Baseline Human Health Risk Assessment

Ash Pit 1 Plum Brook Ordnance Works
Sandusky, Ohio

Prepared for:

U.S. Army Corps of Engineers
P.O. Box 1070
Nashville, Tennessee 37202-1070

Prepared by:

Shaw Environmental & Infrastructure, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

FUDS Project No. G0OH001821
Shaw Project No. 132457

August 2011

Final

Table of Contents

Page

List of Tables iv
List of Figures v
List of Acronyms vi
Executive Summary ES-1
1.0 Introduction 1-1
1.1 Facility Location and Description 1-1
1.2 Facility History and Background 1-1
1.3 Ash Pit 1Description and History 1-3
1.4 Groundwater Use and Site Use 1-5
1.5 Protocol for the Baseline Human Health Risk Assessment 1-5
1.6 Report Organization 1-6
2.0 Data Evaluation 2-1
2.1 Data Sources 2-1
2.2 Sorting the Analytical Data 2-1
2.3 Evaluation of Data Quality 2-2
2.4 Identification of Chemicals of Potential Concern 2-3
2.4.1 Risk-Based Screening 2-3
2.4.2 Frequency of Detection 2-6
2.4.3 Comparison to Background 2-6
2.4.3.1 Background Screening of Inorganics 2-7
2.4.3.2 Statistical Data Set Testing of Inorganics 2-8
2.4.3.3 Treatment of Organic Compounds 2-8
2.5 Data Evaluation Summary 2-9
3.0 Exposure Assessment 3-1
3.1 Conceptual Site Exposure Model 3-1
3.1.1 Physical Setting 3-2
3.1.1.1 Climate/Meteorology 3-2
3.1.1.2 Geology 3-3
3.1.1.3 Soils 3-3
3.1.1.4 Hydrology 3-4

Table of Contents *(Continued)*

Page

3.1.1.5 Surface Water 3-5
3.1.2 Contaminant Sources, Release Mechanisms, and Migration Pathways 3-5
3.1.3 Receptors and Exposure Pathways 3-6
3.1.3.1 Current Groundskeeper 3-7
3.1.3.2 Future Groundskeeper 3-8
3.1.3.3 Indoor Worker 3-9
3.1.3.4 Construction Worker 3-10
3.1.3.5 On-Site Resident 3-12
3.1.3.6 Hunter 3-15
3.1.3.7 Hunter's Child 3-16
3.1.3.8 Other Receptors Not Considered 3-16
3.2 Quantification of Exposure-Point Concentrations 3-17
3.2.1 Soil, Groundwater, Surface Water, and Sediment Concentrations 3-17
3.2.2 Exposure-Point Concentrations in Air 3-19
3.2.2.1 COPC Concentrations from Dust 3-19
3.2.2.2 Concentrations in Household Air from Groundwater Use 3-21
3.2.2.3 Concentrations of VOCs in Groundwater: Resident Dermal Uptake 3-22
3.2.2.4 Exposure-Point Concentrations of COPCs in Venison 3-22
3.3 Quantification of Chemical Intake 3-24
3.3.1 Inhalation of COPCs in Air 3-24
3.3.2 Incidental Ingestion of COPCs in Soil or Sediment 3-25
3.3.3 Incidental Ingestion of COPCs in Water 3-25
3.3.4 Dermal Contact with COPCs in Soil, Sediment, or Water 3-26
3.3.5 Consumption of Venison 3-29
4.0 Toxicity Evaluation 4-1
4.1 Evaluation of Carcinogenicity 4-1
4.2 Evaluation of Noncarcinogenic Effects 4-4
4.3 Dermal Toxicity Values 4-5
4.4 Target Organ Toxicity 4-5
4.5 Sources of Toxicity Information Used in the Risk Assessment 4-6
5.0 Risk Characterization 5-1

Table of Contents *(Continued)*

Page

5.1 Cancer Risk 5-1
5.2 Noncancer Effects of Chemicals 5-3
5.3 Risk Characterization Results 5-4
5.3.1 Current Groundkeeper 5-5
5.3.2 Future Groundskeeper 5-5
5.3.3 Indoor Worker 5-9
5.3.4 Construction Worker 5-10
5.3.5 Resident 5-11
5.3.6 Adult Hunter 5-14
5.3.7 Hunter's Child 5-14
6.0 Uncertainty Analysis 6-1
6.1 Types of Uncertainty 6-1
6.2 Sources of Uncertainty 6-2
6.2.1 Sample Selection 6-2
6.2.2 Laboratory Analysis 6-2
6.2.3 Exposure-Point Concentration Estimates 6-2
6.2.4 Land-Use Assumptions/Receptor Selection 6-3
6.2.5 Exposure Assumption Values 6-4
6.2.6 Groundwater-to-Air Household Model 6-4
6.2.7 Toxicity Assessment 6-5
6.2.8 Risk Characterization 6-6
6.2.9 Evaluation of Selected COPCs for Site Relatedness 6-6
7.0 Summary, Conclusions, and Recommendations 7-1
7.1 Summary 7-1
7.2 Conclusions 7-2
7.3 Recommendations 7-3
8.0 References 8-1
Appendix A – Data Summary of Chemicals Detected in Overburden Groundwater Piezometers
Appendix B – ProUCL Output for Upper Confidence Limits on the Mean
Appendix C – Toxicological Profiles
Appendix D – Risk Characterization Spreadsheets
Appendix E – Analytical Data Used in Baseline Human Health Risk Assessment
Appendix F – Wilcoxon Rank Sum Statistical Test Output

List of Tables

Table	*Title*	*Follows Tab*
2-1	Summary of Samples Evaluated in the Baseline Human Health Risk Assessment	
2-2	Background Screening Concentrations of Inorganics in Soil	
2-3	Background Screening Concentrations of Inorganics in Groundwater	
2-4	Statistical Summary and Selection of Chemicals of Potential Concern in Surface Soil	
2-5	Statistical Summary and Selection of Chemicals of Potential Concern in Subsurface Soil	
2-6	Statistical Summary and Selection of Chemicals of Potential Concern in Total Soil	
2-7	Statistical Summary and Selection of Chemicals of Potential Concern in Bedrock Groundwater	
2-8	Statistical Summary and Selection of Chemicals of Potential Concern in Monitoring Well Overburden Groundwater	
2-9	Statistical Summary and Selection of Chemicals of Potential Concern in Sediment	
2-10	Statistical Summary and Selection of Chemicals of Potential Concern in Surface Water	
3-1	Receptor/Exposure Scenarios	
3-2	Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors	
3-3	Physical Properties of Site-Related Chemicals	
4-1	Summary of Toxicity Assessment	
5-1	Summary of Risk for All Receptors	
5-2	Summary of Risk for Receptors Excluding Exposure to Groundwater	

List of Figures

Figure	*Title*	*Follows Tab*
1-1	PBOW Vicinity Map	
1-2	Location of Ash Pit 1 at PBOW	
2-1	Ash Pit 1 Site Map with Sample Locations	
3-1	Human Health Conceptual Site Exposure Model	

List of Acronyms

ABS	dermal absorption factor
AF	soil-to-skin adherence factor
AP1	Ash Pit 1
bgs	below ground surface
BHHRA	baseline human health risk assessment
BSC	background screening concentration
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDI	chronic daily intake
cm/hour	centimeters per hour
cm^2	square centimeter
COPC	chemical of potential concern
CSEM	conceptual site exposure model
°F	degrees Fahrenheit
DA	dose absorbed per unit body surface area per day
D&M	Dames and Moore, Inc.
DM	dry matter
DNT	dinitrotoluene
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPC	exposure-point concentration
ET	exposure time
FI	fractional term
GAF	gastrointestinal absorption factor
gpm	gallons per minute
g	gram
g/kg-day	grams per kilogram of body weight per day
g/m^3	grams per cubic meter
GSA	General Services Administration
HHEM	human health evaluation manual
HI	hazard index
HQ	hazard quotient
IEUBK	Integrated Exposure Uptake Biokinetic
ILCR	incremental lifetime cancer risk
IRIS	Integrated Risk Information System

IT	IT Corporation
kg	kilogram
kg/day	kilograms per day
LBA	Locomotive Building Area
LMS	linearized multistage
K_p	permeability coefficient
L/cm^3	liters per cubic centimeter
L/day	liters per day
m^3	cubic meter
m^3/day	cubic meters per day
m^3/hr	cubic meters per hour
m^3/kg	cubic meters per kilogram
m/second	meters per second
MDC	maximum detected concentration
$\mu g/m^3$	micrograms per cubic meter
mg/cm^2	milligrams per square centimeter
mg/cm^2-day	milligrams per square centimeter per day
mg/m^3	milligrams per cubic meter
mg/day	milligrams per day
mg/kg	milligrams per kilogram
mg/kg-day	milligrams per kilogram per day
µg/L	micrograms per liter
mg/L	milligrams per liter
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NIOSH	National Institute for Occupational Safety and Health
OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PBOW	Plum Brook Ordnance Works
PEF	particulate emission factor
PEL	permissible exposure limit
ppm	parts per million
PRG	preliminary remediation goal
QC	quality control

RBSC	risk-based screening concentration
REL	recommended exposure limit
RfC	reference concentration
RfD	reference dose
RI	remedial investigation
RME	reasonable maximum exposure
RSL	regional screening level
SF	cancer slope factor
Shaw	Shaw Environmental, Inc.
TNT	trinitrotoluene
TNTA	TNT Area A
TNTB	TNT Area B
TNTC	TNT Area C
TWA	time-weighted average
UCL	95th percent upper confidence limit on the arithmetic mean
UF	uncertainty factor
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound
WRS	Wilcoxon Rank Sum

Executive Summary

A baseline human health risk assessment (BHHRA) was conducted to evaluate risks associated with exposure to soil, groundwater, surface water and sediment at Ash Pit 1 (AP1) at the Plum Brook Ordnance Works (PBOW), Sandusky, Ohio. The approach used in the BHHRA is consistent with methodologies described in the U.S. Environmental Protection Agency's primary risk assessment guidance documents, the site-specific work plan, and discussions and agreements between the Ohio Environmental Protection Agency, the U.S. Army Corps of Engineers Nashville and Huntington Districts, and Shaw Environmental, Inc.

Site History/Description. The PBOW facility was constructed on property comprising 9,009 acres in early 1941 as a manufacturing plant for 2,4,6-trinitrotoluene (TNT), 2,4-dinitroluene, and pentolite. Production of explosives at PBOW began in December 1941 and continued until 1945. It is estimated that more than 1 billion pounds of nitroaromatic explosives were manufactured during the 4-year operating period. After plant operations ceased, the manufacturing process lines were decontaminated by the Army in late 1945. After the property was certified as decontaminated, 3,230 acres of the property were initially transferred to the Ordnance Department, then to the War Assets Administration. In 1949, PBOW was transferred to the General Services Administration. The Department of the Army reacquired the 3,230 acres in 1954 and performed cleanup efforts from the mid-1950s until 1963.

Accountability and custody for the entire portion of the former PBOW property that had been under the accountability and custody of the Department of the Army were transferred to the National Aeronautics and Space Administration (NASA) on March 15, 1963. NASA performed further decontamination efforts during 1964. NASA has operated and maintained the former PBOW property since 1963, and the facility is currently the NASA Glenn Research Center, Plum Brook Station. NASA operates the property as a space research facility in support of their John Glenn Research Center at Lewis Field, Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site are currently on standby or inactive status.

Three power stations, Powerhouse 1, Powerhouse 2, and Powerhouse 3, were constructed and utilized to support the TNT manufacturing process. Each power station consisted of a main powerhouse, a coal storage area, and an aboveground fuel storage tank. The fuel storage tank was surrounded by a berm to contain any potential spills or leaks. Each powerhouse building consisted of a boiler house, compressor room, electrical room, filter room, and locker room. The buildings also contained two to four large coal-burning boilers, a turboelectric generator, a feed

water treatment system, and several steam-driven or electric air compressors. The powerhouses generated steam that was used for space heating, driving compressors, and generating electrical power. Coal ash waste from each of the boilers in the powerhouses was collected in pits. Water was added to the ash, producing a slurry that flowed through a sluice trench to an ash sump located at the end of each powerhouse. From the ash sump, the ash slurry traveled through a pipeline to a nearby surface water/ash impoundment, referred to as an "ash pit." AP1 was associated with Powerhouse 1.

AP1 is located just south of Maintenance Road, approximately 800 feet west of Taylor Road. The topography of AP1 is generally flat, sloping slightly downward toward the north. Currently, AP1 is largely covered with thickets of trees up to a height of approximately 15 feet. A frequently inundated, low-lying area is located within the northern boundary of AP1. A culvert is located immediately north of AP1, extending under Maintenance Road, which carries runoff from AP1 and Maintenance Road northward under the road and to a ditch on the north side of the road. A larger drainage ditch located west of AP1 contained water that reportedly flowed in a northeast direction. During site visits in October 2008 and April 2009, U.S. Army Corps of Engineers and Shaw personnel observed less than 2 feet of water in this ditch, and it did not appear to be flowing.

Approach. The BHHRA evaluated exposure to chemicals in , surface soil, subsurface soil, bedrock groundwater, overburden groundwater, surface water, and sediment for cancer risks and noncancer hazards. Only validated analytical data were used in the BHHRA. Validated analytical data are from samples collected during 2008 and 2009, as reported in the 2010 site characterization report, and those collected in 1999 and reported in the limited site investigation report.

The standard steps of risk assessment, including data analysis, exposure assessment, toxicity assessment, risk characterization, and uncertainty analysis, were executed in the AP1 BHHRA. A screening for chemicals of potential concern (COPC), which is part of the data analysis, was used to focus the evaluation on those chemicals most likely to present a risk to potentially exposed individuals. The protocol established for background screening (a component of COPC screening) of PBOW sites differs from the current Ohio Environmental Protection Agency guidance as described in Section 2.4.3.1 of this report. Each COPC in each medium was evaluated for exposure via the relevant exposure pathways and the resultant risk and hazards were estimated. One or more COPCs were found in each AP1 environmental medium. The receptors listed below were evaluated for exposure to the COPCs and their associated hazards and risks. The media evaluated for each receptor are shown in parentheses.

- Current groundskeeper (surface soil)
- Future groundskeeper (combined surface and subsurface soil [referred to as "total soil"], bedrock groundwater, overburden groundwater)
- Indoor worker (surface soil, subsurface soil [air pathway only], bedrock groundwater, overburden groundwater)
- Construction worker (total soil, surface water, sediment)
- On-site resident (total soil, surface water, sediment, bedrock groundwater, overburden groundwater)
- Hunter (surface soil)
- Hunter's child (surface soil [venison pathway only]).

Note that there is currently no groundskeeper at AP1, but the current groundskeeper is included because current land use does not prohibit the presence of a groundskeeper or other on-site workers. Even though hunting is not currently permitted at AP1, hunting is permitted in other areas within PBOW; therefore, future use of AP1 for hunting is evaluated in this BHHRA. No construction is planned for AP1, but a construction worker is assumed to be potentially exposed under current or future land use. The future groundskeeper, indoor worker, and resident are evaluated for future land use; these three receptors are also evaluated assuming groundwater use as potable water. Overburden groundwater and bedrock groundwater are evaluated for each receptor separately.

Results/Conclusions. Risks were characterized for each COPC identified in each medium for the relevant receptors. Noncancer hazards were evaluated against a target hazard index (HI) criterion of 1 and the PBOW team target incremental lifetime cancer risk (ILCR) of 1E-5 (i.e., 1 additional incidence of cancer per 100,000 individuals exposed). Cancer risk results are also compared to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) acceptable cancer risk range of 1E-6 to 1E-4 (i.e., a rate of 1 additional incidence of cancer per 1,000,000 to 1 in 10,000 individuals exposed), which is referred to herein as the "NCP risk management range."

The overall HI and ILCR values are summarized in the following bullets; exceedances of PBOW cancer risk criteria (ILCR>1E-5) are shown as bold and exceedances of the noncancer hazard criterion (HI>1) or the NCP risk management range (1E-6 to 1E-4) are shown as bold italics:

- Current groundskeeper: ILCR = 5E-6; HI = 0.21
- Future groundskeeper – bedrock groundwater use: ***ILCR = 9E-4; HI = 11***
- Future groundskeeper – overburden groundwater use: ILCR = 2E-6; ***HI = 15***
- Future groundskeeper – excluding groundwater use: ILCR = 2E-6; HI = 0.2 (excluding background-related manganese [inhalation pathway])

- Indoor worker – bedrock groundwater use: ***ILCR = 8E-4; HI = 9***
- Indoor worker – overburden groundwater use: ILCR = 1E-6; ***HI = 13***
- Future indoor worker – excluding groundwater use: ILCR = 1E-6; HI = 0.008

- Construction worker: ILCR = 8E-7; HI = 0.9 (excluding background-related manganese [inhalation pathway])

- Resident – bedrock groundwater use: ***ILCR = 6E-3***; ***child HI = 135***; ***adult HI = 58***
- Resident – overburden groundwater use: ILCR = 9E-6; ***child HI = 82***; ***adult HI = 35***
- Resident – excluding groundwater use: ILCR = 9E-6; child HI = 0.7; adult HI = 0.1
- Hunter: ILCR = 3E-7; HI = 0.0009
- Hunter's child: None of the COPCs are bioaccumulative; risks and hazards are assumed to be de minimis.

The ILCR of the AP1 future groundskeeper, indoor worker, and resident that is hypothetically assumed to use bedrock groundwater as household tap water exceeds the NCP risk management range as well as the PBOW target cancer risk criterion. The HI values of these receptors, if assumed to use either the bedrock or overburden groundwater as a potable source, also exceed the target criterion of 1, indicating that adverse human health risks cannot be regarded as unlikely to occur under these hypothetical scenarios. Cancer risks and noncancer hazards to all other potential AP1 receptors evaluated under current or future land use are within or less than the NCP risk management range, are less than the target HI criterion, and are less than the PBOW cancer risk criterion, indicating that cancer risks are at acceptable levels and adverse noncancer effects are unlikely to occur under potential current scenarios. These conclusions also apply to the future groundskeeper, indoor worker, and resident not assumed to use bedrock or overburden groundwater. Note that even though the current groundskeeper is used to represent a maximum exposure under current potential land use (i.e., NASA control), there does not appear to have been any groundskeeping activities at AP1 during recent decades, except in the extreme northern portion of the site immediately adjacent to Maintenance Road.

The cancer risks and cancer hazards associated with bedrock groundwater are nearly entirely attributable to natural petroleum-related compounds and arsenic. The noncancer hazards associated with overburden groundwater are due to manganese and thallium from upgradient well AP1-MW01 (thallium was detected only in one sample); it is unclear if these concentrations

are due to former site activities. Use of either the overburden or bedrock groundwater is regarded as implausible because of insufficient yield. Additionally, the naturally poor quality of the bedrock groundwater and associated hydrogen sulfide off-gassing make it unsuitable as a potable source. The readily available municipal water supply obviates the need for use of groundwater as a potential source of tap water in the general vicinity of PBOW.

Recommendations. No remedial actions or further investigation of AP1 media are recommended. If the contributions of exposure to groundwater and apparent background-related manganese are duly excluded, none of the AP1 receptors had ILCRs or HIs that exceed the PBOW target criteria or the NCP risk management range. This indicates that the associated environmental media at AP1 are unlikely to pose an unacceptable cancer risk to any receptor and that exposure to these media is unlikely to result in adverse noncancer health effects for any human receptor. Because groundwater use is not regarded as plausible based on insufficient yield in both the overburden and bedrock units, the risks associated with AP1 groundwater are accordingly implausible. The naturally poor quality of the AP1 bedrock groundwater further increases the implausibility of bedrock groundwater use.

It is noted that the screening level ecological risk assessment for AP1 recommends no further investigation or other actions based on ecological concerns. Therefore, no further investigation or other actions are recommended at AP1 based on either human health or ecological receptors.

1.0 Introduction

This baseline human health risk assessment (BHHRA) evaluates potential human health risks associated with exposure to soil, groundwater, surface water, and sediment associated with Ash Pit 1 (AP1) located at the former Plum Brook Ordnance Works (PBOW), Sandusky, Erie County, Ohio. This work is being conducted for the U.S. Army Corps of Engineers (USACE) under the Defense Environmental Restoration Program-Formerly Used Defense Sites, managed by the USACE Huntington District, and technically overseen by the USACE Nashville District.

This BHHRA is consistent with U.S. Environmental Protection Agency (EPA) guidance and with the procedures established in the BHHRA for TNT Area A (TNTA) and TNT Area C (TNTC) soil (IT Corporation [IT], 2001a), the BHHRA for groundwater at PBOW (Shaw Environmental, Inc. [Shaw], 2006) and, most specifically, the AP1 and Ash Pit 3 BHHRA work plan (Shaw, 2009).

In this BHHRA, the term "facility" refers to the entire former PBOW property, and the term "site" refers to areas within PBOW under investigation, in this case AP1.

1.1 Facility Location and Description

PBOW is located approximately 4 miles south of Sandusky, Ohio, and 59 miles west of Cleveland (Figure 1-1). Although located primarily in Perkins and Oxford Townships, the eastern edge of the facility extends into Huron and Milan Townships. PBOW is bounded on the north by Bogart Road, on the south by Mason Road, on the west by Patten Tract Road, and on the east by U.S. Highway 250. The areas surrounding PBOW are mostly agricultural and residential. The facility is currently surrounded by a chain-link fence, and the perimeter is regularly patrolled. Access by authorized personnel is limited to established checkpoints. Public access is restricted. Hunting is allowed by permit on portions of PBOW during the annual deer hunting season.

1.2 Facility History and Background

The PBOW facility was constructed on property comprising 9,009 acres in early 1941 as a manufacturing plant for 2,4,6-trinitrotoluene (TNT), 2,4-dinitroluene (DNT), and pentolite (USACE, 1995). Production of explosives at PBOW began in December 1941 and continued until 1945. It is estimated that more than 1 billion pounds of nitroaromatic explosives were manufactured during the 4-year operating period. The three explosive manufacturing areas were

designated TNTA, TNT Area B (TNTB), and TNTC. Twelve process lines were used in the manufacture of TNT: four lines at TNTA, three lines at TNTB, and five lines at TNTC.

After plant operations ceased, the manufacturing process lines were decontaminated by the Army in late 1945. During decontamination, all structures, equipment, and manufacturing debris were either removed and salvaged or removed and burned. After the property was certified as decontaminated, 3,230 acres of the property were initially transferred to the Ordnance Department, then to the War Assets Administration. In 1949, PBOW was transferred to the General Services Administration (GSA). This transfer did not include the Plum Brook Depot area, which consists of 2,800 acres. The Department of the Army reacquired the 3,230 acres in 1954. In 1955, the Army completed further decontamination of the manufacturing process lines. This effort included removal of contaminated surface and subsurface soil around the building and wooden and ceramic waste disposal lines containing TNT. Thousands of pounds of TNT were discovered in catch basins; this TNT was removed and burned at the burning grounds. The Army continued cleanup efforts until 1963.

Two property use agreements were entered into by the Army and the National Advisory Committee of Aeronautics, the predecessor of the National Aeronautics and Space Administration (NASA), in 1956 and 1958, respectively. Accountability and custody for the entire portion of the former PBOW property (6,030 acres) that had been under the accountability and custody of the Department of the Army were transferred to NASA on March 15, 1963. NASA performed further decontamination efforts during 1964. The NASA decontamination process included removing contaminated surface soil above the drain tiles, flumes, etc.; destruction of all buildings by fire; then removal of all soil, debris, sumps, and above-grade portions of concrete foundations. Portions of the concrete foundations located below grade were left buried, and some that had been previously slightly above grade were covered with fill material. All materials, including the soil in those areas, were flashed; the area was then rough-graded. The decontamination process was also to have included the burning of excavated nitroaromatic-filled flumes (Dames & Moore, Inc. [D&M], 1997).

NASA has operated and maintained the former PBOW property since 1963, and the facility is currently the NASA Glenn Research Center, Plum Brook Station. NASA operates the property as a space research facility in support of their John H. Glenn Research Center at Lewis Field, Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site are currently on standby or inactive status. On April 18, 1978, NASA declared approximately 2,152 acres of PBOW as excess. This excess included former buffer areas that had not been used by the Army and were thus not subject to decontamination efforts. The Perkins Township Board of

Education acquired 46 acres of the excess acreage and uses this area as a bus transportation area. The GSA retains ownership of the remaining excess acreage and currently has a use agreement with the Ohio National Guard for 604 acres of this land. The details of land transactions are listed in the Site Management Plan (USACE, 1995).

1.3 Ash Pit 1 Description and History

As noted previously, PBOW was built in early 1941 and manufactured TNT, DNT, and pentolite until 1945. Three power stations, Powerhouse 1, Powerhouse 2, and Powerhouse 3, were constructed and utilized to support the TNT manufacturing process. Each power station consisted of a main powerhouse, a coal storage area, and an aboveground fuel storage tank. The powerhouse buildings also contained two to four large coal-burning boilers, a turboelectric generator, a feed water treatment system, and several steam-driven or electric air compressors. The powerhouses generated steam that was used for space heating, driving compressors, and generating electrical power. Coal ash generated from each of the boilers in the powerhouse was collected in pits. Water was added to the ash, producing a slurry that flowed through a sluice trench to an ash sump located at the end of each powerhouse. From the ash sump, the ash slurry traveled through a pipeline to a nearby surface water/ash impoundment, referred to as an "ash pit" (USACE, 1995). AP1 was associated with Powerhouse 1, and its location is shown on Figure 1-2.

The topography of AP1 is generally flat, sloping slightly toward Maintenance Road, which forms the northern border. During a 2009 site reconnaissance by USACE and Shaw personnel, AP1 was observed to be covered with thickets of trees (primarily gray dogwood [*Cornus racemosa*]) at an average height of approximately 15 feet. NASA informed Shaw/USACE that an underground high-voltage utility line bisected AP1 in a north-south direction and an underground telephone line was present approximately 5 feet south and parallel to Maintenance Road. A culvert under Maintenance Road and an associated drainage ditch approximately 5 feet due north of AP1 were observed. The culvert receives runoff from Maintenance Road, and possibly from AP1, and drains to the north under Maintenance Road. A larger drainage ditch located west of AP1 contained standing water that apparently flows in a northeast direction when heavy precipitation occurs. During site visits in October 2008 and April 2009, USACE and Shaw personnel observed water in this ditch, but it did not appear to be flowing. A low-lying, frequently inundated area was observed in the western portion of AP1, adjacent to the northern boundary. Standing water was also observed in the north edge of AP1 during April 2009 reconnaissance, especially in ruts made by vehicles and other equipment along Maintenance Road. This standing water was not observed during site visits in September or October 2008.

1.4 Groundwater Use and Site Use

Two groundwater aquifer systems are utilized for drinking water in the region: a carbonate aquifer to the west and a shale aquifer to the east (Shaw, 2005). PBOW is located within the transition of the two systems. Upwards of 170 private drinking water wells permitted by the Erie County Health Department are located within 4 miles of PBOW. Groundwater is not used on the PBOW facility. Permits are not required for agricultural wells. The Erie County Health Department does not permit using surface water as private drinking water. A shallow discontinuous and variably saturated groundwater system exists within the unconsolidated material atop the bedrock under much of the site.

Current use of the PBOW facility is classified as industrial for the purpose of identifying plausible human receptors and exposure pathways for evaluation in the BHHRA. D&M (1997) describes potential future uses of all or portions of the facility as follows:

- Industrial use (NASA activities and programs) may continue.
- Portions of the site may be used for recreation by hunters and fishermen.
- Portions of the site may be sold to state or local government or private individuals (no land-use restrictions were mentioned).
- Parts of the facility may be used in the future for residential or agricultural purposes.
- Parts of the facility may be used for training by the National Guard.
- Construction activities may be performed during development of any of the sites.

In summary, future site uses of AP1 are considered to be industrial or residential for the purpose of developing receptor and exposure scenarios. There are no current NASA activities at AP1, but because PBOW is under NASA control, the potential for NASA activities at AP1 exists. Even though hunting is not currently permitted at AP1, hunting is permitted in other areas within PBOW; therefore, future use of AP1 for hunting is evaluated in this BHHRA. It is conservatively assumed for purposes of this BHHRA that groundwater may be developed as a source of potable water in the future. Refer to Section 3.1.3 for a discussion of receptors and exposure scenarios.

1.5 Protocol for the Baseline Human Health Risk Assessment

The BHHRA was performed consistent with the AP1 and Ash Pit 3 BHHRA work plan (Shaw, 2009). The AP1 BHHRA work plan was developed consistent with previous PBOW BHHRAs and is based on EPA, USACE, and Ohio Environmental Protection Agency (OEPA) guidance, including, but not limited to, the following:

- Ohio Environmental Protection Agency (OEPA), 2009a***, Use of U.S. EPA's Regional Screening Levels as Screening Values in Human Health Risk Assessments***, Technical Decision Compendium, Division of Emergency and Remedial Response, August.

- Ohio Environmental Protection Agency (OEPA), 2009b***, Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for the DERR Remedial Response Program***, Technical Decision Compendium, Division of Emergency and Remedial Response, August.

- U.S. Army Corps of Engineers (USACE), 1999, ***Risk Assessment Handbook, Volume I: Human Health Evaluation***, Engineer Manual EM 200-1-4.

- U.S. Environmental Protection Agency (EPA), 1989a, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)***, Interim Final, Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002.

- U.S. Environmental Protection Agency (EPA), 1991a, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors***, Interim Final, Office of Solid Waste and Emergency Response, OSWER Directive: 9285.6-03.

- U.S. Environmental Protection Agency (EPA), 1992, ***Guidance on Risk Characterization for Risk Managers and Risk Assessors***, Memorandum from F. Henry Habicht II, Deputy Administrator, to Assistant Administrators, Regional Administrators, February.

- U.S. Environmental Protection Agency (EPA), 1997a, ***Exposure Factors Handbook***, Office of Research and Development, National Center for Environmental Assessment, Washington, D.C., EPA/600/P-95/002Fa, August.

- U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.

- U.S. Environmental Protection Agency (EPA), 2004a, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

- U.S. Environmental Protection Agency (EPA), 2010a, ***ProUCL Version 4.00.05***, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, February, on line at http://www.epa.gov/esd/tsc/form.htm.

- U.S. Environmental Protection Agency (EPA), 2010b, ***ProUCL Version 4.00.05 Technical Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, EPA/600/R-07/041, May.

- U.S. Environmental Protection Agency (EPA), 2010c, ***ProUCL Version 4.00.04 User Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, EPA/600/R-07/038, May.

1.6 Report Organization

The remainder of this document is organized as follows:

- ***Chapter 2.0, Data Evaluation.*** Identifies data sources, evaluates data quality, identifies chemicals of potential concern (COPC), and provides a background screening and evaluation protocol. It is noted that the background screening protocol differs from the current OEPA (2009c) guidance as explained in Section 2.4.3.

- ***Chapter 3.0, Exposure Assessment.*** Presents a conceptual site exposure model (CSEM), including contaminant sources, contaminant release mechanisms, receptors, and exposure pathways; describes exposure-point concentrations (EPC); and presents methods for calculating chemical intake and contact rates.

- ***Chapter 4.0, Toxicity Evaluation.*** Describes the potential for cancer and/or noncancer human health effects, provides an estimate of the quantitative relationship between the magnitude of dose or contact rate and the probability and/or severity of adverse effects, identifies the toxicity values that are used in the BHHRA, and describes the development of dermal toxicity values.

- ***Chapter 5.0, Risk Characterization.*** Combines the output of the exposure assessment and toxicity assessment to quantify the risk to each receptor at each site. Risks associated with exposure to all appropriate media for each site are evaluated.

- ***Chapter 6.0, Uncertainty Analysis.*** Identifies uncertainties in all phases of the BHHRA and discusses their individual effects on the risk assessment results, focusing on those issues that are most likely to have the greatest effect on risk estimates and/or risk management decisions.

- ***Chapter 7.0, Summary, Conclusions, and Recommendations.*** Provides a brief summary of the BHHRA, including quantitative results, uncertainties, and pertinent site information. Summary and discussion is focused on those results and issues that are most likely to directly affect site management decisions. Recommendations of the BHHRA, as well as those of the entire remedial investigation (RI) process, are presented in this section.

- ***Chapter 8.0, References.*** Presents the references used in the preparation of this document.

2.0 Data Evaluation

Data evaluation consists of a description of the appropriate data sources for each environmental medium sampled for AP1, a discussion of data quality, a description of the methodology used for identification of the COPCs, and a summary of the COPCs for each AP1 environmental medium.

2.1 Data Sources

All soil, groundwater, sediment, and surface water samples from which the validated analytical data used in the BHHRA were derived are presented in Table 2-1. These data include surface soil, subsurface soil, overburden groundwater monitoring well samples, bedrock groundwater samples, surface water, and sediment, and overburden and bedrock groundwater monitoring well samples.

The sample summary table identifies each sample used in the BHHRA and the associated analytical suite. Samples included those collected as part of the limited site investigation for AP1 (USACE, 2000), and the RI samples (Shaw, 2010a). All AP1 sampling locations are shown on Figure 2-1.

2.2 Sorting the Analytical Data

Prior to initiation of BHHRA calculations, a database of chemicals present in site samples was compiled for each environmental medium. This database includes all chemicals detected as described in the RI report (Shaw, 2010a) and the limited site investigation report (USACE, 2000). The surface soil and subsurface soil are considered separate media. Surface and subsurface soil data are typically combined to assess exposures under the construction worker, future groundskeeper, and residential site use scenarios, which would likely occur after surface and subsurface soil had been excavated and/or mixed. Combined surface and subsurface soil data are termed “total soil” in the BHHRA. However, it is understood that a reference to the evaluation of exposure to total soil is actually an evaluation of exposure to both surface soil and subsurface soil. The total soil COPC list is created by combining the list of COPCs identified in surface and subsurface soil. If a chemical is either a surface soil COPC or a subsurface soil COPC (or both), then that chemical is a total soil COPC. The EPCs for total soil are typically generated from the combined data sets.

Surface soil is defined as samples collected from within the interval of 0 to 1 foot bgs, and subsurface soil is defined as samples collected from depths greater than 1 foot bgs per the RI work plan (Shaw, 2008a). The limited site investigation (USACE, 2000) historical surface soil

samples were collected from a depth of either 0 to 0.5 or 0.1 foot bgs, or in one case (PBOW99SSA101), at an unspecified depth range near the surface at AP1. The only limited site investigation sample that was collected below a depth of 1 foot bgs (PBOW99SBA103B) was collected at a depth range of 1 to 4 feet bgs. As possible, the RI subsurface soil samples were generally collected at depths of 3 to 5 and 8 to 10 feet bgs at AP1. Where refusal or the water table was encountered before a depth of 10 feet bgs, samples were collected from the deepest 2-foot interval above the water table.

2.3 Evaluation of Data Quality

The quality of the analytical data was evaluated to select data for inclusion in the BHHRA. Data quality is expressed by the assignment of qualifier codes during the analytical laboratory quality control (QC) process or during third-party data evaluation. Some of the more common qualifiers and their meanings are as follows (EPA, 1989a):

U - Chemical was analyzed for but not detected; the associated value is the sample quantitation limit.

J - Value is estimated, usually below the reporting limit.

N - The analysis indicates an analyte for which there is presumptive evidence to make a tentative identification.

NJ - The analysis indicates a “tentatively identified analyte” and the reported value represents its approximate concentration.

UJ - The analyte was not detected above the reporting limit. However, the reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - QC indicates that the data are unusable (chemical may or may not be present).

B - The concentration in the sample is not sufficiently higher than concentration in the blank, using the 5-times, 10-times (5x, 10x) rule, which states that a chemical is considered a nondetect unless its concentration exceeds 5 times the blank concentration. For common laboratory contaminants (acetone, 2-butanone [methyl ethyl ketone], methylene chloride, toluene, and the phthalate esters), the sample concentration must exceed 10 times the blank concentration to be considered a detection.

“J,” “N,” and “NJ” qualified data are treated in the BHHRA as detected concentrations; “R” data and “B” qualified chemical data are not used. “U” qualified data (nondetects) are treated in the BHHRA as nondetections. The use of data with other, less common qualifiers is evaluated on a

case-by-case basis. Generally, data for which the identity of the chemical is unclear are not used in the BHHRA. If confidence is reasonably high that the chemical is present, but the actual concentration is somewhat in question, the data generally are used in the BHHRA.

Some chemicals may be analyzed under two different analytical programs. For example, the DNT isomers are analyzed by EPA Method 8330 for nitroaromatics as well as EPA Method 8270C for semivolatile organic compounds. Risks associated with the reported values from both analyses are considered in the risk characterization (Chapter 5.0) and discussed as appropriate in the uncertainty analysis (Chapter 6.0), together with potential issues such as the relative sensitivities (i.e., differences in respective reporting limits) of the methods.

2.4 Identification of Chemicals of Potential Concern

A screening process is used to identify COPCs, which are the detected chemical analytes carried through the full risk assessment process. The objectives of COPC screening are to focus the risk assessment on those chemicals that may contribute significantly to overall risk and to remove from quantification those chemicals whose contribution is clearly inconsequential. COPC screening includes a risk-based screen which also considers status as a human nutrient (Section 2.4.1), a frequency-of-detection evaluation (Section 2.4.2), and a background screen (Section 2.4.3).

2.4.1 Risk-Based Screening

In the risk-based screen, the maximum detected concentration (MDC) of a chemical in a given medium is compared to the appropriate risk-based screening concentration (RBSC) for that chemical and medium. This is performed for each chemical in each medium. The units of the MDC and RBSC are the same for each chemical in a given medium. In groundwater, for example, both the MDC and RBSC have units of micrograms per liter (µg/L) in water.

If the MDC of a chemical is less than or equal to its RBSC, then the chemical is not considered further in the BHHRA for this medium because it is very unlikely that chemical concentrations at or below the RBSC would contribute substantially to risk. An analyte may be identified as a COPC if its MDC exceeds its RBSC. As indicated in Section 2.4, actual status as a COPC also depends on a chemical's frequency of detection (Section 2.4.2), concentration with respect to background (Section 2.4.3), and potential status as a nutrient. Groundwater RBSCs used in the BHHRA are derived from the Oak Ridge National Laboratory–EPA regional screening level (RSL) table "tap water" values, and RBSCs for soil are derived from "residential soil" RSL values (EPA, 2010d). This is a change in the source of the RBSCs for PBOW BHHRA work plans begun prior to March 2009 based on discussion between USACE and OEPA (2009d), and

this change is consistent with recent OEPA (2009a) guidelines. Previously, the groundwater and soil RBSCs were derived from the corresponding EPA (2004b) Region 9 preliminary remediation goals (PRG). The soil RBSCs are applied to both surface and subsurface soil.

RSL values are based on a concentration equal to either an incremental lifetime cancer risk (ILCR) of 1E-6 or a noncancer hazard quotient (HQ) of 1, the threshold at (or below) which adverse noncancer effects are regarded as unlikely to occur. For the BHHRA, the noncancer values listed in the RSL tables are multiplied by a factor of 0.1 to provide additional protection for simultaneous exposure to multiple chemicals (OEPA, 2009a; EPA, 2010d). This results in RBSC values associated with an HQ of 0.1. For cancer risk, the RSL values based on an ILCR of 1E-6 were used directly as RBSCs in the BHHRA. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) identifies acceptable exposure levels that are generally associated with concentration levels that represent an excess upper bound lifetime cancer risk to an individual of 1E-6 to 1E-4 (EPA, 1990). This range is hereinafter referred to as the "NCP risk management range." Cancer risks associated with RSL values represent the lower end of this range. The OEPA recognizes an overall cancer risk of 1E-5, which represents the logarithmic midpoint of the EPA risk management range, as a remedial goal (OEPA, 2009b). The RBSC for a chemical that elicits both cancer and noncancer health effects is selected based on either a cancer risk of 1E-6 or an HQ of 0.1, whichever associated concentration is lower.

