550B

Lab Sample ID: LCS 400-56333/14-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 10/04/2007 1905
Date Prepared: 10/02/2007 0808

Analysis Batch: 400-56631
Prep Batch: 400-56333
Units: ug/Kg

Instrument ID: GC/MSD
Lab File ID: LS56333S.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acenaphthene	1670	1370	82	54 - 118	
Acenaphthylene	1670	1400	84	58 - 124	
Anthracene	1670	1430	86	56 - 120	
Benzo[a]anthracene	1670	1480	89	65 - 118	
Benzo[a]pyrene	1670	1520	91	66 - 114	
Benzo[b]fluoranthene	1670	1400	84	60 - 110	
Benzo[g,h,i]perylene	1670	1460	88	47 - 130	
Benzo[k]fluoranthene	1670	1630	98	68 - 128	
Chrysene	1670	1470	88	66 - 120	
Dibenz(a,h)anthracene	1670	1910	114	30 - 177	
Fluoranthene	1670	1580	95	69 - 125	
Fluorene	1670	1470	88	58 - 124	
Indeno[1,2,3-cd]pyrene	1670	1470	88	60 - 117	
Naphthalene	1670	1380	83	44 - 112	
Phenanthrene	1670	1430	86	63 - 122	
Pyrene	1670	1400	84	62 - 124	
1-Methylnaphthalene	1670	1470	88	47 - 122	
2-Methylnaphthalene	1670	1400	84	48 - 118	

Surrogate	% Rec	Acceptance Limits
2-Fluorobiphenyl	88	41 - 94
Nitrobenzene-d5	89	22 - 94
Terphenyl-d14	92	53 - 96

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

Method Blank - Batch: 400-55769

Method: OA-2
Preparation: 3550B

Lab Sample ID: MB 400-55769/24-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 0905
Date Prepared: 09/24/2007 0830

Analysis Batch: 400-56122
Prep Batch: 400-55769
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 1901019.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Diesel	0.52	J	0.39	3.0
Fuel Oil	<3.0		0.39	3.0
Hydraulic Fluid	<3.0		0.39	3.0
Kerosene	<3.0		0.39	3.0
Mineral Spirits	<3.0		0.39	3.0
Motor Oil	<3.0		0.39	3.0
Unknown Hydrocarbons	<3.0		2.5	3.0

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	89	39 - 159

Lab Control Spike - Batch: 400-55769

Method: OA-2
Preparation: 3550B

Lab Sample ID: LCS 400-55769/23-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 0909
Date Prepared: 09/24/2007 0830

Analysis Batch: 400-56122
Prep Batch: 400-55769
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 2001020.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Diesel	335	301	90	33 - 156	B

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	90	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55769

Method: OA-2
Preparation: 3550B

MS Lab Sample ID:	510-18356-1	Analysis Batch:	400-56122	Instrument ID:	GC/FID
Client Matrix:	Solid	Prep Batch:	400-55769	Lab File ID:	2101021.D
Dilution:	1.0			Initial Weight/Volume:	30.25 g
Date Analyzed:	09/27/2007 0913			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	

MSD Lab Sample ID:	510-18356-1	Analysis Batch:	400-56122	Instrument ID:	GC/FID
Client Matrix:	Solid	Prep Batch:	400-55769	Lab File ID:	2201022.D
Dilution:	1.0			Initial Weight/Volume:	30.01 g
Date Analyzed:	09/27/2007 0918			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0830			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Diesel	91	96	33 - 133	6	60	B	B

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
o-Terphenyl	90	93	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 400-55770

Method: OA-2
Preparation: 3550B

Lab Sample ID: MB 400-55770/11-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1936
Date Prepared: 09/24/2007 0836

Analysis Batch: 400-56124
Prep Batch: 400-55770
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 4401044.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Diesel	<3.0		0.39	3.0
Fuel Oil	<3.0		0.39	3.0
Hydraulic Fluid	<3.0		0.39	3.0
Kerosene	<3.0		0.39	3.0
Mineral Spirits	<3.0		0.39	3.0
Motor Oil	<3.0		0.39	3.0
Unknown Hydrocarbons	<3.0		2.5	3.0

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	94	39 - 159

Lab Control Spike - Batch: 400-55770

Method: OA-2
Preparation: 3550B

Lab Sample ID: LCS 400-55770/10-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1104
Date Prepared: 09/24/2007 0836

Analysis Batch: 400-56124
Prep Batch: 400-55770
Units: mg/Kg

Instrument ID: GC/FID
Lab File ID: 4601046.D
Initial Weight/Volume: 30.00 g
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Diesel	335	306	91	33 - 156	

Surrogate	% Rec	Acceptance Limits
o-Terphenyl	95	39 - 159

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-55770

Method: OA-2
Preparation: 3550B

MS Lab Sample ID:	510-18356-27	Analysis Batch:	400-56124	Instrument ID:	GC/FID
Client Matrix:	Solid	Prep Batch:	400-55770	Lab File ID:	4701047.D
Dilution:	1.0			Initial Weight/Volume:	30.20 g
Date Analyzed:	09/27/2007 1109			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0836			Injection Volume:	

MSD Lab Sample ID:	510-18356-27	Analysis Batch:	400-56124	Instrument ID:	GC/FID
Client Matrix:	Solid	Prep Batch:	400-55770	Lab File ID:	4801048.D
Dilution:	1.0			Initial Weight/Volume:	30.16 g
Date Analyzed:	09/27/2007 1113			Final Weight/Volume:	1.0 mL
Date Prepared:	09/24/2007 0836			Injection Volume:	

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Diesel	0	0	33 - 133	NC	60	F	F

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
o-Terphenyl	79	90	39 - 159

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

Method Blank - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23319/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/24/2007 1006
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23463
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<0.25		0.014	0.25
Lead	<0.13		0.052	0.13

Method Blank - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID: MB 510-23319/1-A
Client Matrix: Solid
Dilution: 5.0
Date Analyzed: 09/25/2007 1626
Date Prepared: 09/21/2007 1644

Analysis Batch: 510-23490
Prep Batch: 510-23319
Units: mg/Kg

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 1.0 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<0.25		0.014	0.25

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Lab Control Spike - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID:	LCS 510-23319/2-A	Analysis Batch:	510-23463	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23319	Lab File ID:	N/A
Dilution:	5.0	Units:	mg/Kg	Initial Weight/Volume:	1.0939 g
Date Analyzed:	09/24/2007 1009			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	77.3	73.3	95	78 - 121	
Lead	106	106	100	81 - 118	

Lab Control Spike - Batch: 510-23319

Method: 6020
Preparation: 3050B

Lab Sample ID:	LCS 510-23319/2-A	Analysis Batch:	510-23490	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23319	Lab File ID:	N/A
Dilution:	5.0	Units:	mg/Kg	Initial Weight/Volume:	1.0939 g
Date Analyzed:	09/25/2007 1630			Final Weight/Volume:	50 mL
Date Prepared:	09/21/2007 1644				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	77.3	73.8	95	78 - 121	

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 510-23331

Method: 6020
Preparation: 3050B

Lab Sample ID:	MB 510-23331/1-A	Analysis Batch:	510-23454	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23331	Lab File ID:	N/A
Dilution:	5.0	Units:	mg/Kg	Initial Weight/Volume:	1.0 g
Date Analyzed:	09/24/2007 2009			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	Result	Qual	MDL	RL
Cadmium	<0.25		0.014	0.25
Lead	<0.13		0.052	0.13

Lab Control Spike - Batch: 510-23331

Method: 6020
Preparation: 3050B

Lab Sample ID:	LCS 510-23331/2-A	Analysis Batch:	510-23454	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23331	Lab File ID:	N/A
Dilution:	5.0	Units:	mg/Kg	Initial Weight/Volume:	1.0121 g
Date Analyzed:	09/24/2007 2012			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	77.3	67.4	87	78 - 121	
Lead	106	100	94	81 - 118	

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23331

Method: 6020
Preparation: 3050B

MS Lab Sample ID:	510-18356-11	Analysis Batch:	510-23454	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23331	Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0061 g
Date Analyzed:	09/24/2007 2034			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

MSD Lab Sample ID:	510-18356-11	Analysis Batch:	510-23454	Instrument ID:	TE ICPMS
Client Matrix:	Solid	Prep Batch:	510-23331	Lab File ID:	N/A
Dilution:	5.0			Initial Weight/Volume:	1.0509 g
Date Analyzed:	09/24/2007 2037			Final Weight/Volume:	50 mL
Date Prepared:	09/24/2007 0925				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	78	84	75 - 125	3	20		
Lead	220	832	75 - 125	21	20	4	4

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 510-23584

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23584/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/27/2007 1435
Date Prepared: N/A

Analysis Batch: 510-23584
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

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

Client: Burns & McDonnell

Job Number: 510-18356-1

Method Blank - Batch: 510-23639

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: MB 510-23639/1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1310
Date Prepared: N/A

Analysis Batch: 510-23639
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Result	Qual	RL	RL
Percent Moisture	100		0.10	0.10
Percent Solids	<0.10		0.10	0.10

Duplicate - Batch: 510-23639

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 510-18356-19
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 09/28/2007 1310
Date Prepared: N/A

Analysis Batch: 510-23639
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	15	13.8	11	20	
Percent Solids	85	86.2	2	20	

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

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sampler: TIM STECHER	Lab PM: Byrnes, Adrienne R	Carrier Tracking No(s):	COC No: 510-2440.1
Phone:	E-Mail: adrienne.byrnes@testamericainc.com		Page: Page 1 of ~~2~~ 3
			STL Job #:

Client Information

Client Contact: Ms. Sharon Shelton
Company: Burns & McDonnell
Address: 9400 Ward Parkway
City: Kansas City
State, Zip: MO, 64114
Phone:
Email: sshelton@burnsmcd.com
Project Name: SWMU 6 / AOC4
Site: Missouri AK STEEL, K.C. MO

Due Date Requested:
TAT Requested (days):
PO #: Purchase Order not requir
WO #:
Project #: 51001006
SSOW#:

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

0.5°C in 50 qt
Fed Exp 10/15/07

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 - (MOD) RCRA Metals by 6020	8270C - (MOD) Local Method	SUBCONTRACT - Iowa DRO OA2 Methodology	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
06B17/SB1	9/18/07	0730	G	Solid			X	X	X		18356 -1
06B17/SB2		0735	G	Solid			X	X	X		-2
06B17/SB2D		0735	G	Solid			X	X	X		-3
06B15/SB1		0740	G	Solid			X	X	X		-4
06B15/SB2		0745	G	Solid			X	X	X		-5
06B16/SB1		0755	G	Solid			X	X	X		-6
06B16/SB2		0800	G	Solid			X	X	X		-7
06B18/SB1		0810	G	Solid			X	X	X		-8
06B18/SB2		0815	G	Solid			X	X	X		-9
06B20/SB1		0835	G	Solid			X	X	X		-10
06B20/SB2		0840	G	Solid			X	X	X		-11

18356

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements: SHIPPED IN 2 COOLERS

Deliverable Requested: I, II, III, IV, Other (specify)

Method of Shipment: 2 COOLERS

Empty Kit Relinquished by:	Date:	Time:	Received by:	Date/Time:	Company
Relinquished by: TIM STECHER	Date/Time: 9/18/07	Company	Received by:	Date/Time:	Company
Relinquished by: [signature]	Date/Time: 9/18/07 9/18/07	Company TA	Received by:	Date/Time:	Company
Relinquished by: [signature]	Date/Time: 9/19/07 @ 10:15	Company STL	Cooler Temperature(s) °C and Other Remarks:		

Custody Seals Intact: Custody Seal No.:

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information
Client Contact: Ms. Sharon Shelton
Company: Burns & McDonnell
Address: 9400 Ward Parkway
City: Kansas City
State, Zip: MO, 64114
Phone:
Email: sshelton@burnsmcd.com
Project Name: SWMU 6 / AOC 4
Site: Missouri AIC STEEL, K.C., MO

Sampler: TIM STECHER
Phone:
Lab PM: Byrnes, Adrienne R
E-Mail: adrienne.byrnes@testamericainc.com
Carrier Tracking No(s):
COC No: 510-2440.2
Page: Page 2 of 3
STL Job #:

Due Date Requested:
TAT Requested (days):
PO #: Purchase Order not requir
WO #:
Project #: 51001006
SSOW#:

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 - (MOD) RCRA Metals by 6020	8270C - (MOD) Local Method	SUBCONTRACT - Iowa DRO OA2 Methodology	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
06B21/SB1	9/18/07	0845	G	Solid			X	X	X		18356 - 12
06B21/SB2		0850	G	Solid			X	X	X		- 13
06B19/SB1		0900	G	Solid			X	X	X		- 14
06B19/SB2		0905	G	Solid			X	X	X		- 15
A04B07/SB1		0920	G	Solid			X	X	X		- 16
A04B07/SB2		0925	G	Solid			X	X	X		- 17
A04B05/SB1		0940	G	Solid			X	X	X		- 18
A04B05/SB2		0945	G	Solid			X	X	X		- 19
A04B05/SB2MS		0945	G	Solid			X	X	X		- 20
A04B05/SB2MSD		0945	G	Solid			X	X	X		- 21
A04B06/SB1		1015	G	Solid			X	X	X		- 22

18356

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements: SHIPPED IN 2 COOLERS

Deliverable Requested: I, II, III, IV, Other (specify)

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: TIM STECHER	9/18/07				
Relinquished by:	9/18/07	TA	Received by:	Date/Time:	Company
Relinquished by:	9/19/07 @ 10:15	STL	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

TestAmerica Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone (219) 464-2389 Fax (219) 462-2953

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information
Client Contact: Ms. Sharon Shelton
Company: Burns & McDonnell
Address: 9400 Ward Parkway
City: Kansas City
State, Zip: MO, 64114
Phone:
Email: sshelton@burnsmcd.com
Project Name: AOC 4 (SWMU 6
Site: Missouri AK STEEL, K.C., MO

Sampler: TIM STEELMER
Phone:
Lab PM: Byrnes, Adrienne R
E-Mail: adrienne.byrnes@testamericainc.com
Carrier Tracking No(s):
COC No: 510-2441.1
Page: 3 of 3
STL Job #:

Due Date Requested:
TAT Requested (days):
PO #: Purchase Order not requir
WO #:
Project #: 51001006
SSOW#:

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Fed Ex 10215 to
1.7°C
Special Instructions/Note:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 - (MOD) RCRA Metals by 6020	8270C - (MOD) Local Method	SUBCONTRACT - Iowa DRO OA2 Methodology	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
A04B06/SB2	9/18/07	1020	G	Solid			X	X	X		18356 - 23
06B23/SB1		1030	G	Solid			X	X	X		- 24
06B23/SB2		1035	G	Solid			X	X	X		- 25
06B22/SB1		1055	G	Solid			X	X	X		- 26
06B22/SB2		1100	G	Solid			X	X	X		- 27
				Solid							
				Solid							
				Solid							

18356

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements: SHIPPED IN 2 COOLERS

Deliverable Requested: I, II, III, IV, Other (specify)

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time:	Company		Date/Time:	Company
Relinquished by: TIM STEELMER	9/18/07		Received by:		
Relinquished by:	9/18/07	TA	Received by:		
Relinquished by:	9/19/07 @ 1015	STL	Received by:		

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.7°C 510-1185-051

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18356-1

Login Number: 18356

List Source: TestAmerica Valparaiso

Creator: Cavanaugh, Tim P

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

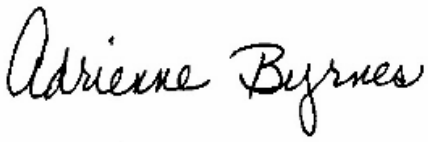
ANALYTICAL REPORT

Job Number: 510-18739-1

Job Description: AK Steel Kansas City Facility

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
10/25/2007

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

TestAmerica Laboratories, Inc.
TestAmerica Valparaiso 2400 Cumberland Drive, Valparaiso, IN 46383
Tel (219) 464-2389 Fax (219) 462-2953 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Job Narrative
510-J18739-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method 8260B: Bromoform did not pass quality control limits for the initial calibration. This compound is rejected in the affected samples 510-18739-1, 510-18739-2, 510-18739-3, 510-18739-4, 510-18739-5, 510-18739-6and will be re-analyzed. Batch 24070.