Risks associated with exposure to sediment and surface water along the unnamed tributary to Plum Brook to the west of AP1 are also evaluated in the BHHRA. Although RSLs have not been developed specifically for sediment and surface water, RBSCs can be derived from the RSLs based on site conditions at PBOW and the types of exposure to these media that may reasonably be anticipated. The routes by which receptors may be exposed to sediment (i.e., incidental ingestion, dermal contact) are similar to those by which receptors may be exposed to soil. However, sediment contact is expected to be appreciably less intense than soil contact, due to the lower duration and frequency of contact with sediment as compared with soil. Similarly, surface water exposure is expected to be much less intense than exposure to groundwater, as surface water from AP1 is not regarded as a plausible source of drinking water, partly because the Erie County Health Department does not permit using surface water as private drinking water. Consequently, the exposure frequency is expected to be much lower for surface water, and the incidental ingestion of surface water would be much lower than the assumed intentional ingestion and use of groundwater from the tap. For these reasons, OEPA (1999) stated that unadjusted tap water PRG values (i.e., HQ = 1; ILCR = 1E-6) should be used for screening PBOW surface water. This screening protocol was adopted specifically because it was agreed that the magnitude of exposure associated with PBOW surface water exposure would be far less

than that associated with household tap water. In other words, it was agreed that analytes with a maximum concentration at the PRG level would not contribute appreciably to overall risks and hazards for PBOW sites based on the exposure pathways of the surface water exposure scenarios for PBOW. The same agreement was reached for screening sediment against unadjusted residential soil PRGs. This protocol has been updated to base RBSCs on RSLs rather than PRGs. Even though the sediment and surface water RBSCs are an order of magnitude higher for noncarcinogens than the respective soil and groundwater RBSCs, these sediment and surface water RBSCs are regarded as protective of sediment and surface water receptors for screening because of the lower exposure rate to these media. Note that this previously made PBOW Team agreement for screening surface water and sediment (OEPA, 1999), which considered site-specific conditions, takes precedence over current OEPA (2009c) guidance, which simply states that adjusted RSLs (i.e., RBSCs) for soil may be used to screen contaminants in sediment, and those for groundwater may be used to screen surface water. The surface water RBSCs also meet the outside-of-the-mixing-zone average non-drinking water concentrations for the Lake Erie Basin.

The screening of lead in soil and groundwater is a special case. The EPA (2009) Office of Water treatment technique action level of 15 µg/L for lead is listed in the RSL table, and the RSL User's Guide recommends this level for use as an RSL. Lead exposure and risk is evaluated separately from other chemicals using the EPA (2004c) Integrated Exposure Uptake Biokinetic (IEUBK) model. The selection of the action level as the drinking water RSL is based partly on IEUBK model. Section 5.2 of the RSL User's Guide states that if the average tap water concentration exceeds 15 µg/L and the average soil concentration exceeds a value of 250 milligrams per kilogram (mg/kg), then more than the IEUBK target (EPA, 2004c) of 5 percent of the population of exposed children would exceed 10 micrograms per deciliter of lead in blood. Because an RSL of 15 µg/L sufficiently screens for a potential average concentration of 15 µg/L, the RSL of 15 µg/L is used as the RBSC. However, it is possible that the residential soil RSL of 400 mg/kg, which is selected as the soil RBSC, may not screen for an average soil concentration of 250 mg/kg within a given data set. Therefore, the following conditions were placed on the screening of lead: 1) If either the soil RBSC or groundwater RBSC is exceeded, then the IEUBK blood-lead model is run using both average soil and groundwater concentrations, and 2) if the average soil concentration exceeds 250 mg/kg, then the IEUBK model is run, even if neither RBSC is exceeded, using average concentrations of lead in both soil and groundwater. Note that for AP1 total soil, the MDC for lead (27.1 mg/kg) is less than both the RBSC (400 mg/kg) and the criterion for average concentration (250 mg/kg). Likewise, the lead MDC in AP1 overburden groundwater (4.3 µg/L) is less than the RBSC (15 µg/L), and lead was not detected in bedrock groundwater. Therefore, the IEUBK model was not run for AP1 soil and groundwater.

There are no RSLs for sulfate in tap water, but the drinking water outside-of-the-mixing-zone average value of 250 milligrams per liter (mg/L) for the Lake Erie Basin is used as the RBSC. This value is the same as the secondary drinking water regulation of 250 mg/L (EPA, 2009). Secondary drinking water regulations are non-promulgated values, based on aesthetic characteristics, which are used as guidelines for public water systems. A health-based advisory level of 500 mg/L also exists for sulfate (EPA, 2009).

The evaluation of essential nutrients is a special form of risk-based screening applied to certain ubiquitous elements that are generally considered to be required human nutrients. Essential nutrients such as calcium, chloride, iodine, magnesium, phosphorous, potassium, and sodium are generally considered innocuous at levels found in environmental media. There are no RSLs listed for these nutrients. Should any of these chemicals be identified as site related, an exposure analysis is performed whereby a daily dose of chemical from ingestion of the medium in question is calculated. The dose is compared with levels known or expected to be safe or toxic, and/or with recommended daily allowances, depending on the availability of data.

2.4.2 Frequency of Detection

When confidence is high that a given chemical is present, the data generally are used in the BHHRA. For most chemicals, their detection is presumptive evidence of their presence. As suggested by EPA (1989a), chemicals that are reported infrequently may be artifacts in the data that do not reflect the actual presence of the chemical in question. For the BHHRA, chemicals that are reported only at low concentrations in less than 5 percent of the samples from a given medium are excluded from further consideration, unless the presence of a given chemical is expected based on historical information about the site. Chemicals detected infrequently at high concentrations may identify the existence of contaminant plumes or limited “hot spots” and are retained as COPCs.

2.4.3 Comparison to Background

A number of the chemicals detected in PBOW environmental media may have MDCs that exceed RBSCs but are part of normal background concentrations. Such chemicals may include inorganics and polycyclic aromatic hydrocarbons (PAH), a class of organic compounds which form from natural or anthropogenic combustion of organic matter, including fossil fuels, and are generally ubiquitous in the environment. Airborne PAHs associated with non-U.S. Department of Defense sources may be deposited on soil and leach to groundwater. Benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds, as well as PAHs, may also be associated with background concentrations due to the presence of natural petroleum-derived compounds present in the vicinity of PBOW (see Section 3.1.1).

Site concentrations of inorganic chemicals in site environmental media may be compared to those of PBOW background using a two-step approach: 1) background screening and 2) statistical data set testing. This second step (Section 2.4.3.2) is initiated only in cases where the concentration used for background screening is exceeded (refer to Section 2.4.3.1) and is performed after the risk characterization (Chapter 5.0). The results of the statistical data testing are discussed in the uncertainty analysis (Chapter 6.0). No suitable background data set exists for overburden groundwater, so no background screening or statistical comparisons to background concentrations can be made for overburden groundwater samples. Similarly, no background screening or statistical evaluation can be performed for surface water or sediment analytical data, as these media lack PBOW background data sets.

Inorganics and organics are treated similarly from a quantitative perspective. However, all organics not eliminated on the basis of RBSC exceedance (Section 2.4.1) or infrequent detection (Section 2.4.2) are carried through the risk calculation process (exposure assessment, toxicity assessment, and risk characterization). As presented in Section 2.4.3.3, organic compounds are quantitatively eliminated as background related only through the uncertainty analysis if applicable.

2.4.3.1 Background Screening of Inorganics

Background screening is applied to each inorganic whose MDC in soil or limestone bedrock groundwater exceeds the RBSC and that cannot be characterized as an infrequently detected analyte. In background screening, the MDC is compared to the PBOW chemical-specific background screening concentration (BSC). The background data set and derivation of soil BSCs for all PBOW soil investigations are described in IT (1998), and the background data set and derivation of BSCs for PBOW bedrock groundwater are described in the 2004 groundwater report (Shaw, 2005). It is noted that the method agreed upon for the development of BSCs, as recorded in the September 11, 2002 PBOW Team Meeting minutes, differs from that shown in current OEPA (2009c) guidance. This PBOW Team agreement, which has been used for all PBOW risk assessments to date, takes precedence over the subsequent OEPA (2009c) guidance. Summary tables of the background data sets for soil and groundwater are provided as Tables 2-2 and 2-3, respectively. The background soil samples were collected from near the property boundary, away from any potential source areas, and the background groundwater wells were installed in off-site areas upgradient of PBOW sources. Briefly, BSCs were calculated for use at PBOW based on concentrations found in these background soil and bedrock monitoring well samples. Each BSC is either the MDC or the calculated 95th percent upper tolerance limit of the background data set, whichever value is lower (IT, 1998; Shaw, 2005). The background monitoring well samples were collected using low-flow samples and were unfiltered.

The background screening consists of comparing the MDC of the site data set to the BSC. The chemical may be regarded as a COPC if its MDC exceeds the BSC for that chemical or if no BSC can be determined due to a lack of detections in the background data set. COPCs are fully evaluated in the exposure assessment, toxicity assessment, and risk characterization. An inorganic analyte is not regarded as a COPC if its MDC is equal to or less than the BSC.

2.4.3.2 Statistical Data Set Testing of Inorganics

Statistical testing is performed to compare data sets of site inorganics data against the appropriate PBOW background data sets. As described in Section 2.4.3.1, the background data set for groundwater is presented in the 2004 groundwater report (Shaw, 2005), and the background data set for soil is presented in the site investigation for the acid areas (IT, 1998). As mentioned previously, background data sets do not exist for overburden groundwater, surface water, or sediment; therefore, a statistical background evaluation for COPCs in these media cannot be performed. The method for statistical comparison of the site data sets to the background data sets, described in Appendix M of Shaw (2005), is the Wilcoxon Rank Sum (WRS) statistical test (also known as the Mann-Whitney U test). WRS testing is performed for inorganics having MDCs that exceed the respective BSCs and are identified as COPCs based on RBSC comparison (Section 2.4.1) and frequency of detection (Section 2.4.2). All COPCs are carried through the risk characterization process; thus, statistical testing results are not used to screen out any chemicals.

Site data sets are interpreted as being significantly different from PBOW background if the associated p-level is less than 0.05. WRS statistical output and box-and-whisker plots of the various inorganic COPC data sets are appended to the BHHRA for each inorganic data set evaluated against the appropriate site background data set; the WRS results are discussed as part of the uncertainties. Analytes shown by the WRS results to exceed background (or for which the WRS testing was not run) are assumed to be site related, unless a qualitative chemical-specific explanation is presented in the uncertainties analysis as to why the analyte should not be regarded as site related. The WRS is not run if the COPC was not detected in the PBOW background data set. Data sets for which the WRS results do not suggest site relatedness (i.e., site data and background data are not statistically different) are still evaluated for risks and hazards in the risk characterization (Chapter 5.0).

2.4.3.3 Treatment of Organic Compounds

As mentioned in Section 2.4.3, certain organic compounds (e.g., BTEX and PAHs) in site media may be attributable to background conditions. However, no organic compounds are summarily

screened out. Instead, all detected organic compounds are carried through the risk assessment process (i.e., exposure assessment, toxicity assessment, risk characterization) unless screened out on the basis of comparison to RBSCs (Section 2.4.1) or characterized as infrequently detected (Section 2.4.2). Background contribution of organics are discussed in the uncertainties analysis, as applicable.

2.5 Data Evaluation Summary

Data summary tables are provided for the following media: surface soil (Table 2-4), subsurface soil (Table 2-5), total soil (Table 2-6), bedrock groundwater (Table 2-7), overburden groundwater (wells) (Table 2-8), sediment (Table 2-9), and surface water (Table 2-10). These tables provide the following information for each detected chemical in each environmental medium:

- Chemical name
- Frequency of detection
- Range of detected concentrations
- Range of detection limits
- Arithmetic mean of site concentrations
- 95th percent upper confidence limit on the arithmetic mean (UCL) (for COPCs only)
- Appropriate RBSC
- Appropriate BSC
- Selection/exclusion of chemical as a COPC
- EPC (for COPCs only).

The estimation of the UCL values for COPCs is discussed in Section 3.2.1. For duplicate samples, the associated values are averaged in the data summary, if both samples are detects or if both are nondetects; if only one of the duplicates is a detect, then this detected value is used in the data summary.

An analogous summary table for the overburden groundwater piezometer samples is appended (Appendix A). Note that these direct-push groundwater samples are collected for nature-and-extent purposes to determine groundwater flow direction and the placement of monitoring wells. These data are not sufficiently representative of groundwater conditions for use in risk assessment. Therefore, they are not used to identify COPCs and are not quantitatively evaluated in the BHHRA. This piezometer groundwater summary table is appended only to provide ancillary information.

The COPCs for each of the AP1 media are identified as follows:

- ***Surface Soil*** – Aluminum, beryllium, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene

- ***Subsurface Soil*** – Cadmium, manganese, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene

- ***Total Soil*** – Aluminum, beryllium, cadmium, manganese, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene

- ***Bedrock Groundwater*** –Antimony, arsenic, iron, manganese, thallium, 2-methylnpthalene, naphthalene, benzene, chloroform, chloromethane, ethylbenzene, methylene chloride, 1,1,2,2-tetrachloroethane, toluene, xylenes, cyanide, sulfate

- ***Overburden Groundwater*** – Cobalt, iron, manganese, thallium, chloroform, sulfate

- ***Sediment*** – Arsenic, chromium, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene

- ***Surface Water*** – Arsenic, chromium.

As discussed in Section 2.2, the total soil COPCs include all surface soil and subsurface soil COPCs.

3.0 Exposure Assessment

Exposure is the contact of a receptor with a chemical or physical agent. An exposure assessment estimates the type and magnitude of potential exposure of a receptor to COPCs found at or migrating from a site (EPA, 1989a). An exposure assessment includes the following steps:

- Characterize the physical setting.
- Identify the contaminant sources, release mechanisms, and migration pathways.
- Identify the potentially exposed receptors.
- Identify the potential exposure pathways.
- Estimate exposure concentrations.
- Estimate chemical intakes or contact rates.

The BHHRA characterizes potential exposures to COPCs in AP1 environmental media as portrayed by the CSEM in Section 3.1. Note that these environmental media include soil, groundwater, surface water, and sediment.

3.1 Conceptual Site Exposure Model

The CSEM provides the basis for identifying and evaluating the potential risks to human health in the BHHRA. The CSEM, graphically depicted on Figure 3-1, includes the receptors appropriate to all plausible site-use scenarios and the potential exposure pathways. This presentation of all possible pathways by which a potential receptor may be exposed, including all sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health and helps to ensure that potential pathways are not overlooked. The elements of a CSEM include the following:

- Source
- Source media (i.e., initially contaminated environmental media)
- Contaminant release mechanisms
- Contaminant transport pathways
- Intermediate or transport media
- Exposure media
- Receptors
- Routes of exposure.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium (e.g., ingestion or dermal contact).

The receptors and pathways on Figure 3-1 reflect scenarios developed from information regarding site background and history, topography, climate, and demographics as presented by

D&M (1997) and the sitewide groundwater investigation (IT, 1997). On Figure 3-1, asterisks identify exposure pathways that are complete and addressed in this BHHRA. Justification for exclusion of other pathways is provided in the Figure 3-1 footnotes, and the exclusion of other potential receptors is discussed in Section 3.1.3.8. No current or future exposure by off-site residents is evaluated. Most of the off-site residents are serviced by municipal water from surface water sources. Although there are numerous private groundwater wells in the vicinity, including eight within 1 mile of the facility boundary, none of these is used as a potable source. Based on the investigations of other PBOW sites, natural hydrocarbons and hydrogen sulfide are known to be present within the bedrock limestone, and shale formation groundwater generally provides low yields and is of low quality (e.g., Shaw [2008b]); however, the groundwater underlying AP1 is not summarily excluded for consideration as a tap water source based on natural water quality parameters or general assumptions concerning yield. Therefore, given the presence of numerous off-site wells and the assumption of unrestricted future land use on site, the development of groundwater for on-site residential (or on-site worker) use as tap water is initially regarded as plausible for purposes of this BHHRA. Groundwater quality and potential use is discussed further in the risk characterization (Chapter 5.0) and uncertainty analysis (Chapter 6.0).

3.1.1 Physical Setting

AP1 is vegetated with thickets of trees, mostly grey dogwood (*Cornus racemosa*), at heights of approximately 15 feet. During site reconnaissance, NASA personnel informed USACE and Shaw personnel that an underground, high-voltage utility line bisected AP1 in a north-south direction and an underground telephone line was present approximately 5 feet south and parallel to Maintenance Road.

The following subsections describe the physical setting of AP1, including the climate and meteorology of the Sandusky region (Section 3.1.1.1), and the geology (Section 3.1.1.2), soil (3.1.1.3), hydrology (Section 3.1.1.4), and surface water characteristics (Section 3.1.1.5) of the area and of AP1 in particular. A general description of AP1 is provided in Section 1.3.

3.1.1.1 Climate/Meteorology

The climate in the Sandusky area is continental and strongly affected by Lake Erie. July is generally the warmest month (average high and low temperatures of 82 and 65 degrees Fahrenheit [°F], respectively), and January is generally the coldest (average high and low temperatures of 32 and 19°F, respectively) (The Weather Channel, 2004). On average, the first freezing day (low of 32°F or less) occurs in late October (average of three per month), and the last freezing day falls in early May (average of one per month) (National Oceanic and Atmospheric Administration, 1990). The average annual precipitation for Sandusky is 34.5

inches per year, with a monthly average of more than 3 inches per month falling in April through September and less than 3 inches in each of the other seven months (The Weather Channel, 2004). Precipitation is fairly evenly distributed throughout the year, with the fewest precipitation days (0.01 inch or greater) per month (10) occurring during July, August, September, and October, and the most (15) occurring in December and January (City-Data.com, 2004). The mean annual wind speed is 10.3 miles per hour (City-Data.com, 2004), with winds predominantly from the southwest (Science Applications International Corporation, 1991). Sandusky area winters are cloudy, with 33 percent sunshine during November through February, as compared with to 65 percent sunshine during the summer months (City-Data.com, 2004).

3.1.1.2 Geology

Three formations, all of Devonian Age, outcrop across PBOW, each of which was encountered in the upper 100 feet of bedrock at PBOW (Shaw, 2005). The Delaware Limestone is the lowermost formation screened by site wells. It is characterized as a hard, dense, finely crystalline limestone and dolomite. The unit is typically buff colored and usually is described as fossiliferous. In the vicinity of PBOW, quarries mine limestone from the Delaware. Traces of natural petroleum-derived hydrocarbons and hydrogen sulfide are common in area quarries (Shaw, 2005). Petroleum hydrocarbons were observed during the drilling of AP1 well AP1-BEDGW-001 (Shaw, 2010a); approximately 1 to 2 feet of free product has been found on the surface of this well during sampling. Petroleum hydrocarbons were also found at depth in four of the six bedrock wells in the nearby Locomotive Building Area (LBA) (Shaw, 2010b), indicating the prevalence of petroleum contamination in the bedrock zone within this general area of PBOW. High levels of hydrogen sulfide (more than 200 parts per million [ppm]) were detected in the groundwater during development of AP1 monitoring well AP1-BEDGW-002, and similarly elevated hydrogen sulfide concentrations (more than 200 ppm) were detected in downgradient LBA monitoring well MNTA-BEDGW-001 (Shaw, 2010b).

3.1.1.3 Soils

The bedrock overburden in Erie County is predominantly glacial till, glacial outwash, or glacial lacustrine (lake) deposits. In the vicinity of PBOW, the soil has been interpreted to be lacustrine. In many areas, the overburden also consists of highly weathered bedrock. The thickness of the overburden ranges from less than 1 foot to more than 25 feet. Overburden is thickest on the northern portion of the site in the vicinity of the Reactor Facility Area, where it has filled in a bedrock low (Shaw, 2005). In the AP1 area, the overburden thickness ranges from 21 to 26 feet, based on boring logs.

The soil in the northwest portion of PBOW is placed within the Kibbie-Elnora-Tuscola-Colwood Association, which is described as nearly level to gently sloping. This soil is described as somewhat poorly drained, moderately well drained, and very poorly drained soils formed in outwash, lacustrine, and deltaic sediments. Along a strip from west to northeast across the site is the Castalia-Millsdale-Milton-Ritchey Association. This association is described as shallow to moderately deep, nearly level to moderately steep, well-drained and very poorly drained soils formed in glacial till, lacustrine sediments, and limestone residuum. Across much of the central portion of the site is the Hornell-Fries-Colwood Association, described as moderately deep to deep, nearly level to gently sloping, somewhat poorly drained to very poorly drained soils formed in glacial till and lacustrine sediments over shale bedrock. At the extreme southeast portion of PBOW is the Pewamo-Bennington Association, described as nearly level to gently sloping, very poorly drained and somewhat poorly drained soils formed from glacial till and lacustrine sediments.

3.1.1.4 Hydrology

The two main water-bearing zones at PBOW are located in the overburden/shale unit and the limestone bedrock and are thus called the overburden/shale and bedrock water-bearing zones. The overburden and shale groundwater units show similar water levels in these two units, suggesting substantial vertical communication. Therefore, these two geologic units are combined for purposes of PBOW groundwater evaluation. Data collected during the more recent investigations (Shaw, 2005; IT, 1997, 1999, 2001b) indicate that groundwater in the overburden is in discontinuous pockets during dry time periods. The shallow overburden generally has low yields over most of PBOW due to the high percentage of silt and clay. In contrast, the limestone bedrock water-bearing zone is saturated year round. During periods of low precipitation, only limited migration of contaminants would occur in the overburden due to less infiltration.

Regional groundwater flow in both the overburden/shale and the limestone bedrock is to the north-northeast towards Lake Erie, although local flow may vary due to local topography. The general flow direction in the overburden water-bearing zone is to the north in the immediate vicinity of AP1. A hydrogeological study by the U.S. Geological Survey (1992) conducted in the glacial deposits of Sandusky in 1990 reported a horizontal hydraulic conductivity of 0.046 feet per day and a vertical hydraulic conductivity of 1.2 feet per day.

Water in the limestone typically occurs in joints and along bedding planes or in solutionally enlarged openings. The conceptual model interprets that bedrock groundwater flow in the Delaware Limestone water-bearing zone is influenced by the frequency, orientation, density, and

connectivity of the bedrock fractures. These fractures result in localized groundwater flow direction to the west-northwest in the vicinity of AP1.

At PBOW, the bedrock groundwater has been subdivided into three zones based on location and yield. Zone 1 occurs in the north and northwestern portion of PBOW. It has been characterized as yielding from 100 to 500 gallons per minute (gpm) from karstic limestone approximately 100 feet below grade. Zone 2 is in the northern portion of PBOW and has yields of 15 gpm or less from limestone approximately 300 feet below grade. Zone 3 is located in the eastern and southern portion of the site in predominantly shale bedrock. In addition to being found in the shale, groundwater is located in thin sand and gravel horizons interbedded with silt and clay deposits. Most Zone 3 wells are poor yielding, many of them providing less than 3 gpm (D&M, 1997). AP1 is likely in Zone 2.

3.1.1.5 Surface Water

An unnamed north-to-south tributary to Plum Brook is located just west of AP1, within a ditch that is roughly 10 feet wide and 7 feet deep. Standing water, at a depth of less than 2 feet, has been observed in this ditch. Flow would be south to north during heavy precipitation events, although no flow was observed during field reconnaissance or RI sampling events. A culvert from this ditch passes under Maintenance Road. A low-lying area that is frequently inundated is located along the central part of the northern boundary, adjacent to Maintenance Road. A culvert is located at the extreme north-central part of AP1 along Maintenance Road. This second culvert accepts runoff from Maintenance Road and may also receive some runoff from AP1. During precipitation events, water flows through this culvert under Maintenance Road and into a ditch north of Maintenance Road. This smaller ditch flows into the unnamed north-to-south tributary to Plum Brook mentioned above that is west of AP1. No water was observed in this smaller ditch during field reconnaissance and the RI sampling event.

3.1.2 Contaminant Sources, Release Mechanisms, and Migration Pathways

Contaminant sources, release mechanisms, and migration pathways are summarized on Figure 3-1. Briefly, AP1 received a coal ash slurry via a pipeline from Powerhouse 1. AP1 also received ash from the incinerator at the Waste Water Treatment Plant 3. Depending on specific location, this coal ash layer is present at AP1 from the surface to a depth of up to 2.2 feet. Thus, the coal ash and any contaminants within it may represent surface and subsurface soil.

Leaching and downward migration may have carried contaminants from the subsurface soil to the groundwater. Therefore, exposure to contaminants in groundwater is quantitatively evaluated in the BHHRA. It is possible that surface water and sediment at the nearby unnamed tributary to

Plum Brook may have been impacted by contaminants originating from the AP1 through surface drainage and groundwater migration.

3.1.3 Receptors and Exposure Pathways

Receptors selected to represent the upper bound on exposure from all plausibly exposed groups of people associated with AP1 as well as the pathways by which they may be exposed to chemicals are summarized on Figure 3-1 and in Table 3-1. The exposure variable values used in the contaminant intake models are compiled in Table 3-2. The receptors evaluated in the BHHRA are listed below. Note that the current (Section 3.1.3.1) and future (Section 3.1.3.2) groundskeeper scenarios include different environmental media and are, thus, listed separately. Receptors such as the construction worker, hunter, and hunter's child may be viable under current or future land use. However, the evaluation for these receptors is exactly the same under current and future land use.

- Current groundskeeper
- Future groundskeeper
- Indoor worker (future)
- Construction worker (current/future)
- On-site resident (future)
- Hunter (future)
- Hunter's child (future).

Most BHHRAs are based on a reasonable maximum exposure (RME) assumption. The intent of the RME assumption is to estimate the highest exposure level that could reasonably be expected to occur, but not necessarily the worst possible case (EPA, 1989a; 1991a). It is interpreted as reflecting the upper 90 to 95th percentile on exposure. In keeping with EPA (1989a; 1991a) guidance, variables chosen for a baseline RME scenario for ingestion rate, exposure frequency, and exposure duration are generally upper bounds. Other variables, such as body weight and exposed skin surface area, are generally central or average values. In the case of contact rates consisting of multiple components, e.g., dermal contact with soil or water, which consists of a dermal absorption factor (ABS) and soil-to-skin adherence factor (AF) for soil, and permeability coefficient (K_p) and exposure time (ET) for water, only one variable, ABS or K_p, needs to be an upper bound. The conservativeness built into the individual variables ensures that the entire estimate for contact rate is sufficiently conservative.

The averaging time for noncancer evaluation is computed as the product of the exposure duration (years) multiplied by 365 days per year. The resultant noncancer averaging time is used to estimate an average daily dose over the entire exposure period (EPA, 1989a). For cancer evaluation, the averaging time is computed as the product of 70 years, the assumed human

lifetime, times 365 days/year. This cancer-based averaging time is used to estimate an average daily dose prorated over a lifetime, regardless of the frequency or duration of exposure. The methodology used in deriving the averaging time for cancer risks assumes that the risk from short-term exposure to a high dose of a given carcinogen is equivalent to long-term exposure to a correspondingly lower dose, provided that the total lifetime doses are equivalent. This approach is generally consistent with the EPA (2005) policy of carcinogen evaluation, although it introduces considerable uncertainty into the BHHRA cancer risk estimates.

A fractional term (FI) is introduced into the chemical intake equations to account for scenarios in which exposure to a potentially contaminated medium associated with the site is less than total daily exposure to that medium. For example, if the site of interest is small or has unusual dimensions so that a groundskeeper would be unlikely to spend all (or nearly all) of his working time at the site, an FI value of less than 1 might be applied to the soil ingestion and dermal intake equations. An FI may also be split between two comparable media. For example, if a resident is exposed to both soil and sediment, FI values are introduced that apportion exposure between the two media such that the FI value for the two analogous media does not exceed a value of 1 (see Section 3.1.3.5).

Receptors and the associated exposure pathways are presented in the following subsections. Please note that some of the pathways considered for the receptors (e.g., surface water exposure; volatile organic compounds [VOC] in soil) could not be quantitatively evaluated because pertinent chemicals associated with these pathways were not identified as COPCs.

3.1.3.1 Current Groundskeeper

The groundskeeper scenario is designed to evaluate the upper bound for long-term site worker exposure to surface soil in the current site use scenario and total soil in the future site-use scenario. It is noted that no groundskeeper is currently working at the site, but current land use does not prohibit a site worker from performing groundskeeping activities at the site.

Exposure to surface soil is evaluated for a (potential) current groundskeeper. Total soil is typically evaluated under the future groundskeeper use scenario because hypothetical future construction may include considerable excavation of subsurface soil. This soil may be spread on the surface and regraded such that some of the soil currently in the subsurface (i.e., 1 to 10 feet bgs) will be spread as surface soil (0 to 1 foot bgs). Groundwater use is also evaluated for the groundskeeper in the future site-use scenario, as discussed in Section 3.1, which could theoretically be developed as a source of drinking water. It is assumed that any contact with surface water or sediment associated with AP1 by this receptor would be infrequent and

sporadic, because such contact would not be a part of the groundskeeper's regular duties or activities. Therefore, exposure to these media is not quantified.

Direct soil exposure pathways include incidental ingestion and dermal contact. Inhalation of dust raised by lawnmowers or other equipment is also evaluated because relatively high dust concentrations may be produced within the groundskeeper's breathing zone, with little opportunity for dilution by the large volume of ambient air.

Shaw's experience has been that surface soil that is contaminated with VOCs and that has been in place for extended periods is not a significant source of airborne VOCs, because infiltration and dissipation over time reduces residues at the surface (i.e., first few centimeters) from which volatilization would occur. However, as noted above, the data set for surface soil may include samples taken from up to 1 foot bgs, which would include the soil zone deeper than the top few centimeters, where dissipation has not reduced VOC concentrations. In other words, the surface soil data set might indicate the presence of VOCs, although volatilization to the air is unlikely to be significant. Therefore, a surface soil-to-air volatilization model is not used in addition to the activity-based dust emissions model to estimate airborne concentrations of VOCs. Instead, the airborne concentrations estimated by the dust emissions model are assumed to sufficiently estimate levels of VOCs that may arise from volatilization, because the dust emissions model treats the VOCs as if they were located at the surface. It is assumed that VOC emissions from subsurface soil (i.e., at depths greater than 1 foot bgs) would be attenuated by the overlying soil so that concentrations in ambient air would not be toxicologically significant.

The groundskeeper is assumed to be a 70-kilogram (kg) adult who works 8 hours per day, approximately 5 days per week year-round on site for a total of 250 days/year for 25 years (EPA, 2004a). The respiratory rate for the groundskeeper is assumed to be 20 cubic meters (m^3) per 8-hour workday or 2.5 cubic meters per hour (m^3/hr) (EPA, 1991a), and the soil incidental ingestion rate is assumed to be 100 milligrams per day (mg/day) (EPA, 2002). The groundskeeper is assumed to be exposed dermally to soil. An exposed skin surface area of 3,300 square centimeters (cm^2) and a soil AF of 0.2 milligrams per square centimeter (mg/cm^2) are assumed (EPA, 2004a).

3.1.3.2 Future Groundskeeper

A future groundskeeper would be exposed to soil via the same exposure pathways as the current groundskeeper described in Section 3.1.3.1. However, the future groundskeeper scenario assumes that construction has taken place and that some of the soil currently in the subsurface has been brought to the surface during earthmoving activities. Therefore, the future

groundskeeper is assumed to be exposed to a combination of surface and subsurface soil (total soil) rather than surface soil alone.

In addition, a hypothetical future groundskeeper is assumed to be exposed to groundwater, which could theoretically be developed as a source of drinking water in the future. His drinking water ingestion rate is assumed to be 1 liter per day (L/day) (EPA, 1991a). He may also experience dermal contact with groundwater used to clean equipment and to rinse dust or perspiration from his body. For this evaluation, it is assumed that the head, forearms, and hands, approximately 3,300 cm^2 of his body (EPA, 2004a), would be exposed intermittently for up to 1 hour/day. Because exposure is assumed to be intermittent rather than continuous, organic chemical uptake across the dermis would not reach steady state, which guides the selection of the EPA (2004a) model used to quantify this pathway (see Section 3.3).

3.1.3.3 Indoor Worker

This receptor scenario was used to evaluate exposure to indoor airborne VOCs entrapped in a building. VOCs released from subsurface soil may enter a building through joints or cracks in the foundation or slab. The indoor worker is also potentially exposed to surface soil via incidental ingestion. Exposure to COPCs in surface soil via dermal contact and inhalation of airborne dust and VOCs from surface soil, although plausible, are expected to be less significant than incidental ingestion, because this receptor spends his work time indoors. Therefore, dermal contact and inhalation of dust and airborne VOCs from surface soil are not quantified separately from ingestion exposure (EPA, 2002). Under a future use scenario for this receptor, construction of a building would be necessary. This would require excavation and regrading of soil. Normally, when construction is involved, such as for the future groundskeeper or resident, total soil rather than surface soil would be evaluated for ingestion exposure. However, the chief purpose for this receptor is to evaluate exposure via vapor intrusion of contaminants from subsurface soil into indoor air. Thus, the evaluation of direct contact with subsurface soil as a component of total soil would equate to “double counting” of COPCs in subsurface soil. Also, the groundskeeper reflects a worst-case exposure for a long-term worker with respect to direct contact with both surface soil and total soil. Therefore, direct contact with surface soil for the indoor worker is included to reflect a more complete exposure scenario, but direct contact with subsurface soil is most effectively addressed from an RME perspective by the groundskeeper.

The indoor worker is assumed to be a 70-kg adult who works 8 hours/day, approximately 5 days/week year-round on the site for a total of 250 days/year for 25 years (EPA, 2002). His incidental soil ingestion rate is assumed to be 50 mg/day (EPA, 2002), and his inhalation rate is assumed to be 20 m^3/8-hour workday (EPA, 1991a).

A future indoor worker is assumed to be exposed to groundwater, which could theoretically be developed as a source of drinking water (see Section 3.1). His drinking water ingestion rate is assumed to be 1 L/day (EPA, 1991a). Some indoor worker positions may require relatively frequent dermal contact with groundwater as well, e.g., a food preparer/cafeteria worker who would wash his hands, produce, equipment, etc. For this evaluation, it is assumed that the head, forearms, and hands, approximately 3,300 cm^2 of his body (EPA, 2004a), would be exposed intermittently for up to 1 hour per day. Because exposure is assumed to be intermittent rather than continuous, organic chemical uptake across the dermis would not reach steady state, which guides the selection of the EPA (2004a) model used to quantify this pathway (see Section 3.3.4).

3.1.3.4 Construction Worker

The construction worker scenario is used to evaluate short-term exposure to surface and subsurface soil (total soil) in either the current or future land-use scenario. Construction projects are expected to be infrequent. It is assumed that the construction worker participates in only one construction project on the site. Note that no construction projects are anticipated for AP1, but AP1 is currently under NASA control and a construction project may be possible under current land use. Relevant exposure pathways include incidental ingestion and dermal contact, inhalation of dust raised by operating construction equipment, and inhalation of airborne VOCs released from subsurface soil during excavation and grading. Exposure to groundwater by the construction worker is also possible; however, if on-site groundwater were developed as a tap water source, other potential future groundwater receptors such as the groundskeeper would have longer and/or more frequent groundwater exposure. Therefore, groundwater exposure is not evaluated for the construction worker.

The construction worker may also be exposed to surface water and sediment associated with AP1 during projects such as installation of underground utilities or rerouting stream flow. Dermal contact is the most significant pathway for exposure to surface water. Incidental ingestion of surface water is also possible but is not expected to be nearly as significant as dermal contact. Inhalation of VOCs from surface water is also possible, but the large volume of outdoor air and natural air currents are expected to dilute airborne concentrations, so that this pathway is expected to be less significant than dermal contact, which is quantified. For these reasons, incidental ingestion and inhalation of VOCs from surface water are not quantified separately from dermal contact. Dermal contact and incidental ingestion may be important pathways for exposure to sediment, and both are evaluated.

The construction worker is assumed to be a 70-kg adult who works 8 hours/day, approximately 5 days/week. This represents an annual exposure frequency rate of about 250 days per year, which

is the same as described for the groundskeeper (Section 3.1.3.1) and indoor worker (Section 3.1.3.3). Construction projects involving soil exposure are assumed to last 6 months. The respiratory rate for the construction worker is assumed to be 20 m^3/8-hour workday (2.5 m^3/hr) (EPA, 1991a). A soil ingestion rate of 330 mg/day is assumed for the construction worker (EPA, 2002). A dermal soil AF for the construction worker of 0.3 mg/cm^2 and an exposed body surface area of 3,300 cm^2 are assumed, which represent the head, hands, and forearms (EPA, 2002; 2004a).

The construction worker may be exposed to surface water and sediment during the 6-month construction period. The construction worker dermal exposure parameters for sediment are assumed to be exactly the same as those for soil. Dermal exposure to surface water is assumed to occur for up to 4 hours per day, or one-half the normal work day. It is assumed the exposure to surface water is intermittent during this period. An exposed body surface area of 3,300 cm^2, the same as for sediment and soil, is assumed for exposure of the construction worker to surface water. It is expected that the construction worker would wear appropriate footgear and leg protection to minimize surface water and sediment exposure to the legs.

The construction worker scenario described above provides for several different kinds of construction projects, such as upland excavation and building projects (exposure primarily to soil), as well as stream rerouting (exposure primarily to surface water and sediment). It is unlikely, however, that a single construction worker would participate in all these activities during a given project. Therefore, the evaluation described above is probably overly conservative and may represent some double counting. For example, it is unlikely that the construction worker would be simultaneously ingesting soil, sediment, and surface water. Similarly, the air in his breathing zone is not likely to contain the reasonable maximum concentrations of COPCs estimated for soil while he is exposed to surface water. The potential for double counting is not expected to contribute significantly to total risk estimates summed across chemicals, pathways, and media. Should construction worker risk estimates exceed acceptable limits, risk and hazard estimates may be performed using refined exposure assumptions based on the physical characteristics of the site. For example, an upland excavation and building project may be assumed for one or more areas of the site, and a stream rerouting project may be assumed for another. Effectively, the risks and hazards associated with surface water/sediment exposure and soil exposure could be separated. This approach would more precisely reflect plausible exposure scenarios, reduce the likelihood of double counting, and more accurately identify risk-driving media and chemicals. These refined estimates would be presented in the uncertainty analysis.

3.1.3.5 On-Site Resident

The on-site residential scenario is used to evaluate the upper bound for long-term exposure to site soil, surface water, sediment, and groundwater under the future land-use scenario. Residential land use is plausible because property surrounding the PBOW facility includes rural residential use. This type of land use is also consistent with assumed future land use of other PBOW sites such as TNTA and TNTC (IT, 2001a).

The on-site residential scenario is evaluated assuming a 30-year residential exposure scenario, considering exposure to a resident as a young child (6-year duration, ages 1 through 6 years) through the adult portion of life spent at this residence (24-year duration) (EPA, 1991a). Noncancer hazard estimates are derived separately for the child and adult life stages. Cancer risk is estimated as the sum of the risks calculated for the adult (24 years) and the child (6 years) (EPA, 2002; 2010e).