Method 8260B: Samples 510-18739-3, 510-18739-4, 510-18739-5, 510-18739-6 had internal standards low and/or surrogates high. All samples were being run for Bromoform and 1,1,2,2 Tetrachloroethane only. These target compounds were not detected in the samples and were not affected by the high bias. Data is reported. Batch 24208.

No other analytical or quality issues were noted.

Metals
Method 6020: The post digestion spike failed QC limits for barium. The matrix spike, matrix spike duplicate and all other QC were within required ranges. Data is acceptable.

Also, samples were digested to remove matrix interferences.
510-18739-2, 510-18739-3, 510-18739-4, 510-18739-5

Method 6020: Field filtered samples were digested due to matrix interferences.
510-18739-2, 510-18739-3, 510-18739-4, 510-18739-5

No other analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18739-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge-and-Trap	TAL VAL		SW846 5030B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Aqueous Samples and Extracts for	TAL VAL		SW846 3010A
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor Technique)	TAL VAL	SW846 7470A	
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor	TAL VAL		SW846 7470A

Lab References:

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18739-1

Method	Analyst	Analyst ID
SW846 8260B	Hall, Jennifer L	JLH
SW846 6020	Hamner, Barb J	BJH
SW846 7470A	Hamner, Barb J	BJH

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-18739-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18739-1	33MW 4 GW4	Water	09/26/2007 1520	09/28/2007 1020
510-18739-2	33MW 5D GW4	Water	09/26/2007 1710	09/28/2007 1020
510-18739-3	33MW 11S GW4	Water	09/27/2007 1050	09/28/2007 1020
510-18739-4	33MW 12D GW4	Water	09/27/2007 1345	09/28/2007 1020
510-18739-5	33MW 12S GW4	Water	09/27/2007 1605	09/28/2007 1020
510-18739-6	TB092707	Water	09/27/2007 0700	09/28/2007 1020

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: 33MW 4 GW4

Lab Sample ID: 510-18739-1 | Date Sampled: 09/26/2007 1520
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24070 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9202.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1642 | Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1642

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	94	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: 33MW 4 GW4

Lab Sample ID: 510-18739-1 | Date Sampled: 09/26/2007 1520
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8486.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0317	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0317		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0	H	0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8486.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0317	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0317		

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	108	87 - 120
Toluene-d8 (Surr)	94	89 - 106
4-Bromofluorobenzene (Surr)	113	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 5D GW4**

Lab Sample ID: 510-18739-2 | Date Sampled: 09/26/2007 1710
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24070 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9203.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1708 | Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1708

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	0.30	J	0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	0.61	J	0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	0.81	J	0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	101	89 - 106
4-Bromofluorobenzene (Surr)	94	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 5D GW4**

Lab Sample ID: 510-18739-2 | Date Sampled: 09/26/2007 1710
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8487.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0348	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0348		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0	H	0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8487.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0348	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0348		

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	115	87 - 120
Toluene-d8 (Surr)	93	89 - 106
4-Bromofluorobenzene (Surr)	113	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 11S GW4**

Lab Sample ID: 510-18739-3 | Date Sampled: 09/27/2007 1050
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24070 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9204.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1735 | Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1735

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	0.46	J	0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	2.3	J	0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	0.65	J	0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	0.86	J	0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	1.8	J	0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	101	89 - 106
4-Bromofluorobenzene (Surr)	95	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 11S GW4**

Lab Sample ID: 510-18739-3 | Date Sampled: 09/27/2007 1050
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8488.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0418	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0418		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8488.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0418	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0418		

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	125	X	87 - 120
Toluene-d8 (Surr)	95		89 - 106
4-Bromofluorobenzene (Surr)	122	X	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 12D GW4**

Lab Sample ID: 510-18739-4 | Date Sampled: 09/27/2007 1345
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24070 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9205.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1802 | Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1802

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	0.59	J	0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	108	87 - 120
Toluene-d8 (Surr)	102	89 - 106
4-Bromofluorobenzene (Surr)	95	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 12D GW4**

Lab Sample ID: 510-18739-4 | Date Sampled: 09/27/2007 1345
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8489.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0448	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0448		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8489.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0448	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0448		

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	135	X	87 - 120
Toluene-d8 (Surr)	90		89 - 106
4-Bromofluorobenzene (Surr)	118		89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 12S GW4**

Lab Sample ID: 510-18739-5 | Date Sampled: 09/27/2007 1605
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24070 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9206.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1829 | Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1829

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	105	87 - 120
Toluene-d8 (Surr)	102	89 - 106
4-Bromofluorobenzene (Surr)	96	89 - 120

Client: Burns & McDonnell | Job Number: 510-18739-1

Client Sample ID: **33MW 12S GW4**

Lab Sample ID: 510-18739-5 | Date Sampled: 09/27/2007 1605
Client Matrix: Water | Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8490.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0518	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0518		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8490.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0518	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0518		

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	142	X	87 - 120
Toluene-d8 (Surr)	97		89 - 106
4-Bromofluorobenzene (Surr)	119		89 - 120

Client: Burns & McDonnell Job Number: 510-18739-1

Client Sample ID: TB092707

Lab Sample ID: 510-18739-6 Date Sampled: 09/27/2007 0700
Client Matrix: Water Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method: 8260B Analysis Batch: 510-24070 Instrument ID: Volatiles GC/MS A
Preparation: 5030B Lab File ID: A9207.D
Dilution: 1.0 Initial Weight/Volume: 5 mL
Date Analyzed: 10/08/2007 1856 Final Weight/Volume: 5 mL
Date Prepared: 10/08/2007 1856

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	102	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	98	89 - 120

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: **TB092707**

Lab Sample ID: 510-18739-6
Client Matrix: Water

Date Sampled: 09/27/2007 0700
Date Received: 09/28/2007 1020

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8491.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0549	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0549		

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.61	5.0

Method:	8260B	Analysis Batch: 510-24208	Instrument ID: Agilent 5975 GC/MS
Preparation:	5030B		Lab File ID: L8491.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/11/2007 0549	Run Type: RA	Final Weight/Volume: 5 mL
Date Prepared:	10/11/2007 0549		

Surrogate	%Rec		Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	155	X	87 - 120
Toluene-d8 (Surr)	95		89 - 106
4-Bromofluorobenzene (Surr)	128	X	89 - 120

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: 33MW 5D GW4

Lab Sample ID: 510-18739-2
Client Matrix: Water

Date Sampled: 09/26/2007 1710
Date Received: 09/28/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: 3010A
Dilution: 1.0
Date Analyzed: 10/02/2007 1215
Date Prepared: 10/01/2007 0915

Analysis Batch: 510-23801
Prep Batch: 510-23707

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	14		0.21	2.0
Barium	1300		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	1.1		0.10	1.0
Lead	2.4		0.21	0.50
Selenium	0.61	J	0.19	1.0
Silver	0.73	J B	0.047	1.0

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/02/2007 2137
Date Prepared: N/A

Analysis Batch: 510-23814

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic, Dissolved	11		0.21	2.0
Barium, Dissolved	1300		0.15	0.50
Cadmium, Dissolved	<1.0		0.055	1.0
Lead, Dissolved	<0.50		0.21	0.50
Selenium, Dissolved	0.47	J	0.19	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/04/2007 1156
Date Prepared: N/A

Analysis Batch: 510-23896

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium, Dissolved	<1.0		0.10	1.0
Silver, Dissolved	0.66	J B	0.047	1.0

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: 33MW 5D GW4

Lab Sample ID: 510-18739-2
Client Matrix: Water

Date Sampled: 09/26/2007 1710
Date Received: 09/28/2007 1020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1604
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1713
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury, Dissolved	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-18739-1

Client Sample ID: 33MW 11S GW4

Lab Sample ID: 510-18739-3 Date Sampled: 09/27/2007 1050
Client Matrix: Water Date Received: 09/28/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23801 Instrument ID: TE ICPMS
Preparation: 3010A Prep Batch: 510-23707 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/02/2007 1218 Final Weight/Volume: 50 mL
Date Prepared: 10/01/2007 0915

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	9.5		0.21	2.0
Barium	510		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	<0.50		0.21	0.50
Selenium	0.36	J	0.19	1.0
Silver	0.47	J B	0.047	1.0

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-23814 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/02/2007 2140 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic, Dissolved	8.3		0.21	2.0
Barium, Dissolved	530		0.15	0.50
Cadmium, Dissolved	<1.0		0.055	1.0
Lead, Dissolved	<0.50		0.21	0.50
Selenium, Dissolved	0.41	J	0.19	1.0

Method: 6020 Analysis Batch: 510-23896 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/04/2007 1159 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium, Dissolved	<1.0		0.10	1.0
Silver, Dissolved	0.76	J B	0.047	1.0

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: 33MW 11S GW4

Lab Sample ID: 510-18739-3
Client Matrix: Water

Date Sampled: 09/27/2007 1050
Date Received: 09/28/2007 1020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1606
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1715
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury, Dissolved	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-18739-1

Client Sample ID: 33MW 12D GW4

Lab Sample ID: 510-18739-4 Date Sampled: 09/27/2007 1345
Client Matrix: Water Date Received: 09/28/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23801 Instrument ID: TE ICPMS
Preparation: 3010A Prep Batch: 510-23707 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/02/2007 1221 Final Weight/Volume: 50 mL
Date Prepared: 10/01/2007 0915

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	1.2	J	0.21	2.0
Barium	1500		0.15	0.50
Cadmium	0.29	J	0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	0.69		0.21	0.50
Selenium	0.56	J	0.19	1.0
Silver	0.44	J B	0.047	1.0

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-23814 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/02/2007 2144 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic, Dissolved	<2.0		0.21	2.0
Barium, Dissolved	660		0.15	0.50
Cadmium, Dissolved	<1.0		0.055	1.0
Lead, Dissolved	<0.50		0.21	0.50
Selenium, Dissolved	0.38	J	0.19	1.0

Method: 6020 Analysis Batch: 510-23896 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/04/2007 1208 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium, Dissolved	<1.0		0.10	1.0
Silver, Dissolved	0.47	J B	0.047	1.0

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: 33MW 12D GW4

Lab Sample ID: 510-18739-4
Client Matrix: Water

Date Sampled: 09/27/2007 1345
Date Received: 09/28/2007 1020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1608
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1717
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury, Dissolved	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-18739-1

Client Sample ID: 33MW 12S GW4

Lab Sample ID: 510-18739-5 Date Sampled: 09/27/2007 1605
Client Matrix: Water Date Received: 09/28/2007 1020

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-23801 Instrument ID: TE ICPMS
Preparation: 3010A Prep Batch: 510-23707 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/02/2007 1225 Final Weight/Volume: 50 mL
Date Prepared: 10/01/2007 0915

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	<2.0		0.21	2.0
Barium	39		0.15	0.50
Cadmium	0.46	J	0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	1.8		0.21	0.50
Selenium	14		0.19	1.0
Silver	0.39	J B	0.047	1.0

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-23814 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/02/2007 2154 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic, Dissolved	0.21	J	0.21	2.0
Barium, Dissolved	31		0.15	0.50
Cadmium, Dissolved	0.56	J	0.055	1.0
Lead, Dissolved	<0.50		0.21	0.50
Selenium, Dissolved	10		0.19	1.0

Method: 6020 Analysis Batch: 510-23896 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/04/2007 1218 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium, Dissolved	<1.0		0.10	1.0
Silver, Dissolved	0.43	J B	0.047	1.0

Client: Burns & McDonnell

Job Number: 510-18739-1

Client Sample ID: 33MW 12S GW4

Lab Sample ID: 510-18739-5
Client Matrix: Water

Date Sampled: 09/27/2007 1605
Date Received: 09/28/2007 1020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1711
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/02/2007 1719
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury, Dissolved	<0.00020		0.000047	0.00020

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18739-1

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	H	Sample was prepped or analyzed beyond the specified holding time
	X	Surrogate exceeds the control limits
Metals		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-24070

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-24070/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1548
Date Prepared: 10/08/2007 1548

Analysis Batch: 510-24070
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9200.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	111	87 - 120
Toluene-d8 (Surr)	99	89 - 106
4-Bromofluorobenzene (Surr)	93	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24070

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-24070/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1400
Date Prepared: 10/08/2007 1400

Analysis Batch: 510-24070
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9197.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-24070/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1427
Date Prepared: 10/08/2007 1427

Analysis Batch: 510-24070
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9198.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	103	99	33 - 136	4	30		
Benzene	108	109	78 - 117	1	30		
Bromoform	110	112	75 - 126	1	30		
Bromomethane	94	93	84 - 131	1	30		
2-Butanone (MEK)	110	108	66 - 126	2	30		
Carbon disulfide	103	101	64 - 120	2	30		
Carbon tetrachloride	104	102	73 - 131	1	30		
Chlorobenzene	105	104	76 - 112	1	30		
Chlorodibromomethane	115	114	87 - 127	1	30		
Chloroethane	97	96	85 - 131	1	30		
Chloroform	115	115	77 - 125	0	30		
Chloromethane	88	87	64 - 125	1	30		
cis-1,2-Dichloroethene	113	114	82 - 123	1	30		
cis-1,3-Dichloropropene	110	110	74 - 122	0	30		
Dichlorobromomethane	111	112	79 - 131	1	30		
1,1-Dichloroethane	111	112	80 - 125	0	30		
1,2-Dichloroethane	109	108	75 - 131	1	30		
1,1-Dichloroethene	103	101	71 - 123	2	30		
1,2-Dichloropropane	119	119	81 - 124	1	30		
Ethylbenzene	97	96	78 - 125	1	30		
2-Hexanone	109	108	59 - 125	1	30		
Methylene Chloride	111	110	67 - 117	1	30		
methyl isobutyl ketone	109	109	72 - 117	0	30		
m-Xylene & p-Xylene	99	98	77 - 123	1	30		
o-Xylene	104	104	78 - 121	1	30		
Styrene	110	109	74 - 115	1	30		
1,1,2,2-Tetrachloroethane	112	110	78 - 131	2	30		
Tetrachloroethene	103	104	77 - 123	0	30		
Toluene	106	106	76 - 114	0	30		
trans-1,2-Dichloroethene	107	108	74 - 136	1	30		
trans-1,3-Dichloropropene	107	108	76 - 125	1	30		
1,1,1-Trichloroethane	103	103	76 - 130	0	30		

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24070

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-24070/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1400
Date Prepared: 10/08/2007 1400

Analysis Batch: 510-24070
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9197.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-24070/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1427
Date Prepared: 10/08/2007 1427

Analysis Batch: 510-24070
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9198.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,2-Trichloroethane	111	111	80 - 122	0	30		
Trichloroethene	106	107	80 - 122	1	30		
Vinyl acetate	108	109	84 - 136	1	30		
Vinyl chloride	92	91	76 - 131	1	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	109	110	87 - 120
Toluene-d8 (Surr)	101	101	89 - 106
4-Bromofluorobenzene (Surr)	92	93	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-24208

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-24208/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0247
Date Prepared: 10/11/2007 0247

Analysis Batch: 510-24208
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8485.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromoform	<5.0		0.61	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
m-Xylene & p-Xylene	<5.0		0.21	5.0
o-Xylene	<5.0		0.11	5.0
Styrene	<5.0		0.15	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.16	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	99	87 - 120
Toluene-d8 (Surr)	95	89 - 106
4-Bromofluorobenzene (Surr)	105	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24208

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-24208/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0147
Date Prepared: 10/11/2007 0147

Analysis Batch: 510-24208
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8483.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-24208/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0217
Date Prepared: 10/11/2007 0217