The resident is assumed to be exposed directly to total soil, because residential development would involve excavation and regrading, which would mix surface and subsurface soil. Relevant pathways for total soil exposure include incidental ingestion, dermal contact, and inhalation of dust and VOCs. Evaluation of VOCs from total soil is addressed during evaluation of airborne dust, as described for the groundskeeper. For evaluating inhalation of airborne dust, it is assumed that 80 percent of the soil surface is covered with pavement or vegetation. Inhalation of VOCs released from subsurface soil entrapped in indoor air is also evaluated. The resident is also assumed to be exposed to VOCs that have been released from subsurface soil through cracks in the building foundation to indoor air. It is noted that because some of the subsurface soil is expected to be brought to the surface in the future, using only subsurface soil data will conservatively result in some double counting of exposure to any VOC COPCs that may be present in the subsurface soil. This may be addressed in the uncertainty analysis should the subsurface soil-to-indoor air pathway significantly affects risk and hazard estimates. This pathway did not contribute significantly to risk at AP1, as no VOCs were identified as COPCs in subsurface soil.

It is assumed that, under future residential land use, the overburden and limestone bedrock water units will be developed as sources of potable water (see Section 3.1). The resident is assumed to use groundwater underlying the site as the sole source of household tap water. Exposure to COPCs in groundwater would occur via ingestion, dermal contact during bathing/washing, and inhalation of VOCs released to the air during household use of tap water associated with multiple household uses.

The resident could have access to the unnamed tributary to Plum Brook in the vicinity of AP1 and could be exposed to contaminants in surface water and sediment associated with AP1. Plausible exposure pathways include dermal contact with surface water and incidental ingestion and dermal contact with sediment. Incidental ingestion of surface water in a wading scenario is considered less significant than dermal contact and is not quantified separately from dermal contact. Inhalation of VOC emissions from surface water is also possible, but the large volume of outdoor air and natural air currents are expected to dilute airborne concentrations, so that this pathway is expected to be less significant than dermal contact, which is quantified. For these reasons, the inhalation of VOC emissions from surface water is not quantified separately from dermal contact.

The adult resident is assumed to be a 70-kg person with an incidental soil ingestion rate of 100 mg/day and an inhalation rate of 20 cubic meters per day (m^3/day) or 0.83 m^3/hr (EPA, 1991a). A body surface area of 5,700 cm^2, representing the hands, forearms, head, and lower legs, is assumed to be available for dermal exposure to soil (EPA, 2004a). A soil AF of 0.07 mg/cm^2 is used as the default RME value for the adult resident (EPA, 2004a). The adult resident is assumed to be exposed for 350 days/year for 24 years (EPA, 1991a; 2002).

The child resident is assumed to be a 1- through 6-year-old child with an average body weight of 15 kg, a soil ingestion rate of 200 mg/day, and an average inhalation rate of 10 m^3/day or 0.417 m^3/hr (EPA, 2004d). An average body surface area of 2,800 cm^2 throughout the 6-year childhood exposure period, representing the head, hands, forearms, lower legs, and feet, is assumed for dermal contact with soil (EPA, 2004a). A soil AF of 0.2 mg/cm^2 is used as the default RME value for the child resident (EPA, 2004a). The child resident is assumed to be exposed for 350 days/year for 6 years (EPA, 1991a; 2002).

It is assumed that the resident would visit the unnamed tributary to Plum Brook in the vicinity of AP1 surface water for 8 hours/day, 2 days/week during the warmer half of the year. This resident is assumed to wade for 3 hours/day on 52 days of the year. Mechanisms of exposure to soil and sediment are likely to be similar. Therefore, the incidental soil ingestion rate of 100 mg/day, the surface area of 5,700 cm^2, and the AF of 0.07 mg/cm^2 are also applied to sediment exposure in the adult. Similarly, the resident child soil ingestion rate of 200 mg/day, skin surface area of 2,800 cm^2, and soil AF of 0.2 mg/cm^2 are applied to sediment exposure for this receptor. The unnamed tributary to Plum Brook in the vicinity of AP1 generally contains less than 2 feet of water. The shallowness of the surface water would limit the surface area of the body that would typically be exposed. It is assumed that an adult body surface area of 7,000 cm^2 is available for exposure to surface water. This represents the same body parts to which soil and sediment would

be exposed (i.e., hands, forearms, head, and lower legs) plus the feet (EPA, 1997a; 2004a). The body surface area of 2,800 cm^2, representing the hands, forearms, head, lower legs, and feet, used for soil and sediment exposure in the young child are also used for surface water exposure for this receptor.

EPA (1989a) permits the development of an FI to reflect the proportion of total daily exposure that a receptor obtains from potentially contaminated medium (refer to Section 3.1.3). For this receptor, the FI is used to apportion the resident's time of exposure between site soil and sediment. It is assumed that the resident spends 16 hours/day awake and potentially exposed to soil or sediment. As previously noted, 350 days/year are available for contact with soil; 52 of those days are also available for contact with sediment. It is assumed that contact with soil and sediment does not occur simultaneously; i.e., on those days when the resident spends time at the streams, 8 hours would be spent in contact with soil and 8 hours would be spent in contact with sediment. Therefore, the fraction of exposure to soil is 16 hours/16 hours = 1 on the 298 days without time spent at the streams, and the fraction of exposure to soil is estimated as 8 hours/16 hours = 0.5 on the 52 days with some time spent at the streams. A weighted fraction of 0.93 (rounded to 0.9) is estimated for exposure to soil over the entire 350 days/year exposure frequency. A weighted fraction of 0.07 (rounded to 0.1) is estimated for exposure to sediment over the entire 350 days/year exposure frequency.

An adolescent resident may be the most likely individual to have regular exposure to sediment and surface water associated with AP1. It is not expected that adults would regularly visit the AP1 surface water areas, as these areas do not support game fish and would seemingly not provide any attraction. It is unlikely that a young child (i.e., ages 1 through 6) would frequent these areas for substantial portions of time, because such young children (especially at the lower end of this age range) would require continued adult supervision. However, as described above, it is conservatively assumed that the resident will be regularly exposed to surface water and sediment for 30 years, 6 years assumed as a young child and 24 years assumed as an adult. For cancer effects, the 30-year exposure to surface water and sediment represented by both the young child and adult are combined. This approach is more conservative than evaluating an adolescent and is also consistent with BHHRAs performed for PBOW sites in the past.

With respect to groundwater exposure, it is assumed that an adult resident ingests 2 L/day of tap water (EPA, 1991a) and that the young child drinks 1 L/day (EPA, 2010d). The total body surface areas of the adult and of the young child resident are assumed to be exposed to tap water while bathing/showering. The total surface area for an adult is assumed to be 20,000 cm^2 and the total surface area for the young child is assumed to be 6,600 cm^2 (EPA, 1997a). Both the child

and adult resident are assumed to be dermally exposed to COPCs in groundwater while bathing/showering. The child is assumed to bathe for 20 minutes per day (0.33 hour/day) (EPA, 1997a), and the adult is assumed to shower for 12 minutes per day (0.2 hour/day) (EPA, 1997a). Inhalation rates of 0.833 m^3/hr for the adult (EPA, 1991a) and 0.416 m^3/hr for the child (EPA, 2004d) are used. Because EPA (1997a) lists a 90th percentile for time spent in a residence as over 23 hours per day, it is conservatively assumed that the resident spends 24 hours per day in the house.

3.1.3.6 Hunter

This scenario is created to evaluate the potential for contaminants in soil to affect food chain pathways. AP1 provides habitat for deer and other wildlife. Even though hunting is not currently permitted at AP1, deer hunting is permitted in other areas within PBOW; therefore, future use of AP1 for hunting is evaluated in this BHHRA.

Many kinds of game animals may be hunted and consumed (e.g., squirrel, pheasant and other upland birds, turkey, deer); however, the deer is the species most likely to contribute meaningfully to the diet. Therefore, this evaluation is limited to a deer hunter. Potential exposure pathways include incidental surface soil ingestion, dermal contact with surface soil, and ingestion of venison from deer that browse plants growing on contaminated surface soil, all of which are evaluated quantitatively. Inhalation of airborne dust from wind currents is a potentially complete exposure pathway; however, vegetation reduces dust emissions to insignificant levels (EPA, 1996), and it is assumed that the deer hunter would spend virtually all of his time on vegetated rather than bare soil. Therefore, it is assumed that inhalation exposure would contribute much less than incidental ingestion, and the inhalation exposure pathway is not quantified separately from ingestion.

Inhalation exposure to airborne VOCs from subsurface soil and surface water is not evaluated for the reasons previously explained for other receptors. Also, ingestion and dermal exposure to surface water and sediment are expected to be negligible for this receptor, as contact with these media would generally be avoided during hunting activities.

The deer hunter is assumed to be a 70-kg adult who harvests deer and consumes venison over a 30-year period. It is assumed that he spends 14 days per year hunting on PBOW. His incidental soil ingestion rate is assumed to be 100 mg/day (EPA, 1991a). Hunting at PBOW occurs in the fall and winter. Given the temperate climate of northern Ohio during hunting season, a hunter would dress appropriately, with typically only the hands and head exposed, at most. The default industrial RME exposed skin surface area of 3,300 cm^2, which represents the hands, forearms,

and head (EPA, 2004a), is conservatively assumed for the hunter. The default industrial RME soil AF of 0.2 mg/cm^2 (EPA, 2004a) is also assumed.

Data regarding the rate of venison ingestion were not located; therefore, a hypothetical scenario is adapted from the assumptions applied to a similar site in West Virginia (IT, 2000) and subsequently applied to TNTA and TNTC (IT, 2001a). A highly conservative but plausible scenario consists of a hunter who kills one deer from the AP1 property each year. It is assumed that the hunter eats 10 pounds (4.5 kg) of venison per year (Sharp, 1995). This consumption rate corresponds to 0.013 kilograms per day (kg/day) (0.186 grams per kilogram of body weight per day [g/kg-day]) of venison for each of the 350 days per year (EPA, 1991a) that the hunter spends at his residence.

3.1.3.7 Hunter's Child

It is likely that a successful hunter, described in Section 3.1.3.6, would share his venison with the rest of the family, which may include small children. Small children, however, would be unlikely to accompany the hunter afield. Therefore, the direct exposure pathways evaluated for the hunter (i.e., incidental ingestion and dermal contact with soil) are not evaluated for the small child.

Data regarding the rate of venison ingestion by small children were not located. However, if it is assumed that venison may replace beef in the diet, the differences in beef consumption between adults and children can be used to estimate a venison ingestion rate for children. EPA (1997a) provides per capita beef intake data for <1- to 5-year-old children ranging from 0.941 to 1.46 g/kg-day (time-weighted average of 1.296 g/kg-day). EPA (1997a) provides per capita beef intake data for 12- to 70-plus-year-old adults ranging from 0.568 to 0.83 g/kg-day (time-weighted average of 0.727 g/kg-day). From these data, it can be estimated that the rate of beef consumption for small children, expressed on a body weight basis, is approximately 1.8 times that of an adult. Therefore, a venison ingestion rate of 0.335 g/kg-day is estimated for a young child from the venison ingestion rate of 0.186 g/kg-day for the adult. Assuming that the child is 1 through 6 years old with an average body weight of 15 kg (EPA, 1991a; 2002), the child's venison ingestion rate may be expressed as 0.005 kg/day.

3.1.3.8 Other Receptors Not Considered

Another plausible receptor group is delivery personnel. These receptors, however, would be less intensively exposed to soil than the groundskeeper; therefore, their exposures are not evaluated. AP1 could become part of the area used for National Guard training activities. National Guard trainees, however, may be less exposed to any of the potentially contaminated media than the receptors identified above. Because they would likely not represent an upper bound for

nonresidential exposure, these receptors are not evaluated. The unnamed tributary to Plum Brook is too small to support game fish. Therefore, fish ingestion as an indirect pathway for exposure to surface water and sediment is not evaluated. Also, as discussed in Section 3.1, off-site use of groundwater is not evaluated because nearby residents use municipal water (from surface water sources) as a potable source, and potential on-site users would be exposed to higher concentrations of contaminants in groundwater.

3.2 Quantification of Exposure-Point Concentrations

The EPC is an estimate of the concentration of a COPC in a given medium to which a receptor may be exposed over the duration of the exposure. An EPC may be based on chemical concentrations in media that have been directly measured using laboratory analysis, or it may be derived based on environmental medium-to-medium transport modeling. The EPCs of COPCs in soil, groundwater, surface water, and sediment are derived based on measured analytical data. Note that the EPC for dermal exposure to VOCs in groundwater is based on one-half the EPC concentration derived from the measured concentrations in groundwater (Sections 3.2.1 and 3.2.2.3). This value is used because it is assumed that 50 percent of the groundwater VOC concentration is volatilized during normal household use (Section 3.2.2.2). Concentrations of COPCs in air and venison are not measured (and in some cases cannot reasonably be measured) but are based on models that use the EPCs of COPCs in the appropriate directly measured media (i.e., soil and groundwater) as input values.

Section 3.2.1 describes the approaches used to derive EPCs for direct exposure to soil, groundwater, surface water, and sediment based on analytical measurements from samples of these media. Models to derive EPCs for the air are described in Sections 3.2.2.1 and 3.2.2.2, and the model used to derive venison EPCs is described in Section 3.2.2.4.

3.2.1 Soil, Groundwater, Surface Water, and Sediment Concentrations

Exposure to an environmental medium is generally assumed to be random, and the EPC should be the arithmetic average encountered over the duration of exposure (EPA, 1989a). Therefore, the population mean concentration, if known, would be the ideal value selected as the EPC. The sample mean is an obvious estimate of the population mean. However, uncertainties exist as to how well the sample mean represents the population mean. Therefore, EPA (1989a) has recommended the inclusion of a UCL for RME evaluation as a conservative estimate of the true mean exposure concentration.

The EPA (2010a,b,c) ProUCL (Version 4.00.05) software was used to estimate UCLs for the data sets of all environmental media represented by at least five samples. If the data set consists

of fewer than five data points, the MDC was selected as the EPC. Analytical data from field duplicates are averaged with originals to yield one result for use in the statistical manipulations (see Section 2.5). One-half the reporting limit is used as the ProUCL input concentration for nondetects. Nondetect sample results with aberrantly high detection limits due to matrix interferences or other sample-specific causes, are included in the initial ProUCL calculations. This is a conservative approach, as EPA (1989a) recommends that nondetect results with aberrantly high detection limits be removed from the data set so that calculation of the UCL is not unduly skewed by a nondetect. Because the latest version of ProUCL (EPA, 2010a) includes mathematical manipulations under the default "with NDs" mode that are more robust than previous versions, single elevated detection limits are less likely to skew the UCL estimates than in the past. If it is observed during the risk characterization that an elevated nondetect value skews a UCL estimate such that this value substantially affects the result of the risk estimate, the ProUCL model is rerun without the elevated nondetect value and the risks are recalculated. If this recalculation is performed on a data set, data eliminated for the recalculation are identified in the risk characterization and discussed in the uncertainty analysis. The re-evaluation of elevated nondetects was not performed in the AP1 BHHRA.

ProUCL generates a variety of UCL estimates for each data set. The ProUCL output for each COPC is included in Appendix B. Generally, the results of one or two (sometimes more) of the UCL estimates are recommended. This recommendation is based on a variety of factors, including the distribution (i.e., normal, lognormal, gamma, or not discernable) that provides the best fit, number of nondetects, size of the data set, and skewness. If the recommended value(s) under the default mode equals or exceeds the MDC, ProUCL is re-run using the full data set mode, under the assumption that the COPC is present in nondetects at one-half the reporting limit. Occasionally, ProUCL recommends the 97.5 or 99 percent upper confidence limit on the arithmetic mean estimated by the Chebyshev method. In these cases, the UCL estimated by the Chebyshev method (95th percent) is selected as the EPC because this is more consistent with the intent of the RME paradigm as defined by EPA (1989a; 1991a).

The UCL generated by the ProUCL protocol described in the preceding paragraphs or the MDC, whichever is smaller, is selected as the EPC and is understood to represent a conservative estimate of average for use in the risk assessment or in various transport models used to estimate EPCs. Note that EPA (1989a) guidance states that an estimate of average rather than the MDC should be used to represent the EPC under chronic exposure and that use of the maximum is typically not reasonable. Therefore, data sets which use the MDC as the EPC are generally biased high. Unusually high detected values are included in the calculation of the UCL

concentration. Inclusion of these high values increases the statistical variability and the overall conservativeness of the risk estimate.

ProUCL is a software tool that provides estimates of the UCL using a variety of mathematical approaches. As mentioned, its output includes one or more recommendations. Depending on the data set, some of the estimates generated by the various calculation methods included in ProUCL may vary by an order of magnitude. ProUCL and the decision tree on which its recommendations are based have been developed using multitudes of simulated data sets with a variety of distributions and other characteristics. There are uncertainties as to how well this decision tree derives a recommended UCL for a given data set. This uncertainty tends to increase with variability and skewness and where a large number of the samples are nondetects. For example, with respect to distribution testing, ProUCL bases the determination of distribution type only on the detected samples. The true concentrations of the nondetected values are unknown, and this lack of information can affect the distribution determination and consequently affect the ProUCL recommendation. The general uncertainties associated with the EPC values and the use of ProUCL are discussed in the uncertainty analysis (Chapter 6.0). Specific uncertainties associated with the EPC values of specific data sets may be discussed in the uncertainty analysis as appropriate.

3.2.2 Exposure-Point Concentrations in Air

The models shown in the following subsections for estimating COPC concentrations in air include only those relevant and used specifically for AP1 COPCs and media.

3.2.2.1 COPC Concentrations from Dust

Inhalation exposure to particulate (dust) emissions from soils for the groundskeeper and construction worker evaluations arises from activities that raise dust. Therefore, the most appropriate approach for estimating chemical concentrations in ambient air is the use an activity-based dust loading equation (U.S. Department of Energy [DOE], 1989):

Eq. 3.1

$$C_a = (D)(C_s)(CF_1)$$

where:

C_a	=	contaminant concentration in air (milligrams per cubic meter [mg/m^3], calculated)
D	=	dust loading factor (grams [g] of soil/m^3 of air)
C_s	=	contaminant concentration in soil (mg/kg)
CF_1	=	conversion factor (1E-3 kg per g).

Plausible values for D include 2E-4 grams per cubic meter (g/m^3) for agricultural activity (DOE, 1989), 6E-4 g/m^3 for construction work (DOE, 1983), and 1E-4 g/m^3 for other activity (National Council on Radiation Protection and Measurements, 1984). The value for D of 1E-4 g/m^3 for other activity is used for the groundskeeper. It is assumed that construction activities requiring intensive contact with soil, for which D = 6E-4 g/m^3 is appropriate, may last for one-half of a construction period. The remaining one-half of the time is more realistically characterized by D = 1E-4 g/m^3. Therefore, a time-weighted average dust loading factor for construction work of 3.5E-4 g/m^3 is estimated for the construction worker.

Airborne concentrations of VOCs estimated by the dust loading model are assumed to sufficiently estimate levels of VOCs that may arise from volatilization, because the dust loading model treats the VOCs as if they were located at the ground surface.

The resident is more likely to be exposed to dust arising from wind erosion than from dust-raising activities on the site. EPA (1996) derived a model for estimating a dust particulate emission factor (PEF) based on an "unlimited reservoir" model and the assumption that the source area is square:

Eq. 3.2

$$PEF = Q/C \times \frac{3600}{0.036 \times (1 - V) \times (U_m / U_t)^3 \times F(x)}$$

where:

PEF	=	particulate emission factor (cubic meters per kilogram [m^3/kg], calculated)
Q/C	=	inverse of the mean concentration at center of square source (55.99 grams per square meter-second per kg/m^3, site-specific value from Table 3 in EPA [1996] [Zone 7, Cleveland, 5-acre site])
3600	=	seconds/hour
V	=	fraction of surface covered with vegetation (0.8, unitless, assumed)
U_m	=	mean annual wind speed (default, 4.60 meters per second [m/second] equals mean annual wind speed of 10.3 miles per hour [see Section 3.1.1])
U_t	=	equivalent threshold value of wind speed at 7 meters (default, 11.32 m/second)
F(x)	=	function dependent on U_m/U_t (default, 0.194).

The concentration of a COPC in air is calculated as follows:

Eq. 3.3

$$C_a = \frac{C_s}{PEF}$$

where:

C_a = contaminant concentration in air (mg/m^3, calculated)
C_s = contaminant concentration in soil (mg/kg)
PEF = particulate emission factor (m^3/kg).

Airborne concentrations of VOCs estimated by the wind erosion model are assumed to sufficiently estimate levels of VOCs that may arise from volatilization, because the wind erosion model treats the VOCs as if they were located at the ground surface.

3.2.2.2 Concentrations in Household Air from Groundwater Use

The inhalation of VOCs released from groundwater, which is assumed to be used as tap water, is evaluated for the on-site residential scenario. Chemicals that have a Henry's Law value exceeding 1E-5 atmospheres/m^3-mole and a molecular weight less than 200 g/mole are considered to be VOCs and are subject to evaluation via this pathway; Henry's Law values and molecular weights are presented in Table 3-3. Other groundwater contaminants are considered on a case-by-case basis for their potential contribution to risk via the inhalation pathway based on the degree of departure from the Henry's Law and molecular weight criteria, groundwater concentration, and toxicity.

The simple whole-house tap water-to-air model described in Part B of the EPA (1991b) Human Health Evaluation Manual (HHEM) was used to evaluate the tap water-to-air pathway. This model was selected based on correspondence between OEPA (2004) and USACE. Part B of the HHEM recommends a volatilization constant of 0.0005 for the total concentrations of all VOCs detected in groundwater; the conversion is characterized by the following equation:

Eq. 3.4

$$C_a = C_{gw} \times K_{wa} \times 1{,}000 \, {}^{L}\!/_{m^3}$$

where:

C_a = modeled concentration in air (mg/m^3)
C_{gw} = groundwater EPC (mg/L)
K_{wa} = tap water-to-air volatilization constant (0.0005 [unitless]: [EPA, 1991b])

Implicit in the HHEM Part B application of this model are the following assumptions: 1) A family of four uses the groundwater as the sole source of household tap water, 2) the volume of the house is 150 m^3, 3) the daily groundwater use is 720 L/day, 4) 50 percent of VOCs in tap water volatilize to household air, and 5) the air exchange rate of the house is 0.25 volumes per hour (EPA, 1991b).

3.2.2.3 Concentrations of VOCs in Groundwater: Resident Dermal Uptake

Volatilization of VOCs from household water reduces the remaining concentration available for dermal contact. As mentioned in Section 3.2.2.2, the HHEM Part B whole-house tap water-to-air model assumes that 50 percent of the VOC concentrations are released to household air. Thus, the concentrations of VOCs remaining in the water after volatilization occurs are calculated by difference as follows:

Eq. 3.5

$$C_d = C_{gw} \times (1 - F_v)$$

where:

C_d = concentration of VOC in household water available for dermal exposure (mg/L, calculated)
C_{gw} = concentration of VOC in groundwater (mg/L)
F_v = fraction of VOCs volatilized to air, (0.5 unitless).

Only the concentration remaining in tap water after volatilization (C_d), as applicable, is assumed to be available for contact with the skin during bathing/showering.

3.2.2.4 Exposure-Point Concentrations of COPCs in Venison

The hunter is assumed to harvest and consume game and share it with family members, including small children. The game is assumed to be venison, because the white-tailed deer is the species hunted most widely and most likely to provide a regular contribution to the diet. Data do not exist to reliably estimate contaminant concentrations in venison, but the following simplifying assumptions permit estimates sufficient for a BHHRA.

- Deer are small ruminants and, as such, are not unlike cattle; thus, it is reasonable to assume they may have similar physiological processes that could yield similar biotransfer factors. Unlike beef, however, deer meat does not undergo marbling with fat, and deer fat is quite unpalatable and is likely to be trimmed rather than consumed. Therefore, the biotransfer factors for edible venison are derived by adjusting biotransfer factors for beef to account for differences in the fat content of table-ready beef (cooked choice retail cuts trimmed to 0 inches of fat: average 14.4 percent fat) and venison (cooked boneless muscle meats: average 2.9 percent fat) (Nutrient Database, 1997).

- Deer are expected to browse a much larger area than that encompassed in AP1; therefore, the fraction of total browse consumed from AP1 is expected to be relatively small.

- Indirect food chain pathways may be significant for some metals and for those semivolatile organic compounds that persist in the environment and have the

tendency to bioaccumulate. VOCs are generally mobile in the environment and labile in biological systems and do not tend to bioaccumulate.

To reflect the assumptions previously noted, venison biotransfer factors are estimated by multiplying beef biotransfer factors by 2.9/14.4 (or 0.20), and by a fraction, FI_r. This fraction reflects the areal portion of the site compared to a deer's home range area. These assumptions are captured in the following equation:

Eq. 3.6

$$B_v = 0.20(B_b)(FI_r)$$

where:

B_v	=	biotransfer factor for venison (unitless, calculated)
0.20	=	factor to reflect differences in fat content between beef and venison (0.20, unitless, see above)
FI_r	=	areal portion of site compared to a deer's home range (0.03, unitless, see below)
B_b	=	biotransfer factor for beef.

Values for B_b for metals are provided in the toxicity profiles (Appendix C). Toxicity profiles are prepared for each of the COPCs. The toxicity profiles briefly describe the uses of the chemical, its physical properties, behavior in environmental media, biotransfer capability, and toxicity values.

The AP1 area is relatively small in comparison to the home range of a white-tailed deer. The total acreage of the AP1 study area is approximately 2 acres. The home range of the white-tailed deer is between 150 and 1,280 acres (Sample and Suter, 1994). Even if the low end of this range (150 acres) is assumed for deer in northern Ohio, the area represented by AP1 is approximately 1 percent of this land area. Although the use of FI_r equal to 0.01 or lower is justified, an FI_r value of 0.03 is used in the BHHRA to be consistent with other small sites evaluated at PBOW.

Deer are assumed to be exposed to contaminants by ingesting browse growing on contaminated soil. It is estimated that deer consume approximately 1.74 kg of browse per day (Sample, et al., 1996), which is approximately 50 percent dry matter (DM), or 0.87 kg browse DM per day (Mautz, et al., 1976). The contaminant concentration in browse is estimated from the following equation, which was originally developed for estimating the contaminant concentration in forage to which cattle may be exposed (EPA, 1994):

Eq. 3.7

$$C_p = (CF)(C_s)(B_p)$$

where:

C_p	=	concentration of contaminant in (plant) forage DM (mg/kg, calculated)
CF	=	conversion factor to adjust for soil containing 20 percent moisture (1.25, unitless).
C_s	=	concentration of contaminant in soil (mg/kg)
B_p	=	soil-to-forage biotransfer factor (mg of chemical per kg of dry plant/mg of chemical per kg of dry soil).

Values for B_p are taken from the toxicity profiles in Appendix C. B_p values for the vegetative parts of plants, rather than the reproductive parts of plants, are selected, as possible, because deer browse year-round, and the vegetative parts are more available for the greater part of the year.

The concentration of a COPC in venison can be estimated from the following equation (adapted from EPA [1994]):

Eq. 3.8

$$C_v = (Q_p)(C_p)(B_v)$$

where:

C_v	=	contaminant concentration in venison (mg/kg, calculated)
Q_p	=	browse ingestion rate (0.87 kg DM/day)
C_p	=	contaminant concentration in browse DM (mg/kg)
B_v	=	biotransfer factor for venison (days/kg).

3.3 Quantification of Chemical Intake

This section describes the models used to quantify doses or intakes of the COPCs by the exposure pathways identified above. Models were taken or modified from EPA (1989a) unless otherwise indicated.

3.3.1 Inhalation of COPCs in Air

The inhaled dose of a COPC in air (for the groundskeeper, construction worker, on-site resident: inhalation of dust and VOCs in ambient air from surface or total soil; for the construction worker: inhalation of VOCs in ambient air from subsurface soil; for the indoor worker and on-site resident: inhalation of VOCs in indoor air from subsurface soil) is estimated as follows:

Eq. 3.9

$$I_a = \frac{(C_a)(FI_a)(IR_a)(EF)(ED)}{(BW)(AT)}$$

where:

I_a = inhaled dose of COPC (milligrams per kilograms per day [mg/kg-day], calculated)
C_a = concentration of COPC in air (mg/m^3)
FI_a = fraction of exposure attributed to site media (unitless)
IR_a = inhalation rate (m^3/day)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (days).

3.3.2 Incidental Ingestion of COPCs in Soil or Sediment

The ingested dose of a COPC in soil (groundskeeper, construction worker, resident, indoor worker, hunter) or sediment (construction worker, resident) is estimated from the following equation:

Eq. 3.10

$$I = \frac{(C)(FI)(IR)(EF)(ED)(CF)}{(BW)(AT)}$$

where:

I = I_s for soil, I_{sd} for sediment, = ingested dose of COPC (mg/kg-day, calculated)
C = C_s for soil; C_{sd} for sediment; = concentration of COPC (mg/kg)
FI = FI_s for soil; FI_{sd} for sediment; = fraction of exposure attributed to site medium (unitless)
IR = IR_s for soil; IR_{sd} for sediment; = ingestion rate of medium (mg/day)
EF = exposure frequency (days/year)
ED = exposure duration (years)
CF = conversion factor (1E-6 kg/mg)
BW = body weight (kg)
AT = averaging time (days).

3.3.3 Incidental Ingestion of COPCs in Water

The ingested dose of a COPC in groundwater (future groundskeeper, resident) is estimated from the following equation:

$$I_w = \frac{(C_w)(IR_w)(FI_w)(EF_w)(ED_w)}{(BW)(AT)} \qquad \text{Eq. 3.11}$$

where:

I_w = ingested dose of COPC in water (mg/kg-day, calculated)
C_w = concentration of COPC in water (mg/L)

IR_w = water ingestion rate (L/day)
FI_w = fraction of exposure attributed to site water (unitless)
EF_w = fraction of exposure attributed to site water exposure frequency (days/year)
ED_w = exposure duration (years)
BW = body weight (kg)
AT = averaging time (days).

3.3.4 Dermal Contact with COPCs in Soil, Sediment, or Water

Unlike the methodologies for estimating inhaled or ingested doses of a COPC, which quantify the dose presented to the barrier membrane (the pulmonary or gastrointestinal mucosa, respectively), dermal dose is estimated as the dose that crosses the skin and is systemically absorbed. For this reason, dermal toxicity values are also based on absorbed dose. The absorbed dose of a COPC is estimated from the following equation (EPA, 2004a):

Eq. 3.12

$$DAD = \frac{(DA)(SA)(EF)(ED)}{(BW)(AT)}$$

where:

DAD = average dermally absorbed dose of COPC (mg/kg-day, calculated)
DA = dose absorbed per unit body surface area per day (milligrams per square centimeter per day [mg/cm^2-day])
SA = SA_s for soil, SA_{sd} for sediment, S_{gw} for groundwater, SA_{sw} for surface water, = surface area of the skin exposed (cm^2)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (days).

Dose absorbed per unit body surface area per day (DA) is calculated differently for dermal uptake from soil/sediment and from water. Dermal uptake of constituents from soil (groundskeeper, construction worker, on-site resident, hunter) or sediment (construction worker, on-site resident) assumes that absorption is a function of the fraction of a dermally applied dose that is absorbed. DA is calculated from the following equation (EPA, 2004a):

Eq. 3.13

$$DA = (C_s)(FI_s)(CF)(AF)(ABS)$$

where:

DA = dose absorbed per unit body surface area per day (mg/cm^2-day, calculated)
C = C_s for soil, C_{sd} for sediment, = concentration of COPC in medium (mg/kg)

FI = FI_s for soil, FI_{sd} for sediment, = fraction of exposure attributed to site medium (unitless)
CF = conversion factor (1E-6 kg/mg)
AF = AF_s for soil, AF_{sd} for sediment, = soil- or sediment-to-skin adherence factor (mg/cm^2-day)
ABS = absorption fraction (unitless, chemical-specific).

ABS values are provided in the toxicity profiles for each COPC (Appendix C).

Quantification of dermal uptake of constituents from groundwater (future groundskeeper, resident) or surface water (construction worker, resident) depends on a K_p, which describes the rate of movement of a constituent from water across the dermal barrier to the systemic circulation (EPA, 2004a). The equation for dermal uptake of chemicals from water is the same as the equation for dermal uptake of chemicals from soil (Eq. 3.12). DA is calculated differently for inorganic and organic chemicals in water. For inorganic chemicals, DA is calculated from the following equation:

Eq. 3.14

$$DA = (C_w)(FI)(K_p)(ET_w)(CF)$$

where:

DA = dose absorbed per unit body surface area per day (mg/cm^2-day, calculated)
C_w = concentration of COPC in water (mg/L)
K_p = permeability coefficient (centimeters per hour [cm/hour])
ET_w = time of exposure (hours/day)
CF = conversion factor (1E-3 liters per cubic centimeter [L/cm^3]).

K_p for organic chemicals varies by several orders of magnitude and is highly dependent on lipophilicity, expressed as a function of the octanol/water partition coefficient (EPA, 2004a). Because the stratum corneum (the outer skin layer) is rich in lipid content, it may act as a sink, initially reducing the transport of chemical to the systemic circulation. With continued exposure and the attainment of steady-state conditions, the rate of dermal uptake increases. Therefore, different equations are used to estimate DA, depending on whether the ET is less than or greater than the estimated time to reach steady state. Non-steady-state exposures occur when either the ET is relatively brief (e.g., showering, for most chemicals) or when intermittent exposure occurs throughout the day (e.g., wading exposure to surface water or washing of hands). For exposure scenarios under which steady state is not reached for a given organic chemical (τ> ET, see below), the following equation is used to calculate DA (EPA, 2004a):

Eq. 3.15

$$DA = 2(FA)(K_p)(C_w)(CF)\sqrt{\left(\frac{6\tau(ET_w)}{\pi}\right)}$$

where:

DA	=	dose absorbed per unit body surface area per day (mg/cm^2-day, calculated)
C_w	=	C_{sw} for surface water, C_{gw} for groundwater, = concentration of COPC in water (mg/L)
FA	=	fraction absorbed from the water (unitless)
K_p	=	permeability coefficient (cm/hour)
CF	=	conversion factor (1E-3 L/cm^3)
τ	=	time for concentration of contaminant in stratum corneum to reach steady state per event (hours)
ET_w	=	time of contact (hour(s)/day).

In cases where steady state is reached (τ<ET), such as where the duration of a bath exceeds the time to reach steady state for a given organic compound, the following equation is used to calculate DA (EPA, 2004a):

Eq. 3.16

$$DA = (FA)(K_p)(C_w)(CF)\left[\frac{ET_w}{1+B} + 2\tau\left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$$

where:

DA	=	dose absorbed per unit body surface area per day (mg/cm^2-day, calculated)
C_w	=	concentration of COPC in water (mg/L)
FA	=	fraction absorbed from the water (unitless)
K_p	=	permeability coefficient (cm/hour)
CF	=	conversion factor (1E-3 L/cm^3)
τ	=	time for concentration of contaminant in stratum corneum to reach steady state per event (hours)
ET_w	=	time of contact (hour[s]/day)
B	=	Ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (unitless).

Assuming one exposure event/day allows expressing ET as hour(s)/day, which preserves the dimensional integrity of the equation.

When available, values for K_p and τ are taken from EPA (2004a). For organics that have no K_p values listed, the values are calculated using the following equation (EPA, 2004a):

Eq. 3.17

$$\text{Log}(K_p) = -2.80 + 0.66(\log K_{ow}) - 0.0056(MW)$$

where:

K_p	=	permeability coefficient (cm/hour, calculated)
log K_{ow}	=	log of the octanol/water partition coefficient (unitless)
MW	=	molecular weight.

Where values for τ are not available, they were calculated using the following equation (EPA, 2004a).

Eq. 3.18

$$\tau = 0.105 \times 10^{(0.0056 \times MW)}$$

where:

τ	=	time for concentration of contaminant in stratum corneum to reach steady state (hours, calculated)
MW	=	molecular weight.

Values of K_p and τ used in the BHHRA are summarized in Table 3-3 and documented in Appendix C.

3.3.5 Consumption of Venison

Consumption of venison by the hunter or the hunter's child is evaluated by the following equation:

Eq. 3.19

$$I_v = \frac{(C_v)(IR_v)(EF)(ED)}{(BW)(AT)}$$

where:

I_v	=	ingested dose of COPC in venison (mg/kg-day, calculated)
Cv	=	concentration of COPC in venison (mg/kg)
IRv	=	venison ingestion rate (kg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days).

4.0 Toxicity Evaluation

Toxicity is defined as the ability of a chemical to induce adverse effects in biological systems. The purpose of the toxicity assessment is two-fold:

- Identify the cancer and noncancer effects that may arise from exposure of humans to the COPC (hazard assessment).
- Provide an estimate of the quantitative relationship between the magnitude and duration of exposure and the probability or severity of adverse effects (dose-response assessment).

The latter is accomplished by the derivation of cancer and noncancer toxicity values, as described in the following sections.

4.1 Evaluation of Carcinogenicity

A few chemicals are known, and many more are suspected, to be human carcinogens. The evaluation of the potential carcinogenicity of a chemical includes both a qualitative and a quantitative aspect (EPA, 2005). The qualitative aspect is a weight-of-evidence evaluation of the likelihood that a chemical might induce cancer in humans. EPA (2005) recognizes five weight-of-evidence group classifications for carcinogenicity. Formerly, EPA (1986) used a letter-based system to describe the weight of evidence for carcinogenicity. Reference to this former system is included because many of the carcinogenicity assessments listed on the Integrated Risk Information System (IRIS) use the former letter-based system (EPA, 2010f). The five EPA weight-of-evidence classifications are as follows:

- ***Carcinogenic to Humans*** (corresponds to the former Group A - Human Carcinogen).
- ***Likely to be Carcinogenic to Humans*** (includes both the former Group B1 and Group B2-Probable Human Carcinogens)
- ***Suggestive Evidence of Carcinogenic Potential*** (corresponds to the former Group C - Possible Human Carcinogen)
- ***Inadequate Information to Assess Carcinogenic Potential*** (corresponds to the former Group D - Not Classifiable as to Human Carcinogenicity)
- ***Not Likely to be Carcinogenic to Humans*** (corresponds to the former Group E - Evidence of Noncarcinogenicity to Humans).

The toxicity value for carcinogenicity, called a cancer slope factor (SF), is an estimate of potency. SFs are developed only for chemicals in the first three groups and only if the data are sufficient. The SFs are statistically derived from the dose-response curve from the best human or animal study or studies of the chemical. Although human data are often considered to be more reliable than animal data because there is no need to extrapolate the results obtained in one species to another, most human studies have one or more of the following limitations:

- The duration of exposure is usually considerably less than lifetime.
- The concentration or dose of chemical to which the humans were exposed can be approximated only crudely, usually from historical data.
- Concurrent exposure to other chemicals frequently confounds interpretation.
- Data regarding other factors (tobacco, alcohol, illicit or medicinal drug use, nutritional factors and dietary habits, heredity) are usually insufficient to eliminate or quantify confounding effects on the results.
- Most epidemiologic studies are occupational investigations of workers, which may not accurately reflect the range of sensitivities of the general population.
- Most epidemiologic studies lack the statistical power (i.e., sample size) to detect a low, but chemical-related increased incidence of tumors.

Most potency estimates are derived from animal data, which present different limitations:

- It is necessary to extrapolate from results in animals to predict results in humans, usually by estimating an equivalent human dose from the animal dose.
- The range of sensitivities arising from genotypic and phenotypic diversity in the human population is not reflected in the animal models ordinarily used in cancer studies.
- Usually, very high doses of chemical are used, which may alter normal biology, creating a physiologically artificial state and introducing substantial uncertainty regarding the extrapolation to the low-dose range expected with environmental exposure.
- Individual studies vary in quality (e.g., duration of exposure, group size, scope of evaluation, adequacy of control groups, appropriateness of dose range, absence of concurrent disease, sufficient long-term survival to detect tumors with long induction or latency periods).

The SF is usually expressed as "extra risk" per unit dose, that is, the additional risk above background in a population corrected for background incidence. It is calculated using the following equation:

Eq. 4.1

$$SF = (p_{(d)} - p_{(0)})/(1 - p_{(0)})$$

where:

SF	=	chemical-specific slope factor per unit dose $(mg/kg\text{-}day)^{-1}$
$p_{(d)}$	=	the probability of developing cancer at a dose of 1 mg/kg-day of the chemical of interest
$p_{(0)}$	=	the background probability of developing cancer at a dose of 0 mg/kg-day of the chemical of interest.

The SF is expressed as risk per mg/kg-day, shown mathematically as $(mg/kg\text{-}day)^{-1}$. To be appropriately conservative, the SF is usually the 95 percent upper bound on the slope of the dose-response curve extrapolated from high (experimental) doses to the low-dose range expected in environmental exposure scenarios. EPA (2005) assumes that there are no thresholds for carcinogenic expression; therefore, any exposure represents some quantifiable risk, however miniscule it may be.

The oral SF is usually derived directly from the experimental dose data, because oral dose is usually expressed as mg/kg-day. When the test chemical was administered in the diet or drinking water, oral dose first must be estimated from data for the concentration of the test chemical in the food or water, food or water intake data, and body weight data.

IRIS (EPA, 2010f) expresses inhalation cancer potency as a unit risk based on concentration, or risk per microgram of chemical per m^3 of ambient air, shown mathematically as (micrograms per cubic meter [$\mu g/m^3$])$^{-1}$. Because cancer risk characterization requires an SF expressed as risk per mg/kg-day, the unit risk must be converted to the mathematical equivalent of an inhalation cancer SF, or risk per unit dose as $(mg/kg\text{-}day)^{-1}$. Because the inhalation unit risk is based on continuous lifetime exposure of an adult human (assumed to inhale 20 m^3 of air per day and to weigh 70 kg), the mathematical conversion consists of multiplying the unit risk (per $\mu g/m^3$) by 70 kg and by 1,000 µg/mg, and dividing the result by 20 m^3 per day.

4.2 Evaluation of Noncarcinogenic Effects

Many chemicals, whether or not associated with carcinogenicity, are associated with adverse noncarcinogenic effects. The evaluation of noncancer effects (EPA, 1989b) involves the following:

- Qualitative identification of the adverse effect(s) associated with the chemical; these may differ depending on the duration (acute or chronic) or route (oral or inhalation) of exposure.
- Identification of the critical effect for each duration of exposure (i.e., the first adverse effect that occurs as dose is increased).
- Estimation of the threshold dose for the critical effect for each duration of exposure.
- Development of an uncertainty factor (UF); i.e., quantification of the uncertainty associated with interspecies extrapolation, intraspecies variation in sensitivity, severity of the critical effect, slope of the dose-response curve, and deficiencies in the database, in regard to developing a reference dose (RfD) for human exposure.
- Identification of the target organ(s) for the critical effect for each route of exposure.

These information points are used to derive an exposure route- and duration-specific toxicity value called an RfD, expressed as mg/kg-day, which is considered to be the dose for humans, with uncertainty of an order of magnitude or greater, at which adverse effects are not expected to occur. Mathematically, it is estimated as the ratio of the threshold dose to the UF. For purposes of risk assessment, chronic exposure is typically defined as equal to or greater than 7 years, i.e., at least 10 percent of expected life span; subchronic exposure is typically defined as 2 weeks to 7 years. However, professional judgment may be used where exposure durations approach 10 percent of the expected life span. Also, exposure during a critical stage of development, such as a portion of early childhood, may be treated as chronic even if the anticipated exposure duration is considerably less than 10 percent of the expected life span.

IRIS (EPA, 2010f) expresses the inhalation noncancer reference value as a reference concentration (RfC) in units of mg/m^3. Because noncancer hazard characterization requires a reference value expressed as mg/kg-day, the RfC must be converted to an inhalation RfD. Because the inhalation RfC is based on continuous exposure of an adult human (assumed to inhale 20 m^3 of air per day and to weigh 70 kg), the mathematical conversion consists of multiplying the RfC (mg/m^3) by 20 m^3/day and dividing the result by 70 kg.

RfD and RfC values are derived for both chronic and subchronic exposure. Under the assumption of monotonicity (incidence, intensity, or severity of effects can increase, but cannot decrease, with increasing magnitude or duration of exposure), a chronic RfD may be considered sufficiently protective for subchronic exposure, but a subchronic RfD may not be protective for chronic exposure. Currently, subchronic RfD values exist for few chemicals. Subchronic RfD values can be derived from chronic RfD values as follows:

- If the UF applied in the derivation of the chronic RfD (or RfC) does not provide for expansion from subchronic to chronic exposure (e.g., if the chronic RfD was derived from a chronic study), the chronic RfD is adopted as being sufficiently protective for subchronic exposure.

- If the UF applied in the derivation of the chronic RfD (or RfC) contains a component to expand from subchronic to chronic exposure, the subchronic RfD is derived by multiplying the chronic RfD by the factor used to expand from subchronic to chronic exposure (e.g., if a factor of 10 was used to expand from subchronic to chronic exposure, the subchronic RfD would be 10 times larger than the chronic RfD).

Only chronic RfDs and RfCs are used in the risk characterization of this BHHRA.

4.3 Dermal Toxicity Values

Dermal RfDs and SFs are derived from the corresponding oral values, provided there is no evidence to suggest that dermal exposure induces exposure route-specific effects that are not appropriately modeled by oral exposure data. In the derivation of a dermal RfD, the oral RfD is multiplied by the gastrointestinal absorption factor (GAF), expressed as a decimal fraction. The resulting dermal RfD, therefore, is based on absorbed dose. The RfD based on absorbed dose is the appropriate value with which to compare a dermal dose, because dermal doses are expressed as absorbed doses rather than exposure doses. The dermal SF is derived by dividing the oral SF by the GAF. The oral SF is divided, rather than multiplied, by the GAF because the SF is expressed as a reciprocal dose.

4.4 Target Organ Toxicity

As a matter of science policy, EPA assumes dose and effect to be additive for noncarcinogenic effects (EPA, 1989a). This assumption provides the justification for adding the HQ or hazard index (HI) values in the risk characterization for noncancer effects (Section 5.2) resulting from exposure to multiple chemicals, pathways, or media. However, EPA (1989a) acknowledges that adding all HQ or HI values may overestimate hazard, because the assumption of additivity is probably appropriate only for those chemicals that exert their toxicity by the same mechanism.

Mechanisms of toxicity data sufficient for predicting additivity with a high level of confidence are available for very few chemicals. In the absence of such data, EPA (1989a) assumes that chemicals that act on the same target organ may do so by the same mechanism of toxicity; that is, the target organ serves as a surrogate for mechanism of toxicity. When total HI for all media for a receptor exceeds 1 due to the contributions of several chemicals, it is appropriate to segregate the chemicals by route of exposure and mechanism of toxicity (i.e., target organ) and estimate separate HI values for each target organ.

As a practical matter, because human environmental exposures are likely to involve near- or sub-threshold doses, the target organ chosen for a given chemical is the one associated with the critical effect. If more than one organ is affected by a given chemical at the threshold, then all affected target organs are selected for this chemical. The target organ is also selected on the basis of duration of exposure (i.e., the target organ for chronic or subchronic exposure to low or moderate doses is selected rather than the target organ for acute exposure to high doses) and route of exposure. Because dermal RfD values are derived from oral RfD values, the oral target organ is adopted as the dermal target organ. For some chemicals, no target organ is identified. This occurs when no adverse effects are observed or when adverse effects such as reduced longevity or growth rate are not accompanied by recognized organ- or system-specific functional or morphologic alteration.

4.5 Sources of Toxicity Information Used in the Risk Assessment

Toxicity values were selected for use in the BHHRA based on EPA Office of Solid Waste and Emergency Response Directive 9285.7-53 (EPA, 2003), which prescribes the following hierarchy:

- **Tier 1** values: IRIS (EPA, 2010f) database.
- **Tier 2** values: These are EPA's provisional peer-reviewed toxicity values. The provisional peer-reviewed toxicity values are developed by the Office of Research and Development, the National Center for Environmental Assessment, and the Superfund Health Risk Technical Support Center on a chemical-specific basis when requested by the Superfund program.
- **Tier 3** values: These are other toxicity values from additional EPA and non-EPA sources of toxicity information. As stated in the EPA Office of Solid Waste and Emergency Response directive, "priority should be given to those sources of information that are the most current, the basis for which is transparent and publicly available, and which have been peer reviewed." Two common examples of Tier 3 values are the EPA's Health Effects Assessment Summary Tables (EPA, 1997b) and

the California Environmental Protection Agency (2005) Office of Environmental Health Hazard Assessment Toxicity Criteria Database.

The Environmental Council of States-U.S. Department of Defense (2007) has issued a toxicity value hierarchy that basically supports the EPA (2003) hierarchy presented previously but places higher emphasis on the necessity for external peer review.

GAFs used to derive dermal RfD values and SFs from the corresponding oral toxicity values are obtained from the following sources:

- Oral absorption efficiency data compiled by the National Center for Environmental Assessment for the Superfund Health Risk Technical Support Center of EPA
- Federal agency reviews of the empirical data, such as Agency for Toxic Substances and Disease Registry toxicological profiles and various EPA criteria documents
- Other published reviews of the empirical data
- The primary literature.

GAFs obtained from reviews are compared to empirical (especially more recent) data, when possible, and are evaluated for suitability for use in deriving dermal toxicity values from oral toxicity values. The suitability of the GAF increases when the following similarities are present in the oral pharmacokinetic study from which the GAF is derived and in the key toxicity study from which the oral toxicity value is derived:

- The same strain, sex, age, and species of test animal were used.
- The same chemical form (e.g., the same salt or complex of an inorganic element or organic compound) was used.
- The same mode of administration (e.g., diet, drinking water, or gavage vehicle) was used.
- Similar dose rates were used.

Individual COPC-specific toxicity profiles, including sources of the toxicity and GAF values, are included in Appendix C for all of the COPCs evaluated in the BHHRA. Summary toxicity information sufficient to support the risk calculations, including toxicity values, GAFs, target organs, and sources, are provided in Table 4-1.

5.0 Risk Characterization

Risk characterization is the process of applying numerical methods and professional judgment to determine the potential for adverse human health effects to result from the presence of site-specific contaminants. This is done by combining the intake rates estimated during the exposure assessment with the appropriate toxicity information identified during the toxicity assessment. Noncancer hazards and cancer risks are characterized separately, including COPCs that induce both types of effects.

Quantitative expressions are calculated during risk characterization that describe the probability of developing cancer (i.e., ILCRs), or the nonprobabilistic comparison of estimated dose with an RfD for noncancer effects (i.e., HQs and HIs). Quantitative estimates are developed for individual chemicals, exposure pathways, and exposure media for each receptor. These quantitative risk characterization expressions, in combination with qualitative information, are used to guide risk management decisions. Risk characterization, as described in this section, is applied only to COPCs.

Generally, the risk characterization follows the methodology prescribed by EPA (1989a), as modified by more recent information and guidance. EPA methods are designed to be health protective and tend to overestimate rather than underestimate risk (EPA, 1989a; Burmaster and Harris (1993); Cogliano, 1997). The risk results, however, may be overly conservative, because risk characterization involves multiplication of the conservative assumptions built into the estimation of the EPCs, exposure (intake) estimates, and toxicity dose-response assessments.

5.1 Cancer Risk

The risk from exposure to potential chemical carcinogens is estimated as the probability of an individual developing cancer over a lifetime and is called the ILCR. In the low-dose range, which would be expected for most environmental exposures, cancer risk is estimated from the following linear equation (EPA, 1989a):

Eq. 5.1

$$ILCR = (CDI)\,(SF)$$

where:

ILCR = incremental lifetime cancer risk, a unitless expression of the probability of developing cancer, adjusted for background incidence, calculated

CDI = chronic daily intake, averaged over 70 years (mg/kg-day)
SF = cancer slope factor (risk per mg/kg-day).

The chronic daily intake (CDI) term in Equation 5.1 is equivalent to the "I" or "DAD" terms (intake or dose) in Equations 3.9 through 3.12 and 3.19 when these equations are evaluated for cancer intakes.

The use of Equation 5.1 assumes that chemical carcinogenesis does not exhibit a threshold and that the dose-response relationship is linear in the low-dose range. Because this equation could generate theoretical cancer risks greater than 1 for high-dose levels, it is considered to be inaccurate at cancer risks greater than 1E-2. In these cases, cancer risk is estimated by the following one-hit model (EPA, 1989a):

Eq. 5.2

$$ILCR = 1 - e^{-(CDI)(SF)}$$

where:

ILCR = incremental lifetime cancer risk, a unitless expression of the probability of developing cancer, adjusted for background incidence, calculated
$-e^{(CDI)(SF)}$ = the exponential of the negative of the risk calculated using Equation 5.1.

Because all of the risks associated with AP1 COPCs are less than 1E-2, only Equation 5.1 was used in this BHHRA. As a matter of policy, EPA (1986) considers the carcinogenic potency of simultaneous exposure to low doses of carcinogenic chemicals to be additive, regardless of the chemicals' mechanisms of toxicity or sites of action (organs of the body). Cancer risk arising from exposure to multiple chemicals in a given exposure medium and pathway is estimated from the following equation (EPA, 1989a):

Eq. 5.3

$$ILCR_p = ILCR_{(chem\,1)} + ILCR_{(chem\,2)} + \ldots ILCR_{(chem\,i)}$$

where:

$ILCR_p$ = total pathway risk of cancer incidence, calculated
$ILCR_{(chem\ i)}$ = individual chemical cancer risk for the pathway.

The sum of the ILCRs summed across pathways is the total ILCR as shown in the equation below:

Eq. 5.4

$$Total\ ILCR = ILCR_{(p\,1)} + ILCR_{(p\,2)} + \ldots ILCR_{(p\,i)}$$

where:

Total ILCR	=	total incremental lifetime cancer risk across all pathways
$ILCR_{pi}$	=	incremental lifetime cancer risks associate with pathway "*i*."

The total ILCR represents all additional cancer risks posed to a given receptor by contact with contaminants in site environmental media.

Total ILCRs in the range of 1E-6 to 1E-4 are regarded as acceptable (EPA, 1990); as mentioned in Section 2.4.1, this range is referred to as the "NCP risk management range." Risks less than this range are regarded as negligible. A target cancer risk criterion of 1E-5 is used by OEPA and was selected by the PBOW Project Delivery Team as a basis to consider remedial action. Use of this 1E-5 criterion represents a departure from the Army's practice of generally using a cancer risk exceeding a value of 1E-4 (the upper end of the NCP risk management range) to trigger remedial action considerations.

5.2 Noncancer Effects of Chemicals

The hazards associated with noncancer effects of chemicals are evaluated by comparing an exposure level or intake with an RfD. The HQ, defined as the ratio of intake to RfD, is estimated as follows (EPA, 1989a):

Eq. 5.5

$$HQ = I \ / \ RfD$$

where:

HQ	=	hazard quotient (unitless, calculated)
I	=	intake of chemical averaged over subchronic or chronic exposure period (mg/kg-day)
RfD	=	reference dose (mg/kg-day).

The I term in Equation 5.4 is equivalent to the "I" or "DAD" terms (intake or dose) in Equations 3.9 through 3.12 and 3.19 when these equations are evaluated for noncancer intakes.

Chemical noncancer hazards are evaluated using chronic RfD values. This approach is different from the probabilistic approach used to evaluate cancer risks. An HQ of 0.01 does not imply a 1-in-100 chance of an adverse effect, but indicates only that the estimated intake is 100 times lower than the RfD. An HQ of unity indicates that the estimated intake equals the RfD. If the HQ is greater than unity, there may be concern for potential adverse health effects.

In the case of simultaneous exposure of a receptor to multiple chemicals, or to a given chemical by multiple pathways, an HI is calculated as the sum of the HQs by the following equation:

Eq. 5.6

$$HI = HQ_1 + HQ_2 + \ldots HQ_i$$

where:

HI = hazard index (unitless, calculated)
HQ_i = hazard quotient for the ith chemical, or for the ith pathway.

A total HI is calculated as the sum of all HI values, including all media and all COPCs, for a given receptor. Calculating a total HI as the sum of HQ values is based on the assumption that the potential for noncancer effects is additive. EPA (1989a), however, acknowledges that the assumption of additivity is probably appropriate only for chemicals that induce adverse effects by the same mechanism (please see Section 4.4). Therefore, if the total HI for a receptor exceeds 1, individual HI values may be calculated for each target organ.

A total target organ HI is calculated by summing the HI values (associated by target organ[s]), across exposure pathways as follows:

Eq. 5.7

$$Total\ Target\ Organ\ HI_a = HI_{p1-a} + HI_{p2-a} + \ldots HI_{pi-a}$$

where:

Total target organ HI_a = total hazard index for target organ "*a*" (unitless, calculated)
HI_{pi-a} = hazard index for target organ "*a*" via pathway "*i*."

HI values of 1 or less indicate that adverse noncancer health effects associated with that target organ of any individual under the exposure assumptions for that receptor are unlikely. If the total target organ HI exceeds a value of 1, then adverse noncancer health effects concerning that target organ and receptor cannot be regarded as unlikely.

5.3 Risk Characterization Results

Cancer and noncancer risk characterization results were evaluated for each receptor and each environmental medium, using the methods described in Sections 5.1 and 5.2. The following subsections describe the risk characterization results for each receptor associated with AP1. Risk summary tables are shown for each receptor as referenced. The detailed quantitative evaluation tables that include the exposure equations presented in Chapter 3.0 and the risk characterization equations presented in Chapter 5.0 are provided in Appendix D. Analytical results used as input in the BHHRA are included in Appendix E.

5.3.1 Current Groundkeeper

The ILCR for the current groundskeeper (Table 5-1) exposed to surface soil both through direct contact and via inhalation of suspended particulates is estimated as 5E-6. This is within the 1E-6 to 1E-4 NCP risk management range and is less than the PBOW cancer risk criterion of 1E-5. The total HI for the current groundskeeper (Table 5-1) is 0.2. This is less than the target HI value of 1, indicating that noncancer health effects are unlikely to occur.

5.3.2 Future Groundskeeper

The exposure assumptions for the future groundskeeper differ from those of the current groundskeeper (Section 5.3.1) in that the future groundskeeper is assumed to be exposed to total soil rather than surface soil, and the future groundkeeper is also assumed to be exposed to groundwater via direct contact (ingestion and dermal exposure). The risk characterization was run separately for bedrock groundwater exposure and overburden (well) groundwater exposure.

Bedrock Groundwater Use. The total ILCR for the future groundskeeper, assuming hypothetical bedrock groundwater use, is 9E-4 (Table 5-1). This value exceeds both the NCP risk management range and the PBOW target cancer risk criterion of 1E-5. Over 99 percent of this ILCR is associated with benzene (2.7E-4) and arsenic (5.8E-4) in groundwater.

Benzene is a petroleum constituent that is known to be naturally occurring in the limestone groundwater at PBOW (Shaw, 2006), and was found to be prevalent in bedrock groundwater underlying the adjacent LBA site (Shaw, 2010b). Petroleum was reported seeping at depth in well AP1-BEDGW-001 (57.8-59.5 feet bgs; 62.8-64.8 feet bgs; 75.7-75.8 feet bgs) during well installation, and accumulated product was evident in this well during sampling. Also, a petroleum sheen was seen on the surface of downgradient well IT-MNTA-BEDGW-001 (evaluated for risk in the LBA BHHRA [Shaw, 2010b]), which is also one of the highest hydrogen sulfide producers at PBOW, and strong hydrogen sulfide also emanated from well AP1-BEDGW-002.

Arsenic was detected in both AP1 bedrock monitoring wells, AP1-BEDMW-001 and AP1-BEDMW-002, at concentrations ranging from 50.7 to 110 µg/L. It is noted that AP1-BEDGW-002 could only be sampled by bailer because of insufficient yield for low-flow sampling, and AP1-BEDGW-001 had to be sampled via bailer because of the presence of petroleum product. It is also noted that at the nearby LBA site, the intent was to collect 12 groundwater samples from 6 bedrock wells during two sampling events using low-flow sampling method. Of these 12, only

5 could be collected because the wells were dry; of the 5 that were collected, all had to be collected via bailer because of insufficient yield.
The low yield for the AP1 and nearby LBA bedrock monitoring wells, as well as the presence of naturally occurring petroleum, indicates that potable use by a site worker is not a plausible exposure pathway. In addition, the arsenic present in the AP1 bedrock groundwater appears to be unrelated to PBOW activities based on the following observations:

- Arsenic was not detected above background in any of the overlying overburden well samples.
- Arsenic was found to be present at background concentrations in AP1 soil samples. The MDC (31.2 mg/kg) and mean concentration (9.7 mg/kg) of arsenic in total soil are both less than those of PBOW background data set (36.5 and 10.1 mg/kg, respectively).

The ILCR for the future groundskeeper without the contributions of groundwater is 2E-6 (Table 5-2), which is within the NCP cancer risk management range and less than the 1E-5 PBOW cancer risk criterion.

The total HI for the future groundskeeper (Table 5-1) is 11. This exceeds the target HI value of 1, which would seem to indicate that noncancer health effects cannot be regarded as unlikely to occur. Most of this HI is associated with the hypothetical use of bedrock groundwater, which alone represents an HI of 9. As discussed previously for cancer risk to the future groundskeeper, AP1 groundwater is not present in sufficient quantity. Also, note that approximately 90 percent of this HI value is associated with benzene (HQ=3.4), arsenic (HQ=3.6), and thallium (HQ=0.8) in groundwater. As stated above, benzene is not associated with former PBOW operations but is associated with naturally occurring petroleum.

As discussed previously for cancer effects, arsenic was not detected above background concentrations in AP1 overburden groundwater and AP1 soil. The thallium found in a single bedrock groundwater sample (estimated concentration of 5.3 µg/L, which is below the reporting limit of 5.3 µg/L at AP1-BEDGW-001 in May 2009) was not found in the associated filtered sample, indicating that the thallium is associated with suspended sediments. Also, thallium was not detected in this well in the November 2009 sample (Shaw, 2010a). It is noted that thallium analysis is subject to electronic interference, especially at concentrations below the reporting limit, frequently resulting in false positives. Note also that no RfD is currently listed on IRIS; the HQ for thallium is based on an RfD that has recently been withdrawn because the studies are of poor quality (EPA, 2010d).

If the contributions of groundwater pathways are appropriately excluded based on low water yield and naturally poor groundwater quality, the resulting HI for this receptor is 2 (Table 5-2). This exceeds the threshold criterion of 1. Over 90 percent of this value is associated with manganese in soil. However, of the 30 total soil samples collected from AP1, only the sample collected from AP1-SB04 at a depth of 8 to 10 feet bgs exhibited a concentration (4,470 mg/kg) that exceeds the BSC (3,510 mg/kg). Because the BSC is based on an upper tolerance limit of 95 percent, it is statistically expected that up to 5 percent of samples (mathematically 1.5 of the 30 total soil samples collected) from the same background population may exceed the BSC. Thus, the single exceedance of the BSC among the 30 AP1 total soil samples is not unexpected from a statistical perspective and is consistent with the background data set, wherein 1 of 26 manganese samples exceeds the BSC. Also, the ash at seven of eight soil borings, including AP1-SB04, extends to a depth of less than 2.5 feet bgs. The soil at 8 to 10 feet bgs at AP1-SB04 appears to be native soil (clayey silt), and the soil samples collected from this boring at 0 to 1 foot bgs (within the ash layer) and at 3 to 4 feet have concentrations of manganese of only 241 and 871 mg/kg, respectively. Further, manganese concentrations at 8 to 10 feet bgs in the other seven AP1 soil borings were all less than 600 mg/kg. This observation indicates that appreciable amounts of manganese are not leaching or have not leached to the deeper soil, thereby providing further evidence that the BSC exceedance found at depth in boring AP1-SB04 is associated with the native soil rather than the ash. Note that the arithmetic mean concentration of manganese in AP1 total soil (672 mg/kg) is consistent with and slightly less that of the PBOW background data set (729 mg/kg), and the MDC in AP1 total soil (4,470 mg/kg) is less than that of the background data set (13,300 mg/kg). This further indicates that the HQ of manganese at AP1 is associated with concentrations that do not exceed PBOW background.

It is also noted that the HI for the construction worker is based on conservative soil-to-air dust-loading assumptions (Section 3.2.2.1) which result in a predicted air concentration of 0.00014 mg/m^3. This concentration is four orders of magnitude less than the Occupational Safety and Health Administration (OSHA) 8-hour time-weight average permissible exposure limit (PEL) (8-hour time weighted average [TWA]) of 5 mg/m^3 for construction applications and the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) 10-hour TWA (REL [10-hour TWA]) of 1 mg/m^3. The OSHA PEL (8-hour TWA) is regulatorily enforceable and the lower of the OSHA PEL and NIOSH REL TWA values is commonly implemented as a protective value for respiratory protection. Clearly, the predicted conservative concentrations of manganese in air for this receptor meet the NIOSH recommended and OSHA regulatorily enforceable levels. Also, as discussed in the previous paragraph, manganese concentrations in AP1 soil do not exceed background.

If the contributions of manganese to the HI are excluded due to manganese concentrations being consistent with background levels, the resulting HI for the AP1 groundskeeper is 0.2. This is less than the target HI criterion of 1.

Overburden Groundwater Use. The total ILCR for the future groundskeeper, assuming hypothetical use of overburden groundwater, is 2E-6 (Table 5-1). This value is within the NCP risk management range, and is less than the PBOW target cancer risk criterion of 1E-5. Because no carcinogenic COPCs were identified in AP1 overburden groundwater, this ILCR is entirely associated with exposure to total soil.

The total HI for the future groundskeeper, assuming hypothetical use of overburden groundwater, is 15 (Table 5-1). This exceeds the target HI criterion of 1, indicating that noncancer health effects cannot be considered unlikely to occur under this scenario. The HI associated with exposure to overburden groundwater is 13, approximately 95 percent of which is associated with manganese (HQ=7.3) and thallium (HQ=4.7). Manganese was detected at concentrations (32,300 µg/L in May and 8,290 µg/L in November 2009) exceeding the BSC only in well AP1-MW01. Similarly, thallium was detected only in well AP-MW01, but was detected only in the May 2009 sample (34.6 µg/L); it was not detected in any other AP1 sample, including the November 2009 sample from AP1-MW01. It is noted that AP1-MW0l is located upgradient (south) of AP1 and, thus, may not be associated with the ash. Note that no RfD is currently listed on IRIS; the HQ for thallium is based on an RfD that has recently been withdrawn because the studies are of poor quality (EPA, 2010f).

Regardless of the source(s) of manganese and thallium and questions concerning the toxicity of thallium, the overburden groundwater underlying AP1 produces insufficient yield for potable use. Of the six samples collected from the three AP1 wells, only the two samples from AP1-MW01 could be collected using low-flow sampling, and the flow rate of AP1-MW01 in November 2009 was only 42 µg/L, which is less than the 50 µg/L criterion below which samples typically are collected via bailer. All of the other four AP1 overburden samples had to be collected with a bailer because of inadequate recharge for low-flow collection. It is noted that the overburden groundwater underlying the adjacent LBA also was found to produce inadequate yield for potable use (Shaw, 2010b). Therefore, inclusion of the groundwater use pathway exaggerates exposure to this receptor. The total HI for the future groundskeeper excluding use of overburden water of 2 exceeds the target HI criterion. This soil-only exposure scenario is discussed above under “Bedrock Groundwater Use” for this receptor.

5.3.3 Indoor Worker

The exposure assumptions for the future indoor worker include direct contact with surface soil, inhalation of volatiles from subsurface soil, and direct exposure with groundwater via direct contact (ingestion and dermal exposure). The risk characterization was run separately for bedrock groundwater exposure and overburden (well) groundwater exposure.

Bedrock Groundwater Use. The total ILCR for the future indoor worker, assuming hypothetical bedrock groundwater use, is 8E-4 (Table 5-1). This value exceeds both the NCP risk management range and the PBOW target cancer risk criterion of 1E-5. Over 99 percent of this ILCR is associated with benzene (2.7E-4) and arsenic (5.8E-4) in groundwater. As described in Section 5.3.2, benzene is a petroleum constituent that is known to be naturally occurring in the limestone groundwater at PBOW (Shaw, 2006), and petroleum was reported seeping at depth in well AP1-BEDGW-001 and at four of the six wells bedrock wells at the adjacent LBA site (Shaw, 2010b). Also, as discussed in Section 5.3.2, the presence of elevated arsenic in LBA bedrock groundwater does not appear to be related to former site activities. The ILCR for the future indoor worker is 1E-6 if the contribution of bedrock groundwater is appropriately excluded (Table 5-2). This value equals the lower end of the NCP risk management range and is less than the PBOW 1E-5 cancer risk criterion.

The total HI for the future indoor worker (Table 5-1) is 9. This exceeds the target HI value of 1, which would seem to indicate that noncancer health effects cannot be regarded as unlikely to occur. Virtually all of this HI is associated with the hypothetical use of bedrock groundwater. As discussed in Section 5.3.2 for the future groundskeeper, AP1 groundwater is not present in quantities sufficient for use. Also, approximately 90 percent of this HI value is associated with benzene (HQ=3.6), arsenic (HQ=3.4), and thallium (HQ=0.8) in bedrock groundwater. As stated above, benzene is not related to former PBOW operations but is associated with naturally occurring petroleum. As discussed previously for cancer effects, arsenic was not detected above background concentrations in AP1 overburden groundwater and was found to be present in soil at background concentrations. The thallium found in a single bedrock groundwater sample (estimated concentration below the reporting limit of 5.3 µg/L at AP1-BEDGW-001 in May 2009) was not found in the associated filtered sample, indicating that the thallium is associated with suspended sediments. It is also noted that thallium was not detected in this well in the November 2009 sample. Thallium analysis is also subject to electronic interference, especially at concentrations below the reporting limit, frequently resulting in false positives. Therefore, it appears that arsenic and thallium reported in bedrock groundwater are unlikely to be associated with former PBOW activities. Note also that no RfD is currently listed on IRIS; the HQ for

thallium is based on an RfD that has recently been withdrawn because the studies are of poor quality (EPA, 2010f).

If the contributions of hypothetical bedrock groundwater are excluded because of low yield and naturally poor quality as described in Section 5.3.2, the resulting HI for the indoor worker is 0.008 (Table 5-2). This is far less than the target criterion of 1 and suggests that adverse noncancer health effects are unlikely.

Overburden Groundwater Use. The total ILCR for the future indoor worker, assuming hypothetical use of overburden groundwater, is 1E-6 (Table 5-1). This value equals the lower end of the NCP risk management range and is less than the PBOW target cancer risk criterion of 1E-5. Because no carcinogenic COPCs were identified, this ILCR is entirely associated with exposure to total soil.

The total HI for the indoor worker is 13, assuming hypothetical use of overburden groundwater (Table 5-1). This exceeds the target HI criterion of 1, indicating that noncancer health effects cannot be considered unlikely to occur under this scenario. Virtually all of this value is associated with assumed exposure to groundwater. Approximately 95 percent of this HI is associated with manganese (HQ=7.3) and thallium (HQ=4.7). Manganese was detected at concentrations (32,300 µg/L in May and 8,290 µg/L in November 2009) exceeding the BSC only in well AP1-MW01. Similarly, thallium was detected only in well AP-MW01, but was detected only in the May 2009 sample (34.6 µg/L); it was not detected in any other AP1 sample, including the November 2009 sample from AP1-MW01. AP1-MW0l is located upgradient (south) of AP1 and thus may not be associated with the ash. Note also that no RfD is currently listed on IRIS; the HQ for thallium is based on an RfD that has recently been withdrawn because the studies are of poor quality (EPA, 2010f).

Overburden groundwater underlying AP1 produces insufficient yield for potable use, as described in Section 5.3.2. Therefore, regardless of the source(s) of the overburden groundwater COPCs, inclusion of the groundwater use pathway exaggerates overall exposure. If the use of overburden groundwater is appropriately excluded, the total HI for the future indoor worker is 0.008, which is far less than the target HI criterion. This soil-only exposure scenario is discussed above under “Bedrock Groundwater Use” for this receptor.

5.3.4 Construction Worker

The construction worker is assumed to be exposed to total soil through direct contact and via inhalation of suspended particulates, and to sediment and surface water via direct contact. The

ILCR for the AP1 construction worker (Table 5-1) is estimated as 8E-7. This is less than both the 1E-6 to 1E-4 NCP risk management range and the PBOW cancer risk criterion of 1E-5.

The total HI for the construction worker (Table 5-1) is 8. This exceeds the target HI value of 1. Therefore, noncancer health effects cannot be regarded as unlikely to occur. Approximately 90 percent of this value is associated with manganese in total soil (HQ=6.8). As mentioned in Section 5.3.2, the arithmetic mean concentration of manganese in AP1 total soil is slightly less than that of the PBOW background data set, and the MDC is less than that of the background data set. Also, only 1 of the 30 total soil samples exceeds the BSC. Because the BSC is based on an upper tolerance limit of 95 percent, statistically, 5 percent of samples (or 1.5 of the 30 total soil samples collected) may be expected to exceed the BSC; thus, the single exceedance of the BSC in not unexpected and is consistent with the PBOW background data set, wherein 1 of 26 background samples exceeds the BSC for manganese. In summary, manganese in AP1 soil does not exceed PBOW background concentrations.

It is also noted that the HI for the construction worker is based on conservative soil-to-air dust-loading assumptions (Section 3.2.2.1) and results in a predicted manganese air concentration of 0.00048 mg/m^3. This concentration is four orders of magnitude less than the OSHA PEL (8-hour TWA) of 5 mg/m^3 for construction applications and the NIOSH REL (10-hour TWA) of 1 mg/m^3. The OSHA PEL (8-hour TWA) is regulatorily enforceable, and the lower of the OSHA PEL and NIOSH REL TWA values is commonly implemented as a protective value for respiratory protection. Clearly, the conservatively predicted concentrations of manganese in air for this receptor meet the regulatorily enforceable and NIOSH-recommended levels. Also, as discussed in the previous paragraph, manganese concentrations in AP1 soil do not exceed those of PBOW background.

If the contributions of manganese to the HI are excluded due to manganese concentrations being consistent with background levels, the resulting HI for the AP1 construction worker is 0.9. This is less than the target HI criterion of 1.

5.3.5 Resident

The exposure assumptions for the resident include direct contact with total soil, inhalation of particulates from total soil, inhalation of volatiles from subsurface soil, direct exposure to sediment and surface water (ingestion and dermal exposure), and direct exposure with groundwater via direct contact (ingestion and dermal exposure). The risk characterization was run separately for bedrock groundwater exposure and overburden (well) groundwater exposure. The ILCR was calculated assuming exposure during a combined 30-year child/adult exposure

duration, whereas separate noncancer HI values were calculated for the young child and adult life stages (refer to Section 3.1.3.5). The results of each are described below.

Bedrock Groundwater Use. The total ILCR for the resident, assuming bedrock groundwater exposure, is 6E-3 (Table 5-1). This value exceeds both the NCP risk management range and the PBOW target cancer risk criterion. Over 99 percent of this ILCR is associated with arsenic (2.5E-3), benzene (3.7E-3), and naphthalene (3.0E-4) in groundwater. As discussed in Section 5.3.2, the presence of elevated arsenic in AP1 bedrock groundwater does not appear to be related to former site activities. As described in Section 5.3.2, benzene is a petroleum constituent that is known to be naturally occurring in the limestone groundwater at PBOW (Shaw, 2006), and during well installation, petroleum was observed seeping at depth from well AP1-BEDGW-001 as well as from four of the six monitoring wells at the adjacent LBA site (Shaw, 2010b). Naphthalene is also a naturally occurring constituent in petroleum. Evidence that the naphthalene found in AP1 bedrock groundwater is not related to PBOW activities includes the following observations: 1) Naphthalene and other petroleum-related compounds were not detected in the overlying overburden groundwater, and 2) naphthalene was not identified as a soil COPC. Further, as discussed in Section 5.3.2, bedrock groundwater underlying the AP1 does not provide adequate yield for tap water use. All bedrock groundwater samples had to be collected via bailer except those from AP-BEDGW-001, and the sample collected from this well in November 2009 had a flow rate of 42 µg/L, which is less than the 50 µg/L criterion typically used for low-flow collection. Therefore, if the bedrock groundwater use is appropriately excluded, the ILCR for the resident is 9E-6. This value is within the NCP risk management range and meets the PBOW 1E-5 cancer risk criterion.

The total HI for the child resident, assuming bedrock groundwater exposure, is 135 (Table 5-1). This exceeds the target HI value of 1, indicating that noncancer health effects cannot be regarded as unlikely to occur. Virtually all of this HI is associated with exposure to bedrock groundwater, and approximately 90 percent of the groundwater HI value is associated with benzene (HQ=70), arsenic (HQ=23), naphthalene (HQ=12), and xylenes (HQ=15). The non-site-relatedness of arsenic, benzene, and naphthalene are discussed in the preceding paragraph. Similar to benzene and naphthalene, xylenes are a component of naturally occurring petroleum. Xylenes appear to be unrelated to former PBOW activities based on the observations that xylenes were not detected in the overlying overburden unit or in AP1 soil.

As discussed in Section 5.3.2, bedrock groundwater underlying AP1 does not provide adequate yield for potable use. Therefore, if the contribution of bedrock groundwater is appropriately excluded, the resultant HI for the child resident is 0.7. This meets the target HI, indicating that

adverse noncancer health effects are unlikely to result from exposure by the child resident receptor to AP1 total soil, sediment, and surface water (Table 5-2).

The total HI for the adult resident, assuming bedrock groundwater exposure, is 58 (Table 5-1). This exceeds the target HI value of 1, indicating that noncancer health effects cannot be regarded as unlikely to occur. Similar to the child resident discussed above, virtually all of this HI is associated with exposure to bedrock groundwater, and approximately 90 percent of the groundwater HI value is associated with benzene (HQ=30), arsenic (HQ=10), naphthalene (HQ=5), and xylenes (HQ=7). The non-site-relatedness of these four compounds is discussed for the child resident in the preceding paragraphs. Also, as discussed above, bedrock groundwater underlying the AP1 provides insufficient yield to consider as a source of residential groundwater. Therefore, the contribution of bedrock groundwater may be appropriately excluded; the resultant HI for the adult resident is 0.1. This meets the target HI, indicating that adverse noncancer health effects are unlikely to result from exposure by the adult resident receptor to AP1 total soil, sediment, and surface water (Table 5-2).