Analysis Batch: 510-24208
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8484.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	81	83	33 - 136	2	30		
Benzene	101	104	78 - 117	2	30		
Bromoform	108	112	75 - 126	4	30		
Bromomethane	95	95	84 - 131	0	30		
2-Butanone (MEK)	101	103	66 - 126	2	30		
Carbon disulfide	93	96	64 - 120	3	30		
Carbon tetrachloride	103	103	73 - 131	1	30		
Chlorobenzene	100	104	76 - 112	4	30		
Chlorodibromomethane	113	117	87 - 127	3	30		
Chloroethane	103	104	85 - 131	1	30		
Chloroform	101	102	77 - 125	1	30		
Chloromethane	103	101	64 - 125	2	30		
cis-1,2-Dichloroethene	99	100	82 - 123	1	30		
cis-1,3-Dichloropropene	97	97	74 - 122	0	30		
Dichlorobromomethane	107	107	79 - 131	0	30		
1,1-Dichloroethane	99	104	80 - 125	5	30		
1,2-Dichloroethane	99	100	75 - 131	1	30		
1,1-Dichloroethene	94	98	71 - 123	4	30		
1,2-Dichloropropane	96	101	81 - 124	6	30		
Ethylbenzene	107	111	78 - 125	4	30		
2-Hexanone	91	91	59 - 125	0	30		
Methylene Chloride	94	98	67 - 117	5	30		
methyl isobutyl ketone	94	89	72 - 117	5	30		
m-Xylene & p-Xylene	106	109	77 - 123	3	30		
o-Xylene	97	99	78 - 121	2	30		
Styrene	99	100	74 - 115	1	30		
1,1,2,2-Tetrachloroethane	104	105	78 - 131	0	30		
Tetrachloroethene	97	106	77 - 123	8	30		
Toluene	100	102	76 - 114	2	30		
trans-1,2-Dichloroethene	95	98	74 - 136	3	30		
trans-1,3-Dichloropropene	98	101	76 - 125	3	30		
1,1,1-Trichloroethane	101	104	76 - 130	3	30		

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24208

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID: LCS 510-24208/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0147
Date Prepared: 10/11/2007 0147

Analysis Batch: 510-24208
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8483.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

LCSD Lab Sample ID: LCSD 510-24208/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0217
Date Prepared: 10/11/2007 0217

Analysis Batch: 510-24208
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 5975 GC/MS
Lab File ID: L8484.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
1,1,2-Trichloroethane	99	102	80 - 122	3	30		
Trichloroethene	105	110	80 - 122	4	30		
Vinyl acetate	93	92	84 - 136	1	30		
Vinyl chloride	98	97	76 - 131	0	30		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100	96	87 - 120
Toluene-d8 (Surr)	99	100	89 - 106
4-Bromofluorobenzene (Surr)	106	107	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-23707

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-23707/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 1209
Date Prepared: 10/01/2007 0915

Analysis Batch: 510-23801
Prep Batch: 510-23707
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<2.0		0.21	2.0
Barium	<0.50		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	<0.50		0.21	0.50
Selenium	<1.0		0.19	1.0
Silver	0.55	J	0.047	1.0

Lab Control Spike - Batch: 510-23707

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-23707/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 1212
Date Prepared: 10/01/2007 0915

Analysis Batch: 510-23801
Prep Batch: 510-23707
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	200	215	107	80 - 120	
Barium	200	204	102	80 - 120	
Cadmium	200	213	106	80 - 120	
Chromium	200	202	101	80 - 120	
Lead	200	208	104	80 - 120	
Selenium	200	215	108	80 - 120	
Silver	200	212	106	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23707

Method: 6020
Preparation: 3010A

MS Lab Sample ID:	510-18739-5	Analysis Batch:	510-23801	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	510-23707	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/02/2007 1234			Final Weight/Volume:	50 mL
Date Prepared:	10/01/2007 0915				

MSD Lab Sample ID:	510-18739-5	Analysis Batch:	510-23801	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	510-23707	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/02/2007 1237			Final Weight/Volume:	50 mL
Date Prepared:	10/01/2007 0915				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	103	103	75 - 125	0	20		
Barium	103	104	75 - 125	2	20		
Cadmium	104	105	75 - 125	1	20		
Chromium	97	96	75 - 125	1	20		
Lead	104	106	75 - 125	2	20		
Selenium	103	103	75 - 125	0	20		
Silver	101	103	75 - 125	2	20		

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-23814

Method: 6020
Preparation: N/A

Lab Sample ID: MB 510-23814/10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 2130
Date Prepared: N/A

Analysis Batch: 510-23814
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result	Qual	MDL	RL
Arsenic, Dissolved	<2.0		0.21	2.0
Barium, Dissolved	<0.50		0.15	0.50
Cadmium, Dissolved	<1.0		0.055	1.0
Chromium, Dissolved	<1.0		0.10	1.0
Lead, Dissolved	<0.50		0.21	0.50
Selenium, Dissolved	<1.0		0.19	1.0

Lab Control Spike - Batch: 510-23814

Method: 6020
Preparation: N/A

Lab Sample ID: LCS 510-23814/11
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 2134
Date Prepared: N/A

Analysis Batch: 510-23814
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic, Dissolved	200	210	105	80 - 120	
Barium, Dissolved	200	207	103	80 - 120	
Cadmium, Dissolved	200	215	107	80 - 120	
Chromium, Dissolved	200	201	101	80 - 120	
Lead, Dissolved	200	213	106	80 - 120	
Selenium, Dissolved	200	214	107	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23814

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18739-4	Analysis Batch:	510-23814	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/02/2007 2147			Final Weight/Volume:	50 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-18739-4	Analysis Batch:	510-23814	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/02/2007 2150			Final Weight/Volume:	50 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic, Dissolved	107	108	75 - 125	1	20		
Barium, Dissolved	116	105	75 - 125	3	20		
Cadmium, Dissolved	107	106	75 - 125	1	20		
Chromium, Dissolved	97	97	75 - 125	1	20		
Lead, Dissolved	111	110	75 - 125	1	20		
Selenium, Dissolved	103	104	75 - 125	1	20		

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-23896

Method: 6020
Preparation: N/A

Lab Sample ID: MB 510-23896/11
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1150
Date Prepared: N/A

Analysis Batch: 510-23896
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result	Qual	MDL	RL
Chromium, Dissolved	<1.0		0.10	1.0
Silver, Dissolved	0.64	J	0.047	1.0

Lab Control Spike - Batch: 510-23896

Method: 6020
Preparation: N/A

Lab Sample ID: LCS 510-23896/12
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1153
Date Prepared: N/A

Analysis Batch: 510-23896
Prep Batch: N/A
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium, Dissolved	200	214	107	80 - 120	
Silver, Dissolved	200	206	103	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23896

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18739-4	Analysis Batch: 510-23896	Instrument ID: TE ICPMS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: mL
Date Analyzed:	10/04/2007 1211		Final Weight/Volume: 50 mL
Date Prepared:	N/A		

MSD Lab Sample ID:	510-18739-4	Analysis Batch: 510-23896	Instrument ID: TE ICPMS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: mL
Date Analyzed:	10/04/2007 1214		Final Weight/Volume: 50 mL
Date Prepared:	N/A		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Chromium, Dissolved	106	103	75 - 125	3	20		
Silver, Dissolved	100	99	75 - 125	1	20		

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Method Blank - Batch: 510-23725

Method: 7470A
Preparation: 7470A

Lab Sample ID: MB 510-23725/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 1550
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<0.00020		0.000047	0.00020
Mercury, Dissolved	<0.00020		0.000047	0.00020

Lab Control Spike - Batch: 510-23725

Method: 7470A
Preparation: 7470A

Lab Sample ID: LCS 510-23725/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/02/2007 1552
Date Prepared: 10/02/2007 0825

Analysis Batch: 510-23809
Prep Batch: 510-23725
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00500	0.00489	98	80 - 120	
Mercury, Dissolved	0.00500	0.00489	98	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18739-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23725

Method: 7470A
Preparation: 7470A
Dissolved

MS Lab Sample ID:	510-18739-5	Analysis Batch:	510-23809	Instrument ID:	Leeman Hydra AA
Client Matrix:	Water	Prep Batch:	510-23725	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/02/2007 1721			Final Weight/Volume:	50 mL
Date Prepared:	10/02/2007 0825				

MSD Lab Sample ID:	510-18739-5	Analysis Batch:	510-23809	Instrument ID:	Leeman Hydra AA
Client Matrix:	Water	Prep Batch:	510-23725	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/02/2007 1723			Final Weight/Volume:	50 mL
Date Prepared:	10/02/2007 0825				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	93	95	75 - 125	1	20		
Mercury, Dissolved	93	95	75 - 125	1	20		

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

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

4.6°C
510-28-104

18739

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: Sharon Shelton

Laboratory: Test America Valparaiso
Address: 2400 Cumberland Drive
City/State/Zip: Valpraiso, IN ~~46~~ 46383
Telephone: 219-464-2389

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619

Client Name: ~~Burns & McDonnell~~ AK Steel

Sample Type

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: 6020/3010A - RCRA Metals Hg	Analysis: 6020/Field Filtered RCRA Metals 6020	Analysis: 7470A/7470A - Prep - Hg	Analysis: 7470A/Field Filtered - Hg	Analysis: 8260B/5030B - (MOD)		Remarks
33MW	4	GW4					9-26-07	1520	X			3					X		18739-1
33MW	5D	GW4					9-26-07	1710	X			5	X	X	X	X	X		-2
33MW	11S	GW4					9-27-07	1050	X			5	X	X	X	X	X		-3
33MW	12D	GW4					9-27-07	1345	X			5	X	X	X	X	X		-4
33MW	12S	GW4					9-27-07	1605	X			5	X	X	X	X	X		-5
SWMU 33	TB092707	GW4					9-27-07	0700	X			3					X		Trip Blank -6
~~Temp Blank~~							~~9/27/07~~		~~X~~			~~1~~							~~Temp Blank~~

Sampler (signature): [signature]

Sampler (signature): [signature]

Special Instructions:

Relinquished By (signature): 1. [signature] Date/Time 9-27-07 1740

Received By (signature): [signature] Date/Time 9-28-07 1020

Ice Present in Container: Yes [X] No [ ]

Temperature Upon Receipt: 4.6

Relinquished By (signature): 2. Date/Time

Received By (signature): Date/Time

Laboratory Comments:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18739-1

Login Number: 18739
List Source: TestAmerica Valparaiso
Creator: Conner, Christine A
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

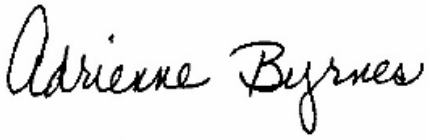
ANALYTICAL REPORT

Job Number: 510-18936-1

Job Description: AK Steel - Kansas City

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
10/25/2007

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

TestAmerica Laboratories, Inc.
TestAmerica Valparaiso 2400 Cumberland Drive, Valparaiso, IN 46383
Tel (219) 464-2389 Fax (219) 462-2953 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
Method(s) 8260B: Internal standard (ISTD) response for the following samples 33MW 15D GW4 (510-18936-6), 33MW 15S GW4 (510-18936-7) was outside of acceptance limits. The internal standard was low as compared to the continuing calibration standard, which would bias results high. However, since there were no target compounds associated with this internal detected, the results are not affected by the high bias. Data is reported. Batch 24199.

Method(s) 8260B: Internal standard (ISTD) response for the following sample was outside of acceptance limits: 33MW 16S GW4 (510-18936-8). The sample did not contain any target compounds above the reporting limit, and is therefore not affected by the possible high bias. Data is reported. Batch 24199.

No other analytical or quality issues were noted.

Metals
Method(s) 6020: The field filtered samples were digested due to matrix interferences.
33MW 13D GW4 (510-18936-1), 33MW 13S GW4 (510-18936-9)

Method(s) 6020: Field filtered samples were digested due to matrix interference.
33MW 13D GW4 (510-18936-1), 33MW 13S GW4 (510-18936-9)

No other analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-18936-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL PEN	SW846 8260B	
Purge-and-Trap	TAL PEN		SW846 5030B
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge-and-Trap	TAL VAL		SW846 5030B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Aqueous Samples and Extracts for	TAL VAL		SW846 3010A
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor Technique)	TAL VAL	SW846 7470A	
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor	TAL VAL		SW846 7470A

Lab References:

TAL PEN = TestAmerica Pensacola

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-18936-1

Method	Analyst	Analyst ID
SW846 8260B	Drew, Walter	WD
SW846 8260B	Hall, Jennifer L	JLH
SW846 6020	Thomas, Deidra	DT
SW846 7470A	Hoham, Chris H	CHH

SAMPLE SUMMARY

Client: Burns & McDonnell Job Number: 510-18936-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-18936-1	33MW 13D GW4	Water	10/01/2007 1105	10/03/2007 0955
510-18936-2	33MW 6D GW4	Water	10/01/2007 1245	10/03/2007 0955
510-18936-3	33MW 7D GW4	Water	10/01/2007 1450	10/03/2007 0955
510-18936-4	33MW 7S GW4	Water	10/01/2007 1605	10/03/2007 0955
510-18936-5	33MW 4S GW4	Water	10/01/2007 1805	10/03/2007 0955
510-18936-6	33MW 15D GW4	Water	10/02/2007 0935	10/03/2007 0955
510-18936-7	33MW 15S GW4	Water	10/02/2007 1055	10/03/2007 0955
510-18936-8	33MW 16S GW4	Water	10/02/2007 1205	10/03/2007 0955
510-18936-9	33MW 13S GW4	Water	10/02/2007 1440	10/03/2007 0955
510-18936-9MS	33MW 13S GW4	Water	10/02/2007 1440	10/03/2007 0955
510-18936-9MSD	33MW 13S GW4	Water	10/02/2007 1440	10/03/2007 0955
510-18936-10	TB 100207 GW4	Water	10/02/2007 0700	10/03/2007 0955

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 13D GW4

Lab Sample ID: 510-18936-1 | Date Sampled: 10/01/2007 1105
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9204.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1555 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1555

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	87 - 120
Toluene-d8 (Surr)	99	89 - 106
4-Bromofluorobenzene (Surr)	106	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 13D GW4

Lab Sample ID: 510-18936-1
Client Matrix: Water

Date Sampled: 10/01/2007 1105
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 0948
Date Prepared: 10/13/2007 0948

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012013.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	103	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 6D GW4

Lab Sample ID: 510-18936-2 | Date Sampled: 10/01/2007 1245
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9205.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1622 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1622

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	106	89 - 120

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: **33MW 6D GW4**

Lab Sample ID: 510-18936-2
Client Matrix: Water

Date Sampled: 10/01/2007 1245
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1021
Date Prepared: 10/13/2007 1021

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012015.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	91	82 - 114
Dibromofluoromethane	103	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 7D GW4

Lab Sample ID: 510-18936-3 | Date Sampled: 10/01/2007 1450
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9206.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1649 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1649

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	109	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: **33MW 7D GW4**

Lab Sample ID: 510-18936-3
Client Matrix: Water

Date Sampled: 10/01/2007 1450
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1054
Date Prepared: 10/13/2007 1054

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012017.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	104	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 7S GW4

Lab Sample ID: 510-18936-4
Client Matrix: Water

Date Sampled: 10/01/2007 1605
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/10/2007 1716
Date Prepared: 10/10/2007 1716

Analysis Batch: 510-24199

Instrument ID: Volatiles GC/MS A
Lab File ID: A9207.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	91	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	112	89 - 120

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: **33MW 7S GW4**

Lab Sample ID: 510-18936-4 | Date Sampled: 10/01/2007 1605
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57152 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4012019.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/13/2007 1128 | Final Weight/Volume: 5 mL
Date Prepared: 10/13/2007 1128

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	105	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 4S GW4

Lab Sample ID: 510-18936-5 | Date Sampled: 10/01/2007 1805
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9208.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1743 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1743

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	93	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	108	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 4S GW4

Lab Sample ID: 510-18936-5
Client Matrix: Water

Date Sampled: 10/01/2007 1805
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1201
Date Prepared: 10/13/2007 1201

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012021.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	91	82 - 114
Dibromofluoromethane	101	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 15D GW4

Lab Sample ID: 510-18936-6 | Date Sampled: 10/02/2007 0935
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9209.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1809 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1809

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	87 - 120
Toluene-d8 (Surr)	97	89 - 106
4-Bromofluorobenzene (Surr)	113	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 15D GW4

Lab Sample ID: 510-18936-6
Client Matrix: Water

Date Sampled: 10/02/2007 0935
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1234
Date Prepared: 10/13/2007 1234

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012023.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	91	82 - 114
Dibromofluoromethane	105	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 15S GW4

Lab Sample ID: 510-18936-7 | Date Sampled: 10/02/2007 1055
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9210.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1836 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1836

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	91	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	112	89 - 120

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 15S GW4

Lab Sample ID: 510-18936-7 | Date Sampled: 10/02/2007 1055
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57152 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4012025.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/13/2007 1308 | Final Weight/Volume: 5 mL
Date Prepared: 10/13/2007 1308

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	105	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: 33MW 16S GW4

Lab Sample ID: 510-18936-8 | Date Sampled: 10/02/2007 1205
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9211.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1903 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1903

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	91	87 - 120
Toluene-d8 (Surr)	98	89 - 106
4-Bromofluorobenzene (Surr)	111	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 16S GW4

Lab Sample ID: 510-18936-8
Client Matrix: Water

Date Sampled: 10/02/2007 1205
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1341
Date Prepared: 10/13/2007 1341

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012027.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	106	81 - 115
Toluene-d8 (Surr)	96	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: **33MW 13S GW4**

Lab Sample ID: 510-18936-9 | Date Sampled: 10/02/2007 1440
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9200.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1407 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1407

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	0.73	J	0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	106	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	104	89 - 120

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: **33MW 13S GW4**

Lab Sample ID: 510-18936-9 | Date Sampled: 10/02/2007 1440
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57152 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4012029.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/13/2007 1415 | Final Weight/Volume: 5 mL
Date Prepared: 10/13/2007 1415

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	106	81 - 115
Toluene-d8 (Surr)	96	87 - 113

Client: Burns & McDonnell | Job Number: 510-18936-1

Client Sample ID: **TB 100207 GW4**

Lab Sample ID: 510-18936-10 | Date Sampled: 10/02/2007 0700
Client Matrix: Water | Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24199 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9199.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/10/2007 1340 | Final Weight/Volume: 5 mL
Date Prepared: 10/10/2007 1340

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	101	87 - 120
Toluene-d8 (Surr)	97	89 - 106
4-Bromofluorobenzene (Surr)	103	89 - 120

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: **TB 100207 GW4**

Lab Sample ID: 510-18936-10
Client Matrix: Water

Date Sampled: 10/02/2007 0700
Date Received: 10/03/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/13/2007 1449
Date Prepared: 10/13/2007 1449

Analysis Batch: 400-57152

Instrument ID: GC/MS
Lab File ID: 4012031.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	88	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	96	87 - 113

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 13D GW4

Lab Sample ID: 510-18936-1
Client Matrix: Water

Date Sampled: 10/01/2007 1105
Date Received: 10/03/2007 0955

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/04/2007 1813
Date Prepared: N/A

Analysis Batch: 510-23929
Prep Batch: 510-23898

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	1.8	J	0.21	2.0
Barium	720		0.15	0.50
Cadmium	0.42	J	0.055	1.0
Chromium	4.9	B	0.10	1.0
Lead	3.3		0.21	0.50
Selenium	<1.0		0.19	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/05/2007 1230
Date Prepared: N/A

Analysis Batch: 510-23994

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Silver	<1.0		0.047	1.0

Client: Burns & McDonnell Job Number: 510-18936-1

Client Sample ID: 33MW 13D GW4

Lab Sample ID: 510-18936-1 Date Sampled: 10/01/2007 1105
Client Matrix: Water Date Received: 10/03/2007 0955

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-23929 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/04/2007 1841 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	0.28	J	0.21	2.0
Barium	630		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	<0.50		0.21	0.50
Selenium	0.42	J	0.19	1.0

Method: 6020 Analysis Batch: 510-23994 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/05/2007 1248 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Silver	<1.0		0.047	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A Analysis Batch: 510-23910 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-23874 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/04/2007 1607 Final Weight/Volume: 50 mL
Date Prepared: 10/04/2007 0915

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A Analysis Batch: 510-23910 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-23874 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/04/2007 1615 Final Weight/Volume: 50 mL
Date Prepared: 10/04/2007 0915

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Client: Burns & McDonnell

Job Number: 510-18936-1

Client Sample ID: 33MW 13S GW4

Lab Sample ID: 510-18936-9
Client Matrix: Water

Date Sampled: 10/02/2007 1440
Date Received: 10/03/2007 0955

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/04/2007 1816
Date Prepared: N/A

Analysis Batch: 510-23929
Prep Batch: 510-23898

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	4.5		0.21	2.0
Barium	38		0.15	0.50
Cadmium	0.26	J	0.055	1.0
Chromium	1.1	B	0.10	1.0
Lead	1.4		0.21	0.50
Selenium	0.32	J	0.19	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/05/2007 1232
Date Prepared: N/A

Analysis Batch: 510-23994

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Silver	<1.0		0.047	1.0

Client: Burns & McDonnell Job Number: 510-18936-1

Client Sample ID: 33MW 13S GW4

Lab Sample ID: 510-18936-9 Date Sampled: 10/02/2007 1440
Client Matrix: Water Date Received: 10/03/2007 0955

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-23929 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/04/2007 1845 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	2.2		0.21	2.0
Barium	35		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	0.48	J	0.10	1.0
Lead	<0.50		0.21	0.50
Selenium	0.46	J	0.19	1.0

Method: 6020 Analysis Batch: 510-23994 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/05/2007 1251 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Silver	<1.0		0.047	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A Analysis Batch: 510-23910 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-23874 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/04/2007 1609 Final Weight/Volume: 50 mL
Date Prepared: 10/04/2007 0915

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A Analysis Batch: 510-23910 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-23874 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/04/2007 1617 Final Weight/Volume: 50 mL
Date Prepared: 10/04/2007 0915

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-18936-1

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Metals		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Client: Burns & McDonnell

Job Number: 510-18936-1

Method Blank - Batch: 510-24199

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-24199/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/10/2007 1257
Date Prepared: 10/10/2007 1257

Analysis Batch: 510-24199
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9198.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	100	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Lab Control Spike - Batch: 510-24199

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 510-24199/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/10/2007 1157
Date Prepared: 10/10/2007 1157

Analysis Batch: 510-24199
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9196.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Acetone	50.0	35.9	72	33 - 136	
Benzene	50.0	46.3	93	78 - 117	
Bromomethane	50.3	52.7	105	84 - 131	
2-Butanone (MEK)	50.0	46.9	94	66 - 126	
Carbon disulfide	50.0	46.6	93	64 - 120	
Carbon tetrachloride	50.0	51.2	102	73 - 131	
Chlorobenzene	50.0	46.6	93	76 - 112	
Chlorodibromomethane	50.0	49.9	100	87 - 127	
Chloroethane	50.2	56.2	112	85 - 131	
Chloroform	50.0	48.1	96	77 - 125	
Chloromethane	50.1	54.3	108	64 - 125	
cis-1,2-Dichloroethene	50.0	44.9	90	82 - 123	
cis-1,3-Dichloropropene	50.0	48.6	97	74 - 122	
Dichlorobromomethane	50.0	49.5	99	79 - 131	
1,1-Dichloroethane	50.0	47.7	95	80 - 125	
1,2-Dichloroethane	50.0	46.4	93	75 - 131	
1,1-Dichloroethene	50.0	48.6	97	71 - 123	
1,2-Dichloropropane	50.0	45.9	92	81 - 124	
Ethylbenzene	50.0	47.2	94	78 - 125	
2-Hexanone	50.0	44.4	89	59 - 125	
Methylene Chloride	50.0	43.0	86	67 - 117	
methyl isobutyl ketone	50.0	44.8	90	72 - 117	
Styrene	50.0	45.9	92	74 - 115	
Tetrachloroethene	50.0	47.2	94	77 - 123	
Toluene	50.0	46.9	94	76 - 114	
trans-1,2-Dichloroethene	50.0	47.6	95	74 - 136	
trans-1,3-Dichloropropene	50.0	49.0	98	76 - 125	
1,1,1-Trichloroethane	50.0	49.9	100	76 - 130	
1,1,2-Trichloroethane	50.0	45.8	92	80 - 122	
Trichloroethene	50.0	47.2	94	80 - 122	
Vinyl acetate	50.0	49.9	100	84 - 136	
Vinyl chloride	50.1	54.9	110	76 - 131	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	98	87 - 120
Toluene-d8 (Surr)	100	89 - 106
4-Bromofluorobenzene (Surr)	99	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-24199

Method: 8260B
Preparation: 5030B

MS Lab Sample ID: 510-18936-9
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/10/2007 1434
Date Prepared: 10/10/2007 1434

Analysis Batch: 510-24199
Prep Batch: N/A

Instrument ID: Volatiles GC/MS A
Lab File ID: A9201.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

MSD Lab Sample ID: 510-18936-9
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/10/2007 1501
Date Prepared: 10/10/2007 1501

Analysis Batch: 510-24199
Prep Batch: N/A

Instrument ID: Volatiles GC/MS A
Lab File ID: A9202.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Acetone	54	58	33 - 136	8	30		
Benzene	96	94	78 - 117	2	30		
Bromomethane	96	95	84 - 131	0	30		
2-Butanone (MEK)	88	90	66 - 126	2	30		
Carbon disulfide	96	97	64 - 120	1	30		
Carbon tetrachloride	111	113	73 - 131	2	30		
Chlorobenzene	97	96	76 - 112	1	30		
Chlorodibromomethane	107	100	87 - 127	6	30		
Chloroethane	104	108	85 - 131	3	30		
Chloroform	99	98	77 - 125	2	30		
Chloromethane	96	97	64 - 125	1	30		
cis-1,2-Dichloroethene	92	90	82 - 123	3	30		
cis-1,3-Dichloropropene	101	97	74 - 122	4	30		
Dichlorobromomethane	104	100	79 - 131	3	30		
1,1-Dichloroethane	98	97	80 - 125	1	30		
1,2-Dichloroethane	98	92	75 - 131	6	30		
1,1-Dichloroethene	99	102	71 - 123	3	30		
1,2-Dichloropropane	94	91	81 - 124	3	30		
Ethylbenzene	99	101	78 - 125	2	30		
2-Hexanone	92	93	59 - 125	2	30		
Methylene Chloride	83	83	67 - 117	0	30		
methyl isobutyl ketone	97	88	72 - 117	9	30		
Styrene	97	96	74 - 115	2	30		
Tetrachloroethene	101	101	77 - 123	0	30		
Toluene	99	98	76 - 114	1	30		
trans-1,2-Dichloroethene	97	97	74 - 136	0	30		
trans-1,3-Dichloropropene	105	100	76 - 125	5	30		
1,1,1-Trichloroethane	107	108	76 - 130	2	30		
1,1,2-Trichloroethane	98	92	80 - 122	6	30		

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-24199

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-18936-9	Analysis Batch:	510-24199	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9201.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/10/2007 1434			Final Weight/Volume:	5 mL
Date Prepared:	10/10/2007 1434				

MSD Lab Sample ID:	510-18936-9	Analysis Batch:	510-24199	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9202.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/10/2007 1501			Final Weight/Volume:	5 mL
Date Prepared:	10/10/2007 1501				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Trichloroethene	100	99	80 - 122	1	30		
Vinyl acetate	106	102	84 - 136	4	30		
Vinyl chloride	97	104	76 - 131	7	30		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	101	97	87 - 120
Toluene-d8 (Surr)	101	101	89 - 106
4-Bromofluorobenzene (Surr)	100	101	89 - 120

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Method Blank - Batch: 400-57152

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57152/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/13/2007 0734
Date Prepared: 10/13/2007 0734

Analysis Batch: 400-57152
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4012005.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	90	82 - 114
Dibromofluoromethane	103	81 - 115
Toluene-d8 (Surr)	95	87 - 113

Lab Control Spike - Batch: 400-57152

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57152/18
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/13/2007 0807
Date Prepared: 10/13/2007 0807

Analysis Batch: 400-57152
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4012007.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromoform	50.0	56.5	113	75 - 125	
1,1,2,2-Tetrachloroethane	50.0	49.2	98	76 - 125	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	102	82 - 114
Dibromofluoromethane	104	81 - 115
Toluene-d8 (Surr)	100	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-57152

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-18936-9	Analysis Batch: 400-57152	Instrument ID: GC/MS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: 4012041.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/13/2007 1737		Final Weight/Volume: 5 mL
Date Prepared:	10/13/2007 1737		

MSD Lab Sample ID:	510-18936-9	Analysis Batch: 400-57152	Instrument ID: GC/MS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: 4012043.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/13/2007 1810		Final Weight/Volume: 5 mL
Date Prepared:	10/13/2007 1810		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Bromoform	92	97	76 - 125	5	14		
1,1,2,2-Tetrachloroethane	84	88	72 - 134	4	21		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
4-Bromofluorobenzene	100	100	82 - 114
Dibromofluoromethane	101	100	81 - 115
Toluene-d8 (Surr)	98	99	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Method Blank - Batch: 510-23898

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-23898/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1806
Date Prepared: 10/04/2007 1400

Analysis Batch: 510-23929
Prep Batch: 510-23898
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<2.0		0.21	2.0
Barium	<0.50		0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	0.14	J	0.10	1.0
Lead	<0.50		0.21	0.50
Selenium	<1.0		0.19	1.0

Method Blank - Batch: 510-23898

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-23898/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/05/2007 1225
Date Prepared: 10/04/2007 1400

Analysis Batch: 510-23994
Prep Batch: 510-23898
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Silver	<1.0		0.047	1.0

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

Lab Control Spike - Batch: 510-23898

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-23898/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1809
Date Prepared: 10/04/2007 1400

Analysis Batch: 510-23929
Prep Batch: 510-23898
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	200	208	104	80 - 120	
Barium	200	203	102	80 - 120	
Cadmium	200	211	105	80 - 120	
Chromium	200	197	98	80 - 120	
Lead	200	203	102	80 - 120	
Selenium	200	207	103	80 - 120	

Lab Control Spike - Batch: 510-23898

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-23898/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/05/2007 1228
Date Prepared: 10/04/2007 1400

Analysis Batch: 510-23994
Prep Batch: 510-23898
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Silver	200	210	105	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23898

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18936-9	Analysis Batch:	510-23929	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/04/2007 1820			Final Weight/Volume:	mL
Date Prepared:	10/04/2007 1400				

MSD Lab Sample ID:	510-18936-9	Analysis Batch:	510-23929	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/04/2007 1824			Final Weight/Volume:	mL
Date Prepared:	10/04/2007 1400				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	105	93	75 - 125	12	20		
Barium	108	91	75 - 125	15	20		
Cadmium	106	93	75 - 125	12	20		
Chromium	97	84	75 - 125	14	20		
Lead	110	98	75 - 125	12	20		
Selenium	93	85	75 - 125	9	20		

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23929

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18936-9	Analysis Batch:	510-23929	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/04/2007 1849			Final Weight/Volume:	50 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-18936-9	Analysis Batch:	510-23929	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/04/2007 1852			Final Weight/Volume:	50 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	103	101	75 - 125	1	20		
Barium	103	99	75 - 125	4	20		
Cadmium	100	99	75 - 125	1	20		
Chromium	91	89	75 - 125	2	20		
Lead	106	103	75 - 125	3	20		
Selenium	98	96	75 - 125	2	20		