Overburden Groundwater Use. The total ILCR for the future resident, assuming overburden groundwater exposure, is 9E-6 (Table 5-1). This value is within the NCP risk management range and is less than the PBOW target cancer risk criterion. Because none of the overburden groundwater COPCs are carcinogenic, the ILCR for this receptor is associated with exposure to total soil, sediment, and surface water.

The total HI for the child resident, assuming overburden groundwater exposure, is 82 (Table 5-1). This exceeds the target HI value of 1, which would seem to indicate that noncancer health effects cannot be regarded as unlikely to occur. Approximately 94 percent of this HI is associated with manganese (HQ=46) and thallium (HQ=31). Manganese was detected at concentrations (32,300 µg/L in May and 8,290 µg/L in November 2009) exceeding the BSC only in well AP1-MW01. Similarly, thallium was detected only in well AP-MW01, but was detected only in the May 2009 sample (34.6 µg/L); it was not detected in any other AP1 sample, including the November 2009 sample from AP1-MW01. AP1-MW0l is located upgradient (south) of AP1 and thus may not be associated with the ash. Note also that no RfD is currently listed on IRIS; the HQ for thallium is based on an RfD that has recently been withdrawn because the studies are of poor quality (EPA, 2010f).

Regardless of the source(s) of manganese and thallium and questions concerning the toxicity of thallium, overburden groundwater underlying AP1 produces insufficient yield for potable use, as described in Section 5.3.2. Therefore, regardless of the source(s) of the overburden groundwater

COPCs, inclusion of the groundwater use pathway exaggerates overall exposure. If the groundwater pathway is appropriately excluded, then the total HI for the child resident exposed to AP1 total soil, sediment, and surface water is 0.7 (Table 5-2). This value is meets the target HI criterion of 1.

The total HI for the adult resident, assuming overburden groundwater exposure, is 35 (Table 5-1). This exceeds the target HI value of 1, which would seem to indicate that noncancer health effects cannot be regarded as unlikely to occur. Approximately 95 percent of this HI is associated with manganese (HQ=20) and thallium (HQ=13). As discussed above for the child resident, these inorganic COPCs may not be associated with the ash, and the HQ of thallium is highly questionable.

Overburden groundwater underlying AP1 produces insufficient yield for potable use, as described in Section 5.3.2. Therefore, regardless of the source(s) of the overburden groundwater COPCs, inclusion of the groundwater use pathway exaggerates overall exposure. If the groundwater pathway is appropriately excluded, then the total HI for the adult resident exposed to AP1 total soil, sediment, and surface water is 0.1 (Table 5-2), which meets the target HI criterion of 1.

5.3.6 Adult Hunter

The ILCR for the adult hunter (Table 5-1) exposed to surface soil both through direct contact and via the ingestion of venison is estimated as 3E-7. This is less than the 1E-6 to 1E-4 NCP risk management range and than the PBOW cancer risk criterion of 1E-5.

The total HI for the adult hunter is (Table 5-1) is 0.0009. This is far less than the target HI value of 1, indicating that noncancer health effects are unlikely to occur.

5.3.7 Hunter's Child

The ILCR for the hunter's child (Table 5-1) exposed to surface soil via the ingestion of venison from deer which grazed on site cannot be quantified because none of the carcinogenic COPCs in surface soil bioaccumulates in food. Cancer risks associated with PBOW to this receptor are regarded as de minimis and less than the 1E-6 to 1E-4 NCP risk management range and the PBOW cancer risk criterion of 1E-5.

The total HI for the hunter's child (Table 5-1) likewise cannot be quantified because none of noncancer COPCs in surface soil bioaccumulates in food. This indicates that noncancer health effects are unlikely to occur.

6.0 Uncertainty Analysis

The primary objective of the BHHRA is to characterize and quantify potential human health risks. However, these risks are estimated using incomplete and imperfect information that introduces uncertainties at various stages of the risk assessment process. Uncertainties associated with earlier stages of the risk assessment become magnified when they are linked with other uncertainties in the latter stages. Reliance on a simplified numerical presentation of dose rate and risk without consideration of uncertainties, limitations, and assumptions inherent in their derivation can be misleading. For example, the calculated ILCR for a given scenario "A" may be 1E-5 (meets the PBOW risk criterion) and that of scenario "B" may be 5E-5 (exceeds the PBOW risk criterion). However, if the uncertainties associated with scenario "B," for instance, span orders of magnitude and the ILCR is regarded as biased high, it is not unlikely that scenario "A" actually presents a higher risk of developing cancer.

The chief goal of this analysis is to evaluate uncertainties and present them in context of their potential impact on the interpretation of the risk assessment results and the types of environmental management decisions that may be based on these results. The uncertainty analysis does not exhaustively describe all potential uncertainties but presents those that have the largest implications for the interpretation of the risk assessment results. This analysis also summarizes the types and, as applicable, the magnitude of the uncertainties at each stage of the risk assessment. Although the discussion in the following sections includes generic uncertainties that are common to the state of human health risk assessment practice overall (e.g., additivity of health effects in the risk characterization), the uncertainty analysis focuses on the sets of uncertainties that are specific to AP1.

6.1 Types of Uncertainty

Uncertainties in risk assessment are categorized into two general types: 1) variability inherent in the (true) heterogeneity of the data set, measurement precision, and measurement accuracy; and 2) uncertainty that arises from data gaps. Estimates of the degree of variability tend to decrease as the sample size increases. This is because larger data sets are less impacted by individual samples/measurements and typically allow for greater accuracy. Uncertainty that arises from data gaps is addressed by applying models and assumptions. Models are applied because they represent a level of understanding to address certain exposure parameters that are impractical or impossible to measure (e.g., COPC concentrations in air that would result from groundwater use that has not yet occurred—or may never occur—at the site). Assumptions represent an educated estimate to address information that is not available (e.g., additivity of carcinogens).

6.2 Sources of Uncertainty

The discussion in the following subsections provides an overview of uncertainty, with a focus on those sources that are most likely to affect interpretation of the risk assessment results.

6.2.1 Sample Selection

Soil samples were collected from within the former AP1 area where ash waste was deposited. The well locations were selected from within and adjacent to AP1, including downgradient areas. Surface water and sediment samples were collected along the unnamed tributary to Plum Brook in the vicinity of AP1 that had potentially been impacted by AP1 materials. The sample locations appear to be representative of the site, and no information suggests that they have introduced an identifiable bias.

6.2.2 Laboratory Analysis

State-of-the-practice SW-846 laboratory methods were used for analysis of the RI samples (Shaw, 2010a). For metal in groundwater, this included Method 6010b, which utilizes inductively coupled plasma spectrometry. This method is subject to electronic interferences, particularly at concentrations less than the reporting limit. Although thallium was identified as a COPC in bedrock groundwater, the only detection among the four AP1 bedrock groundwater samples was an estimated concentration of 5.3J µg/L (May 2009 sample from well AP1-BEDGW-001); thallium was not detected in the filtered sample from this same well. Use of this detection likely introduces a high bias to the risk calculations for receptors assumed to use bedrock groundwater. However, because AP1 bedrock groundwater was identified as a unsuitable source of potable water due to naturally poor quality and unreliable yield (Section 5.3.2), inclusion of this sample does not affect overall risks if AP1 bedrock groundwater use is appropriately excluded.

6.2.3 Exposure-Point Concentration Estimates

Uncertainty is introduced in the statistical approach used to calculate the EPCs. As stated in the HHEM (EPA, 1989a), the average concentration of the site should be used as the concentration term. Generally, a UCL is used to account for the uncertainty of using a sample data set to estimate the true population mean concentration for the site. ProUCL Version 4.0 software (EPA, 2010a) was used to calculate the EPCs for those media with five or more samples. However, as is readily observed by reviewing the ProUCL output (Appendix B), the calculation of the UCL can vary with methodology. It is unclear as to whether the UCL value of a specific EPC would result in an underestimate or overestimate of the true population mean. However, the general use of a UCL on all the data sets, even given the uncertainty as to whether a given method provides full coverage at 95 percent confidence, would result in general overestimation of the population

mean and associated risks. Therefore, as intended by the guidance (EPA, 1989a), this practice of using the UCL as the EPC (note that the MDC is used as the EPC if the UCL exceeds the MDC) introduces bias that tends to overestimate the population mean and the resultant risk values.

The bedrock groundwater, sediment, and surface water data sets have fewer than five samples. Thus, the MDC was used as the EPC for these data sets. Use of the MDC likely introduces a high bias to the risk values.

6.2.4 Land-Use Assumptions/Receptor Selection

The current groundskeeper is intended to represent an on-site worker under the current land use as NASA-controlled property. Because there is currently no identified NASA activity at AP1, the use of this receptor likely overestimates risks and hazards to a current site worker. The assumed future use of the hunter and the hunter's child are reasonable, as other areas within PBOW may currently be legally hunted by permit.

Unrestricted land use, including residential use, is a reasonable assumption for the future at AP1, given the rural residential use of property adjacent to the PBOW facility. The assumption that either the overburden or bedrock groundwater will be used as a potable water source in the future is unlikely for reasons described in the following paragraphs.

The use of AP1 bedrock groundwater is regarded as unlikely because it contains natural petroleum and hydrogen sulfide, which can be commonly observed in area quarries (Shaw, 2005). A strong hydrogen sulfide odor was observed emanating from well AP1-BEDGW-001 during sample collection; downgradient well IT-MNTA-BEDGW-001 (evaluated as part of the LBA [Shaw, 2010b]) is one of the highest hydrogen sulfide producers on PBOW. The hydrogen sulfide makes the water distasteful, produces nuisance odors, and is damaging to metal components, including plumbing. Petroleum hydrocarbon seepage was noted on the rock cores at depth of well AP1-BEDGW-001 and on the cores of four of the six nearby LBA bedrock wells (Shaw, 2010b). Petroleum sheens have also been noted on the water surface of these wells and that of IT-MNTA-BEDGW-001. Also, AP1-BEDGW-002 could only be sampled by bailer because of insufficient yield for low-flow sampling, and AP1-BEDGW-001 had to be sampled via bailer because of the presence of petroleum product. It is also noted that at the nearby LBA site, the intent was to collect 12 groundwater samples from 6 bedrock wells during two sampling events using low-flow sampling method. Of these 12, only 5 could be collected because the wells were dry; of the 5 that were collected, all had to be collected via bailer because of insufficient yield. Based on the inability to collect bedrock groundwater samples via low-flow methodology

at the AP1 and nearby LBA wells, it is concluded that the bedrock unit in the area of AP1 yields little water.

Overburden groundwater throughout much of PBOW has been found to be typically of low yield, and is regionally and seasonally discontinuous (Shaw, 2006). This low yield was also observed with respect to AP1 groundwater. Of the three AP1 overburden groundwater monitoring wells, only AP1-MW01 could be sampled using low-flow sampling. Also, the flow rate of AP1-MW01 was actually less than the criterion for low-flow sampling of 50 milliliters per minute in November 2009. Note that potable wells need to provide a flow rate that is orders of magnitude greater.

In summary, use of the bedrock groundwater and overburden groundwater as a potable source at AP1 is regarded as implausible for the following reasons: 1) Both bedrock and overburden groundwater yield water volumes that are clearly inadequate; 2) bedrock groundwater has naturally occurring petroleum and hydrogen sulfide constituents that make the water unsuitable for potable or industrial use, regardless of yield; 3) this poor bedrock quality is associated with the presence of hydrogen sulfide off-gassing, a concern with respect to nuisance odors and potential health issues; 4) no residential wells in the area have been identified as potable; and 5) municipal water is available in the area.

6.2.5 Exposure Assumption Values

The exposure assumption values used in the exposure assessment (Table 3-1) are selected to represent either an upper bound (e.g., 95th percentile) or mid-range value, depending on the particular parameter. Mathematically combining these terms in exposure equations is generally thought to result in decidedly conservative exposure estimations (Cogliano, 1997; Burmaster and Harris, 1993). However, this conservativeness is associated with the state of risk assessment practice, which attempts to focus on the upper end of exposure possibilities rather than more realistic levels of exposure, and not on assumptions made specifically for AP1.

6.2.6 Groundwater-to-Air Household Model

The groundwater-to-air household model (EPA, 1991b) has considerable associated uncertainties. Some parameters that affect the model include the air exchange rate of the house (which can vary with the season) level of groundwater usage, and size of the house. EPA (1991b) states that the model assumes a four-member household that uses 720 L/day of water, a home with a volume of 150 m^3, and 0.25 household air exchanges per hour. The *Exposure Factors Handbook* (EPA, 1997a) lists the following information for the average four-person home: household use of 892 L/day (4 × 223 L/day), volume of 431 m^3, and air exchange rate of 0.63 volumes per hour. If the values from the *Exposure Factors Handbook* were used instead of the

default values from EPA (1991b), the resultant estimated household air concentrations would be less than those estimated in the BHHRA by a factor of nearly 5. In summary, the selection of the groundwater-to-air model parameter values used by EPA (1991b) may contribute a conservative bias to the resultant risk estimates.

6.2.7 Toxicity Assessment

Uncertainties associated with the toxicity assessment include those regarding development of the health effects criteria values, the classification of potential carcinogenicity, the extrapolation of exposure route-specific toxicity values to other routes of exposure, and the extrapolation of toxic effects observed in animal studies to potential adverse effects in humans. A general summary of these uncertainties is provided in the following paragraphs.

The development of health effects criteria for noncancer effects involves considerable professional judgment. An uncertainty factor of up to 10 may be applied to a toxicologically identified benchmark dose or concentration to address the unknown regarding each of the following (EPA, 1989b): lowest-observed-adverse-effects level to no-observed-adverse-effects level, subchronic-to-chronic extrapolation, route-to-route extrapolation, and species-to-species extrapolation. A “modifying factor” of 10 or less is likewise applied in the development of RfDs and RfC, using professional judgment. This modifying factor is intended to address gaps in the database and steepness of the dose-response curve. In practice, the overall UF, derived by multiplying the individual uncertainty factors by the modifying factor, associated with RfD and RfC values may span up to four orders of magnitude.

This BHHRA used an RfD for thallium that was withdrawn from IRIS (EPA, 2010f) in September 2010. This RfD was withdrawn because the thallium studies were judged to be of poor quality. To account for this poor quality, EPA formerly included a UF of 3,000, which is the maximum that EPA uses for verified RfDs. Inclusion of an RfD for thallium with this high UF is likely to introduce a conservative bias. The fact that EPA has withdrawn the RfD for thallium should be considered in any environmental decision related to the potential effects of thallium on human health.

The EPA weight-of-evidence classification system for carcinogens is used to examine and classify chemical agents with respect to their carcinogenic potential. Most EPA potential carcinogens are classified based on animal data, without sufficient human data to support a causal association (i.e., former Group B2; refer to Section 4.1). Also, the linearized multistage (LMS) mathematical model was used to extrapolate values from relatively high-dose rodent studies to relatively low-dose human exposures in the development of SFs for these compounds.

This application of the LMS model is the subject of much controversy. Thus, the LMS approach used to develop SFs, combined with other assumptions, tends to overestimate potential risks.

Overall, the toxicity values, assuming similar effects between humans and test species, tend to result in overestimates of noncancer hazards or cancer risks. However, it is possible that a given chemical can elicit a toxic response in humans that is not observed in the laboratory species studied or that humans may be more sensitive to a given chemical. In this instance, it is possible for the use of the toxicity values to result in underestimates of risks/hazards.

6.2.8 Risk Characterization

It is assumed that the effects of simultaneous exposures to multiple carcinogens at a site are additive. Likewise, it is assumed that noncancer effects of contaminants are additive if they have a similar mechanism of toxicity. In risk assessment practice, it is assumed that the effects of chemicals that affect the same target organ are additive unless chemical-specific information would dictate otherwise. However, chemicals in combination may act additively, synergistically, or antagonistically or may not influence one another at all. Therefore, depending on the interactive effects (if any), the risk characterization approach to multiple contaminants may lead to either underestimates or overestimates of potential risk/hazard.

6.2.9 Evaluation of Selected COPCs for Site Relatedness

As described in Section 2.4.3, a comparison of naturally occurring metals is performed in two steps. The first is a comparison to BSCs; a chemical whose MDC does not exceed the BSC is assumed to be related to background and thus eliminated from further evaluation. The second step is performed for selected metals and organic compounds during the risk characterization step, after exposure calculations are performed which include the potential background-related contributions as part of the overall ILCR and HI results.

For inorganics, this risk characterization background evaluation step typically includes a statistical comparison of the site data set to the background data set using the WRS statistical test as appropriate (Section 2.4.3.2). The WRS output and box-and-whisker plots are provided in Appendix E. Note that no suitable background data sets exist for overburden groundwater, sediment, or surface water. Also, the AP1 bedrock groundwater data set was considered to be too small for statistical testing.

The WRS results for surface soil (p=0.01) and total soil (p=0.000005) confirm that beryllium concentrations found in AP1 surface and total soil are significantly different and are greater than those found in PBOW background; therefore, these beryllium concentrations are assumed to be

related to former site operations. The WRS results indicate that manganese concentrations in AP1 total soil are significantly different from those found in PBOW background. However, the mean manganese concentration detected in AP1 total soil (672 mg/kg) is slightly less than the mean concentration detected in the PBOW background soil (729 mg/kg). It is further noted that only one total soil sample (AP1-SB04 at 8 to 10 feet bgs) had a manganese concentration that exceeded the BSC. As described in Section 5.3.2, this sample was collected from several feet below the ash layer, the overlying soil samples collected from within the ash layer (0 to 1 foot bgs) and below the ash layer (871 mg/kg at 3 to 4 feet bgs) do not have elevated manganese concentrations. Also, manganese concentrations at 8- to 10-foot bgs in the other seven AP1 soil borings were all less than 600 mg/kg, which demonstrates that leaching of manganese from the ash layer to the underlying soil has not appreciably occurred. These results collectively indicate that the elevated manganese concentration found in the 8 to 10 feet bgs AP1-SB04 sample is not related to former site operations. Aluminum in both AP1 surface soil (p=0.25) and total soil (p=0.42) are shown to be at background levels, but this had little effect on the risk characterization results.

A qualitative background evaluation was also performed for petroleum-related organic compounds observed in AP1 bedrock groundwater, most notably BTEX compounds as well as naphthalene. These compounds are petroleum constituents that are known to be naturally occurring in the limestone groundwater at PBOW (Shaw, 2006). Petroleum was reported seeping at depth in well AP1-BEDGW-001 and in four of the six bedrock monitoring wells from the nearby LBA site (see Section 5.3.2). Based on the observation of petroleum in the rock cores during drilling and the known regional presence of petroleum associated with the limestone bedrock, the observed elevated concentrations of the BTEX compounds and naphthalene that drive risks/hazards to a hypothetical bedrock groundwater user are not regarded as related to former PBOW activities.

The noncancer hazards associated with overburden groundwater use are driven by the presence of manganese and thallium. Both of these were elevated only in upgradient well AP1-MW01, with thallium being detected only in the May 2009 sample. Because this well is upgradient of AP1 and the other samples were not elevated with respect to manganese, it is possible that the thallium and manganese concentrations reported in AP1-MW01 are not related to the former ash pit.

7.0 Summary, Conclusions, and Recommendations

7.1 Summary

The BHHRA was conducted to evaluate cancer risk and noncancer hazards associated with AP1 surface soil, subsurface soil, bedrock groundwater, overburden groundwater, surface water, and sediment. A risk-based screening approach was used to identify COPCs and focus the risk assessment on those chemicals detected at AP1 that may contribute appreciably to risk or hazard. The sampled media were screened against the respective RBSCs, and inorganics in bedrock groundwater and soil were also screened against BSCs. COPCs for the various media were identified based on this screening. Exposure and risk/hazard associated with the COPCs were evaluated using the following receptors (media evaluated in parentheses):

- Current groundskeeper (surface soil)
- Future groundskeeper (total soil, groundwater)
- Future indoor worker (surface soil, subsurface soil [inhalation pathway only], groundwater)
- Current/future construction worker (total soil, surface water, sediment)
- Future resident (total soil, surface water, sediment, overburden groundwater, bedrock groundwater)
- Future adult hunter (surface soil, including venison pathway)
- Future hunter's child (surface soil [venison pathway only]).

Each receptor scenario that includes groundwater was run separately for overburden groundwater and bedrock groundwater. Because groundwater yield was found to be insufficient for potable use in the overburden and bedrock units underlying AP1, and the AP1 bedrock groundwater was observed to be of naturally poor quality due to the presence of petroleum and hydrogen sulfide, the receptors evaluated for potable groundwater use were also evaluated assuming no groundwater use. The resident was evaluated for noncancer hazards separately for the young child (ages 1 through 6 years) and adult life stages.

The overall HI and ILCR values are summarized in the following bullets; exceedances of PBOW cancer risk criteria (ILCR>1E-5) are shown as bolded and exceedances of the noncancer hazard criterion (HI>1) or the NCP risk management range (1E-6 to 1E-4) are shown as bold italics:

- Current groundskeeper: ILCR = 5E-6; HI = 0.21
- Future groundskeeper – bedrock groundwater use: ***ILCR = 9E-4; HI = 11***
- Future groundskeeper – overburden groundwater use: ILCR = 2E-6; ***HI = 15***
- Future groundskeeper – excluding groundwater use: ILCR = 2E-6; HI = 2 (0.2 excluding background-related manganese [inhalation pathway])
- Indoor worker – bedrock groundwater use: ***ILCR = 8E-4; HI = 9***
- Indoor worker – overburden groundwater use: ILCR = 1E-6; ***HI = 13***
- Future indoor worker – excluding groundwater use: ILCR = 1E-6; HI = 0.008
- Construction worker: ILCR = 8E-7; HI = 8 (0.9 excluding background-related manganese [inhalation pathway])
- Resident – bedrock groundwater use: ***ILCR = 6E-3***; ***child HI = 135***; ***adult HI = 58***
- Resident – overburden groundwater use: ILCR = 9E-6; ***child HI = 82***; ***adult HI = 35***
- Resident – excluding groundwater use: ILCR = 9E-6; child HI = 0.7; adult HI = 0.1
- Hunter: ILCR = 3E-7; HI = 0.0009
- Hunter's child: None of the COPCs is bioaccumulative; risks and hazards are assumed to be de minimis.

7.2 Conclusions

The ILCR and HI values for the two current exposure scenarios (current groundskeeper and construction worker) each meet the PBOW cancer risk criterion (i.e., 1E-5) and the noncancer hazard criterion (i.e., HI$\leq$1). Note that the noncancer hazard criterion is met for the construction worker only if the contribution of background-related manganese is appropriately excluded. An HI value exceeding the HI of 1 for the construction worker (HI of 8), calculated in the risk characterization, is nearly entirely associated with the inhalation of this background-related manganese in soil, using the output of a conservative dust-loading model. Even so, the output of this model is four orders of magnitude less than regulatorily enforceable PELs or recommended RELs for construction areas. Note that no construction is currently planned at AP1.

Each of the potential future exposure scenarios that does not assume potable use of groundwater also meets the PBOW risk and hazard criteria. Note that the noncancer hazard criterion for the future groundskeeper is met only if the contribution of background-related manganese is appropriately excluded. An HI value of 2, calculated in the risk characterization for the future

groundskeeper, is nearly entirely associated with the inhalation of this background-related manganese in soil, using the output of a conservative dust-loading model. As described in the preceding paragraph for the construction worker, the output of this model is four orders of magnitude less than regulatorily enforceable PELs or recommended RELs for construction areas. Note that no groundskeeping appears to have occurred at AP1 in recent years, except immediately along Maintenance Road. Thus, the current groundskeeper scenario, which assumes a full-time, 25-year employee who works exclusively at the AP1 for 250 days per year, appears to greatly overestimate the exposure levels of any current on-site worker or other current receptor.

The cancer risks associated with the following future receptors assumed to use bedrock groundwater as a hypothetical source of tap water exceed the NCP risk management range and PBOW cancer risk criterion: future groundskeeper, future indoor worker, and resident. Each of these also exceeds the target HI criterion of 1. The HI for each of these under the assumption of overburden groundwater use also exceeds the NCP risk management range and the PBOW cancer risk criterion.

The cancer risks and cancer hazards associated with bedrock groundwater are nearly entirely attributable to natural petroleum-related BTEX compounds and arsenic. The noncancer hazards associated with overburden groundwater are due to manganese and thallium from upgradient well AP1-MW01 (thallium was detected only in one sample); it is unclear if these concentrations are due to former site activities. Use of either the overburden or bedrock groundwater is regarded as implausible because of insufficient yield. Additionally, the naturally poor quality of the bedrock groundwater and associated hydrogen sulfide off-gassing make it unsuitable as a potable source. The readily available municipal water supply obviates the need for use of groundwater as a potential source of tap water in the general vicinity of PBOW.

7.3 Recommendations

No remedial actions or further investigation of AP1 media are recommended. If the contributions of exposure to groundwater and apparent background-related manganese are appropriately excluded, none of the AP1 receptors had ILCRs or HIs that exceed the PBOW target criteria or the NCP risk management range. This indicates that the associated environmental media at AP1 are unlikely to pose an unacceptable cancer risk to any receptor, and that exposure to these media is unlikely to result in adverse noncancer health effects for any human receptor. Because groundwater use is not regarded as plausible based on insufficient yield in both the overburden and bedrock units, the risks associated with AP1 groundwater are accordingly implausible. The

naturally poor quality in the AP1 bedrock groundwater further strengthens the implausibility of bedrock groundwater use.

It is noted that the screening level ecological risk assessment for AP1 (Shaw, 2010e) recommends no further investigation or other actions at AP1 based on ecological concerns. Therefore, no further investigation or other actions are recommended at AP1 based on either human health or ecological receptors.

8.0 References

Burmaster, D.E., and R.H. Harris, 1993, "The Magnitude of Compounding Conservatisms in Superfund Risk Assessment," ***Risk Analysis, 13(2): 131-134***.

California Environmental Protection Agency, 2005, ***Toxicity Criteria Database***, Office of Environmental Health Hazard Assessment, Sacramento, California, http://www.oehha.co.gov/risk/ChemicalDB/index.asp.

City-Data.com, 2004, on-line data search for Sandusky, Ohio, performed November 11, 2004, http://www.city-data.com/city/Sandusky-South-Ohio.html.

Cogliano, V.J., 1997, "Plausible Upper Bounds: Are Their Sums Plausible?" ***Risk Analysis***, 17(1): 77-84.

Dames and Moore, Inc. (D&M), 1997, ***TNT Areas Site Investigation Final Report for Plum Brook Ordnance Works, Plum Brook Station/NASA, Sandusky, Ohio***, prepared for U.S. Army Corps of Engineers, Nashville District/Huntington District, April.

Environmental Council of States-U.S. Department of Defense, 2007, ***Identification and Selection of Toxicity Values/Criteria for CERCLA and Hazardous Waste Site Risk Assessments in the Absence of IRIS Values,*** ECO-DOD Sustainability Work Group, Emerging Contaminants Task Group, Risk Assessment Provisional Values Subgroup Issue Paper, 23 April.

IT Corporation (IT), 2001a, ***TNT Areas A and C Remedial Investigation, Volume II – Human Health Risk Assessment, Final, Former Plum Book Ordnance Works, Sandusky, Ohio,*** November.

IT Corporation (IT), 2001b, ***TNT Areas A and C Remedial Investigation, Volume I – Report of Findings, Final, Former Plum Book Ordnance Works, Sandusky, Ohio,*** November.

IT Corporation (IT), 2000, ***Draft Baseline Human Health Risk Assessment Work Plan for the Former TNT Manufacturing Area, West Virginia Ordnance Works, Mason Count, West Virginia***, January.

IT Corporation (IT), 1999, ***Final - Summary Report, Site-Wide Groundwater Monitoring (1997-1998), Former Plum Brook Ordnance Works, Sandusky, Ohio,*** June.

IT Corporation (IT), 1998, ***Site Investigation of the Acid Areas, Former Plum Brook Ordnance Works, Sandusky, Ohio***, August.

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

Mautz, W.W., H. Silver, and J.B. Holter, 1976, "Digestibility and Related Nutritional Data for Seven Northern Deer Browse Species," ***Journal of Wildlife Management***, 40(4): 630-638.

National Council on Radiation Protection and Measurements, 1984, ***Radiological Assessment: Predicting the Transport, Bioaccumulation, and Uptake by Man of Radionuclides Released to the Environment***, NCRP Report No. 76.

National Oceanic and Atmospheric Administration, 1990, ***Comparative Climatic Data for the United States through 1989***, National Climatic Data Center, Asheville, North Carolina.

Nutrient Database, 1997, Data compiled from U.S. Department of Agriculture releases, and published nutrient information from 71 chain references, on line, http://www.nutribase.com.

Ohio Environmental Protection Agency (OEPA), 2009a***, Use of U.S. EPA's Regional Screening Levels as Screening Values in Human Health Risk Assessments***, Technical Decision Compendium, Division of Emergency and Remedial Response, August.

Ohio Environmental Protection Agency (OEPA), 2009b***, Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for the DERR Remedial Response Program***, Technical Decision Compendium, Division of Emergency and Remedial Response, August.

Ohio Environmental Protection Agency (OEPA), 2009c***, Use of Background for Remedial Response Sites***, Technical Decision Compendium, Division of Emergency and Remedial Response, August.

Ohio Environmental Protection Agency (OEPA), 2009d, Email Correspondence from B. Buthker, OEPA Risk Assessor, to L. Long, USACE Risk Assessor, March 18.

Ohio Environmental Protection Agency (OEPA), 2004, Email Correspondence from L. Moore (OEPA Risk Assessor) to L. Long (USACE Risk Assessor), December 15.

Ohio Environmental Protection Agency (OEPA), 1999, Email Correspondence between Lawrence Sirinek (OEPA Risk Assessor) and Paul Goetchius (Shaw Risk Assessor), March 5.

Sample, B.E. and Suter II, G.W., 1994, ***Estimating Exposure of Terrestrial Wildlife Contaminants***, Environmental Sciences Division, Oak Ridge National Laboratory, ES/ER/TM-125.

Sample, B.E., D.M. Opresko, and G.W. Suter II, 1996, ***Toxicological Benchmarks for Wildlife: 1996 Revision***, prepared for the U.S. Department of Energy by Health Sciences Research Division, Oak Ridge National Laboratory.

Science Applications International Corporation, 1991, ***Plum Brook Station Preliminary Assessment,*** June.

Sharp, G., 1995, Personal Communication: Telephone conversation between P. Goetchius, IT Corp. and Gary Sharp, Wildlife Biologist, West Virginia Division of Natural Resources, Point Pleasant, West Virginia, 17 February.

Shaw Environmental, Inc. (Shaw), 2010a, ***Ash Pit 1 and Ash Pit 3, Site Characterization Report, Final, Plum Brook Ordnance Works, Sandusky, Ohio***, November.

Shaw Environmental, Inc. (Shaw), 2010b, ***Baseline Human Health Risk Assessment, Locomotive Building Area, Draft, Plum Brook Ordnance Works, Sandusky, Ohio***, September.

Shaw Environmental, Inc. (Shaw), 2010c, ***Waste Water Treatment Plants 1 and 3, Site Characterization Report, Draft, Plum Brook Ordnance Works, Sandusky, Ohio***, November.

Shaw Environmental, Inc. (Shaw), 2010d, ***Baseline Human Health Risk Assessment, Power House 2 Ash Pits, Final, Plum Brook Ordnance Works, Sandusky, Ohio***, September.

Shaw Environmental, Inc. (Shaw), 2010e, ***Screening Level Ecological Risk Assessment, Ash Pit 1 and Ash Pit 2, Draft, Plum Brook Ordnance Works, Sandusky, Ohio***, December.

Shaw Environmental, Inc. (Shaw), 2009, ***Ash Pit 1and Ash Pit 3, Baseline Human Health Risk Assessment and Screening Level Ecological Risk Assessment Work Plans, Final, Plum Brook Ordnance Works, Sandusky, Ohio***, August.

Shaw Environmental, Inc. (Shaw), 2008a, ***Final Phase 1 Remedial Investigation, Site-Specific Sampling and Analysis Plan and Site-Specific Safety and Health Plan, Waste Water Treatment Plants 1 and 3 and Ash Pits 1 and 3,*** *Plum Brook Ordnance Works, Sandusky, Ohio,* November.

Shaw Environmental, Inc. (Shaw), 2008b, ***Feasibility Study for Groundwater, TNT and Red Water Pond Areas, Final,*** *Former Plum Brook Ordnance Works, Sandusky, Ohio*, December.

Shaw Environmental, Inc. (Shaw), 2006, ***Baseline Human Health Risk Assessment of Groundwater, Former Plum Brook Ordnance Works, Sandusky, Ohio***, September.

Shaw Environmental, Inc. (Shaw), 2005, ***2004 Groundwater Data Summary and Evaluation Report, Final, Former Plum Brook Ordnance Works, Sandusky, Ohio***, April.

The Weather Channel, 2004, on-line data search for weather averages and records for Sandusky, Ohio, performed November 11, 2004, http://www.weather.com.

U.S. Army Corps of Engineers (USACE), 2000, ***Limited Site Investigation for the Former Plum Brook Ordnance Works, Ash Pit Numbers 1 and 3, Final Report***, July.

U.S. Army Corps of Engineers (USACE), 1999, ***Risk Assessment Handbook, Volume I: Human Health Evaluation***, Engineer Manual EM 200-1-4.

U.S. Army Corps of Engineers (USACE), 1995, ***Site Management Plan, Plum Brook Ordnance Works, Sandusky, Ohio, Part B, Areas of Concern***, September.

U.S. Department of Energy (DOE), 1989, ***A Manual for Implementing Residual Radioactive Material Guidelines***, Argonne National Laboratory, Argonne, Illinois, ANL/ES-160, DOE/CH/8901.

U.S. Department of Energy (DOE), 1983, ***Pathway Analysis and Radiation Dose Estimates for Radioactive Residues at Formerly Utilized MED/AEC Sites***, U.S. Dept. of Energy, Oak Ridge Operations Office, Oak Ridge, Tennessee, DOE ORO-832.

U.S. Environmental Protection Agency (EPA), 2010a, ***ProUCL Version 4.00.05***, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, February, on line at http://www.epa.gov/esd/tsc/form.htm.

U.S. Environmental Protection Agency (EPA), 2010ba, ***ProUCL Version 4.00.05 Technical Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, EPA/600/R-07/041, May.

U.S. Environmental Protection Agency (EPA), 2010c, ***ProUCL Version 4.00.05 User Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, April, EPA/600/R-07/038, May.

U.S. Environmental Protection Agency (EPA), 2010d, ***Regional Screening Level Table***, May 17, on line at www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.

U.S. Environmental Protection Agency (EPA), 2010e, ***Regional Screening Level Table, User's Guide (May 2010)***, on line at www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm.

U.S. Environmental Protection Agency (EPA), 2010f, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, Ohio, on line.

U.S. Environmental Protection Agency (EPA), 2009, ***2009 Edition of the Drinking Water Standards and Health Advisories***, Office of Water, August, EPA 822-R-09-011.

U.S. Environmental Protection Agency (EPA), 2005, ***Guidelines for Carcinogen Risk Assessment***, Risk Assessment Forum, Washington, D.C., March, EPA/630/P-03/001B.

U.S. Environmental Protection Agency (EPA), 2004a, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2004b, ***Region 9 Preliminary Remediation Goals (PRG) Table***, San Francisco, California, October.

U.S. Environmental Protection Agency (EPA), 2004c, ***User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK) Windows 32-bit Version,*** Lead and IEUBK Technical Review Workgroup, Washington, D.C., May http://www.epa.gov/superfund/programs/lead/products.htm.

U.S. Environmental Protection Agency (EPA), 2004d, ***User's Guide and Background Technical Document for Region 9 Preliminary Remediation Goals (PRG) Table***, Region 9, San Francisco, California, October, <http://www.epa.gov/region09/waste/sfund /prg/files/04usersguide.pdf>.

U.S. Environmental Protection Agency (EPA), 2003, ***Human Health Toxicity Values in Superfund Risk Assessments***, Office of Solid Waste and Emergency Response, Washington, D.C., OSWER Directive 9285.7-53, December.

U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.

U.S. Environmental Protection Agency (EPA), 1997a, ***Exposure Factors Handbook***, Office of Research and Development, National Center for Environmental Assessment, Washington, D.C., EPA/600/P-95/002Fa, August.

U.S. Environmental Protection Agency (EPA), 1997b, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, NTIS No. PB97-921199.

U.S. Environmental Protection Agency (EPA), 1996, ***Soil Screening Guidance: Technical Background Document***, Office of Solid Waste and Emergency Response, EPA/540/R-95/128, NTIS No. PB96-963502.

U.S. Environmental Protection Agency (EPA), 1994, ***Exposure Assessment Guidance for RCRA Hazardous Waste Combustion Facilities,*** Office of Solid Waste and Emergency Response, Draft, April, EPA530-R-94-021, including Errata, ”Guidance for Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Wastes,” October, and “Modification of Screening Guidance Fate and Transport Equations, November.

U.S. Environmental Protection Agency (EPA), 1992, ***Guidance on Risk Characterization for Risk Managers and Risk Assessors,*** Memorandum from F. Henry Habicht II, Deputy Administrator, to Assistant Administrators, Regional Administrators, February.

U.S. Environmental Protection Agency (EPA), 1991a, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors***, Interim Final, Office of Solid Waste and Emergency Response, OSWER Directive: 9285.6-03.

U.S. Environmental Protection Agency (EPA), 1991b, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals***, Interim, Office of Emergency and Remedial Response, December, EPA/540/R-92/003.

U.S. Environmental Protection Agency (EPA), 1990, “National Oil and Hazardous Substances Pollution Contingency Plan,” ***Federal Register*** 55(46): 8666-8865.

U.S. Environmental Protection Agency (EPA), 1989a, ***Risk Assessment Guidance for Superfund***, ***Volume I, Human Health Evaluation Manual (Part A)***, Interim Final, Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002.

U.S. Environmental Protection Agency (EPA), 1989b, ***General Quantitative Risk Assessment Guidelines for Noncancer Health Effects***, prepared by the Office of Health and Environmental Assessment, Cincinnati, Ohio, for the Risk Assessment Forum, ECAO-CIN-538.

U.S. Environmental Protection Agency (EPA), 1986, "Guidelines for Carcinogen Risk Assessment," ***Federal Register***, 51(185): 33992-34003.

U.S. Geological Survey, 1992, ***Hydraulic Properties of Three Types of Glacial Deposits in Ohio***, Water-Resources Investigation Report 92-4135.