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

Client: Burns & McDonnell Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23994

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18936-9	Analysis Batch:	510-23994	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/05/2007 1239			Final Weight/Volume:	mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-18936-9	Analysis Batch:	510-23994	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/05/2007 1241			Final Weight/Volume:	mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Silver	87	79	75 - 125	10	20		

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23994

Method: 6020
Preparation: N/A

MS Lab Sample ID:	510-18936-9	Analysis Batch:	510-23994	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/05/2007 1253			Final Weight/Volume:	mL
Date Prepared:	N/A				

MSD Lab Sample ID:	510-18936-9	Analysis Batch:	510-23994	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	mL
Date Analyzed:	10/05/2007 1255			Final Weight/Volume:	mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Silver	89	87	75 - 125	2	20		

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Method Blank - Batch: 510-23874

Method: 7470A
Preparation: 7470A

Lab Sample ID: MB 510-23874/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1559
Date Prepared: 10/04/2007 0915

Analysis Batch: 510-23910
Prep Batch: 510-23874
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Lab Control Spike - Batch: 510-23874

Method: 7470A
Preparation: 7470A

Lab Sample ID: LCS 510-23874/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/04/2007 1606
Date Prepared: 10/04/2007 0915

Analysis Batch: 510-23910
Prep Batch: 510-23874
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00500	0.00489	98	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-18936-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23874

Method: 7470A
Preparation: 7470A

MS Lab Sample ID:	510-18936-9	Analysis Batch: 510-23910	Instrument ID: Leeman Hydra AA
Client Matrix:	Water	Prep Batch: 510-23874	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 50 mL
Date Analyzed:	10/04/2007 1611		Final Weight/Volume: 50 mL
Date Prepared:	10/04/2007 0915		

MSD Lab Sample ID:	510-18936-9	Analysis Batch: 510-23910	Instrument ID: Leeman Hydra AA
Client Matrix:	Water	Prep Batch: 510-23874	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 50 mL
Date Analyzed:	10/04/2007 1613		Final Weight/Volume: 50 mL
Date Prepared:	10/04/2007 0915		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	103	105	75 - 125	2	20		

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-23874

Method: 7470A
Preparation: 7470A
Dissolved

MS Lab Sample ID:	510-18936-9	Analysis Batch: 510-23910	Instrument ID: Leeman Hydra AA
Client Matrix:	Water	Prep Batch: 510-23874	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 50 mL
Date Analyzed:	10/04/2007 1619		Final Weight/Volume: 50 mL
Date Prepared:	10/04/2007 0915		

MSD Lab Sample ID:	510-18936-9	Analysis Batch: 510-23910	Instrument ID: Leeman Hydra AA
Client Matrix:	Water	Prep Batch: 510-23874	Lab File ID: N/A
Dilution:	1.0		Initial Weight/Volume: 50 mL
Date Analyzed:	10/04/2007 1621		Final Weight/Volume: 50 mL
Date Prepared:	10/04/2007 0915		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	104	101	75 - 125	3	20		

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

Burns & McDonnell SINCE 1898

021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

.1°C

18936

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Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention: Sharon Shelton

Laboratory: Test America Valparaiso
Address: 2400 Cumberland Drive
City/State/Zip: Valparaiso IN 46283
Telephone: 219-464-2389

Document Control No: 100207A
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK Steel

Sample Number			Sample Event		Sample Depth (in feet)		Sample Collected		Sample Type / Matrix			Number of Containers	Analysis						Remarks
Group or SWMU Name	Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas		6010B/6010A - RCRA Metals	6020/Field-Filtered - RCRA Metals	7470A/7470A	7470A/Field Filtered	8260B/5032B		
33 MW	13D	GW4		2007			10-1-07	1105	X			5	X	X	X	X	X		18936-1
	6D	GW4		2007			10-1-07	1245	X			3					X		-2
	7D	GW4		2007			10-1-07	1450	X			3					X		-3 1 vial had bubble
	7S	GW4		2007			10-1-07	1605	X			3					X		-4
	4S	GW4		2007			10-1-07	1805	X			3					X		-5
	15D	GW4		2007			10-2-07	0935	X			3					X		-6
	15S	GW4		2007			10-2-07	1055	X			3					X		-7
	16S	GW4		2007			10-2-07	1205	X			3					X		-8
	13S	GW4		2007			10-2-07	1440	X			5	X	X	X	X	X		-9
	13S	GW4MS		2007			10-2-07	1440	X			5	X	X	X	X	X		Matrix Spike DUP-10-9A
	13S	GW4MSD		2007			10-2-07	1440	X			5	X	X	X	X	X		Matrix Spike Duplicate DUP-11
	TB100207GW4			2007			10-2-07	0700	X			2					X		Trip Blank DUP-12-10

Sampler (signature): SAMWoodland

Sampler (signature): Kenny White

Special Instructions:

Relinquished By (signature):	Date/Time	Received By (signature):	Date/Time	Ice Present in Container: Yes ☐ No ☐	Temperature Upon Receipt:
1	10-2-07 1630		10-2-07 1700	Laboratory Comments:	
Relinquished By (signature): 2.	Date/Time	Received By (signature):	Date/Time 10-3-07 0845		

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18936-1

Login Number: 18936
List Source: TestAmerica Valparaiso
Creator: Conner, Christine A
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	False	1 vial has bubble >6mm for sample 3
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-18936-1

Login Number: 18936
Creator: Hedaria, Raven
List Number: 1

List Source: TestAmerica Pensacola
List Creation: 10/12/07 11:20 AM

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	4.1°C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

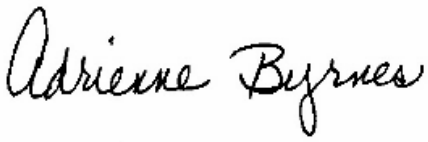
ANALYTICAL REPORT

Job Number: 510-19035-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/07/2007

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

TestAmerica Laboratories, Inc.
TestAmerica Valparaiso 2400 Cumberland Drive, Valparaiso, IN 46383
Tel (219) 464-2389 Fax (219) 462-2953 www.testamericainc.com

ACCREDITED IN ACCORDANCE WITH nelac

Job Narrative
510-J19035-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
The laboratory control standard (LCS) for analytical batch 57216 exceeded control limits for the following analytes:Xylenes, Isopropylbenzene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No other analytical or quality issues were noted.

Metals
Method(s) 6020: Field filtered samples were digested due to matrix interference.
33 11D GW4 (510-19035-8), 33 5I GW4 (510-19035-14), 33 5S GW4 (510-19035-12), 33 5S GW4D (510-19035-13)

Method(s) 6020: The post digestion spike failed QC requirements for arsenic. The matrix spike, matrix spike duplicate and all other QC were within range. Data is acceptable.
33 11D GW4 (510-19035-8), 33 5I GW4 (510-19035-14), 33 5S GW4 (510-19035-12), 33 5S GW4D (510-19035-13)

Method(s) 6020: Field filtered samples were digested due to matrix interference.

No other analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-19035-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL PEN	SW846 8260B	
Purge-and-Trap	TAL PEN		SW846 5030B
Volatile Organic Compounds by GC/MS	TAL VAL	SW846 8260B	
Purge-and-Trap	TAL VAL		SW846 5030B
Inductively Coupled Plasma - Mass Spectrometry	TAL VAL	SW846 6020	
Acid Digestion of Aqueous Samples and Extracts for	TAL VAL		SW846 3010A
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor Technique)	TAL VAL	SW846 7470A	
Sample Filtration performed in the Field	TAL VAL		FIELD_FLTRD
Mercury in Liquid Waste (Manual Cold Vapor	TAL VAL		SW846 7470A

Lab References:

TAL PEN = TestAmerica Pensacola

TAL VAL = TestAmerica Valparaiso

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-19035-1

Method	Analyst	Analyst ID
SW846 8260B	Drew, Walter	WD
SW846 8260B	Hall, Jennifer L	JLH
SW846 8260B	Lee, Jefferson	JL
SW846 6020	Hamner, Barb J	BJH
SW846 7470A	Hamner, Barb J	BJH

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-19035-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-19035-1	33 TB100307	Water	10/03/2007 0700	10/05/2007 1000
510-19035-2	33 16D GW4	Water	10/03/2007 1140	10/05/2007 1000
510-19035-3	33 10S GW4	Water	10/03/2007 1235	10/05/2007 1000
510-19035-4	33 10D GW4	Water	10/03/2007 1400	10/05/2007 1000
510-19035-5	33 10D GW4D	Water	10/03/2007 1400	10/05/2007 1000
510-19035-6	33 14S GW4	Water	10/03/2007 1535	10/05/2007 1000
510-19035-7	33 14D GW4	Water	10/03/2007 1630	10/05/2007 1000
510-19035-8	33 11D GW4	Water	10/04/2007 0835	10/05/2007 1000
510-19035-9	33 9S GW4	Water	10/04/2007 1000	10/05/2007 1000
510-19035-10	33 8S GW4	Water	10/04/2007 1200	10/05/2007 1000
510-19035-11	33 3 GW4	Water	10/04/2007 1320	10/05/2007 1000
510-19035-12	33 5S GW4	Water	10/04/2007 1420	10/05/2007 1000
510-19035-13	33 5S GW4D	Water	10/04/2007 1420	10/05/2007 1000
510-19035-14	33 5I GW4	Water	10/04/2007 1530	10/05/2007 1000

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 TB100307**

Lab Sample ID: 510-19035-1 | Date Sampled: 10/03/2007 0700
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9235.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0503 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0503

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	0.38	J	0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	0.91	J	0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	0.51	J	0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	103	89 - 120
1,2-Dichloroethane-d4 (Surr)	106	87 - 120
Toluene-d8 (Surr)	101	89 - 106

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 TB100307**

Lab Sample ID: 510-19035-1
Client Matrix: Water

Date Sampled: 10/03/2007 0700
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1523
Date Prepared: 10/15/2007 1523

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016022.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	82 - 114
Dibromofluoromethane	107	81 - 115
Toluene-d8 (Surr)	104	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 16D GW4**

Lab Sample ID: 510-19035-2 | Date Sampled: 10/03/2007 1140
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9236.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0529 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0529

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	101	89 - 120
1,2-Dichloroethane-d4 (Surr)	108	87 - 120
Toluene-d8 (Surr)	101	89 - 106

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 16D GW4**

Lab Sample ID: 510-19035-2
Client Matrix: Water

Date Sampled: 10/03/2007 1140
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1556
Date Prepared: 10/15/2007 1556

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016024.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	82 - 114
Dibromofluoromethane	107	81 - 115
Toluene-d8 (Surr)	104	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 10S GW4**

Lab Sample ID: 510-19035-3 | Date Sampled: 10/03/2007 1235
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9237.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0556 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0556

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	105	89 - 120
1,2-Dichloroethane-d4 (Surr)	112	87 - 120
Toluene-d8 (Surr)	102	89 - 106

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 10S GW4**

Lab Sample ID: 510-19035-3
Client Matrix: Water

Date Sampled: 10/03/2007 1235
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1630
Date Prepared: 10/15/2007 1630

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016026.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	104	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 10D GW4**

Lab Sample ID: 510-19035-4 | Date Sampled: 10/03/2007 1400
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9238.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0623 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0623

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	105	89 - 120
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	103	89 - 106

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 10D GW4**

Lab Sample ID: 510-19035-4
Client Matrix: Water

Date Sampled: 10/03/2007 1400
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1703
Date Prepared: 10/15/2007 1703

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016028.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	82 - 114
Dibromofluoromethane	112	81 - 115
Toluene-d8 (Surr)	104	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 10D GW4D**

Lab Sample ID: 510-19035-5 | Date Sampled: 10/03/2007 1400
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9239.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0650 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0650

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	0.88	J	0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	102	89 - 120
1,2-Dichloroethane-d4 (Surr)	112	87 - 120
Toluene-d8 (Surr)	100	89 - 106

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 10D GW4D**

Lab Sample ID:	510-19035-5	Date Sampled:	10/03/2007 1400
Client Matrix:	Water	Date Received:	10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method:	8260B	Analysis Batch: 400-57216	Instrument ID:	GC/MS	
Preparation:	5030B		Lab File ID:	4016030.D	
Dilution:	1.0		Initial Weight/Volume:	5	mL
Date Analyzed:	10/15/2007 1737		Final Weight/Volume:	5	mL
Date Prepared:	10/15/2007 1737				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	82 - 114
Dibromofluoromethane	114	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 14S GW4**

Lab Sample ID: 510-19035-6 | Date Sampled: 10/03/2007 1535
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9240.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0717 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0717

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	103	89 - 120
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	101	89 - 106

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 14S GW4**

Lab Sample ID: 510-19035-6
Client Matrix: Water

Date Sampled: 10/03/2007 1535
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1810
Date Prepared: 10/15/2007 1810

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016032.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	82 - 114
Dibromofluoromethane	111	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 14D GW4**

Lab Sample ID: 510-19035-7 | Date Sampled: 10/03/2007 1630
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 510-24203 | Instrument ID: Volatiles GC/MS A
Preparation: 5030B | Lab File ID: A9241.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/11/2007 0744 | Final Weight/Volume: 5 mL
Date Prepared: 10/11/2007 0744

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	101	89 - 120
1,2-Dichloroethane-d4 (Surr)	109	87 - 120
Toluene-d8 (Surr)	101	89 - 106

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 14D GW4**

Lab Sample ID: 510-19035-7
Client Matrix: Water

Date Sampled: 10/03/2007 1630
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 1.0
Date Analyzed: 10/15/2007 1844
Date Prepared: 10/15/2007 1844

Analysis Batch: 400-57216

Instrument ID: GC/MS
Lab File ID: 4016034.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	82 - 114
Dibromofluoromethane	112	81 - 115
Toluene-d8 (Surr)	106	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 11D GW4**

Lab Sample ID: 510-19035-8 | Date Sampled: 10/04/2007 0835
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57216 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4016036.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/15/2007 1917 | Final Weight/Volume: 5 mL
Date Prepared: 10/15/2007 1917

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	82 - 114
Dibromofluoromethane	114	81 - 115
Toluene-d8 (Surr)	106	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 9S GW4**

Lab Sample ID: 510-19035-9 | Date Sampled: 10/04/2007 1000
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57286 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4018012.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1115 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1115

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	1.3	J	0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	1.9	J	0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	1.4	J	0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 8S GW4**

Lab Sample ID: 510-19035-10 | Date Sampled: 10/04/2007 1200
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57286 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4018014.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1149 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1149

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	4.4	J	0.50	5.0
1,1-Dichloroethene	1.7	J	0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	33		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	130		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	0.89	J	0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	97	82 - 114
Dibromofluoromethane	110	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 3 GW4**

Lab Sample ID: 510-19035-11 | Date Sampled: 10/04/2007 1320
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57286 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4018016.D
Dilution: 2.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1222 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1222

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<10		1.0	10
1,1,2,2-Tetrachloroethane	<10		1.0	10
1,1,2-Trichloroethane	<10		1.0	10
1,1-Dichloroethane	1.8	J	1.0	10
1,1-Dichloroethene	8.8	J	1.0	10
1,2-Dichloroethane	<10		1.0	10
1,2-Dichloropropane	<10		1.0	10
2-Butanone (MEK)	<50		3.0	50
2-Hexanone	<50		6.2	50
4-Methyl-2-pentanone (MIBK)	<50		3.6	50
Acetone	<50		5.4	50
Benzene	<2.0		0.40	2.0
Bromodichloromethane	<10		1.0	10
Bromoform	<10		1.2	10
Bromomethane	<10		1.5	10
Carbon disulfide	<10		1.0	10
Carbon tetrachloride	<10		1.0	10
Chlorobenzene	<10		1.0	10
Chloroethane	<10		1.0	10
Chloroform	<10		1.0	10
Chloromethane	<10		1.1	10
cis-1,3-Dichloropropene	<10		1.0	10
Dibromochloromethane	<10		1.0	10
Ethylbenzene	<10		1.0	10
Methylene Chloride	<10		1.6	10
m-Xylene & p-Xylene	<20		3.2	20
o-Xylene	<10		1.0	10
Styrene	<10		1.0	10
Tetrachloroethene	<10		1.0	10
Toluene	<10		1.0	10
trans-1,2-Dichloroethene	3.5	J	1.0	10
trans-1,3-Dichloropropene	<10		1.0	10
Vinyl acetate	<50		2.2	50
Vinyl chloride	60		1.0	10