TABLES

Table 2-1

Summary of Samples Evaluated in the Baseline Human Health Risk Assessment
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Location	Sample Number	Sample Type	Sample Date	Depth (ft bgs)	Analyses
SOIL					
Surface Soil					
ASH PIT 1-SB01	AP0001	REG	8-Dec-08	0.5 - 1.5	Exp, Metals, PCBs SVOC
ASH PIT 1-SB02	AP0004	REG	8-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB03	AP0007	REG	9-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB04	AP0010	REG	9-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB05	AP0014	REG	9-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB08	AP0023	REG	9-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB08	AP0063	FD	9-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
ASH PIT 1-SB09	AP0026	REG	8-Dec-08	0 - 1	Exp, Metals, PCBs SVOC
PBOW99-SBA101A	PBOW99SBA101A	REG	11-Jun-99	0 - 0.5	Metals, SVOC
PBOW99-SBA101A	PBOW99SBA101A-DUP	FD	11-Jun-99	0 - 0.5	Metals, SVOC
PBOW99-SBA102A	PBOW99SBA102A	REG	10-Jun-99	0 - 1	Metals, SVOC
PBOW99-SBA103A	PBOW99SBA103A	REG	10-Jun-99	0 - 1	Metals, SVOC
PBOW99-SBA104B	PBOW99SBA104B	REG	10-Jun-99	0 - 1	Metals, SVOC
PBOW99-SSA101	PBOW99SSA101	REG	10-Jun-99	0 - 0	Metals, SVOC
Subsurface Soil					
ASH PIT 1-SB01	AP0002	REG	8-Dec-08	3.5 - 5.5	Exp, Metals, PCBs SVOC
ASH PIT 1-SB01	AP0003	REG	8-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB02	AP0005	REG	8-Dec-08	3 - 3.8	Exp, Metals, SVOC
ASH PIT 1-SB02	AP0006	REG	8-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB03	AP0008	REG	9-Dec-08	3 - 5	Exp, Metals, PCBs SVOC
ASH PIT 1-SB03	AP0009	REG	9-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB04	AP0011	REG	9-Dec-08	3 - 4	Exp, Metals, Pest, PCB, SVOC
ASH PIT 1-SB04	AP0012	FD	9-Dec-08	3 - 4	Exp, Metals, Pest, PCB, SVOC
ASH PIT 1-SB04	AP0013	REG	9-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB05	AP0015	REG	9-Dec-08	3 - 3.7	Exp, Metals, PCBs SVOC
ASH PIT 1-SB05	AP0016	REG	9-Dec-08	8 - 9	Exp, Metals, SVOC
ASH PIT 1-SB06	AP0018	REG	8-Dec-08	5 - 5.8	Exp, Metals, PCBs SVOC
ASH PIT 1-SB06	AP0019	REG	8-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB06	AP0017	REG	8-Dec-08	0.8 - 1.8	Exp, Metals, PCBs SVOC

Table 2-1

Summary of Samples Evaluated in the Baseline Human Health Risk Assessment
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Location	Sample Number	Sample Type	Sample Date	Depth (ft bgs)	Analyses
ASH PIT 1-SB08	AP0024	REG	9-Dec-08	3 - 5	Exp, Metals, PCBs SVOC
ASH PIT 1-SB08	AP0025	REG	9-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB09	AP0027	REG	8-Dec-08	3 - 4	Exp, Metals, PCBs SVOC
ASH PIT 1-SB09	AP0028	REG	8-Dec-08	8 - 10	Exp, Metals, SVOC
ASH PIT 1-SB09	AP0058	FD	8-Dec-08	8 - 10	Exp, Metals, SVOC
PBOW99-SBA103B	PBOW99SBA103B	REG	10-Jun-99	1 - 4	Metals, SVOC
SEDIMENT					
AP1-SD01	AP1007	REG	19-May-09	0 - 0.5	Exp, Metals, PCB, SVOC
AP1-SD02	AP1008	REG	19-May-09	0 - 0.5	Exp, Metals, PCB, SVOC
AP1-SD03	AP1012	REG	19-May-09	0 - 0.5	Exp, Metals, PCB, SVOC
AP1-SD04	AP1013	REG	20-May-09	0 - 0.5	Exp, Metals, PCB, SVOC
SURFACE WATER					
AP1-SW01	AP2007	REG	19-May-09	NA	Exp, Metals, PCB, SVOC
AP1-SW02	AP2008	REG	19-May-09	NA	Exp, Metals, PCB, SVOC
AP1-SW03	AP2012	REG	19-May-09	NA	Exp, Metals, PCB, SVOC
AP1-SW04	AP2013	REG	20-May-09	NA	Exp, Metals, PCB, SVOC
GROUNDWATER					
Overburden-Monitoring Well					
AP1-MW01	AP3050	REG	7-May-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-MW01	AP3070	REG	4-Nov-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-MW02	AP3051	REG	10-May-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-MW02	AP3071	REG	6-Nov-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-MW03	AP3052	REG	11-May-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-MW03	AP3072	REG	6-Nov-09	0 - 0	Explosives, Gen Chem, Metals (f & uf), SVOC, VOC
Bedrock					
AP1-BEDGW-001	AP3053	REG	9-May-09	0 - 0	Exp, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-BEDGW-001	AP3073	REG	6-Nov-09	0 - 0	Exp, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-BEDGW-002	AP3054	REG	10-May-09	0 - 0	Exp, Gen Chem, Metals (f & uf), SVOC, VOC
AP1-BEDGW-002	AP3074	REG	10-Nov-09	0 - 0	Exp, Gen Chem, Metals (f & uf), SVOC, VOC

Table 2-1

Summary of Samples Evaluated in the Baseline Human Health Risk Assessment
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Location	Sample Number	Sample Type	Sample Date	Depth (ft bgs)	Analyses
Piezometer [a]					
ASH PIT 1-PZ01	AP3000	REG	12-Dec-08	19 - 19	Cyanide, Exp, Gen Chem, Metals (f & uf), SVOC
ASH PIT 1-PZ02	AP3001	REG	11-Dec-08	16 - 16	Cyanide, Exp, Gen Chem, Metals (f & uf), SVOC
ASH PIT 1-PZ04	AP3003	REG	15-Dec-08	20 - 20	Exp, SVOC
ASH PIT 1-PZ04	WW3005	FD	15-Dec-08	20 - 20	Exp, SVOC
ASH PIT 1-PZ05	AP3004	REG	15-Dec-08	20 - 20	Cyanide, Exp, Gen Chem, Metals (f & uf), SVOC

[a] These samples are summarized and screened, but no exposure calculations are presented.

ft bgs - Feet below ground surface.
FD - Field duplicate; averaged with the regular sample at the same location to create one result.
REG - regular sample
Exp - Explosives
f & uf - Metals analysis performed on filtered and unfiltered samples, respectively.
Gen Chem - General Chemistry
Metals - Metals analysis performed on unfiltered samples unless otherwise noted.
PCB - Polychlorinated biphenyls
SVOC - Semivolatile organic compounds
VOC - Volatile organic compounds.

Table 2-2

Background Screening Concentrations of Inorganics in Soil
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Chemical Name (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Reporting Limits	Statistical Distribution	Arithmetic Mean	95% UTL [a]	Background Screening Criterion [b]
Aluminum	12 / 12	3520 - 15500	NA	L	8.43E+03	2.69E+04	15500
Antimony	9 / 25	5.9 - 9.3	5.4 - 74	NP	4.68E+00	NA	9.30
Arsenic	23 / 26	2.1 - 36.5	1.2 - 3.7	L	1.08E+01	7.10E+01	36.5
Barium	9 / 12	35.6 - 826	23.2 - 24.7	L	1.16E+02	1.30E+03	826
Beryllium	6 / 25	0.57 - 1	0.57 - 1.2	L	5.65E-01	1.17E+00	1.00
Cadmium	0 / 25	NA	0.57 1.2	L	4.49E-01	NA	NA
Calcium	12 / 12	735 - 52300	NA	L	1.13E+04	2.18E+05	52300
Chromium	25 / 26	4.4 - 29	12.3 - 12.3	NP	1.34E+01	NA	29.0
Cobalt	9 / 12	9.6 - 116	5.8 - 6.2	L	2.26E+01	2.48E+02	116
Copper	23 / 26	2.3 - 56.2	2.2 - 2.9	L	1.70E+01	1.47E+02	56.2
Iron	12 / 12	5880 - 234000	NA	L	4.01E+04	3.58E+05	234000
Lead	26 / 26	1.9 - 48.6	NA	L	1.28E+01	5.13E+01	48.6
Magnesium	12 / 12	629 - 10400	NA	L	3.26E+03	3.08E+04	10400
Manganese	26 / 26	21 - 13300	NA	L	7.29E+02	3.51E+03	3506
Mercury	2 / 26	0.085 - 0.085	0.037 - 0.3	L	9.06E-02	5.60E-01	0.085
Nickel	26 / 26	5.4 - 55.1	NA	L	2.28E+01	7.79E+01	55.1
Potassium	11 / 12	579 - 3390	617 - 617	L	1.24E+03	6.08E+03	3390
Selenium	5 / 25	0.61 - 2	0.57 - 4.9	NP	1.55E+00	NA	2.00
Silver	2 / 26	1.1 - 11.1	1.1 - 1.3	NP	1.00E+00	NA	11.1
Sodium	0 / 12	NA	566 - 663	L	3.03E+02	NA	NA
Thallium	2 / 25	1.2 - 1.3	1.1 - 6.1	NP	1.91E+00	NA	1.30
Vanadium	11 / 12	9 - 40.9	61.7 - 61.7	L	2.48E+01	8.31E+01	40.9
Zinc	26 / 26	6.6 - 655	NA	L	7.30E+01	3.22E+02	322

mg/kg - Milligrams per kilogram.
NA - Not applicable; not available.

[a] 95% UTL - 95% upper tolerance limit calculated as described in Shaw (2005).

[b] The maximum detected concentration is used as the background screening criterion for nonparametric data sets; for normal or lognormal data sets, the 95% UTL or the maximum detected concentration, whichever is less, is used.

Note: Detection limits from sample 6990 were deleted when calculating results for antimony, beryllium, cadmium, selenium, and thallium. The detection limits were elevated by dilution factors which greatly exceed any detected concentration and would bias results unrealistically high.

Source: Shaw Environmental, Inc. (Shaw), 2005, 2004 Data Summary and Evaluation Report, Final, Plum Brook Ordnance Works, Sandusky, Ohio, April.

Table 2-3

Background Screening Concentrations of Inorganics in Groundwater Ash Pit 1 Former Plum Brook Ordnance Works, Sandusky, Ohio

Chemical	Detection Frequency	Percent hits	Range of Values, µg/L: Detected Concentrations Minimum	Detected Concentrations Maximum	Reporting Limits Minimum	Reporting Limits Maximum	Mean µg/L	Standard Deviation	UTL [a] µg/L	BSC [b] µg/L
Metals - Unfiltered										
Aluminum	11 / 13	85	3.15E+01	3.09E+02	2.00E+02	2.00E+02	1.05E+02	6.98E+01	4.17E+02	309
Arsenic	4 / 26	15	3.30E+00	7.40E+00	1.00E+01	1.00E+01	4.99E+00	6.56E-01	7.92E+00	7.4
Barium	28 / 28	100	2.58E+01	1.18E+04	2.00E+02	2.00E+03	1.73E+03	3.77E+03	1.86E+04	11800
Calcium	28 / 28	100	1.74E+04	3.16E+05	5.00E+03	5.00E+03	1.38E+05	8.31E+04	5.09E+05	316000
Cobalt	6 / 27	22	1.00E+00	1.21E+01	5.00E+01	5.00E+01	2.05E+01	8.75E+00	5.96E+01	12.1
Copper	2 / 28	7	3.30E+00	1.98E+01	2.50E+01	2.50E+01	1.24E+01	2.26E+00	2.25E+01	19.8
Iron	24 / 27	89	3.82E+01	1.55E+03	1.00E+02	1.00E+02	4.15E+02	4.87E+02	2.59E+03	1550
Magnesium	28 / 28	100	7.28E+03	2.17E+05	5.00E+03	5.00E+03	7.17E+04	5.85E+04	3.33E+05	217000
Manganese	28 / 28	100	3.60E+00	6.88E+02	1.50E+01	1.50E+01	8.12E+01	1.24E+02	6.36E+02	636
Nickel	4 / 27	15	4.80E+00	8.60E+00	4.00E+01	4.00E+01	1.81E+01	4.67E+00	3.90E+01	8.6
Potassium	28 / 28	100	2.53E+03	1.16E+05	5.00E+03	5.00E+04	2.70E+04	3.06E+04	1.64E+05	116000
Sodium	28 / 28	100	1.33E+04	1.39E+06	5.00E+03	5.00E+04	3.55E+05	4.36E+05	2.30E+06	1390000
Zinc	14 / 19	74	8.30E-01	5.07E+02	2.00E+01	2.00E+01	5.55E+01	1.23E+02	6.06E+02	507

[a] The UTL (upper tolerance limit) is calculated as described in Shaw (2005).

[b] The BSC (background screening concentration) is the calculated UTL or the maximum detected concentration, whichever is less.

µg/L - Micrograms per liter.

BTEX - Benzene, toluene, ethylbenzene, and xylenes.

Source: Shaw Environmental, Inc. (Shaw), 2005, 2004 Data Summary and Evaluation Report, Final, Plum Brook Ordnance Works, Sandusky, Ohio, April.

Table 2-4

Statistical Summary and Selection of Chemicals of Potential Concern in Surface Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

(Page 1 of 2)

Chemical	Detection Frequency	Percent Detection	Range of Values, mg/kg: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Mean mg/kg	BSC [a] mg/kg	RBSC [b] mg/kg		COPC? [c,d]	95% UCL [e] mg/kg	EPC [f] mg/kg
Inorganics															
Aluminum	13 / 13	100	6.19E+03	J	1.66E+04		3.81E+00	4.89E+01	9.89E+03	1.55E+04	7700		Y	1.13E+04	1.13E+04
Antimony	4 / 13	31	3.47E-01	J	8.38E-01		4.60E-01	2.60E+00	5.98E-01	9.30E+00	3.1		N (b)		---
Arsenic	13 / 13	100	6.40E+00	J	3.12E+01		9.19E-01	2.60E+00	1.25E+01	3.65E+01	0.39		N (b)		---
Barium	13 / 13	100	3.27E+01	J	1.63E+02		1.90E-01	4.89E+01	9.09E+01	8.26E+02	1500		N (b)		---
Beryllium	9 / 13	69	1.50E+00		1.65E+01	J	1.90E-01	1.20E+00	7.31E+00	1.00E+00	16		Y	1.14E+01	1.14E+01
Cadmium	1 / 13	8	2.60E-01	J/U	2.60E-01	J/U	2.60E-01	6.10E-01	2.40E-01	NA	7		N (a)		---
Calcium	13 / 13	100	3.33E+03		5.91E+04		4.76E+00	1.22E+03	1.50E+04	5.23E+04	Nutrient		N (c)		---
Chromium	13 / 13	100	1.05E+01		1.81E+01		4.76E-01	1.30E+00	1.31E+01	2.90E+01	0.29		N (b)		---
Cobalt	12 / 13	92	5.47E+00		2.60E+01		1.90E-01	1.22E+01	8.89E+00	1.16E+02	2.3		N (b)		---
Copper	13 / 13	100	1.35E+01		5.00E+01		4.76E-01	6.10E+00	2.78E+01	5.62E+01	310		N (b)		---
Iron	13 / 13	100	1.72E+04		9.51E+04		3.97E+00	2.62E+01	5.19E+04	2.34E+05	5500		N (b)		---
Lead	13 / 13	100	4.90E+00		2.71E+01		3.90E-01	7.90E-01	9.53E+00	4.86E+01	400		N (b)		---
Magnesium	12 / 13	92	6.51E+02		5.83E+03		1.90E+00	1.22E+03	2.49E+03	1.04E+04	Nutrient		N (c)		---
Manganese	13 / 13	100	1.25E+02		2.81E+03		1.90E-01	3.90E+00	5.71E+02	3.51E+03	180		N (b)		---
Mercury	7 / 13	54	1.46E-02	J	3.83E-01		2.46E-02	2.40E-01	9.34E-02	8.50E-02	2.3		N (a)		---
Nickel	6 / 13	46	3.93E+00	J	7.92E+01		2.86E-01	9.80E+00	1.28E+01	5.51E+01	150		N (a)		---
Potassium	11 / 13	85	5.77E+02	J	1.28E+03		2.38E+01	1.22E+03	8.90E+02	3.39E+03	Nutrient		N (c)		---
Selenium	9 13	69	4.97E-01	J/U	2.70E+00		6.50E-01	1.30E+00	9.49E-01	2.00E+00	39		N (a)		---
Sodium	8 / 13	62	5.76E+01		1.65E+02		9.54E+00	1.22E+03	2.23E+02	NA	Nutrient		N (c)		---
Thallium	4 / 13	31	2.74E-01	JJ	5.63E-01		4.60E-01	2.60E+00	5.63E-01	1.30E+00	0.51	g	N (b)		---
Vanadium	13 / 13	100	1.44E+01		3.92E+01		1.90E-01	1.31E+01	2.48E+01	4.09E+01	39		N (b)		---
Zinc	11 / 13	85	3.48E+01		9.58E+01		2.38E+00	5.20E+00	5.11E+01	3.22E+02	2300		N (b)		---
Polychlorinated biphenyls (PCB)															
Aroclor 1260	1 / 7	14	1.03E-01	J/U	1.03E-01	JU	2.02E-01	2.69E-01	1.16E-01		0.22		N (a)		---
Semivolatile Organic Compounds															
Acenaphthylene	1 / 13	8	2.79E-01	JJ	2.79E-01	JJ	4.10E-01	2.37E+00	3.25E-01		340	h	N (a)		---
Anthracene	1 / 13	8	2.16E-01	JJ	2.16E-01	JJ	4.10E-01	2.37E+00	3.20E-01		1700		N (a)		---
Benzo(a)anthracene	1 / 13	8	8.56E-01	JJ	8.56E-01	JJ	4.10E-01	2.37E+00	3.69E-01		0.15		Y	7.33E-01	7.33E-01
Benzo(a)pyrene	1 / 13	8	7.21E-01	JJ	7.21E-01	JJ	4.10E-01	2.37E+00	3.59E-01		0.015		Y	7.03E-01	7.03E-01
Benzo(b)fluoranthene	1 / 13	8	1.21E+00	JJ	1.21E+00	JJ	4.10E-01	2.37E+00	3.96E-01		0.15		Y	8.29E-01	8.29E-01
Chrysene	1 / 13	8	8.50E-01	JJ	8.50E-01	JJ	4.10E-01	2.37E+00	3.69E-01		15		N (a)		---
Dibenzofuran	1 / 13	8	7.57E-02	QJ	7.57E-02	QJ	4.10E-01	2.37E+00	3.69E-01		7.8		N (a)		---
Fluoranthene	2 / 13	15	4.77E-02	QJ	1.88E+00	JJ	4.10E-01	2.37E+00	4.35E-01		230		N (a)		---
Indeno(1,2,3-cd)pyrene	1 / 13	8	1.82E+00	JJ	1.82E+00	JJ	4.10E-01	2.37E+00	4.43E-01		0.15		Y	1.03E+00	1.03E+00
Methylnaphthalene, 2-	2 / 13	15	3.63E-01	QJ	9.42E-01	J	4.10E-01	2.37E+00	3.72E-01		31		N (a)		---
Naphthalene	4 / 13	31	6.61E-02	J	7.64E-01	J	4.10E-01	2.37E+00	3.07E-01		3.6		N (a)		---
Phenanthrene	4 / 13	31	5.50E-02	J	8.31E-01	JJ	4.10E-01	2.37E+00	2.75E-01		170	i	N (a)		---
Pyrene	2 / 13	15	3.78E-02	QJ	1.32E+00	JJ	4.10E-01	2.37E+00	3.92E-01		170		N (a)		---

BSC - Background screening concentration.
COPC - Chemical of Potential Concern.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.
mg/kg - milligrams per kilogram.
Q - Data is biased high due to a calibration error.

Table 2-4

Statistical Summary and Selection of Chemicals of Potential Concern in Surface Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

RBSC - Risk based screening concentration.
VQ - Validation qualifier.

[a] IT Corporation (IT), 1998, ***Site Investigation of Acid Areas*** , Plum Brook Ordnance Works, Sandusky, Ohio, August.

[b] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) residential soil values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.

[c] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = maximum detected concentration does not exceed the BSC.
(c) = essential nutrient.

[d] Y = Chemical is chosen as COPC.

[e] 95% UCL (Upper confidence limit) determined using ProUCL Version 4.00.05 (EPA, 2010, Office of Research and evelopment, Las Vegas, Nevada, and Technology Support Center, Atlanta, Georgia, May, on line at http://www.epa.gov/esd/tsc/TSC_form.htm). Calculated only for COPC.

[f] Concentration used in risk assessment equal to 95% UCL or maximum detected concentration, whichever is lower.

[g] RBSC based on thallium from IRIS, 2009.

[h] RBSC based on acenapthene.

[i] RBSC based on pyrene.

Table 2-5

Statistical Summary and Selection of Chemicals of Potential Concern in Subsurface Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

(Page 1 of 2)

Chemical	Detection Frequency	Percent Detection	Range of Values, mg/kg: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Mean mg/kg	BSC [a] mg/kg	RBSC [b] mg/kg		COPC? [c,d]
Inorganics													
Aluminum	17 / 17	100	2.77E+03		1.30E+04	J	3.31E+00	2.53E+01	8.64E+03	1.55E+04	7700		N (b)
Antimony	8 / 17	47	2.58E-01	J	3.48E-01	J	4.15E-01	1.30E+00	2.79E-01	9.30E+00	3.1		N (a)
Arsenic	17 / 17	100	3.57E+00		1.58E+01		8.31E-01	1.30E+00	7.60E+00	3.65E+01	0.39		N (b)
Barium	17 / 17	100	1.30E+01		4.51E+02		1.65E-01	2.53E+01	8.31E+01	8.26E+02	1500		N (a)
Beryllium	16 / 17	94	3.62E+00	J	1.29E+01	J	1.65E-01	6.30E-01	6.57E+00	1.00E+00	16		N (a)
Cadmium	6 / 17	35	2.69E-01	J	7.66E+00		2.50E-01	5.31E-01	6.83E-01	NA	7		Y
Calcium	17 / 17	100	2.30E+03		5.09E+04		4.46E+00	6.32E+02	3.00E+04	5.23E+04	Nutrient		N (c)
Chromium	17 / 17	100	5.51E+00		2.07E+01		4.13E-01	6.30E-01	1.34E+01	2.90E+01	0.29		N (b)
Cobalt	17 / 17	100	3.23E+00		6.22E+01		1.65E-01	6.30E+00	1.39E+01	1.16E+02	2.3		N (b)
Copper	17 / 17	100	7.71E+00		3.77E+01	J	4.13E-01	3.20E+00	2.50E+01	5.62E+01	310		N (a)
Iron	17 / 17	100	1.06E+04		6.20E+04		3.31E+00	1.96E+01	2.67E+04	2.34E+05	5500		N (b)
Lead	17 / 17	100	5.69E+00		1.92E+01		3.80E-01	5.31E-01	1.14E+01	4.86E+01	400		N (a)
Magnesium	17 / 17	100	8.39E+02		2.01E+04		1.65E+00	6.32E+02	1.07E+04	1.04E+04	Nutrient		N (c)
Manganese	17 / 17	100	2.51E+02		4.47E+03		1.65E-01	1.90E+00	7.50E+02	3.51E+03	180		Y
Mercury	12 / 17	71	1.24E-02	J	5.92E-02		2.07E-02	1.30E-01	2.38E-02	8.50E-02	2.3		N (a)
Nickel	15 / 17	88	1.71E+00		4.43E+01		2.48E-01	5.10E+00	1.71E+01	5.51E+01	150		N (a)
Potassium	17 / 17	100	1.64E+02		1.72E+03		2.07E+01	6.32E+02	1.01E+03	3.39E+03	Nutrient		N (c)
Selenium	3 / 17	18	5.59E-01	J	9.70E-01		6.30E-01	1.06E+00	5.21E-01	2.00E+00	39		N (a)
Sodium	16 / 17	94	2.50E+01		1.53E+02		8.26E+00	6.32E+02	1.13E+02	NA	Nutrient		N (c)
Thallium	11 / 17	65	2.39E-01	J	6.63E-01		4.15E-01	1.30E+00	3.38E-01	1.30E+00	0.51	e	N (b)
Vanadium	17 / 17	100	1.51E+01	J	3.76E+01	J	1.65E-01	6.30E+00	2.23E+01	4.09E+01	39		N (a)
Zinc	17 / 17	100	2.31E+01		9.24E+01		2.07E+00	2.50E+00	6.44E+01	3.22E+02	2300		N (a)
Semivolatile Organic Compounds													
Benzo(a)anthracene	1 / 17	6	6.42E-02	J	6.42E-02	J	3.73E-01	4.68E-01	1.93E-01		0.15		N (a)
Benzo(a)pyrene	1 / 17	6	5.34E-02	J	5.34E-02	J	3.73E-01	4.68E-01	1.93E-01		0.015		Y
Benzo(b)fluoranthene	1 / 17	6	8.29E-02	J	8.29E-02	J	3.73E-01	4.68E-01	1.95E-01		0.15		N (a)
Chrysene	1 / 17	6	6.75E-02	J	6.75E-02	J	3.73E-01	4.68E-01	1.94E-01		15		N (a)
Fluoranthene	1 / 17	6	1.26E-01	J	1.26E-01	J	3.73E-01	4.68E-01	1.97E-01		230		N (a)
Indeno(1,2,3-cd)pyrene	1 / 17	6	3.12E-01	J	3.12E-01	J	3.73E-01	4.68E-01	2.08E-01		0.15		Y
Naphthalene	1 / 17	6	5.53E-02	J	5.53E-02	J	3.73E-01	4.68E-01	1.93E-01		3.6		N (a)
Phenanthrene	2 / 17	12	7.50E-02	J	8.33E-02	JJ	3.73E-01	4.68E-01	1.88E-01		170	f	N (a)
Pyrene	1 / 17	6	1.02E-01	J	1.02E-01	J	3.73E-01	4.68E-01	1.96E-01		170		N (a)

Note: Exposure point concentrations (EPC) are not provided. The subsurface soil and surface soil data sets are combined for all AP1 soil pathways as "total soil" to evaluate soil exposure for future receptors. EPCs for these receptors are based on total soil. See Table 2.6.
BSC - Background screening concentration.
COPC - Chemical of Potential Concern.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.

Table 2-5

Statistical Summary and Selection of Chemicals of Potential Concern in Subsurface Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

mg/kg - milligrams per kilogram.
NA - Not available.
RBSC - Risk based screening concentration.
VQ - Validation qualifier.

[a] IT Corporation (IT), 1998, ***Site Investigation of Acid Areas*** , Plum Brook Ordnance Works, Sandusky, Ohio, August.

[b] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) residential soil values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.

[c] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = maximum detected concentration does not exceed the BSC.
(c) = essential nutrient.

[d] Y = Chemical is chosen as COPC.

[e] RBSC based on thallium from EPA, 2009, Integrated Risk Information System (IRIS), on line.

[f] RBSC based on pyrene.

Table 2-6

Statistical Summary and Selection of Chemicals of Potential Concern in Total Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Chemical	Detection Frequency	Percent Detection	Range of Values, mg/kg: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Mean mg/kg	BSC [a] mg/kg	RBSC [b] mg/kg		COPC? [c,d]	95% UCL [e] mg/kg	EPC [f] mg/kg
Inorganics															
Aluminum	30 / 30	100	2.77E+03		1.66E+04		3.31E+00	4.89E+01	9.18E+03	1.55E+04	7700		Y	1.00E+04	1.00E+04
Antimony	12 / 30	40	2.58E-01	J	8.38E-01		4.15E-01	2.60E+00	4.18E-01	9.30E+00	3.1		N (b)		---
Arsenic	30 / 30	100	3.57E+00		3.12E+01		8.31E-01	2.60E+00	9.71E+00	3.65E+01	0.39		N (b)		---
Barium	30 / 30	100	1.30E+01		4.51E+02		1.65E-01	4.89E+01	8.65E+01	8.26E+02	1500		N (b)		---
Beryllium	25 / 30	83	1.50E+00		1.65E+01	J	1.65E-01	1.20E+00	6.89E+00	1.00E+00	16		Y	8.52E+00	8.52E+00
Cadmium	7 / 30	23	2.60E-01	J/U	7.66E+00		2.50E-01	6.10E-01	4.91E-01	NA	7		Y	1.26E+00	1.26E+00
Calcium	30 / 30	100	2.30E+03		5.91E+04		4.46E+00	1.22E+03	2.35E+04	5.23E+04	Nutrient		N (c)		---
Chromium	30 / 30	100	5.51E+00		2.07E+01		4.13E-01	1.30E+00	1.33E+01	2.90E+01	0.29		N (b)		---
Cobalt	29 / 30	97	3.23E+00		6.22E+01		1.65E-01	1.22E+01	1.17E+01	1.16E+02	2.3		N (b)		---
Copper	30 / 30	100	7.71E+00		5.00E+01		4.13E-01	6.10E+00	2.62E+01	5.62E+01	310		N (b)		---
Iron	30 / 30	100	1.06E+04		9.51E+04		3.31E+00	2.62E+01	3.76E+04	2.34E+05	5500		N (b)		---
Lead	30 / 30	100	4.90E+00		2.71E+01		3.80E-01	7.90E-01	1.06E+01	4.86E+01	400		N (b)		---
Magnesium	29 / 30	97	6.51E+02		2.01E+04		1.65E+00	1.22E+03	7.12E+03	1.04E+04	Nutrient		N (c)		---
Manganese	30 / 30	100	1.25E+02		4.47E+03		1.65E-01	3.90E+00	6.72E+02	3.51E+03	180		Y	1.37E+03	1.37E+03
Mercury	19 / 30	63	1.24E-02	J	3.83E-01		2.07E-02	2.40E-01	5.40E-02	8.50E-02	2.3		N (a)		---
Nickel	21 / 30	70	1.71E+00		7.92E+01		2.48E-01	9.80E+00	1.52E+01	5.51E+01	150		N (a)		---
Potassium	28 / 30	93	1.64E+02		1.72E+03		2.07E+01	1.22E+03	9.59E+02	3.39E+03	Nutrient		N (c)		---
Selenium	12 / 30	40	4.97E-01	J/U	2.70E+00		6.30E-01	1.30E+00	7.06E-01	2.00E+00	39		N (a)		---
Sodium	24 / 30	80	2.50E+01		1.65E+02		8.26E+00	1.22E+03	1.61E+02	NA	Nutrient		N (c)		---
Thallium	15 / 30	50	2.39E-01	J	6.63E-01		4.15E-01	2.60E+00	4.35E-01	1.30E+00	0.51	g	N (b)		---
Vanadium	30 / 30	100	1.44E+01		3.92E+01		1.65E-01	1.31E+01	2.34E+01	4.09E+01	39		N (b)		---
Zinc	28 / 30	93	2.31E+01		9.58E+01		2.07E+00	5.20E+00	5.87E+01	3.22E+02	2300		N (b)		---
Polychlorinated biphenyls (PCB)															
Aroclor 1260	1 / 13	8	1.03E-01	J/U	1.03E-01	J/U	4.00E-02	2.69E-01	1.04E-01		0.22		N (a)		---
Semivolatile Organic Compounds															
Acenaphthylene	1 / 30	3	2.79E-01	JJ	2.79E-01	JJ	3.73E-01	2.37E+00	2.56E-01		340	h	N (a)		---
Anthracene	1 / 30	3	2.16E-01	JJ	2.16E-01	JJ	3.73E-01	2.37E+00	2.54E-01		1700		N (a)		---
Benzo(a)anthracene	2 / 30	7	6.42E-02	J	8.56E-01	JJ	3.73E-01	2.37E+00	2.70E-01		0.15		Y	2.57E-01	2.57E-01
Benzo(a)pyrene	2 / 30	7	5.34E-02	J	7.21E-01	JJ	3.73E-01	2.37E+00	2.65E-01		0.015		Y	2.16E-01	2.16E-01
Benzo(b)fluoranthene	2 / 30	7	8.29E-02	J	1.21E+00	JJ	3.73E-01	2.37E+00	2.82E-01		0.15		Y	3.47E-01	3.47E-01
Chrysene	2 / 30	7	6.75E-02	J	8.50E-01	JJ	3.73E-01	2.37E+00	2.69E-01		15		N (a)		---
Dibenzofuran	1 / 30	3	7.57E-02	QJ	7.57E-02	QJ	3.73E-01	2.37E+00	2.75E-01		7.8		N (a)		---
Fluoranthene	3 / 30	10	4.77E-02	QJ	1.88E+00	JJ	3.73E-01	2.37E+00	3.00E-01		230		N (a)		---
Indeno(1,2,3-cd)pyrene	2 / 30	7	3.12E-01	J	1.82E+00	JJ	3.73E-01	2.37E+00	3.10E-01		0.15		Y	4.46E-01	4.46E-01
Methylnaphthalene, 2-	2 / 30	7	3.63E-01	QJ	9.42E-01	J	3.73E-01	2.37E+00	2.76E-01		31		N (a)		---
Naphthalene	5 / 30	17	5.53E-02	J	7.64E-01	J	3.73E-01	2.37E+00	2.43E-01		3.6		N (a)		---
Phenanthrene	6 / 30	20	5.50E-02	J	8.31E-01	JJ	3.73E-01	2.37E+00	2.26E-01		170	i	N (a)		---
Pyrene	3 / 30	10	3.78E-02	QJ	1.32E+00	JJ	3.73E-01	2.37E+00	2.81E-01		170		N (a)		---

BSC - Background screening concentration.
COPC - Chemical of Potential Concern
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.
mg/kg - milligrams per kilogram
Q - Data is biased high due to a calibration error
RBSC - Risk based screening concentration
VQ - Validation qualifier.

Table 2-6

Statistical Summary and Selection of Chemicals of Potential Concern in Total Soil
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

[a] IT Corporation (IT), 1998, ***Site Investigation of Acid Areas*** , Plum Brook Ordnance Works, Sandusky, Ohio, August.
[b] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) residential soil values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.
[c] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = maximum detected concentration does not exceed the BSC.
(c) = essential nutrient.
[d] Y = Chemical is chosen as COPC.
[e] 95% UCL (Upper confidence limit) determined using ProUCL Version 4.00.05 (EPA, 2010, Office of Research and Development, Las Vegas, Nevada, and Technology Support Center, Atlanta, Georgia, May, on line at http://www.epa.gov/esd/tsc/TSC_form.htm). Calculated only for COPC.
[f] Concentration used in risk assessment equal to 95% UCL or maximum detected concentration, whichever is lower.
[g] RBSC based on thallium from EPA, 2009, Integrated Risk Information System (IRIS), on line.
[h] RBSC based on acenapthene.
[i] RBSC based on pyrene.

Table 2-7

Statistical Summary and Selection of Chemicals of Potential Concern in Bedrock Groundwater
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

(Page 1 of 2)

Chemical	Detection Frequency	Percent hits	Range of values, µg/L: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Arithmetic Mean µg/L	BSC [a] µg/L	RBSC [b] µg/L	COPC? [c,d]	EPC [e] µg/L
Inorganics - Unfiltered													
Aluminum	4 / 4	100	4.53E+01	J	6.75E+01	J	2.00E+02	2.00E+02	5.42E+01	3.09E+02	3700	N (a)	---
Antimony	1 / 4	25	5.80E+00	J	5.80E+00	J	6.00E+00	1.20E+01	4.45E+00	NA	1.5	Y	5.80E+00
Arsenic	4 / 4	100	5.07E+01		1.10E+02		1.00E+01	2.00E+01	8.29E+01	7.40E+00	0.045	Y	1.10E+02
Barium	4 / 4	100	4.34E+02		9.89E+02		2.00E+02	2.00E+02	7.19E+02	1.18E+04	730	N (b)	---
Calcium	4 / 4	100	2.20E+05		5.90E+05		1.00E+03	2.00E+03	4.07E+05	3.16E+05	Nutrient	N (c)	---
Iron	4 / 4	100	3.22E+02		4.91E+03		3.00E+02	3.00E+02	1.78E+03	1.55E+03	2600	Y	4.91E+03
Magnesium	4 / 4	100	1.55E+05		4.79E+05		5.00E+03	5.00E+03	3.02E+05	2.17E+05	Nutrient	N (c)	---
Manganese	4 / 4	100	3.80E+01		8.57E+02		1.50E+01	1.50E+01	5.37E+02	6.36E+02	88	Y	8.57E+02
Nickel	2 / 4	50	2.80E+00	J	5.80E+00	J	4.00E+01	4.00E+01	1.22E+01	8.60E+00	73	N (a)	---
Potassium	4 / 4	100	5.96E+04		1.29E+05		1.00E+04	2.00E+04	9.69E+04	1.16E+05	Nutrient	N (c)	---
Selenium	3 / 4	75	5.20E+00	J	1.19E+01	J	1.00E+01	2.00E+01	8.35E+00	NA	18	N (a)	---
Sodium	4 / 4	100	5.73E+05		1.47E+06		1.00E+05	5.00E+05	1.06E+06	1.39E+06	Nutrient	N (c)	---
Thallium	1 / 4	25	5.30E+00	J	5.30E+00	J	1.00E+01	1.00E+01	5.08E+00	NA	0.24	Y	5.30E+00
Vanadium	3 / 4	75	1.30E+00	J	2.60E+00	J	5.00E+01	5.00E+01	7.78E+00	NA	18	N (a)	---
Zinc	3 / 3	100	7.70E+00	J	1.60E+01	J	2.00E+01	2.00E+01	1.17E+01	5.01E+02	1100	N (a)	---
Semivolatile Organic Compounds													
3-Methylphenol and 4-Methylphenol	3 / 4	75	9.70E-01	J	9.00E+00	J	4.80E+00	2.00E+01	5.09E+00		93	N (a)	---
Dimethylphenol, 2,4-	4 / 4	100	2.00E+00	J	2.47E+01		4.80E+00	2.00E+01	1.26E+01		73	N (a)	---
Methylnaphthalene, 2-	4 / 4	100	1.45E+01		3.62E+01		4.80E+00	2.00E+01	2.45E+01		15	Y	3.62E+01
Methylphenol, 2-	2 / 4	50	6.20E+00	J	6.90E+00	J	4.80E+00	2.00E+01	4.49E+00		180	N (a)	---
Naphthalene	4 / 4	100	1.18E+01		3.32E+01		4.80E+00	2.00E+01	2.33E+01		0.14	Y	3.32E+01
Phenol	2 / 4	50	6.60E+00	J	6.60E+00	J	4.80E+00	2.00E+01	4.51E+00		1100	N (a)	---
Volatile Organic Compounds													
Acetone	2 / 2	100	1.40E+02	J	4.63E+02	J	2.50E+02	5.00E+02	3.02E+02		2200	N (a)	---
Benzene	4 / 4	100	2.75E+01		1.30E+03		2.00E+00	2.00E+01	5.02E+02		0.41	Y	1.30E+03
Butanone, 2-	3 / 4	75	1.09E+01		2.99E+02		1.00E+01	1.00E+02	9.66E+01		710	N (a)	---
Carbon disulfide	3 / 4	75	1.90E+00	J	1.23E+01	J	4.00E+00	4.00E+01	9.30E+00		100	N (a)	---
Chloroform	2 / 4	50	1.20E+01		1.80E+01		2.00E+00	2.00E+01	1.03E+01		0.19	Y	1.80E+01
Chloromethane	1 / 4	25	2.16E+02		2.16E+02		4.00E+00	4.00E+01	6.20E+01		19	Y	2.16E+02
Ethylbenzene	4 / 4	100	3.09E+01		1.76E+02		2.00E+00	2.00E+01	9.46E+01		1.5	Y	1.76E+02
Methylene chloride	1 / 2	50	2.88E+01	J	2.88E+01	J	1.00E+01	1.00E+02	1.69E+01		4.8	Y	2.88E+01
Tetrachloroethane, 1,1,2,2-	1 / 4	25	5.30E-01	J	5.30E-01	J	2.00E+00	2.00E+01	4.13E+00		0.067	Y	5.30E-01
Toluene	4 / 4	100	4.36E+01		7.30E+02		2.00E+00	2.00E+01	3.33E+02		230	Y	7.30E+02
Xylenes, total	4 / 4	100	3.70E+02		1.34E+03		6.00E+00	6.00E+01	8.11E+02		20	Y	1.34E+03
General Chemistry													
Chloride	4 / 4	100	7.05E+05		4.28E+06		1.00E+05	2.00E+05	2.46E+06		Nutrient	N (c)	---
Cyanide, total	2 / 4	50	3.70E+01	J	1.20E+02	J	1.00E+01	1.00E+01	4.18E+01		73	Y	1.20E+02
Nitrate-Nitrite	2 / 4	50	4.60E+01	J	1.90E+02	J	1.00E+02	2.00E+03	5.59E+02		1,000 [f]	N (a)	---
Sulfate	2 / 4	50	1.36E+04		9.34E+04		2.00E+03	1.00E+05	4.55E+04		250,000 [g]	N (a)	---

Table 2-7

Statistical Summary and Selection of Chemicals of Potential Concern in Bedrock Groundwater
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

BSC - Background screening concentration.
RBSC - Risk based screening concentration.
COPC - Chemical of Potential Concern.
µg/L - micrograms per liter.
VQ - Validation qualifier.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.

[a] Shaw Environmental, Inc. (Shaw), 2005b, 2004 Groundwater Data Summary and Evaluation Report, Final, Former Plum Brook Ordnance Works, Sandusky, Ohio, April.

[b] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) tap water values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.

[c] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = maximum detected concentration does not exceed the BSC.
(c) = essential nutrient.

[d] Y = Chemical is chosen as COPC.

[e] Exposure point concentration (EPC) used in risk assessment equal to maximum detected concentration.

[f] RBSC for nitrite is used for screening.

[g] EPA, 2009, ***2009 Edition of the Drinking Water Standards and Health Advisories*** , Office of Water, October, EPA 822-R-09-011.

Table 2-8

Statistical Summary and Selection of Chemicals of Potential Concern in Monitoring Well Overburden Groundwater
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Chemical	Detection Frequency	Percent hits	Range of values, µg/L: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Arithmetic Mean µg/L	BSC [a] µg/L	RBSC [b] µg/L		COPC? [c,d]	95% UCL [e] µg/L	EPC [f] µg/L
Inorganics-Unfiltered															
Aluminum	6 / 6	100	1.72E+01	J	1.11E+03	J	2.00E+02	2.00E+02	2.48E+02	3.09E+02	3700		N (a)		---
Arsenic	2 / 6	33	5.40E+00	J	6.30E+00	J	1.00E+01	1.00E+01	5.28E+00	7.40E+00	0.045		N (b)		---
Barium	6 / 6	100	2.86E+01	J	2.52E+02		2.00E+02	2.00E+02	9.78E+01	1.18E+04	730		N (a)		---
Calcium	6 / 6	100	9.34E+04		2.82E+05		1.00E+03	1.00E+03	1.73E+05	3.16E+05	Nutrient		N (c)		---
Cobalt	6 / 6	100	1.00E+00	J	2.22E+01	J	5.00E+01	5.00E+01	6.55E+00	1.21E+01	1.1		Y	1.85E+01	1.85E+01
Iron	3 / 6	50	1.09E+03		4.61E+03		3.00E+02	3.00E+02	1.76E+03	1.55E+03	2600		Y	3.86E+03	3.86E+03
Lead	2 / 3	67	2.20E+00	J	4.30E+00	J	5.00E+00	1.00E+01	3.83E+00	NA	15	g	N (a)		---
Magnesium	6 / 6	100	3.87E+04		9.24E+04		5.00E+03	5.00E+03	6.42E+04	2.17E+05	Nutrient		N (c)		---
Manganese	6 / 6	100	1.36E+02		3.23E+04		1.50E+01	1.50E+02	7.00E+03	6.36E+02	88		Y	9.58E+04	3.23E+04
Nickel	6 / 6	100	4.10E+00		1.52E+01	J	4.00E+01	4.00E+01	8.42E+00	8.60E+00	73		N (a)		---
Potassium	6 / 6	100	2.82E+03	J	2.82E+04		1.00E+04	1.00E+04	1.66E+04	1.16E+05	Nutrient		N (c)		---
Selenium	4 / 6	67	3.70E+00	J	5.20E+00	J	1.00E+01	2.00E+01	5.58E+00	NA	18		N (a)		---
Sodium	6 / 6	100	1.89E+04		8.13E+04		1.00E+04	2.00E+04	5.39E+04	1.39E+06	Nutrient		N (c)		---
Thallium	1 / 6	17	3.46E+01		3.46E+01		1.00E+01	2.00E+01	9.93E+00	NA	0.24		Y	3.14E+01	3.14E+01
Vanadium	2 / 6	33	1.20E+00	J	2.90E+00	J	5.00E+01	5.00E+01	1.74E+01	NA	18		N (a)		---
Zinc	3 / 4	75	1.34E+01	J	2.32E+01		2.00E+01	2.00E+01	1.52E+01	5.01E+02	1100		N (a)		---
Nitroaromatics															
Nitrotoluene, 2-	1 / 6	17	1.80E-01	J	1.80E-01	J	1.90E-01	2.00E-01	1.11E-01		0.31		N (a)		---
Nitrotoluene, 4-	1 / 6	17	1.70E-01	J	1.70E-01	J	1.90E-01	2.00E-01	1.09E-01		4.2		N (a)		---
Volatile Organic Compounds															
Chloroform	1 / 6	17	4.80E-01	J	4.80E-01	J	1.00E+00	1.00E+00	4.97E-01		0.19		Y	5.03E-01	4.80E-01
General Chemistry															
Chloride	6 / 6	100	1.15E+04		4.00E+04		2.00E+03	1.00E+04	3.14E+04		Nutrient		N (c)		---
Nitrate-Nitrite	3 / 6	50	4.10E+01	J	1.30E+02	J	1.00E+02	2.00E+03	3.79E+02		1,000	h	N (a)		---
Sulfate	6 / 6	100	1.09E+05		5.89E+05		4.00E+03	2.00E+05	3.47E+05		250,000	i	Y	5.20E+05	5.20E+05

BSC - Background screening concentration.
RBSC - Risk based screening concentration.
COPC - Chemical of Potential Concern.
µg/L - micrograms per liter.
VQ - Validation qualifier.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.

[a] Shaw Environmental, Inc. (Shaw), 2005b, 2004 Groundwater Data Summary and Evaluation Report, Final, Former Plum Brook Ordnance Works, Sandusky, Ohio, April.
[b] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) tap water values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.
[c] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = maximum detected concentration does not exceed the BSC.
(c) = essential nutrient.
[d] Y = Chemical is chosen as COPC.
[e] 95% UCL (Upper confidence limit) determined using ProUCL Version 4.00.05 (EPA, 2010, Office of Research and Development, Las Vegas, Nevada, and Technology Support Center, Atlanta, Georgia, May, on line at http://www.epa.gov/esd/tsc/TSC_form.htm). Calculated only for COPC.
[f] Concentration used in risk assessment equal to 95% UCL or maximum detected concentration, whichever is lower.
[g] Screening criteria for lead based on the action level of 15 µg/L (EPA, 1996, *Drinking Water Regulations and Health Advisories* , Office of Water, Washington, DC, October).
[h] Screening criteria for nitrite.
[i] EPA, 2009, ***2009 Edition of the Drinking Water Standards and Health Advisories*** , Office of Water, October, EPA 822-R-09-011.

Table 2-9

Statistical Summary and Selection of Chemicals of Potential Concern in Sediment
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Chemical	Detection Frequency	Percent Detection	Range of Values, mg/kg: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Mean mg/kg	RBSC [a] mg/kg	COPC? [b,c]	EPC [d] mg/kg
Inorganics												
Aluminum	4 / 4	100	4.49E+03		9.88E+03		1.30E+01	2.40E+01	7.84E+03	7.70E+04	N (a)	---
Antimony	3 / 4	75	5.00E-01	J	1.30E+00	J	3.80E+00	7.30E+00	1.19E+00	3.10E+01	N (a)	---
Arsenic	4 / 4	100	4.00E+00		1.59E+01		5.10E-01	9.70E-01	9.20E+00	3.90E-01	Y	1.59E+01
Barium	4 / 4	100	3.13E+01		1.10E+02		1.30E+01	2.40E+01	5.86E+01	1.50E+04	N (a)	---
Beryllium	4 / 4	100	3.00E-01	J	1.60E+00		3.20E-01	6.10E-01	7.55E-01	1.60E+02	N (a)	---
Cadmium	4 / 4	100	2.30E-01	J	5.90E-01		2.50E-01	4.80E-01	4.23E-01	7.00E+01	N (a)	---
Calcium	4 / 4	100	1.04E+04		2.99E+04		3.20E+02	6.10E+02	1.77E+04	Nutrient	N (b)	---
Chromium	4 / 4	100	7.80E+00		1.69E+01		6.40E-01	1.20E+00	1.30E+01	2.90E-01	Y	1.69E+01
Cobalt	4 / 4	100	4.40E+00		9.90E+00		3.20E+00	6.10E+00	8.08E+00	2.30E+01	N (a)	---
Copper	4 / 4	100	1.05E+01		3.85E+01		1.60E+00	3.00E+00	2.27E+01	3.10E+03	N (a)	---
Iron	4 / 4	100	9.27E+03		2.17E+04		6.40E+00	1.20E+01	1.79E+04	5.50E+04	N (a)	---
Lead	4 / 4	100	7.00E+00	J	2.37E+01		6.40E+00	1.20E+01	1.67E+01	4.00E+02	N (a)	---
Magnesium	4 / 4	100	1.81E+03		9.37E+03		3.20E+02	6.10E+02	5.13E+03	Nutrient	N (b)	---
Manganese	4 / 4	100	1.65E+02		1.67E+03		1.10E+00	9.10E+00	6.55E+02	1.80E+03	N (a)	---
Mercury	4 / 4	100	2.10E-02	J	1.40E-01		1.00E-01	2.00E-01	7.38E-02	2.30E+01	N (a)	---
Nickel	4 / 4	100	1.20E+01		2.67E+01		2.50E+00	4.80E+00	2.14E+01	1.50E+03	N (a)	---
Potassium	4 / 4	100	7.25E+02	J	1.74E+03		6.40E+02	1.20E+03	1.24E+03	Nutrient	N (b)	---
Selenium	3 / 4	75	3.20E-01	J	1.30E+00	J	6.40E+00	1.20E+01	1.44E+00	3.90E+02	N (a)	---
Silver	1 / 4	25	9.90E-02	J	9.90E-02	J	6.40E-01	1.20E+00	3.49E-01	3.90E+02	N (a)	---
Sodium	2 / 4	50	8.31E+01	J	1.12E+02	J	6.40E+02	1.20E+03	2.79E+02	Nutrient	N (b)	---
Vanadium	4 / 4	100	1.24E+01		2.55E+01		3.20E+00	6.10E+00	1.98E+01	3.90E+02	N (a)	---
Zinc	4 / 4	100	3.33E+01		1.37E+02		1.30E+00	2.40E+00	7.86E+01	2.30E+04	N (a)	---
Polychlorinated Biphenyls												
Aroclor 1254	2 / 4	50	2.50E-02	J	3.52E-02	J	2.20E-02	4.10E-02	2.11E-02	1.10E-01	N (a)	---
Aroclor 1260	2 / 4	50	2.07E-02	J	1.13E-01	J	2.20E-02	4.10E-02	3.94E-02	2.20E-01	N (a)	---
Semivolatiles Organic Compounds												
Benzo(a)anthracene	1 / 4	25	1.21E-01	J	1.21E-01	J	2.20E-01	1.10E+00	2.28E-01	1.50E-01	N (a)	---
Benzo(a)pyrene	1 / 4	25	1.12E-01	J	1.12E-01	J	2.20E-01	1.10E+00	2.26E-01	1.50E-02	Y	1.12E-01
Benzo(b)fluoranthene	1 / 4	25	1.75E-01	J	1.75E-01	J	2.20E-01	1.10E+00	2.41E-01	1.50E-01	Y	1.75E-01
Chrysene	1 / 4	25	1.49E-01	J	1.49E-01	J	2.20E-01	1.10E+00	2.35E-01	1.50E+01	N (a)	---
Dibenzofuran	1 / 4	25	1.50E-01	J	1.50E-01	J	2.20E-01	1.10E+00	2.35E-01	7.80E+01	N (a)	---
Di-n-butyl phthalate	1 / 4	25	1.80E-01	J	1.80E-01	J	4.30E-01	2.20E+00	4.90E-01	6.10E+03	N (a)	---
Fluoranthene	1 / 4	25	1.91E-01	J	1.91E-01	J	2.20E-01	1.10E+00	2.45E-01	2.30E+03	N (a)	---
Methylnaphthalene, 2-	1 / 4	25	6.16E-01		6.16E-01		2.20E-01	1.10E+00	3.52E-01	3.10E+02	N (a)	---
Naphthalene	1 / 4	25	3.37E-01	J	3.37E-01	J	2.20E-01	1.10E+00	2.82E-01	3.60E+00	N (a)	---
Phenanthrene	1 / 4	25	3.06E-01	J	3.06E-01	J	2.20E-01	1.10E+00	2.74E-01	1.70E+02 [e]	N (a)	---
Pyrene	1 / 4	25	1.95E-01	J	1.95E-01	J	2.20E-01	1.10E+00	2.46E-01	1.70E+02	N (a)	---

Table 2-9

Statistical Summary and Selection of Chemicals of Potential Concern in Sediment
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

RBSC - Risk based screening concentration
COPC - Chemical of Potential Concern
mg/kg - milligrams per kilogram.
VQ - Validation qualifier.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.

[a] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) residential soil and are based on a risk level of 1.0E-06 and a hazard index of 1.
[b] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = essential nutrient.
[c] Y = Chemical is chosen as COPC.
[d] Exposure point concentration (EPC) used in risk assessment equal to maximum detected concentration.
[e] RBSC based on pyrene.

Table 2-10

Statistical Summary and Selection of Chemicals of Potential Concern in Surface Water
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Chemical	Detection Frequency	Percent hits	Range of values, µg/L: Detected Conc Minimum	VQ	Detected Conc Maximum	VQ	Reporting Limits Minimum	Reporting Limits Maximum	Arithmetic Mean µg/L	RBSC [a] µg/L		COPC? [b,c]
Metals												
Aluminum	4 / 4	100	31.8	J	8770		200	200	2.23E+03	3.70E+04		N (a)
Arsenic	1 / 4	25	8.3	J	8.3	J	10	10	5.83E+00	4.50E-02		Y
Barium	4 / 4	100	31.9	J	80	J	200	200	4.56E+01	7.30E+03		N (a)
Calcium	4 / 4	100	139000		222000		1000	1000	1.62E+05	Nutrient		N (b)
Chromium	1 / 4	25	13.9		13.9		10	10	7.23E+00	4.30E-02		Y
Cobalt	1 / 4	25	6.9	J	6.9	J	50	50	2.05E+01	1.10E+01		N (a)
Copper	1 / 4	25	19.2	J	19.2	J	25	25	1.42E+01	1.50E+03		N (a)
Iron	3 / 4	75	26.6	J	15100		300	300	3.83E+03	2.60E+04		N (a)
Lead	3 / 4	75	2	J	15		10	10	6.03E+00	1.50E+01	d	N (a)
Magnesium	4 / 4	100	26200		36900		5000	5000	2.90E+04	Nutrient		N (b)
Manganese	4 / 4	100	247		836		15	15	4.92E+02	8.80E+02		N (a)
Nickel	1 / 4	25	26.2	J	26.2	J	40	40	2.16E+01	7.30E+02		N (a)
Potassium	4 / 4	100	2030	J	11800		10000	10000	4.51E+03	Nutrient		N (b)
Sodium	4 / 4	100	6400	J	9140	J	10000	10000	7.36E+03	Nutrient		N (b)
Vanadium	1 / 4	25	20	J	20	J	50	50	2.38E+01	1.80E+02		N (a)
Zinc	4 / 4	100	9.6	J	93.2		20	20	3.17E+01	1.10E+04		N (a)

RBSC - Risk based screening concentration.
COPC - Chemical of Potential Concern.
µg/L - micrograms per liter.
VQ - Validation qualifier.
J - The compound/analyte was positively identified; the reported result is the estimated concentration of the compound/analyte detected in the sample analyzed.

[a] Risk-Based Screening Concentrations based on U.S. Environmental Protection Agency (EPA) Regional Screening Level Table (May 2010) tap water values are based on a risk level of 1.0E-06 and a hazard index of 1.
[b] N = Chemical is not chosen as a COPC:
(a) = maximum detected concentration does not exceed the RBSC.
(b) = essential nutrient.
[c] Y = Chemical is chosen as COPC.
[d] Screening criteria for lead based on the action level of 15 µg/L (EPA, 2009, *Drinking Water Regulations and Health Advisories* , Office of Water, Washington, DC, October, EPA 822-R-09-011).

Table 3-1

Receptor/Exposure Scenarios
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Source Medium	Model	Exposure Medium	Exposure Route
Groundskeeper – Current			
Surface Soil	None	Soil	Incidental Ingestion
			Dermal Contact
	Dust Emissions Based on Activity	Ambient Air	Inhalation
	Volatilization from Soil	Ambient Air	Inhalation[a]
Subsurface Soil	Not Quantified[b]		
Groundwater	Not Quantified[c]		
Surface Water	Not Quantified[b]		
Sediment	Not Quantified[b]		
Groundskeeper – Future			
Total Soil[d]	None	Soil	Incidental Ingestion
			Dermal Contact
	Dust Emissions Based on Activity	Ambient Air	Inhalation
	Volatilization from Soil	Ambient Air	Inhalation
Groundwater	None	Tap Water	Ingestion
			Dermal Contact
Surface Water	Not Quantified[b]		
Sediment	Not Quantified[b]		
Indoor Worker – Future[c]			
Surface Soil	None	Soil	Incidental Ingestion
			Dermal Contact[a]
	Dust Emissions; Volatilization	Indoor Air	Inhalation[a]
Subsurface Soil	Volatilization from Soil	Indoor Air	Inhalation
Groundwater	None	Tap Water	Ingestion
			Dermal Contact
Surface Water	Not Quantified[b]		
Sediment	Not Quantified[b]		

Table 3-1

Receptor/Exposure Scenarios
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Source Medium	Model	Exposure Medium	Exposure Route
Construction Worker – Current/Future			
Total Soil	None	Soil	Incidental Ingestion
			Dermal Contact
	Dust Emissions Based on Activity	Ambient Air	Inhalation
	Volatilization from Soil	Ambient Air	Inhalation
Groundwater	Not Quantified[b]		
Surface Water	None	Surface Water	Dermal Contact
	Volatilization from Water	Ambient Air	Inhalation[a]
Sediment	None	Sediment	Incidental Ingestion
			Dermal Contact
On-Site Resident – Future			
Total Soil[d]	None	Soil	Incidental Ingestion
			Dermal Contact
	Dust Emissions Based on Wind Erosion	Ambient Air	Inhalation
	Volatilization from Soil	Ambient Air	Inhalation
Subsurface Soil	Volatilization from Soil	Indoor Air	Inhalation
Groundwater	None	Tap Water	Ingestion
			Dermal Contact
	Volatilization from Water	Indoor Air	Inhalation
Surface Water	None	Surface Water	Dermal Contact
	Volatilization from Water	Ambient Air	Inhalation[a]
Sediment	None	Sediment	Incidental Ingestion
			Dermal Contact

Table 3-1

Receptor/Exposure Scenarios
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Source Medium	Model	Exposure Medium	Exposure Route
Hunter – Current/Future			
Surface Soil	None	Soil	Incidental Ingestion
			Dermal Contact
	Dust Emissions, Volatilization	Ambient Air	Inhalation[a]
	Biouptake	Venison	Venison Consumption
Subsurface Soil	Not Quantified[e]		
Surface Water	Not Quantified[b]		
Sediment	Not Quantified[b]		
Hunter's Child – Current/Future			
Surface Soil	Not Quantified[e]		
	Not Quantified[e]		
	Biouptake	Venison	Venison Consumption
Subsurface Soil	Not Quantified[e]		
Surface Water	Not Quantified[e]		
Sediment	Not Quantified[e]		

[a] Although theoretically complete, this pathway is not quantified as explained in text.

[b] Although contact with this medium is possible, exposure would be sporadic, rather than continuous or predictable. Such exposures do not lend themselves to evaluation under the chronic toxicity paradigm used in a baseline risk assessment.

[c] Even though the mixing of surface and subsurface soil described in footnote "d" might otherwise be applicable, this receptor was selected primarily to evaluate exposure to indoor air resulting from subsurface soil contamination. Surface soil was used for direct contact exposure to avoid potential "double counting" of contaminants in subsurface soil (refer to Section 3.1.3.2 of text).

[d] Total soil represents a mixture of surface and subsurface soil. This is assumed for future scenarios where excavation and regrading is assumed to take place.

[e] There is no plausible pathway for exposure.

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Pathway Variable	Grounds-keeper	Construction Worker	On-Site Resident	Indoor Worker	Hunter and Hunter's Child
General Variables Used in All Intake Models					
Body weight (BW), kg	70[a]	70[a]	Child: 15[a] Adult: 70[a]	70[a]	Child: 15[a] Adult: 70[a]
Averaging time, noncancer (AT), days[b]	9125	183	Child: 2190 Adult: 8760	9125	Child: 2190 Adult: 10950
Averaging time, cancer (AT), days[b]	25550	25550	25550	25550	25550
Inhalation of VOCs and Resuspended Dust from Surface Soil, Total Soil or Subsurface Soil					
Fraction exposed to contaminated medium (FI_a), unitless	1[c]	1[c]	1[c]	NA	NA
Inhalation rate (IR_a), m^3/day	20[d]	20[d]	Child: 10[e] Adult: 20[d]	NA	NA
Exposure frequency (EF), days/year	250[d]	250[f]	350[a]	NA	NA
Exposure duration (ED), years	25[a]	0.5[f]	Child: 6[a] Adult: 24[a]	NA	NA
Inhalation of VOCs in Indoor Air from Subsurface Soil					
Fraction exposed to contaminated medium (FI_a), unitless	NA	NA	1[c]	1[c]	NA
Inhalation rate (IR_a), m^3/day	NA	NA	Child: 10[e] Adult: 20[d]	20[d]	NA
Exposure frequency (EF), days/year	NA	NA	350[a]	250[a]	NA
Exposure duration (ED), years	NA	NA	Child: 6[a] Adult: 24[a]	25[a]	NA
Incidental Ingestion of Soil					
Fraction exposed to contaminated medium (FI_{so}), unitless	1[c]	1[c]	0.9[g]	1[c]	1[c]

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Pathway Variable	Grounds-keeper	Construction Worker	On-Site Resident	Indoor Worker	Hunter and Hunter's Child
Soil incidental ingestion rate (IR_{so}), mg/day	100[a]	330[a]	Child: 200[a] Adult: 100[a]	50[a]	Child: NA Adult: 100[a]
Exposure frequency (EF), days/year	250[d]	250[a]	350[a]	250[a]	14[d]
Exposure duration (ED), years	25[a]	0.5[f]	Child: 6[a] Adult: 24[a]	25[a]	30[a]
Dermal Contact with Soil					
Fraction exposed to contaminated medium (FI_{so}), unitless	1[c]	1[c]	1[c]	NA	1[c]
Body surface area exposed to soil (SA_{so}), cm^2	3,300[h]	3,300[h]	Child: 2,800[h] Adult: 5,700[h]	NA	Child: NA Adult: 3,300[h,i]
Soil-to-skin adherence factor (AF_{so}), mg/cm^2	0.2[h]	0.3[h]	Child: 0.2[h] Adult: 0.07[h]	NA	0.2[h,i]
Dermal absorption factor (ABS), unitless	csv	csv	csv	NA	csv
Exposure frequency (EF), days/year	250[d]	250[a]	350[a]	NA	14[i]
Exposure duration (ED), years	25[a]	0.5[f]	Child: 6[a] Adult: 24[a]	NA	30[a]
Inhalation of VOCs from Groundwater					
Exposure time (ET), hours/day	NA	NA	24[j]	NA	NA
Inhalation rate (IR_a), m^3/hour	NA	NA	Child: 0.416[e] Adult: 0.833[e]	NA	NA
Exposure frequency (EF), days/year	250[d]	NA	350[a]	250[a]	NA

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Pathway Variable	Grounds-keeper	Construction Worker	On-Site Resident	Indoor Worker	Hunter and Hunter's Child
Drinking Water Ingestion of Groundwater					
Fraction exposed to contaminated medium (Fl_{gw}), unitless	1[c]	NA	1[c]	1[c]	NA
Drinking water ingestion rate (IR_{gw}), L/day	1[d]	NA	Child: 1[e] Adult: 2[d]	1[d]	NA
Exposure frequency (EF), days/year	250[d]	NA	350[a]	250[a]	NA
Dermal Contact with Groundwater					
Fraction exposed to contaminated medium (Fl_{gw}), unitless	1[c]	NA	1[c]	1[c]	NA
Body surface area exposed to water (SA_{gw}), cm^2	3,300[h,k]	NA	Child: 6,600[l] Adult: 20,000[l]	3,300[l]	NA
Permeability coefficient (PC), cm/hour	csv	NA	csv	csv	NA
Exposure time (ET_{gw}), hours/day	1[c]	NA	Child: 0.333[l] Adult: 0.2[l]	1[c]	NA
Exposure frequency (EF), days/year	250[d]	NA	350[d]	250[a]	NA
Incidental Ingestion of Sediment					
Fraction exposed to contaminated medium (Fl_{sd}), unitless	NA	1[c]	0.1[g]	NA	NA
Sediment incidental ingestion rate (IR_{sd}), mg/day	NA	330[a]	Child: 200[a] Adult: 100[a]	NA	NA
Exposure frequency (EF), days/year	NA	250[f]	350[a]	NA	NA
Exposure duration (ED), years	NA	0.5[f]	Child: 6[a] Adult: 24[a]	NA	NA

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Pathway Variable	Grounds-keeper	Construction Worker	On-Site Resident	Indoor Worker	Hunter and Hunter's Child
Dermal Contact with Sediment					
Fraction exposed to contaminated medium (FI_{sd}), unitless	NA	1[f]	0.1[g]	NA	NA
Body surface area exposed to sediment (SA_{sd}), cm^2	NA	3,300[h]	Child: 2,800[h] Adult: 5,700[h]	NA	NA
Sediment-to-skin adherence factor (AF_{sd}), mg/cm^2	NA	0.3[h]	Child: 0.2[h] Adult: 0.07[h]	NA	NA
Dermal absorption factor (ABS), unitless	NA	csv	csv	NA	NA
Exposure frequency (EF), days/year	NA	250[f]	52[m]	NA	NA
Exposure duration (ED), years	NA	0.5[f]	Child: 6[a] Adult: 24[a]	NA	NA
Dermal Contact with Surface Water					
Body surface area exposed to surface water (SA_{sw}), cm^2	NA	3,300[n]	Child: 2,800[n] Adult: 7,000[o]	NA	NA
Permeability coefficient (PC), cm/hour	NA	csv	csv	NA	NA
Exposure time (ET_{sw}), hour/day	NA	4[f]	3[m]	NA	NA
Exposure frequency (EF), days/year	NA	250[f]	52[m]	NA	NA
Exposure duration (ED), years	NA	0.5[f]	Child: 6[a] Adult: 24[a]	NA	NA
Venison Consumption					
Venison ingestion rate (IR_v), kg/day	NA	NA	NA	NA	Child: 0.005[i] Adult: 0.013[p]
Exposure frequency (EF), days/year	NA	NA	NA	NA	350[a]

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Pathway Variable	Grounds-keeper	Construction Worker	On-Site Resident	Indoor Worker	Hunter and Hunter's Child
Exposure duration (ED), years	NA	NA	NA	NA	Child: 6[a] Adult: 30[q]

Note: Groundwater pathways are quantified only for Ash Pit 1 because no groundwater samples could be collected at Ash Pit 3 (see Section 2.1 of text).

[a] U.S. Environmental Protection Agency (EPA), 2002, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, Office of Solid Waste and Emergency Response, Washington, DC, 9355.4-24, December.

[b] For noncancer evaluation, calculated as the product of ED (years) x 365 days/year; for cancer evaluation, calculated as the product of 70 years (assumed human lifetime) x 365 days/year. Source: U.S. Environmental Protection Agency (EPA), 1989a, *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*, Interim Final, Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002.

[c] Default value which assumes 100 percent of exposure is to contaminated medium.

[d] U.S. Environmental Protection Agency (EPA), 1991, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors*, Interim Final, Office of Solid Waste and Emergency Response, OSWER Directive: 9285.603.

[e] U.S. Environmental Protection Agency (EPA), 2004a, *User's Guide and Background Technical Document for Region 9 Preliminary Remediation Goals (PRG) Table*, Region 9, San Francisco, California, October, <http://www.epa.gov/region09/waste/sfund /prg/files/04usersguide.pdf>.

[f] Assumed; see Section 3.1.3.4 of text for explanation.

[g] It is assumed that on days when the resident is visiting the ditches and is exposed to sediment that half of the daily exposure via dermal contact and ingestion are associated with ditch sediment (sediment FI=0.5) and half of the exposure is associated with soil (soil FI=0.5). The resident is assumed to be exposed to soil 350 days/year and to sediment 52 days/year. The FI values of 0.1 for sediment and 0.9 for soil are weighted average daily values as described in Section 3.1.3.4 of the text.

[h] U.S. Environmental Protection Agency (EPA), 2004b, *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)*, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

[i] Please see Section 3.1.3.7 of text for detailed explanation.

[j] The *Exposure Factors Handbook* (see reference h) indicates that the 90th percentile for the amount of time spent at a residence is more than 23 hours per day.

[k] Please see Section 3.1.3.2 of text for detailed explanation.

Table 3-2

Variables Used to Estimate Potential Chemical Intakes and Contact Rates for Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

[l] U.S. Environmental Protection Agency (EPA), 1997, *Exposure Factors Handbook*, Final, National Center for Environmental Assessment, Washington, D.C., EPA/600/P-95/002Fa, August.
[m] Assumed; please see Section 3.1.3.5 of text for detailed explanation.
[n] Value for dermal soil exposure (EPA, 2004b) was selected as appropriate for exposure to this medium by this receptor; refer to Section 3.1.3.5 of text for detail.
[o] Value based on the Exposure Factors Handbook (EPA, 1997). See Section 3.1.3.5 of the text for detailed explanation.
[p] Please see Section 3.1.3.5 of the text for detailed explanation.
[q] Assumes deer are hunted for a 30-year duration.

csv – Chemical-specific value.
NA – Pathway not applicable for receptor.

Table 3-3

Physical Properties of Site-Related Chemicals[a]
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Chemical of Potential Concern	Soil-to-forage Biotransfer Factor B_p (unitless)	Biotransfer Factor for Beef B_b (days/kg)	Biotransfer Factor for Venison B_v (unitless)	Diffusivity In Air (D_i) (cm^2/second)	Soil Organic Carbon-Water Partition Coefficient K_{oc} (cm^3/g)	log K_{ow}	Absorption Fraction ABS (unitless)	Permeability Coefficient K_p (cm/hour)	*tau* (hour/event)	*t** (hour)	Fraction Absorbed from Water FA (unitless)	B (unitless)	Molecular Weight (g/mole)	Henry's Law Constant (atm-m^3/mole)
Metals														
Aluminum	NA	NA	NA	NA	1.50E+03	NA	NA	NA	NA	NA	NA	NA	26.98	NA
Antimony	NA	NA	NA	NA	4.50E+01	NA	NA	1.00E-03	NA	NA	NA	NA	121.75	NA
Arsenic	NA	NA	NA	NA	2.90E+01	NA	0.03	1.00E-03	NA	NA	NA	NA	74.92	NA
Beryllium	NA	NA	NA	NA	7.90E+02	NA	NA	1.00E-03	NA	NA	NA	NA	9.01	NA
Cadmium	6.20E-02	1.20E-04	7.20E-07	NA	7.50E+01	NA	NA	1.00E-03	NA	NA	NA	NA	112.41	NA
Chromium III	NA	NA	NA	NA	1.80E+06	NA	NA	1.00E-03	NA	NA	NA	NA	52	NA
Chromium VI	NA	NA	NA	NA	1.90E+01	NA	NA	2.00E-03	NA	NA	NA	NA	52	NA
Chromium, Total	NA	NA	NA	NA	NA	NA	NA	1.00E-03	NA	NA	NA	NA	52	NA
Cobalt	NA	NA	NA	NA	4.50E+01	NA	NA	4.00E-04	NA	NA	NA	NA	58.93	NA
Iron	NA	NA	NA	NA	2.50E+01	NA	NA	1.00E-03	NA	NA	NA	NA	55.845	NA
Manganese	NA	NA	NA	NA	6.50E+01	NA	NA	1.00E-03	NA	NA	NA	NA	54.94	NA
Thallium	4.00E-04	4.00E-02	2.40E-04	NA	7.10E+01	NA	NA	1.00E-03	NA	NA	NA	NA	204.38	NA
Semivolatile Organic Compounds														
Benzo(a)anthracene	NA	NA	NA	5.10E-02	3.98E+05	5.66E+00	0.13	4.70E-01	2.03	8.53	1	2.8	228.3	3.34E-06
Benzo(a)pyrene	NA	NA	NA	4.30E-02	1.02E+06	6.10E+00	0.13	7.00E-01	2.69	11.67	1	4.3	252.3	4.57E-07
Benzo(b)fluoranthene	NA	NA	NA	2.26E-02	1.23E+06	6.12E+00	0.13	7.00E-01	2.77	12.03	1	4.3	252.3	6.57E-07
Indeno(1,2,3-cd)pyrene	NA	NA	NA	1.90E-02	3.47E+06	6.58E+00	0.13	1.00E+00	3.78	16.83	0.6	6.7	276.3	1.60E-06
Methylnaphthalene, 2-	NA	NA	NA	6.97E-02	3.98E+03	3.86E+00	0.13	8.94E-02	0.657	1.58	1	0.41	142.2	5.18E-04
Naphthalene	NA	NA	NA	5.90E-02	2.00E+03	3.30E+00	0.13	4.70E-02	0.56	1.34	1	0.2	128.2	4.40E-04
Volatile Organic Compounds														
Benzene	NA	NA	NA	8.80E-02	5.89E+01	2.13E+00	NA	1.50E-02	0.29	0.7	1	0.1	78.1	5.55E-03
Chloroform	NA	NA	NA	1.04E-01	3.98E+01	1.97E+00	NA	6.80E-03	0.5	1.19	1	0	119.4	3.67E-03
Chloromethane (Methyl Chloride)	NA	NA	NA	1.39E-01	1.41E+01	9.10E-01	NA	3.30E-03	0.2	0.49	1	0	50.5	8.82E-03
Ethylbenzene	NA	NA	NA	7.50E-02	3.63E+02	3.15E+00	NA	4.90E-02	0.42	1.01	1	0.2	106.2	7.88E-03
Methylene chloride	NA	NA	NA	1.01E-01	1.17E+01	1.25E+00	NA	3.50E-03	0.32	0.76	1	0	84.9	3.25E-03
Tetrachloroethane, 1,1,2,2-	NA	NA	NA	7.10E-02	9.33E+01	2.39E+00	NA	6.90E-03	0.93	2.24	1	0	167.9	3.67E-04
Toluene	NA	NA	NA	8.70E-02	1.82E+02	2.73E+00	NA	3.10E-02	0.35	0.84	1	0.1	92.1	6.64E-03
Xylenes	NA	NA	NA	7.00E-02	4.07E+02	3.20E+00	NA	5.30E-02	0.42	1.01	1	0.2	106.2	5.18E-03
General Chemistry														
Cyanide, total	NA	NA	NA	NA	2.84E+00	NA	NA	1.00E-03	NA	NA	NA	NA	26.02	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

tau - Lag time associated with rate at which chemical crosses stratum corneum per event.
t* - Time for absorption across the stratum corneum to reach steady state ; equals 2.4 times tau.
B - Ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis
kg - kilogram
g - gram
atm-m^3 - atmospheres per cubic meter

[a] See Appendix C which provides references for these values.

Table 4-1

Summary of Toxicity Assessment [a]
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

Chemical of Potential Concern	GAF	Weight of Evidence	Oral Slope Factor (mg/kg-day) $^{-1}$	Dermal Slope Factor (mg/kg-day) $^{-1}$	Weight of Evidence	Inhalation Unit Risk (µg/m^3) $^{-1}$	Inhalation Slope Factor (mg/kg-day) $^{-1}$
Metals							
Aluminum	NA	D	NA	NA	NA	NA	NA
Antimony	0.15	D	NA	NA	NA	NA	NA
Arsenic	1	A	1.50E+00	1.50E+00	A	4.30E-03	1.50E+01
Beryllium	0.007	D	NA	NA	B1	2.40E-03	8.40E+00
Cadmium	0.025	0	NA	NA	B1	1.80E-03	6.30E+00
Chromium III	0.013	D	NA	NA	D	NA	NA
Chromium VI	0.025	D	NA	NA	A	1.20E-02	4.20E+01
Chromium, Total	0.013	D	NA	NA	A	1.20E-02	4.20E+01
Cobalt	1	ND	NA	NA	B	9.00E-04	3.20E+01
Iron	1	ND	NA	NA	ND	NA	NA
Manganese	0.04	D	NA	NA	D	NA	NA
Thallium	1	D	NA	NA	D	NA	NA
Semivolatile Organic Compounds							
Benzo(a)anthracene	1	B2	7.30E-01	7.30E-01	B2	8.80E-05	3.10E-01
Benzo(a)pyrene	1	B2	7.30E+00	7.30E+00	B2	8.80E-04	3.10E+00
Benzo(b)fluoranthene	1	B2	7.30E-01	7.30E-01	B2	8.80E-05	3.10E-01
Indeno(1,2,3-cd)pyrene	1	B2	7.30E-01	7.30E-01	B2	8.80E-05	3.10E-01
Methylnaphthalene, 2-	1	D	NA	NA	D	NA	NA
Naphthalene	1	C	ND	NA	C	3.40E-05	1.20E-01
Volatile Organic Compounds							
Benzene	1	A	5.50E-02	5.50E-02	A	7.80E-06	2.70E-02
Chloroform	1	B2	NC	NA	B2	ND	NC
Chloromethane (Methyl Chloride)	1	D	NA	NA	D	NA	NA
Ethylbenzene	1	D	NA	NA	D	NA	NA
Methylene chloride	1	B2	7.50E-03	7.50E-03	B2	4.70E-07	1.60E-03
Tetrachloroethane, 1,1,2,2-	1	C	2.00E-01	2.00E-01	C	ND	NA
Toluene	1	D	NA	NA	D	NA	NA
Xylenes	1	D	NA	NA	D	NA	NA
General Chemistry							
Cyanide, total	1	D	NA	NA	D	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA

Table 4-1

Summary of Toxicity Assessment [a]
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

mg/kg-day = milligram per kilogram - day
µg/m^3 - milligram per cubic meter
GAF - gastrointestinal absorption factor
NA - not available or not applicable
ND - no data or not determined
NC - Noncancer value is regarded as protective of cancer effects in the Integrated Risk Information System (IRIS) evaluation (EPA, 2010).
[a] See Appendix C which provides references for these values.