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	98	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 3 GW4**

Lab Sample ID: 510-19035-11
Client Matrix: Water

Date Sampled: 10/04/2007 1320
Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 10/16/2007 2013
Date Prepared: 10/16/2007 2013

Analysis Batch: 400-57351

Instrument ID: GC/MS
Lab File ID: 7089038.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,2-Dichloroethane	<50		5.0	50
cis-1,2-Dichloroethene	940		5.0	50
Trichloroethene	480		5.0	50

Method: 8260B
Preparation: 5030B
Dilution: 10
Date Analyzed: 10/16/2007 2013
Date Prepared: 10/16/2007 2013

Analysis Batch: 400-57351

Instrument ID: GC/MS
Lab File ID: 7089038.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	94	82 - 114
Dibromofluoromethane	99	81 - 115
Toluene-d8 (Surr)	97	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 5S GW4**

Lab Sample ID: 510-19035-12 | Date Sampled: 10/04/2007 1420
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57286 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4018018.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1256 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1256

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	0.26	J	0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	53		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	2.4	J	0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	4.1	J	0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	99	82 - 114
Dibromofluoromethane	108	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 5S GW4D**

Lab Sample ID: 510-19035-13 | Date Sampled: 10/04/2007 1420
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57286 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4018020.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1329 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1329

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	0.27	J	0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	55		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	0.51	J	0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	3.2	J	0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	4.2	J	0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	96	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Client: Burns & McDonnell | Job Number: 510-19035-1

Client Sample ID: **33 5I GW4**

Lab Sample ID: 510-19035-14 | Date Sampled: 10/04/2007 1530
Client Matrix: Water | Date Received: 10/05/2007 1000

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57426 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 4021010.D
Dilution: 5.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/17/2007 1746 | Final Weight/Volume: 5 mL
Date Prepared: 10/17/2007 1746

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<25		2.5	25
1,1,2,2-Tetrachloroethane	<25		2.5	25
1,1,2-Trichloroethane	<25		2.5	25
1,1-Dichloroethane	<25		2.5	25
1,1-Dichloroethene	<25		2.5	25
1,2-Dichloroethane	<25		2.5	25
1,2-Dichloropropane	<25		2.5	25
2-Butanone (MEK)	<130		7.5	130
2-Hexanone	<130		16	130
4-Methyl-2-pentanone (MIBK)	<130		9.0	130
Acetone	<130		14	130
Benzene	<5.0		1.0	5.0
Bromodichloromethane	<25		2.5	25
Bromoform	<25		2.9	25
Bromomethane	<25		3.7	25
Carbon disulfide	<25		2.5	25
Carbon tetrachloride	<25		2.5	25
Chlorobenzene	<25		2.5	25
Chloroethane	<25		2.5	25
Chloroform	<25		2.5	25
Chloromethane	<25		2.7	25
cis-1,2-Dichloroethene	560		2.5	25
cis-1,3-Dichloropropene	<25		2.5	25
Dibromochloromethane	<25		2.5	25
Ethylbenzene	<25		2.5	25
Methylene Chloride	<25		4.1	25
m-Xylene & p-Xylene	<50		8.0	50
o-Xylene	<25		2.5	25
Styrene	<25		2.5	25
Tetrachloroethene	<25		2.5	25
Toluene	<25		2.5	25
trans-1,2-Dichloroethene	3.7	J	2.5	25
trans-1,3-Dichloropropene	<25		2.5	25
Trichloroethene	77		2.5	25
Vinyl acetate	<130		5.5	130
Vinyl chloride	66		2.5	25

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	93	82 - 114
Dibromofluoromethane	97	81 - 115
Toluene-d8 (Surr)	98	87 - 113

Client: Burns & McDonnell

Job Number: 510-19035-1

Client Sample ID: **33 11D GW4**

Lab Sample ID: 510-19035-8
Client Matrix: Water

Date Sampled: 10/04/2007 0835
Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1341
Date Prepared: N/A

Analysis Batch: 510-24045

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	1.9	J	0.21	2.0
Barium	1200	B	0.15	0.50
Cadmium	0.49	J	0.055	1.0
Chromium	2.2		0.10	1.0
Lead	3.0		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1712
Date Prepared: N/A

Analysis Batch: 510-24082

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Selenium	<1.0		0.19	1.0

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 11D GW4**

Lab Sample ID: 510-19035-8 Date Sampled: 10/04/2007 0835
Client Matrix: Water Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-24045 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1412 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	0.92	J	0.21	2.0
Barium	1200		0.15	0.50
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020 Analysis Batch: 510-24082 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1743 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium	0.28	J	0.10	1.0
Selenium	2.1		0.19	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1609 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1617 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5S GW4**

Lab Sample ID: 510-19035-12
Client Matrix: Water

Date Sampled: 10/04/2007 1420
Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1344
Date Prepared: N/A

Analysis Batch: 510-24045

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	9.2		0.21	2.0
Barium	250		0.15	0.50
Cadmium	0.30	J	0.055	1.0
Chromium	1.3		0.10	1.0
Lead	2.3		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/09/2007 1714
Date Prepared: N/A

Analysis Batch: 510-24149
Prep Batch: 510-24011

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Selenium	1.7	B	0.19	1.0

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5S GW4**

Lab Sample ID: 510-19035-12
Client Matrix: Water

Date Sampled: 10/04/2007 1420
Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1415
Date Prepared: N/A

Analysis Batch: 510-24045

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	8.5		0.21	2.0
Barium	220		0.15	0.50
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1746
Date Prepared: N/A

Analysis Batch: 510-24082

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium	<1.0		0.10	1.0
Selenium	<1.0		0.19	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/09/2007 1611
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A
Preparation: 7470A
Dilution: 1.0
Date Analyzed: 10/09/2007 1623
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5S GW4D**

Lab Sample ID: 510-19035-13 Date Sampled: 10/04/2007 1420
Client Matrix: Water Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020 Analysis Batch: 510-24045 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1347 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	9.3		0.21	2.0
Barium	250		0.15	0.50
Cadmium	0.32	J	0.055	1.0
Chromium	0.73	J	0.10	1.0
Lead	1.8		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020 Analysis Batch: 510-24149 Instrument ID: TE ICPMS
Preparation: N/A Prep Batch: 510-24011 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/09/2007 1717 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Selenium	1.4	B	0.19	1.0

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5S GW4D**

Lab Sample ID: 510-19035-13 Date Sampled: 10/04/2007 1420
Client Matrix: Water Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-24045 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1418 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	8.8		0.21	2.0
Barium	220		0.15	0.50
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020 Analysis Batch: 510-24082 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1749 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium	0.23	J	0.10	1.0
Selenium	<1.0		0.19	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1613 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1625 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5I GW4**

Lab Sample ID: 510-19035-14
Client Matrix: Water

Date Sampled: 10/04/2007 1530
Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1350
Date Prepared: N/A

Analysis Batch: 510-24045

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	12		0.21	2.0
Barium	220		0.15	0.50
Cadmium	0.084	J	0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	1.5		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020
Preparation: N/A
Dilution: 1.0
Date Analyzed: 10/08/2007 1722
Date Prepared: N/A

Analysis Batch: 510-24082

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Selenium	<1.0		0.19	1.0

Client: Burns & McDonnell Job Number: 510-19035-1

Client Sample ID: **33 5I GW4**

Lab Sample ID: 510-19035-14 Date Sampled: 10/04/2007 1530
Client Matrix: Water Date Received: 10/05/2007 1000

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 510-24045 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1421 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Arsenic	13		0.21	2.0
Barium	220		0.15	0.50
Cadmium	<1.0		0.055	1.0
Lead	<0.50		0.21	0.50
Silver	<1.0		0.047	1.0

Method: 6020 Analysis Batch: 510-24082 Instrument ID: TE ICPMS
Preparation: N/A Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: mL
Date Analyzed: 10/08/2007 1753 Final Weight/Volume: mL
Date Prepared: N/A

Analyte	Result (ug/L)	Qualifier	MDL	RL
Chromium	0.21	J	0.10	1.0
Selenium	<1.0		0.19	1.0

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1615 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

7470A Mercury in Liquid Waste (Manual Cold Vapor Technique)-Dissolved

Method: 7470A Analysis Batch: 510-24118 Instrument ID: Leeman Hydra AA
Preparation: 7470A Prep Batch: 510-24078 Lab File ID: N/A
Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 10/09/2007 1626 Final Weight/Volume: 50 mL
Date Prepared: 10/09/2007 0840

Analyte	Result (mg/L)	Qualifier	MDL	RL
Mercury	<0.00020		0.000047	0.00020

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-19035-1

Lab Section	Qualifier	Description
GC/MS VOA		
	F	MS or MSD exceeds the control limits
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	RPD of the MS and MSD exceeds the control limits
Metals		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 510-24203

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 510-24203/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/11/2007 0342
Date Prepared: 10/11/2007 0342

Analysis Batch: 510-24203
Prep Batch: N/A
Units: ug/L

Instrument ID: Volatiles GC/MS A
Lab File ID: A9232.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Acetone	<10		3.0	10
Benzene	<5.0		0.12	5.0
Bromomethane	<10		0.60	10
2-Butanone (MEK)	<10		2.3	10
Carbon disulfide	<5.0		0.24	5.0
Carbon tetrachloride	<5.0		0.37	5.0
Chlorobenzene	<5.0		0.24	5.0
Chlorodibromomethane	<5.0		0.45	5.0
Chloroethane	<10		0.59	10
Chloroform	<5.0		0.24	5.0
Chloromethane	<10		0.66	10
cis-1,2-Dichloroethene	<5.0		0.72	5.0
cis-1,3-Dichloropropene	<5.0		0.31	5.0
Dichlorobromomethane	<5.0		0.32	5.0
1,1-Dichloroethane	<5.0		0.28	5.0
1,2-Dichloroethane	<5.0		0.37	5.0
1,1-Dichloroethene	<5.0		0.53	5.0
1,2-Dichloropropane	<5.0		0.19	5.0
Ethylbenzene	<5.0		0.17	5.0
2-Hexanone	<10		1.0	10
Methylene Chloride	<5.0		2.1	5.0
methyl isobutyl ketone	<10		0.61	10
Styrene	<5.0		0.15	5.0
Tetrachloroethene	<5.0		0.24	5.0
Toluene	<5.0		0.23	5.0
trans-1,2-Dichloroethene	<5.0		1.6	5.0
trans-1,3-Dichloropropene	<5.0		0.30	5.0
1,1,1-Trichloroethane	<5.0		0.25	5.0
1,1,2-Trichloroethane	<5.0		0.52	5.0
Trichloroethene	<5.0		0.25	5.0
Vinyl acetate	<5.0		0.75	5.0
Vinyl chloride	<2.0		0.42	2.0
Xylenes, Total	<10		0.33	10

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	100	89 - 120
1,2-Dichloroethane-d4 (Surr)	101	87 - 120
Toluene-d8 (Surr)	98	89 - 106

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24203

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 510-24203/1	Analysis Batch:	510-24203	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9229.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	10/11/2007 0221			Final Weight/Volume:	5 mL
Date Prepared:	10/11/2007 0221				

LCSD Lab Sample ID:	LCSD 510-24203/2	Analysis Batch:	510-24203	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9230.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	10/11/2007 0248			Final Weight/Volume:	5 mL
Date Prepared:	10/11/2007 0248				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Acetone	82	81	33 - 136	0	30		
Benzene	102	101	78 - 117	1	30		
Bromomethane	100	104	84 - 131	4	30		
2-Butanone (MEK)	102	99	66 - 126	3	30		
Carbon disulfide	98	97	64 - 120	1	30		
Carbon tetrachloride	102	102	73 - 131	0	30		
Chlorobenzene	101	102	76 - 112	1	30		
Chlorodibromomethane	110	110	87 - 127	0	30		
Chloroethane	108	108	85 - 131	1	30		
Chloroform	107	105	77 - 125	2	30		
Chloromethane	106	106	64 - 125	0	30		
cis-1,2-Dichloroethene	103	103	82 - 123	0	30		
cis-1,3-Dichloropropene	110	110	74 - 122	0	30		
Dichlorobromomethane	106	107	79 - 131	1	30		
1,1-Dichloroethane	105	105	80 - 125	0	30		
1,2-Dichloroethane	103	99	75 - 131	3	30		
1,1-Dichloroethene	99	101	71 - 123	2	30		
1,2-Dichloropropane	102	103	81 - 124	1	30		
Ethylbenzene	101	103	78 - 125	2	30		
2-Hexanone	106	97	59 - 125	9	30		
Methylene Chloride	97	101	67 - 117	3	30		
methyl isobutyl ketone	103	98	72 - 117	5	30		
Styrene	103	104	74 - 115	2	30		
Tetrachloroethene	99	101	77 - 123	1	30		
Toluene	101	99	76 - 114	1	30		
trans-1,2-Dichloroethene	105	105	74 - 136	0	30		
trans-1,3-Dichloropropene	110	113	76 - 125	3	30		
1,1,1-Trichloroethane	105	104	76 - 130	1	30		
1,1,2-Trichloroethane	102	104	80 - 122	1	30		
Trichloroethene	104	103	80 - 122	1	30		
Vinyl acetate	107	103	84 - 136	3	30		
Vinyl chloride	101	104	76 - 131	3	30		

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Lab Control Spike/
Lab Control Spike Duplicate Recovery Report - Batch: 510-24203

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 510-24203/1	Analysis Batch:	510-24203	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9229.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	10/11/2007 0221			Final Weight/Volume:	5 mL
Date Prepared:	10/11/2007 0221				

LCSD Lab Sample ID:	LCSD 510-24203/2	Analysis Batch:	510-24203	Instrument ID:	Volatiles GC/MS A
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	A9230.D
Dilution:	1.0	Units:	ug/L	Initial Weight/Volume:	5 mL
Date Analyzed:	10/11/2007 0248			Final Weight/Volume:	5 mL
Date Prepared:	10/11/2007 0248				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	99	98	89 - 120
1,2-Dichloroethane-d4 (Surr)	99	96	87 - 120
Toluene-d8 (Surr)	99	99	89 - 106

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 400-57216

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57216/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/15/2007 0946
Date Prepared: 10/15/2007 0946

Analysis Batch: 400-57216
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4016006.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
Bromoform	<5.0		0.58	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	97	82 - 114
Dibromofluoromethane	107	81 - 115
Toluene-d8 (Surr)	105	87 - 113

Lab Control Spike - Batch: 400-57216

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57216/17
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/15/2007 1950
Date Prepared: 10/15/2007 1950

Analysis Batch: 400-57216
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4016038.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Bromoform	50.0	53.4	107	75 - 125	
1,1,2,2-Tetrachloroethane	50.0	52.9	106	76 - 125	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	109	82 - 114
Dibromofluoromethane	110	81 - 115
Toluene-d8 (Surr)	106	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-57216

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-19035-2	Analysis Batch:	400-57216	Instrument ID:	GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	4016040.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/15/2007 2024			Final Weight/Volume:	5 mL
Date Prepared:	10/15/2007 2024				

MSD Lab Sample ID:	510-19035-2	Analysis Batch:	400-57216	Instrument ID:	GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	4016041.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/15/2007 2041			Final Weight/Volume:	5 mL
Date Prepared:	10/15/2007 2041				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Bromoform	107	99	76 - 125	7	14		
1,1,2,2-Tetrachloroethane	107	102	72 - 134	5	21		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
4-Bromofluorobenzene	109	107	82 - 114
Dibromofluoromethane	107	101	81 - 115
Toluene-d8 (Surr)	105	104	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 400-57286

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57286/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 0934
Date Prepared: 10/16/2007 0934

Analysis Batch: 400-57286
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4018006.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	97	82 - 114
Dibromofluoromethane	109	81 - 115
Toluene-d8 (Surr)	106	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Lab Control Spike - Batch: 400-57286

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57286/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 1042
Date Prepared: 10/16/2007 1042

Analysis Batch: 400-57286
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4018008A.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	47.6	95	73 - 131	
1,1,2-Trichloroethane	50.0	46.6	93	80 - 116	
1,1-Dichloroethane	50.0	44.4	89	77 - 128	
1,1-Dichloroethene	50.0	43.1	86	79 - 117	
1,2-Dichloroethane	50.0	47.2	94	64 - 135	
1,2-Dichloropropane	50.0	46.4	93	84 - 117	
2-Butanone (MEK)	200	179	90	53 - 166	
2-Hexanone	200	189	94	60 - 164	
4-Methyl-2-pentanone (MIBK)	200	199	99	60 - 149	
Acetone	200	176	88	44 - 168	
Benzene	50.0	46.6	93	80 - 112	
Bromodichloromethane	50.0	48.1	96	78 - 122	
Bromoform	50.0	44.9	90	75 - 125	
Bromomethane	50.0	43.5	87	59 - 120	
Carbon disulfide	50.0	38.1	76	56 - 146	
Carbon tetrachloride	50.0	49.9	100	72 - 127	
Chlorobenzene	50.0	47.2	94	89 - 112	
Chloroethane	50.0	39.6	79	70 - 128	
Chloroform	50.0	44.7	89	73 - 128	
Chloromethane	50.0	34.8	70	62 - 125	
cis-1,2-Dichloroethene	50.0	46.2	92	84 - 120	
cis-1,3-Dichloropropene	50.0	49.2	98	84 - 116	
Dibromochloromethane	50.0	49.1	98	84 - 120	
1,1,2,2-Tetrachloroethane	50.0	44.4	89	76 - 125	
Ethylbenzene	50.0	51.7	103	86 - 116	
Methylene Chloride	50.0	43.2	86	73 - 123	
m-Xylene & p-Xylene	100	105	105	87 - 117	
o-Xylene	50.0	52.5	105	89 - 116	
Styrene	50.0	53.0	106	80 - 122	
Tetrachloroethene	50.0	48.8	98	80 - 116	
Toluene	50.0	47.0	94	80 - 112	
trans-1,2-Dichloroethene	50.0	43.4	87	79 - 122	
trans-1,3-Dichloropropene	50.0	49.1	98	82 - 118	
Trichloroethene	50.0	48.1	96	88 - 114	
Vinyl acetate	100	90.1	90	30 - 168	
Vinyl chloride	50.0	37.9	76	68 - 128	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	109	82 - 114
Dibromofluoromethane	105	81 - 115
Toluene-d8 (Surr)	106	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-57286

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-19035-9	Analysis Batch: 400-57286	Instrument ID: GC/MS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: 4018042.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/16/2007 1938		Final Weight/Volume: 5 mL
Date Prepared:	10/16/2007 1938		

MSD Lab Sample ID:	510-19035-9	Analysis Batch: 400-57286	Instrument ID: GC/MS
Client Matrix:	Water	Prep Batch: N/A	Lab File ID: 4018044.D
Dilution:	1.0		Initial Weight/Volume: 5 mL
Date Analyzed:	10/16/2007 2011		Final Weight/Volume: 5 mL
Date Prepared:	10/16/2007 2011		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
1,1,1-Trichloroethane	108	111	71 - 140	3	39		
1,1,2-Trichloroethane	103	106	86 - 120	3	10		
1,1-Dichloroethane	103	107	74 - 132	4	10		
1,1-Dichloroethene	110	115	69 - 128	4	10		
1,2-Dichloroethane	108	110	66 - 140	2	8		
1,2-Dichloropropane	102	105	82 - 123	3	9		
2-Butanone (MEK)	163	118	60 - 146	32	18	F	F
2-Hexanone	113	116	67 - 148	2	16		
4-Methyl-2-pentanone (MIBK)	120	122	57 - 147	2	18		
Acetone	109	111	62 - 138	2	14		
Benzene	102	105	81 - 119	3	9		
Bromodichloromethane	105	108	81 - 126	3	10		
Bromoform	99	102	76 - 125	3	14		
Bromomethane	124	127	60 - 118	2	13	F	F
Carbon disulfide	104	107	67 - 146	3	10		
Carbon tetrachloride	111	116	80 - 128	4	8		
Chlorobenzene	90	93	84 - 120	4	9		
Chloroethane	107	110	68 - 133	3	11		
Chloroform	100	103	76 - 134	3	9		
Chloromethane	105	113	65 - 124	7	11		
cis-1,2-Dichloroethene	108	111	82 - 126	3	9		
cis-1,3-Dichloropropene	103	107	78 - 126	4	9		
Dibromochloromethane	108	109	87 - 123	1	12		
1,1,2,2-Tetrachloroethane	99	104	72 - 134	5	21		
Ethylbenzene	94	98	84 - 124	3	13		
Methylene Chloride	105	107	74 - 126	2	11		
m-Xylene & p-Xylene	94	97	85 - 125	3	16		
o-Xylene	97	101	88 - 121	4	12		
Styrene	98	102	72 - 132	4	10		

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 400-57286

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	510-19035-9	Analysis Batch:	400-57286	Instrument ID:	GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	4018042.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/16/2007 1938			Final Weight/Volume:	5 mL
Date Prepared:	10/16/2007 1938				

MSD Lab Sample ID:	510-19035-9	Analysis Batch:	400-57286	Instrument ID:	GC/MS
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	4018044.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Date Analyzed:	10/16/2007 2011			Final Weight/Volume:	5 mL
Date Prepared:	10/16/2007 2011				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Tetrachloroethene	93	95	80 - 125	3	11		
Toluene	95	98	84 - 117	3	10		
trans-1,2-Dichloroethene	103	106	77 - 125	4	10		
trans-1,3-Dichloropropene	107	109	81 - 126	2	10		
Trichloroethene	102	106	80 - 124	4	12		
Vinyl acetate	114	119	44 - 136	4	13		
Vinyl chloride	114	119	61 - 134	4	12		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
4-Bromofluorobenzene	110	109	82 - 114
Dibromofluoromethane	107	106	81 - 115
Toluene-d8 (Surr)	106	105	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 400-57351

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57351/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 1215
Date Prepared: 10/16/2007 1215

Analysis Batch: 400-57351
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 7089010.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	93	82 - 114
Dibromofluoromethane	100	81 - 115
Toluene-d8 (Surr)	96	87 - 113

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

Lab Control Spike - Batch: 400-57351

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57351/14
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 1323
Date Prepared: 10/16/2007 1323

Analysis Batch: 400-57351
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 7089014.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	46.1	92	73 - 131	
1,1,2-Trichloroethane	50.0	49.5	99	80 - 116	
1,1-Dichloroethane	50.0	44.2	88	77 - 128	
1,1-Dichloroethene	50.0	44.1	88	79 - 117	
1,2-Dichloroethane	100	88.6	89	64 - 135	
1,2-Dichloropropane	50.0	48.1	96	84 - 117	
2-Butanone (MEK)	200	193	96	53 - 166	
2-Hexanone	200	181	90	60 - 164	
4-Methyl-2-pentanone (MIBK)	200	211	106	60 - 149	
Acetone	200	181	90	44 - 168	
Benzene	100	92.8	93	80 - 112	
Bromodichloromethane	50.0	46.5	93	78 - 122	
Bromoform	50.0	49.6	99	75 - 125	
Bromomethane	50.0	42.4	85	59 - 120	
Carbon disulfide	50.0	44.0	88	56 - 146	
Carbon tetrachloride	50.0	45.7	91	72 - 127	
Chlorobenzene	50.0	48.3	97	89 - 112	
Chloroethane	50.0	46.3	93	70 - 128	
Chloroform	50.0	45.3	91	73 - 128	
Chloromethane	50.0	47.8	96	62 - 125	
cis-1,2-Dichloroethene	50.0	44.4	89	84 - 120	
cis-1,3-Dichloropropene	50.0	49.1	98	84 - 116	
Dibromochloromethane	50.0	48.9	98	84 - 120	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	76 - 125	
Ethylbenzene	100	96.5	97	86 - 116	
Methylene Chloride	50.0	51.4	103	73 - 123	
m-Xylene & p-Xylene	200	194	97	87 - 117	
o-Xylene	100	97.9	98	89 - 116	
Styrene	50.0	53.7	107	80 - 122	
Tetrachloroethene	50.0	48.5	97	80 - 116	
Toluene	100	93.7	94	80 - 112	
trans-1,2-Dichloroethene	50.0	42.1	84	79 - 122	
trans-1,3-Dichloropropene	50.0	50.7	101	82 - 118	
Trichloroethene	50.0	47.6	95	88 - 114	
Vinyl acetate	100	93.9	94	30 - 168	
Vinyl chloride	50.0	46.2	92	68 - 128	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	100	82 - 114
Dibromofluoromethane	93	81 - 115
Toluene-d8 (Surr)	100	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 400-57426

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57426/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/17/2007 1639
Date Prepared: 10/17/2007 1639

Analysis Batch: 400-57426
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4021006.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	93	82 - 114
Dibromofluoromethane	98	81 - 115
Toluene-d8 (Surr)	98	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Lab Control Spike - Batch: 400-57426

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57426/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/17/2007 1713
Date Prepared: 10/17/2007 1713

Analysis Batch: 400-57426
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 4021008.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	50.5	101	73 - 131	
1,1,2-Trichloroethane	50.0	52.6	105	80 - 116	
1,1-Dichloroethane	50.0	49.8	100	77 - 128	
1,1-Dichloroethene	50.0	49.4	99	79 - 117	
1,2-Dichloroethane	50.0	51.0	102	64 - 135	
1,2-Dichloropropane	50.0	50.1	100	84 - 117	
2-Butanone (MEK)	200	247	123	53 - 166	
2-Hexanone	200	265	133	60 - 164	
4-Methyl-2-pentanone (MIBK)	200	263	132	60 - 149	
Acetone	200	225	113	44 - 168	
Benzene	50.0	50.3	101	80 - 112	
Bromodichloromethane	50.0	51.9	104	78 - 122	
Bromoform	50.0	57.9	116	75 - 125	
Bromomethane	50.0	50.4	101	59 - 120	
Carbon disulfide	50.0	49.6	99	56 - 146	
Carbon tetrachloride	50.0	51.1	102	72 - 127	
Chlorobenzene	50.0	50.1	100	89 - 112	
Chloroethane	50.0	47.4	95	70 - 128	
Chloroform	50.0	49.7	99	73 - 128	
Chloromethane	50.0	45.7	91	62 - 125	
cis-1,2-Dichloroethene	50.0	52.1	104	84 - 120	
cis-1,3-Dichloropropene	50.0	55.3	111	84 - 116	
Dibromochloromethane	50.0	54.8	110	84 - 120	
1,1,2,2-Tetrachloroethane	50.0	55.3	111	76 - 125	
Ethylbenzene	50.0	53.5	107	86 - 116	
Methylene Chloride	50.0	48.4	97	73 - 123	
m-Xylene & p-Xylene	100	107	107	87 - 117	
o-Xylene	50.0	55.4	111	89 - 116	
Styrene	50.0	50.7	101	80 - 122	
Tetrachloroethene	50.0	50.6	101	80 - 116	
Toluene	50.0	49.9	100	80 - 112	
trans-1,2-Dichloroethene	50.0	49.4	99	79 - 122	
trans-1,3-Dichloropropene	50.0	56.0	112	82 - 118	
Trichloroethene	50.0	50.9	102	88 - 114	
Vinyl acetate	100	103	103	30 - 168	
Vinyl chloride	50.0	48.0	96	68 - 128	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	102	82 - 114
Dibromofluoromethane	100	81 - 115
Toluene-d8 (Surr)	99	87 - 113

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

Method Blank - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-24011/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1335
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24045
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<2.0		0.21	2.0
Barium	0.27	J	0.15	0.50
Cadmium	<1.0		0.055	1.0
Chromium	<1.0		0.10	1.0
Lead	<0.50		0.21	0.50
Silver	<1.0		0.047	1.0

Method Blank - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-24011/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1706
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24082
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Chromium	<1.0		0.10	1.0
Selenium	<1.0		0.19	1.0

Method Blank - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: MB 510-24011/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1707
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24149
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Selenium	0.63	J	0.19	1.0

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

Lab Control Spike - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-24011/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1338
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24045
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	200	211	105	80 - 120	
Barium	200	202	101	80 - 120	
Cadmium	200	212	106	80 - 120	
Chromium	200	212	106	80 - 120	
Lead	200	206	103	80 - 120	
Silver	200	194	97	80 - 120	

Lab Control Spike - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-24011/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/08/2007 1709
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24082
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chromium	200	194	97	80 - 120	
Selenium	200	202	101	80 - 120	

Lab Control Spike - Batch: 510-24011

Method: 6020
Preparation: 3010A

Lab Sample ID: LCS 510-24011/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1711
Date Prepared: 10/08/2007 0830

Analysis Batch: 510-24149
Prep Batch: 510-24011
Units: ug/L

Instrument ID: TE ICPMS
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Selenium	200	210	105	80 - 120	

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-24011

Method: 6020
Preparation: 3010A

MS Lab Sample ID:	510-19035-14	Analysis Batch:	510-24149	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	510-24011	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/09/2007 1729			Final Weight/Volume:	50 mL
Date Prepared:	10/08/2007 0830				

MSD Lab Sample ID:	510-19035-14	Analysis Batch:	510-24149	Instrument ID:	TE ICPMS
Client Matrix:	Water	Prep Batch:	510-24011	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Date Analyzed:	10/09/2007 1732			Final Weight/Volume:	50 mL
Date Prepared:	10/08/2007 0830				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Selenium	103	102	75 - 125	0	20	B	B

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

Client: Burns & McDonnell

Job Number: 510-19035-1

Method Blank - Batch: 510-24078

Method: 7470A
Preparation: 7470A

Lab Sample ID: MB 510-24078/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1600
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<0.00020		0.000047	0.00020

Lab Control Spike - Batch: 510-24078

Method: 7470A
Preparation: 7470A

Lab Sample ID: LCS 510-24078/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1602
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078
Units: mg/L

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.00500	0.00524	105	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 510-24078

Method: 7470A
Preparation: 7470A
Dissolved

MS Lab Sample ID: 510-19035-8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1619
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 510-19035-8
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/09/2007 1621
Date Prepared: 10/09/2007 0840

Analysis Batch: 510-24118
Prep Batch: 510-24078

Instrument ID: Leeman Hydra AA
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	100	102	75 - 125	1	20		

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

3.4°C
TAKC 610

Burns & McDonnell SINCE 1898
021706 Form WCD-KC1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-9400 Fax: (816) 822-3494

Attention:

Laboratory: Test America Valparaiso
Address: 2400 Cumberland Drive
City/State/Zip: Valparaiso IN. 46383
Telephone: 219·464·2389

Document Control No:
Lab. Reference No. or Episode No.:

Project Number: 46619
Client Name: AK Steel

Sample Number: Group or SWMU Name	Sample Number: Sample Point	Sample Number: Sample Designator	Sample Event: Round	Sample Event: Year	Sample Depth (in feet): From	Sample Depth (in feet): To	Sample Collected: Date	Sample Collected: Time	Matrix: Liquid	Matrix: Solid	Matrix: Gas	Number of Containers	Analysis: 6020-3010A RCRA Metals	Analysis: 6020-Field Filtered RCRA Metals	Analysis: 7470A/7470A Prep Mercury	Analysis: 7470A-Field Filtered Mercury	Analysis: 8260B/5030B (MCD)		Remarks
SWMU 33	TB100307						100307	0700	X			2							Trip Blank 19035-1
	16D	GW4		2007			100307	1140	X			3					X		-2
	10S	GW4		2007			100307	1235	X			3					X		-3
	10D	GW4		2007			100307	1400	X			3					X		-4
	10D	GW4D		2007			100307	1400	X			3					X		-5
	14S	GW4		2007			100307	1535	X			3					X		-6
	14D	GW4		2007			100307	1630	X			3					X		-7
	11D	GW4		2007			100407	0835	X			5	X	X	X	X	X		-8
	9S	GW4		2007			100407	1000	X			3					X		-9
	8S	GW4		2007			100407	1200	X			3					X		-10
	3	GW4		2007			100407	1320	X			3					X		-11
	5S	~~GW4~~ GW4		2007			100407	1420	X			5	X	X	X	X	X		-12
	5S	GW4D		2007			100407	1420	X			5	X	X	X	X	X		-13
	5I	GW4		2007			100407	1530	X			5	X	X	X	X	X		-14
																			~~-5cc~~

Sampler (signature): Sam Woodall
Sampler (signature):

Special Instructions:

Relinquished By (signature): 1. Sam Woodall — Date/Time: 10-04-07 1600
Received By (signature): — Date/Time: 10-4-07 1420

Ice Present in Container: Yes ☐ No ☐
Temperature Upon Receipt:

Relinquished By (signature): 2. — Date/Time:
Received By (signature): Christine Connor — Date/Time: 10-5-07 1000

Laboratory Comments:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-19035-1

Login Number: 19035

List Source: TestAmerica Valparaiso

Creator: Conner, Christine A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	1 VIAL MISSING SAMPLE ID
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-19035-1

Login Number: 19035
Creator: Hedaria, Raven
List Number: 1

List Source: TestAmerica Pensacola
List Creation: 10/12/07 11:25 AM

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	4.1°C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

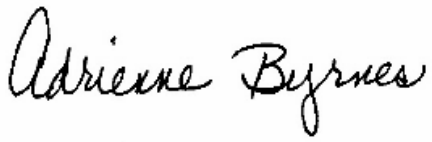
ANALYTICAL REPORT

Job Number: 510-19072-1

Job Description: AK Steel - Kansas City, MO

For:
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Attention: Ms. Sharon Shelton



Adrienne R Byrnes
Project Manager I
adrienne.byrnes@testamericainc.com
11/07/2007
Revision: 1

The test results in this report meet all NELAC requirements for parameters which accreditation is required or available. Any exceptions to NELAC requirements are noted in this report. Pursuant to NELAC, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the Project Manager who signed this test report. Valparaiso IL EPA Accreditation #100432.

Job Narrative
510-J19072-1

Comments
This report has been revised to correct reporting errors.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Burns & McDonnell Job Number: 510-19072-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds by GC/MS	TAL PEN	SW846 8260B	
Purge-and-Trap	TAL PEN		SW846 5030B

Lab References:

TAL PEN = TestAmerica Pensacola

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Burns & McDonnell

Job Number: 510-19072-1

Method	Analyst	Analyst ID
SW846 8260B	Lee, Jefferson	JL

SAMPLE SUMMARY

Client: Burns & McDonnell

Job Number: 510-19072-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
510-19072-1	TRIP BLANK	Water	10/05/2007 0700	10/06/2007 0955
510-19072-2	33 MW2s GW4	Water	10/05/2007 0825	10/06/2007 0955
510-19072-3	33 MW2 GW4	Water	10/05/2007 0910	10/06/2007 0955

Client: Burns & McDonnell | Job Number: 510-19072-1

Client Sample ID: **TRIP BLANK**

Lab Sample ID: 510-19072-1 | Date Sampled: 10/05/2007 0700
Client Matrix: Water | Date Received: 10/06/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57351 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 7089022.D
Dilution: 1.0 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1539 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1539

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	6.3	J	2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	0.94	J	0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	82 - 114
Dibromofluoromethane	102	81 - 115
Toluene-d8 (Surr)	98	87 - 113

Client: Burns & McDonnell | Job Number: 510-19072-1

Client Sample ID: **33 MW2s GW4**

Lab Sample ID: 510-19072-2 | Date Sampled: 10/05/2007 0825
Client Matrix: Water | Date Received: 10/06/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57351 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 7089024.D
Dilution: 10 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1614 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1614

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<50		5.0	50
1,1,2,2-Tetrachloroethane	<50		5.0	50
1,1,2-Trichloroethane	<50		5.0	50
1,1-Dichloroethane	<50		5.0	50
1,1-Dichloroethene	11	J	5.0	50
1,2-Dichloroethane	<50		5.0	50
1,2-Dichloropropane	<50		5.0	50
2-Butanone (MEK)	<250		15	250
2-Hexanone	<250		31	250
4-Methyl-2-pentanone (MIBK)	<250		18	250
Acetone	<250		27	250
Benzene	<10		2.0	10
Bromodichloromethane	<50		5.0	50
Bromoform	<50		5.8	50
Bromomethane	<50		7.3	50
Carbon disulfide	<50		5.0	50
Carbon tetrachloride	<50		5.0	50
Chlorobenzene	<50		5.0	50
Chloroethane	<50		5.0	50
Chloroform	<50		5.0	50
Chloromethane	<50		5.3	50
cis-1,2-Dichloroethene	1800		5.0	50
cis-1,3-Dichloropropene	<50		5.0	50
Dibromochloromethane	<50		5.0	50
Ethylbenzene	<50		5.0	50
Methylene Chloride	<50		8.1	50
m-Xylene & p-Xylene	<100		16	100
o-Xylene	<50		5.0	50
Styrene	<50		5.0	50
Tetrachloroethene	<50		5.0	50
Toluene	<50		5.0	50
trans-1,2-Dichloroethene	<50		5.0	50
trans-1,3-Dichloropropene	<50		5.0	50
Trichloroethene	1100		5.0	50
Vinyl acetate	<250		11	250
Vinyl chloride	150		5.0	50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	93	82 - 114
Dibromofluoromethane	98	81 - 115
Toluene-d8 (Surr)	97	87 - 113

Client: Burns & McDonnell | Job Number: 510-19072-1

Client Sample ID: **33 MW2 GW4**

Lab Sample ID: 510-19072-3 | Date Sampled: 10/05/2007 0910
Client Matrix: Water | Date Received: 10/06/2007 0955

8260B Volatile Organic Compounds by GC/MS

Method: 8260B | Analysis Batch: 400-57351 | Instrument ID: GC/MS
Preparation: 5030B | Lab File ID: 7089026.D
Dilution: 10 | Initial Weight/Volume: 5 mL
Date Analyzed: 10/16/2007 1648 | Final Weight/Volume: 5 mL
Date Prepared: 10/16/2007 1648

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,1,1-Trichloroethane	<50		5.0	50
1,1,2,2-Tetrachloroethane	<50		5.0	50
1,1,2-Trichloroethane	<50		5.0	50
1,1-Dichloroethane	11	J	5.0	50
1,1-Dichloroethene	5.1	J	5.0	50
1,2-Dichloroethane	<50		5.0	50
1,2-Dichloropropane	<50		5.0	50
2-Butanone (MEK)	<250		15	250
2-Hexanone	<250		31	250
4-Methyl-2-pentanone (MIBK)	<250		18	250
Acetone	<250		27	250
Benzene	<10		2.0	10
Bromodichloromethane	<50		5.0	50
Bromoform	<50		5.8	50
Bromomethane	<50		7.3	50
Carbon disulfide	<50		5.0	50
Carbon tetrachloride	<50		5.0	50
Chlorobenzene	<50		5.0	50
Chloroethane	<50		5.0	50
Chloroform	<50		5.0	50
Chloromethane	<50		5.3	50
cis-1,2-Dichloroethene	630		5.0	50
cis-1,3-Dichloropropene	<50		5.0	50
Dibromochloromethane	<50		5.0	50
Ethylbenzene	<50		5.0	50
Methylene Chloride	<50		8.1	50
m-Xylene & p-Xylene	<100		16	100
o-Xylene	<50		5.0	50
Styrene	<50		5.0	50
Tetrachloroethene	<50		5.0	50
Toluene	<50		5.0	50
trans-1,2-Dichloroethene	<50		5.0	50
trans-1,3-Dichloropropene	<50		5.0	50
Trichloroethene	270		5.0	50
Vinyl acetate	<250		11	250
Vinyl chloride	1500		5.0	50

Surrogate	%Rec	Acceptance Limits
4-Bromofluorobenzene	95	82 - 114
Dibromofluoromethane	101	81 - 115
Toluene-d8 (Surr)	98	87 - 113

DATA REPORTING QUALIFIERS

Client: Burns & McDonnell Job Number: 510-19072-1

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Client: Burns & McDonnell

Job Number: 510-19072-1

Method Blank - Batch: 400-57351

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 400-57351/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 1215
Date Prepared: 10/16/2007 1215

Analysis Batch: 400-57351
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 7089010.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result	Qual	MDL	RL
1,1,1-Trichloroethane	<5.0		0.50	5.0
1,1,2,2-Tetrachloroethane	<5.0		0.50	5.0
1,1,2-Trichloroethane	<5.0		0.50	5.0
1,1-Dichloroethane	<5.0		0.50	5.0
1,1-Dichloroethene	<5.0		0.50	5.0
1,2-Dichloroethane	<5.0		0.50	5.0
1,2-Dichloropropane	<5.0		0.50	5.0
2-Butanone (MEK)	<25		1.5	25
2-Hexanone	<25		3.1	25
4-Methyl-2-pentanone (MIBK)	<25		1.8	25
Acetone	<25		2.7	25
Benzene	<1.0		0.20	1.0
Bromodichloromethane	<5.0		0.50	5.0
Bromoform	<5.0		0.58	5.0
Bromomethane	<5.0		0.73	5.0
Carbon disulfide	<5.0		0.50	5.0
Carbon tetrachloride	<5.0		0.50	5.0
Chlorobenzene	<5.0		0.50	5.0
Chloroethane	<5.0		0.50	5.0
Chloroform	<5.0		0.50	5.0
Chloromethane	<5.0		0.53	5.0
cis-1,2-Dichloroethene	<5.0		0.50	5.0
cis-1,3-Dichloropropene	<5.0		0.50	5.0
Dibromochloromethane	<5.0		0.50	5.0
Ethylbenzene	<5.0		0.50	5.0
Methylene Chloride	<5.0		0.81	5.0
m-Xylene & p-Xylene	<10		1.6	10
o-Xylene	<5.0		0.50	5.0
Styrene	<5.0		0.50	5.0
Tetrachloroethene	<5.0		0.50	5.0
Toluene	<5.0		0.50	5.0
trans-1,2-Dichloroethene	<5.0		0.50	5.0
trans-1,3-Dichloropropene	<5.0		0.50	5.0
Trichloroethene	<5.0		0.50	5.0
Vinyl acetate	<25		1.1	25
Vinyl chloride	<5.0		0.50	5.0

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	93	82 - 114
Dibromofluoromethane	100	81 - 115
Toluene-d8 (Surr)	96	87 - 113

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

Client: Burns & McDonnell

Job Number: 510-19072-1

Lab Control Spike - Batch: 400-57351

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 400-57351/14
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 10/16/2007 1323
Date Prepared: 10/16/2007 1323

Analysis Batch: 400-57351
Prep Batch: N/A
Units: ug/L

Instrument ID: GC/MS
Lab File ID: 7089014.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
1,1,1-Trichloroethane	50.0	46.1	92	73 - 131	
1,1,2,2-Tetrachloroethane	50.0	47.8	96	76 - 125	
1,1,2-Trichloroethane	50.0	49.5	99	80 - 116	
1,1-Dichloroethane	50.0	44.2	88	77 - 128	
1,1-Dichloroethene	50.0	44.1	88	79 - 117	
1,2-Dichloroethane	100	88.6	89	64 - 135	
1,2-Dichloropropane	50.0	48.1	96	84 - 117	
2-Butanone (MEK)	200	193	96	53 - 166	
2-Hexanone	200	181	90	60 - 164	
4-Methyl-2-pentanone (MIBK)	200	211	106	60 - 149	
Acetone	200	181	90	44 - 168	
Benzene	100	92.8	93	80 - 112	
Bromodichloromethane	50.0	46.5	93	78 - 122	
Bromoform	50.0	49.6	99	75 - 125	
Bromomethane	50.0	42.4	85	59 - 120	
Carbon disulfide	50.0	44.0	88	56 - 146	
Carbon tetrachloride	50.0	45.7	91	72 - 127	
Chlorobenzene	50.0	48.3	97	89 - 112	
Chloroethane	50.0	46.3	93	70 - 128	
Chloroform	50.0	45.3	91	73 - 128	
Chloromethane	50.0	47.8	96	62 - 125	
cis-1,2-Dichloroethene	50.0	44.4	89	84 - 120	
cis-1,3-Dichloropropene	50.0	49.1	98	84 - 116	
Dibromochloromethane	50.0	48.9	98	84 - 120	
Ethylbenzene	100	96.5	97	86 - 116	
Methylene Chloride	50.0	51.4	103	73 - 123	
m-Xylene & p-Xylene	200	194	97	87 - 117	
o-Xylene	100	97.9	98	89 - 116	
Styrene	50.0	53.7	107	80 - 122	
Tetrachloroethene	50.0	48.5	97	80 - 116	
Toluene	100	93.7	94	80 - 112	
trans-1,2-Dichloroethene	50.0	42.1	84	79 - 122	
trans-1,3-Dichloropropene	50.0	50.7	101	82 - 118	
Trichloroethene	50.0	47.6	95	88 - 114	
Vinyl acetate	100	93.9	94	30 - 168	
Vinyl chloride	50.0	46.2	92	68 - 128	

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene	100	82 - 114
Dibromofluoromethane	93	81 - 115
Toluene-d8 (Surr)	100	87 - 113

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

Burns & McDonnell SINCE 1898

Request for Chemical Analysis and Chain of Custody Record

2.9

Burns & McDonnell Engineering
9400 Ward Parkway
Kansas City, Missouri 64114
Phone: (816) 333-8787 Fax: (816) 822-3463

Attention:

Laboratory: Test America Valparaiso
Address: 2400 Cumberland Drive
City/State/Zip: Valparaiso In 46383
Telephone: 219-464-2389

Document Control No:

Lab. Reference No. or Episode No.:

Project Number: 46609

Client Name: Ak Steel

Sample Type

Matrix

Sample Number			Sample Event		Sample Depth (in feet)		Sample Collected		Matrix			Number of Containers	Analysis							Remarks
Group or SWMU Name	Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas		6020-3050 RCRA Metals	6020 Field Filtered RCRA	7470A/7470A Prep Mercury	7470A Field Filtered Mercury	9060/5030B (MGP)			
	TB100507			2007			100507	0700				2					X			Trip Blank 19072-1
SWMW 33	MW 25	GW4		2007			100507	0825				3					X			-2
	MW2	GW4		2007			100507	0910				3					X			-3

Page 12 of 14

Sampler (signature): Scott Woodland

Sampler (signature):

Special Instructions:

Relinquished By (signature):	Date/Time	Received By (signature):	Date/Time
1.	10-05-07 1030		10/5/07 1030
Relinquished By (signature):	Date/Time	Received By (signature):	Date/Time
2.			10-6-07 0955

Ice Present in Container: Yes ☐ No ☐

Temperature Upon Receipt:

Laboratory Comments:

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-19072-1

Login Number: 19072

List Source: TestAmerica Valparaiso

Creator: Conner, Christine A

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Login Sample Receipt Check List

Client: Burns & McDonnell

Job Number: 510-19072-1

Login Number: 19072
List Source: TestAmerica Pensacola
Creator: Hedaria, Raven
List Creation: 10/12/07 11:22 AM
List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	4.1°C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	