Weight of Evidence (WOE) EPA Group:
A - Carcinogenic to humans
B - Likely to be carcinogenic to humans (includes both the former B1 and B2 probable human carcinogens as classified on IRIS)
C - Suggested evidence of carcinogenic potential
D - Inadequate evidence to assess carcinogenic potential

Table 4-1

Summary of Toxicity Assessment [a]
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

		Oral		Dermal	Reference	Inhalation	
Chemical of Potential Concern	GAF	Reference Dose mg/kg-day	Target Organs	Reference Dose mg/kg-day	Concentration mg/m^3	Reference Dose mg/kg-day	Target Organs
Metals							
Aluminum	NA	1.00E+00	CNS	NA	5.00E-03	1.40E-03	CNS
Antimony	0.15	4.00E-04	Heart	6.00E-05	NA	NA	NA
Arsenic	1	3.00E-04	S	3.00E-04	NA	NA	NA
Beryllium	0.007	2.00E-03	GI	1.40E-05	2.00E-02	5.70E-06	RT
Cadmium	0.025	1.00E-03	K	2.50E-05	1.00E-05	2.90E-06	K
Chromium III	0.013	1.50E+00	ND	2.00E-02	NA	NA	NA
Chromium VI	0.025	3.00E-03	ND	7.50E-05	1.00E-04	2.90E-05	Lung
Chromium, Total	0.013	2.10E-02	ND	2.70E-04	7.00E-04	2.03E-04	Lung
Cobalt	1	3.00E-04	Thyroid	3.00E-04	6.00E-06	1.70E-06	RT
Iron	1	7.00E-01	GI	NA	ND	NA	NA
Manganese	0.04	4.70E-02	CNS	1.90E-03	5.00E-05	1.40E-05	CNS
Thallium	1	6.50E-05	S,L	6.50E-05	ND	NA	NA
Semivolatile Organic Compounds							
Benzo(a)anthracene	1	ND	NA	NA	ND	NA	NA
Benzo(a)pyrene	1	ND	NA	NA	ND	NA	NA
Benzo(b)fluoranthene	1	ND	NA	NA	ND	NA	NA
Indeno(1,2,3-cd)pyrene	1	ND	NA	NA	ND	NA	NA
Methylnaphthalene, 2-	1	4.00E-03	RT	4.00E-03	ND	NA	NA
Naphthalene	1	2.00E-02	RB/OW	2.00E-02	3.00E-03	8.60E-04	RT
Volatile Organic Compounds							
Benzene	1	4.00E-03	IS	4.00E-03	3.00E-03	8.60E-03	BC
Chloroform	1	1.00E-02	L	1.00E-02	5.00E-02	1.40E-02	L,K
Chloromethane (Methyl Chloride)	1	ND	NA	NA	9.00E-02	2.60E-02	CNS
Ethylbenzene	1	1.00E-01	L,K	1.00E-01	1.00E+00	2.90E-01	F
Methylene chloride	1	6.00E-02	L	6.00E-02	1.00E+00	3.00E-01	NA
Tetrachloroethane, 1,1,2,2-	1	5.00E-02	L	5.00E-02	ND	NA	NA
Toluene	1	8.00E-02	K	8.00E-02	5.00E+00	1.40E+00	NA
Xylenes	1	2.00E-01	RB/OW, Su	2.00E-01	1.00E-01	2.90E-02	CNS
General Chemistry							
Cyanide, total	1	2.00E-02	BW/Thyroid/NS	2.00E-02	3.00E-03	8.60E-04	CNS,Thyroid
Sulfate	NA	NA	NA	NA	NA	NA	NA

Table 4-1

Summary of Toxicity Assessment [a]
Ash Pit 1
Plum Brook Ordnance Works
Sandusky, Ohio

mg/kg-day = milligram per kilogram - day
mg/m^3 - milligram per cubic meter
GAF - gastrointestinal absorption factor
NA - not available or not applicable
ND - no data
NC - Noncancer value is regarded as protective of cancer effects in the Integrated Risk Information System (IRIS) evaluation (EPA, 2010).
[a] See Appendix C which provides references for these values.

Target Organs: BC - blood cells; S - skin; GI - gastrointestinal; CNS - central nervous system; L - liver; F - fetus; NE - nasal epithelium; NS - nervous system; IS - immune system; RB/OW - reduced body/organ weight; SU - reduced survival; RT - respiratory tract.

Table 5-1

Summary of Risk for All Receptors
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

	Groundskeeper [a]		Construction Worker		Indoor Worker		Resident			Hunter		Hunter's Child	
	Total ILCR	Total HI	Total ILCR	Total HI	Total ILCR	Total HI	Total ILCR	Total Adult - HI	Total Child - HI	Total ILCR	Total HI	Total ILCR	Total HI
Bedrock Groundwater Use													
Exposure Media													
Surface Soil	5.25E-06	0.21	NE	NE	1.23E-06	0.008	NE	NE	NE	3.07E-07	0.0009	NA	NA
Total Soil	2.08E-06	2.1	1.15E-07	7.5	NE	NE	4.83E-06	0.11	0.6	NE	NE	NE	NE
Groundwater	8.48E-04	9	NE	NE	8.48E-04	9	6.48E-03	58	134	NE	NE	NE	NE
Sediment	NE	NE	6.30E-07	0.2	NE	NE	3.94E-06	0.007	0.07	NE	NE	NE	NE
Surface Water	NE	NE	1.15E-08	0.01	NE	NE	2.68E-07	0.003	0.006	NE	NE	NE	NE
Total ILCR or HI	**9.E-04**	**11**	**8.E-07**	**7.7**	**8.E-04**	**9**	**6.E-03**	**58**	**135**	**3.E-07**	**0.0009**	**NA**	**NA**
Overburden Groundwater Use													
Exposure Media													
Surface Soil	5.25E-06	0.21	NE	NE	1.23E-06	0.008	NE	NE	NE	3.07E-07	0.0009	NA	NA
Total Soil	2.08E-06	2.1	1.15E-07	7.5	NE	NE	4.83E-06	0.11	0.6	NE	NE	NE	NE
Groundwater	NA	12.7	NE	NE	NA	12.7	NA	35	82	NE	NE	NE	NE
Sediment	NE	NE	6.30E-07	0.2	NE	NE	3.94E-06	0.01	0.1	NE	NE	NE	NE
Surface Water	NE	NE	1.15E-08	0.0	NE	NE	2.68E-07	0.00	0.0	NE	NE	NE	NE
Total ILCR or HI	**2.E-06**	**15**	**8.E-07**	**7.7**	**1.E-06**	**12.7**	**9.E-06**	**35**	**82**	**3.E-07**	**0.0009**	**NA**	**NA**

HI - Hazard index.
ILCR - Incremental lifetime cancer risk.
NA - No chemicals of potential concern available for exposure evaluation.
NE - Pathway not evaluated for this receptor.

Note:
[a]Total ILCR and total HI values for the groundskeeper reflect the respective totals for the future groundskeeper assumed to use either bedrock or overburden groundwater. The total ILCR and HI values for the current groundskeeper are simply those shown for soil. The rounded current groundskeeper ILCR is 5E-6 and the rounded HI is 0.2.

Table 5-2

Summary of Risk for Receptors Excluding Exposure to Groundwater
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

	Future Groundskeeper		Indoor Worker		Resident		
	Total ILCR	Total HI	Total ILCR	Total HI	Total ILCR	Total Adult - HI	Total Child - HI
Exposure Media							
Surface Soil	5.25E-06	0.21	1.23E-06	0.008	NE	NE	NE
Total Soil	2.08E-06	2.14	NE	NE	4.83E-06	0.11	0.65
Sediment	NE	NE	NE	NE	3.94E-06	0.007	0.07
Surface Water	NE	NE	NE	NE	2.68E-07	0.003	0.006
Total ILCR or HI	**2.E-06**	**2**	**1.E-06**	**0.008**	**9.E-06**	**0.1**	**0.7**

HI - Hazard index.
ILCR - Incremental lifetime cancer risk.
NA - No chemicals of potential concern available for exposure evaluation.
NE - Pathway not evaluated for this receptor.

Notes:
1. The above receptors are those which were evaluated for groundwater exposure as shown in Table 5-1.
2. Groundwater use is not regarded as plausible because of low yield in the overburden and bedrock units and naturally poor quality in the bedrock unit.

FIGURES

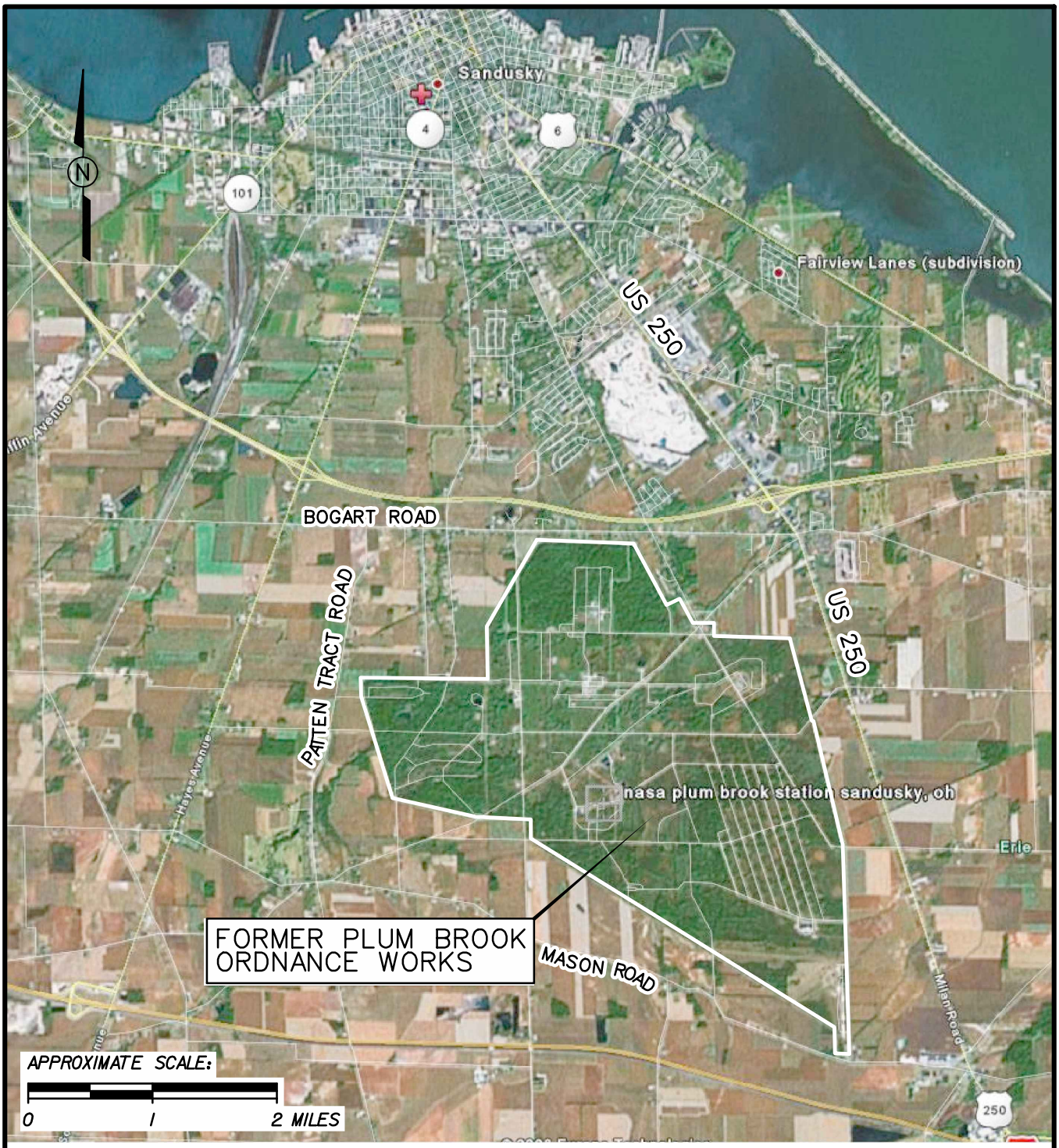
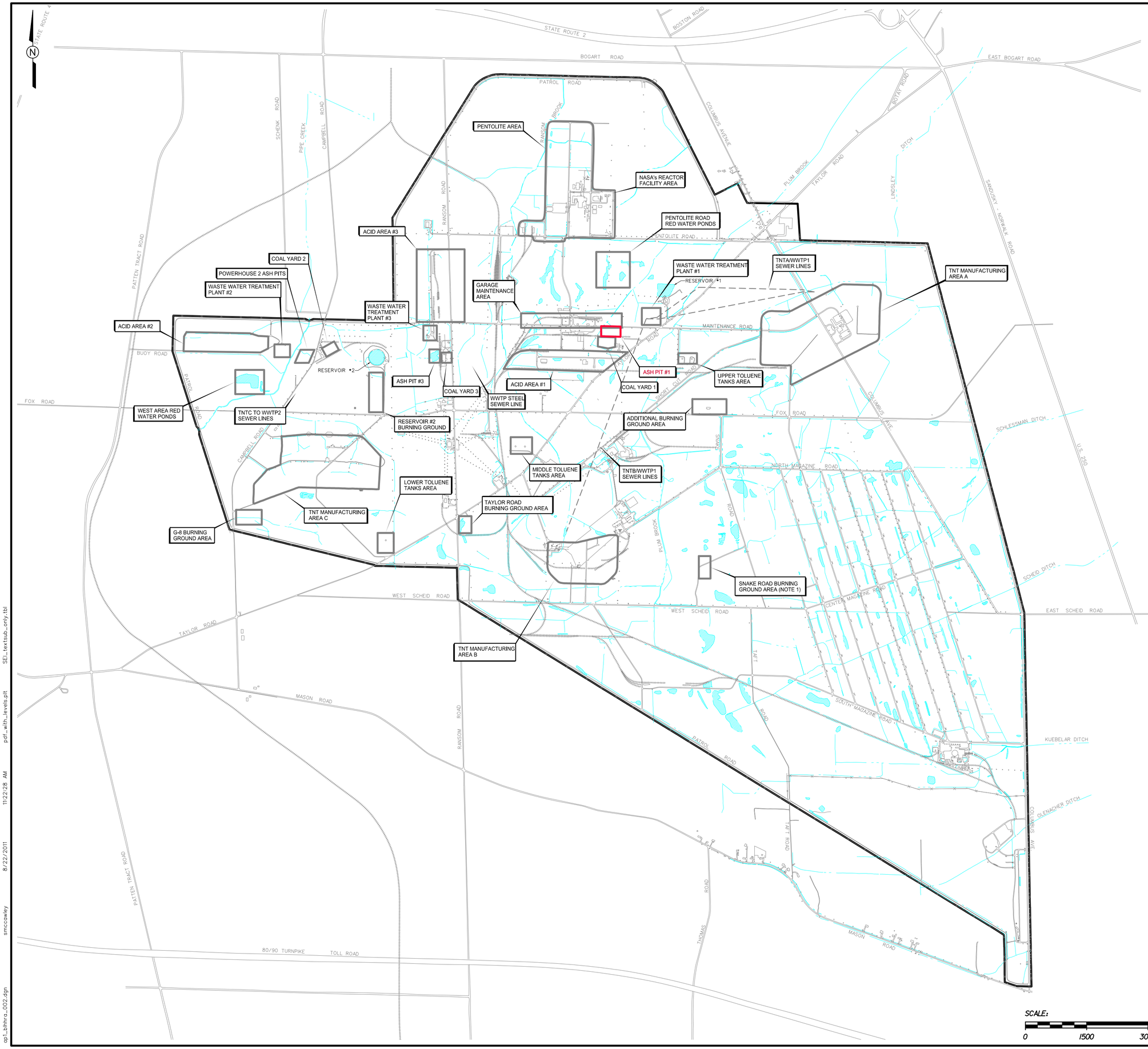


FIGURE 1-1
PBOW VICINITY MAP

ASH PIT 1 BASELINE HUMAN HEALTH RISK ASSESSMENT
FORMER PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

Shaw® a world of Solutions™

ap1_blhhra_001.dgn smccawley 8/22/2011 10:56:34 AM pdf_with_levels.plt SEI_textsub_only.tbl



LEGEND:

- AREA OF CONCERN
- POND
- CREEK, DITCH, CONVEYANCE
- RAILROAD
- ROAD
- FENCE
- FACILITY BOUNDARY

NOTES:

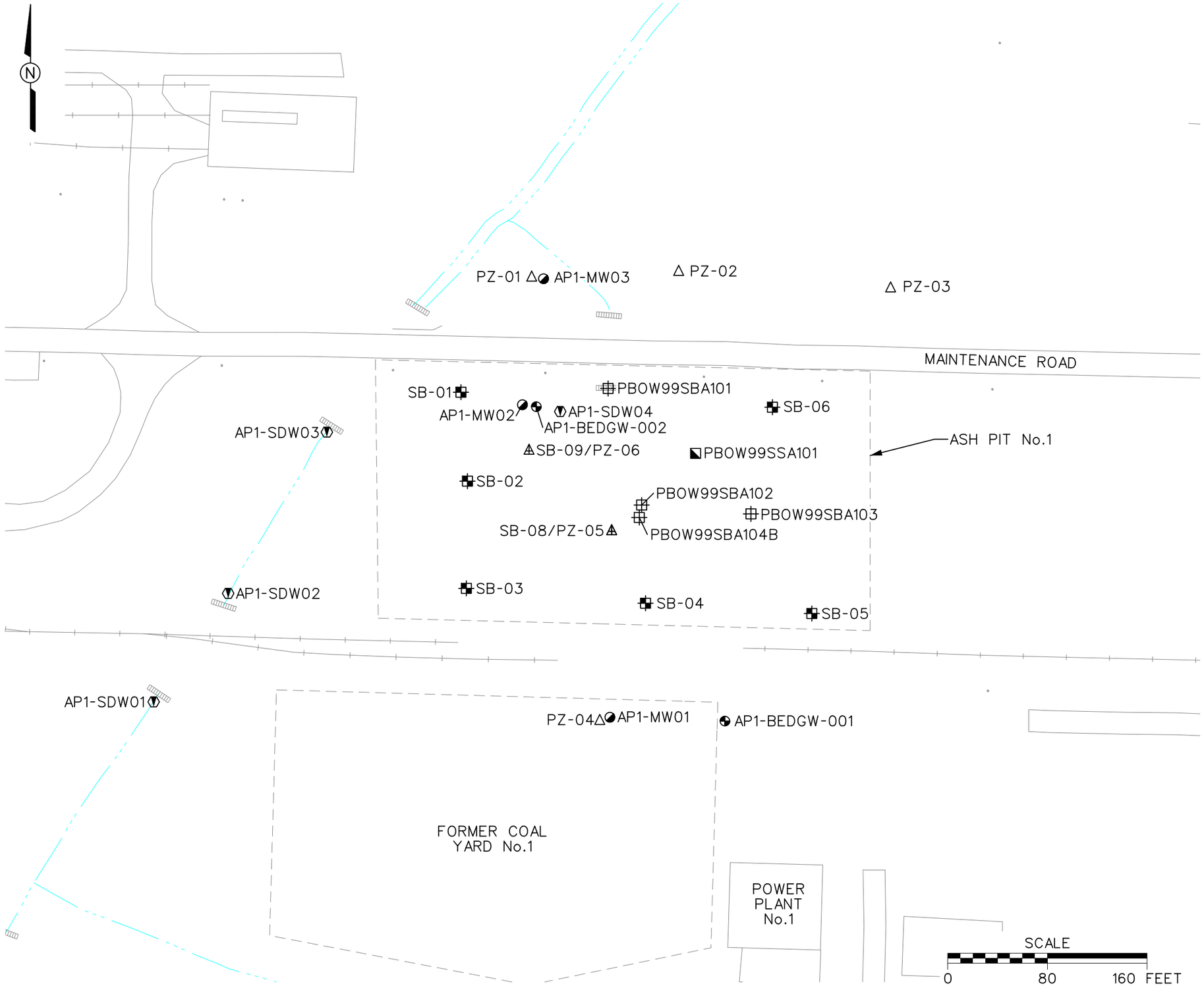
1. SNAKE ROAD BURNING GROUND AREA WAS ALSO REFERRED TO AS "SNAKE ROAD BURN PIT", "SCHEID ROAD BURNING GROUNDS", AND "DISPOSAL AREA THREE".
2. REACTOR FACILITY CONSTRUCTED BY NASA POST WWII AND IS IDENTIFIED FOR LOCATION PURPOSES ONLY.

FIGURE 1-2
LOCATION OF ASH PIT 1
AT PBOW

ASH PIT 1 BASELINE HUMAN HEALTH RISK ASSESSMENT
FORMER PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

Shaw® a world of Solutions™

op1_blhhra_002.dgn smccawley 8/22/2011 11:22:28 AM pdf_with_levels.pit SEL_textsub_only.tbl



LEGEND:

- OVERBURDEN MONITORING WELL (SCREENED IN SHALE)
- BEDROCK MONITORING WELL (SCREENED IN LIMESTONE)
- SOIL BORING
- SOIL BORING/PIEZOMETER
- PIEZOMETER
- SURFACE WATER/SEDIMENT SAMPLE
- SI SOIL BORING (USACE, 2000)
- SI SURFACE SOIL SAMPLE (USACE, 2000)
- UTILITY POLE
- CREEK, DITCH, CONVEYANCE

NOTES:

1. SITE INVESTIGATION (SI) SAMPLES COLLECTED IN 1999 (USACE, 2000, LIMITED SITE INVESTIGATION, FINAL REPORT, FOR THE FORMER PLUM BROOK ORDNANCE WORKS ASH PITS NO. 1 AND 3, SANDUSKY, OHIO, JULY).
2. SAMPLES OTHER THAN THE SI SAMPLES WERE COLLECTED IN 2008 AND 2009 AS PART OF THE REMEDIAL INVESTIGATION.
3. NO BORING LABELED SB-07 WAS DRILLED.

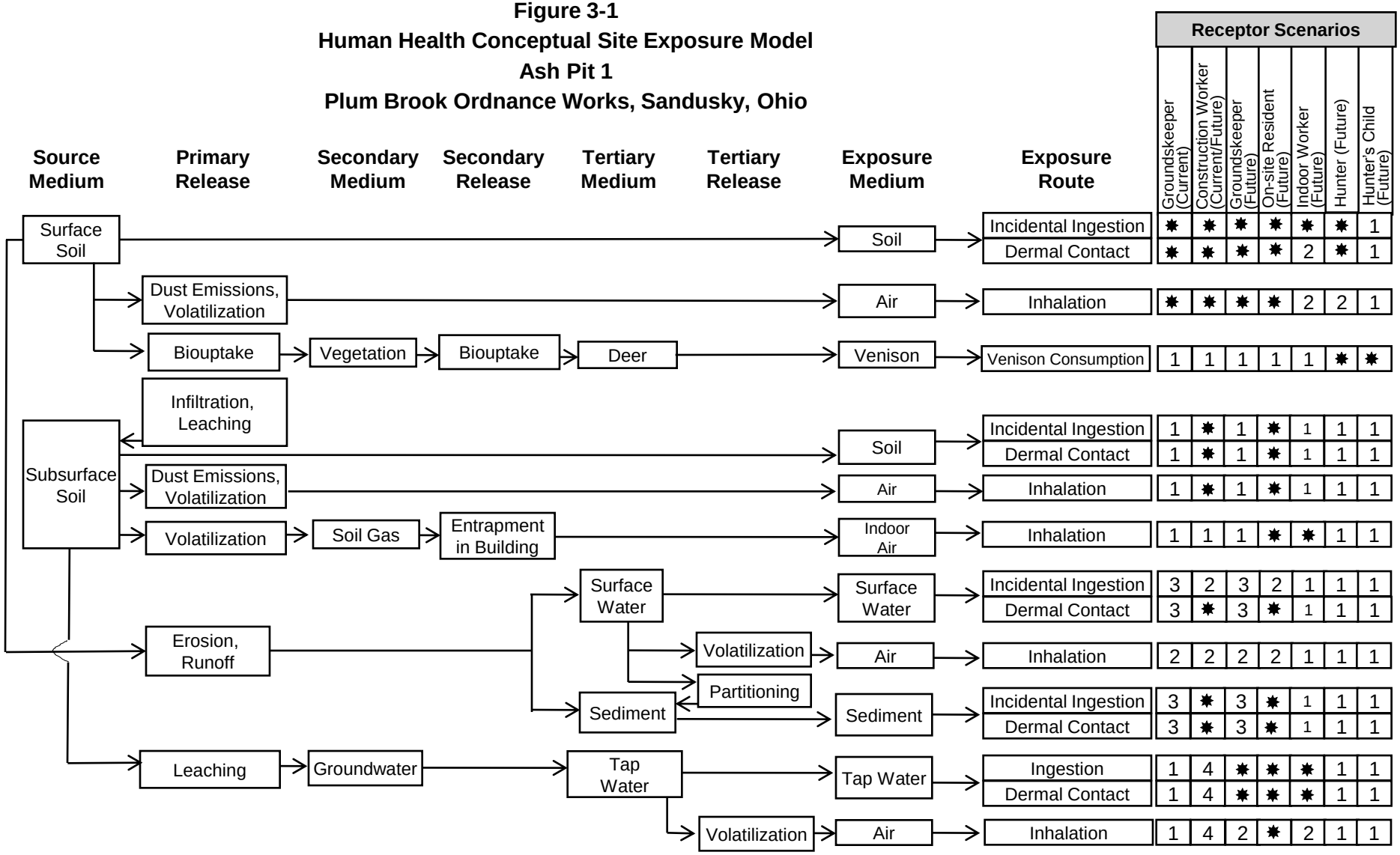
FIGURE 2-1
ASH PIT 1 SITE MAP WITH SAMPLE LOCATIONS

ASH PIT 1 BASELINE HUMAN HEALTH RISK ASSESSMENT
FORMER PLUM BROOK ORDNANCE WORKS
NASA PLUM BROOK STATION
SANDUSKY, OHIO

Shaw® a world of Solutions™

ap1_blhhra_003.dgn smccawley 8/22/2011 11:01:49 AM pdf_with_levels.plt SEL_textsub_only.tbl

Figure 3-1
Human Health Conceptual Site Exposure Model
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio



✸ = Complete exposure route quantified in the risk assessment.
1 = There is no plausible pathway for exposure to this medium.
2 = Although theoretically complete, this pathway is not quantified as explained in text.
3 = Contact with this medium, although plausible, is not part of this receptor's normal or expected activities; therefore contact would be sporadic and is not quantified.
4 = For current use there is no plausible exposure pathway. For future use, the pathway is potentially complete, but is not quantified as explained in the text.

APPENDIX A

DATA SUMMARY OF CHEMICALS DETECTED IN OVERBURDEN GROUNDWATER PIEZOMETERS

Table A-1

Summary and Screening of Chemicals Detected in Groundwater Overburden Piezometer
Ash Pit 1
Plum Brook Ordnance Works, Sandusky, Ohio

Chemical	Detection Frequency	Percent hits	Range of values, µg/L: Detected Concentrations Minimum	VQ	Maximum	VQ	Reporting Limits Minimum	Maximum	Arithmetic Mean µg/L	RBSC [a] µg/L		Exceeds RBSCs? [b,c]
Inorganics - Unfiltered												
Aluminum	3 / 3	100	2.08E+03		9.74E+03		8.89E+01	8.89E+01	5.20E+03	3.70E+03		Y
Barium	2 / 2	100	7.29E+01		9.01E+01		4.44E+00	4.44E+00	8.15E+01	7.30E+02		N
Calcium	3 / 3	100	1.18E+05		1.59E+05		1.11E+02	1.11E+02	1.34E+05	Nutrient		N
Chromium	1 / 3	33	1.12E+01		1.12E+01		1.11E+01	1.11E+01	7.43E+00	4.30E-02		Y
Cobalt	1 / 3	33	2.91E+00	J	2.91E+00	J	4.44E+00	4.44E+00	2.45E+00	1.10E+00		Y
Copper	2 / 3	67	8.60E+00	J	8.93E+00	J	1.11E+01	1.11E+01	7.69E+00	1.50E+02		N
Iron	3 / 3	100	2.58E+03		7.03E+03		8.89E+01	8.89E+01	4.34E+03	2.60E+03		Y
Lead	1 / 3	33	3.20E+00	J	3.20E+00	J	2.78E+00	5.56E+00	2.46E+00	1.50E+01	d	N
Magnesium	3 / 3	100	3.30E+04		5.27E+04		4.44E+01	4.44E+01	4.00E+04	Nutrient		N
Manganese	3 / 3	100	7.14E+01		3.37E+03		4.44E+00	4.44E+00	1.25E+03	8.80E+01		Y
Nickel	2 / 3	67	4.07E+00	J	4.51E+00	J	6.67E+00	6.67E+00	3.97E+00	7.30E+01		N
Potassium	3 / 3	100	1.68E+03		9.13E+03		5.56E+02	5.56E+02	5.03E+03	Nutrient		N
Sodium	2 / 2	100	9.74E+03		1.15E+04		4.44E+02	4.44E+02	1.06E+04	Nutrient		N
Vanadium	3 / 3	100	4.24E+00	J	1.94E+01		4.44E+00	4.44E+00	1.06E+01	1.80E+01		Y
Inorganics - Filtered												
Barium	2 / 2	100	3.05E+01		3.71E+01		4.44E+00	4.44E+00	3.38E+01	7.30E+02		N
Calcium	3 / 3	100	1.01E+05		1.75E+05		1.11E+02	1.11E+02	1.36E+05	Nutrient		N
Lead	1 / 3	33	1.04E+01		1.04E+01		2.78E+00	5.56E+00	4.86E+00	1.50E+01	d	N
Magnesium	3 / 3	100	2.71E+04		5.66E+04		4.44E+01	4.44E+01	3.90E+04	Nutrient		N
Manganese	3 / 3	100	1.07E+01		3.54E+03		4.44E+00	4.44E+00	1.20E+03	8.80E+01		Y
Potassium	3 / 3	100	6.57E+02		9.27E+03		5.56E+02	5.56E+02	3.61E+03	Nutrient		N
Sodium	2 / 2	100	1.11E+04		1.20E+04		2.22E+02	2.22E+02	1.16E+04	Nutrient		N
Thallium	1 / 3	33	5.08E+00	J	5.08E+00	J	2.78E+00	5.56E+00	3.08E+00	2.40E-01		Y
Explosives												
Amino-2,6-dinitrotoluene, 4-	1 / 4	25	3.42E-01	J	3.42E-01	J	3.73E-01	6.45E-01	2.81E-01	7.30E+00		N
General Chemistry												
Chloride	2 / 2	100	3.56E+03		1.21E+04		2.50E+02	2.50E+02	7.83E+03	Nutrient		N
Nitrate-Nitrite	3 / 3	100	3.50E+01	J	3.53E+02		4.00E+01	4.00E+01	1.62E+02	3.70E+02	e	N
Sulfate	2 / 2	100	3.94E+04		6.17E+04		5.00E+02	5.00E+02	5.06E+04	2.50E+05	f	N

RBSC - Risk based screening concentration.
µg/L - micrograms per liter.
VQ - Validation qualifier.
J - The compound/analyte was positively identified; the reported result is the estimated co

[a] Risk-Based Screening Concentrations based on USEPA Regional Screening Level Table (May 2010) tap water values and are based on a risk level of 1.0E-06 and a hazard index of 0.1.
[b] N = Chemical concentration does not exceed the RBSC or is an essential nutrient.
[c] Y = Chemical concentration exceeds the RBSC, or no RBSC is available.
[d] Screening criteria for lead based on the action level of 15 µg/L (US Environmental Protection Agency [EPA],2006, 2006 Edition of the Drinking Water Standards and He Advisories, Office of Water, August,EPA 822-R-06-013, Washington, DC, October).
[e] Screening criterion for nitrite.
[f] Secondary Driking Water Regulations (EPA, 2006).

APPENDIX B

ProUCL OUTPUT FOR UPPER CONFIDENCE LIMITS ON THE MEAN

Input for ProUCL
Ash Pit 1 Surface Soil

		Aluminum	D_Aluminum	Beryllium	D_Beryllium	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Indeno(1,2,3-cd)pyrene
ASH PIT 1-SB01	AP0001	6190	1	5.74	1	0.205	0.205	0.205	0.205
ASH PIT 1-SB02	AP0004	9360	1	10.8	1	0.245	0.245	0.245	0.245
ASH PIT 1-SB03	AP0007	9940	1	13.9	1	0.2425	0.2425	0.2425	0.2425
ASH PIT 1-SB04	AP0010	12700	1	16.5	1	0.229	0.229	0.229	0.229
ASH PIT 1-SB05	AP0014	10700	1	13.6	1	1.185	1.185	1.185	1.185
ASH PIT 1-SB06	AP0017	10500	1	11.5	1	0.224	0.224	0.224	0.224
ASH PIT 1-SB08	AP0023AP0063	7555	1	11.1	1	0.8555	0.721	1.205	1.815
ASH PIT 1-SB09	AP0026	7650	1	8.94	1	0.268	0.268	0.268	0.268
PBOW99-SBA101A	PBOW99SBA101A/101A-DUP	7550	1	0.71	0	0.2325	0.2325	0.2325	0.2325
PBOW99-SBA102A	PBOW99SBA102A	12700	1	0.65	0	0.215	0.215	0.215	0.215
PBOW99-SBA103A	PBOW99SBA103A	8310	1	0.84	0	0.275	0.275	0.275	0.275
PBOW99-SBA104B	PBOW99SBA104B	8820	1	0.65	0	0.215	0.215	0.215	0.215
PBOW99-SSA101	PBOW99SSA101	16600	1	1.5	1	0.405	0.405	0.405	0.405

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	C:\Documents and Settings\debbi.freer\My Documents\PBOW\AP 1 & 3\UCL files\HH UCL input.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum - Surface Soil (AP 1)

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	6190	Minimum of Log Data	8.731
Maximum	16600	Maximum of Log Data	9.717
Mean	9890	Mean of log Data	9.165
Median	9360	SD of log Data	0.269
SD	2820		
Coefficient of Variation	0.285		
Skewness	1.118		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11284	95% H-UCL	11463
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13111
95% Adjusted-CLT UCL	11436	97.5% Chebyshev (MVUE) UCL	14510
95% Modified-t UCL	11325	99% Chebyshev (MVUE) UCL	17257

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.36	**Data appear Normal at 5% Significance Level**	
Theta Star	870.7		
MLE of Mean	9890		
MLE of Standard Deviation	2935		
nu star	295.3		
Approximate Chi Square Value (.05)	256.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	11177
Adjusted Chi Square Value	251.4	95% Jackknife UCL	11284
		95% Standard Bootstrap UCL	11152
Anderson-Darling Test Statistic	0.276	95% Bootstrap-t UCL	11676
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	11945
Kolmogorov-Smirnov Test Statistic	0.117	95% Percentile Bootstrap UCL	11180
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	11423
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13299
		97.5% Chebyshev(Mean, Sd) UCL	14774
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17671
95% Approximate Gamma UCL	11387		
95% Adjusted Gamma UCL	11620		

Potential UCL to Use		Use 95% Student's-t UCL	11284

Beryllium - Surface Soil (AP 1)

General Statistics

Number of Valid Data	13	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	4
		Percent Non-Detects	30.77%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.5	Minimum Detected	0.405
Maximum Detected	16.5	Maximum Detected	2.803
Mean of Detected	10.4	Mean of Detected	2.18
SD of Detected	4.536	SD of Detected	0.731
Minimum Non-Detect	0.65	Minimum Non-Detect	-0.431
Maximum Non-Detect	0.84	Maximum Non-Detect	-0.174

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	9
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	30.77%

Warning: There are only 9 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.748
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.308	Mean	1.19
SD	6.082	SD	1.658
95% DL/2 (t) UCL	10.31	95% H-Stat (DL/2) UCL	20.12
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	6.032	Mean in Log Scale	1.737
SD	7.747	SD in Log Scale	0.918
95% MLE (t) UCL	9.862	Mean in Original Scale	7.851
95% MLE (Tiku) UCL	10.2	SD in Original Scale	5.437
		95% Percentile Bootstrap UCL	10.21
		95% BCA Bootstrap UCL	10.1

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	2.238	**Data appear Normal at 5% Significance Level**
Theta Star	4.645	
nu star	40.29	
A-D Test Statistic	0.736	**Nonparametric Statistics**
5% A-D Critical Value	0.726	Kaplan-Meier (KM) Method
K-S Test Statistic	0.726	Mean 7.66
5% K-S Critical Value	0.281	SD 5.434
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean 1.599
		95% KM (t) UCL 10.51
Assuming Gamma Distribution		95% KM (z) UCL 10.29
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 10.54
Minimum	1.5	95% KM (bootstrap t) UCL 10.14
Maximum	16.5	95% KM (BCA) UCL 12.31
Mean	9.214	95% KM (Percentile Bootstrap) UCL 11.4
Median	8.94	95% KM (Chebyshev) UCL 14.63

SD	4.178	97.5% KM (Chebyshev) UCL	17.64
k star	2.982	99% KM (Chebyshev) UCL	23.57
Theta star	3.09		
Nu star	77.53	**Potential UCLs to Use**	
AppChi2	58.25	95% KM (t) UCL	10.51
95% Gamma Approximate UCL	12.26	95% KM (Percentile Bootstrap) UCL	11.4
95% Adjusted Gamma UCL	12.79		

Note: DL/2 is not a recommended method.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	C:\Documents and Settings\debbi.freer\My Documents\PBOW\AP 1 & 3\UCL files\HH UCL input.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Benzo(a)anthracene - Surface Soil (AP 1)

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.205	Minimum of Log Data	-1.585
Maximum	1.185	Maximum of Log Data	0.17
Mean	0.369	Mean of log Data	-1.185
Median	0.243	SD of log Data	0.56
SD	0.301		
Coefficient of Variation	0.816		
Skewness	2.283		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.585	Shapiro Wilk Test Statistic	0.686
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.518	95% H-UCL	0.509
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.599
95% Adjusted-CLT UCL	0.563	97.5% Chebyshev (MVUE) UCL	0.706
95% Modified-t UCL	0.527	99% Chebyshev (MVUE) UCL	0.916

Gamma Distribution Test		**Data Distribution**
k star (bias corrected)	2.214	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	0.167	
MLE of Mean	0.369	
MLE of Standard Deviation	0.248	
nu star	57.56	
Approximate Chi Square Value (.05)	41.12	**Nonparametric Statistics**
Adjusted Level of Significance	0.0301	95% CLT UCL 0.506
Adjusted Chi Square Value	39.15	95% Jackknife UCL 0.518
		95% Standard Bootstrap UCL 0.502
Anderson-Darling Test Statistic	2.136	95% Bootstrap-t UCL 1.078
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL 1.172
Kolmogorov-Smirnov Test Statistic	0.374	95% Percentile Bootstrap UCL 0.518
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL 0.573
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.733
		97.5% Chebyshev(Mean, Sd) UCL 0.89

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.2
95% Approximate Gamma UCL	0.516		
95% Adjusted Gamma UCL	0.543		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.733

Benzo(a)pyrene - Surface Soil (AP 1)

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.205	Minimum of Log Data	-1.585
Maximum	1.185	Maximum of Log Data	0.17
Mean	0.359	Mean of log Data	-1.198
Median	0.243	SD of log Data	0.536
SD	0.285		
Coefficient of Variation	0.794		
Skewness	2.521		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.582	Shapiro Wilk Test Statistic	0.698
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.499	95% H-UCL	0.486
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.573
95% Adjusted-CLT UCL	0.548	97.5% Chebyshev (MVUE) UCL	0.672
95% Modified-t UCL	0.509	99% Chebyshev (MVUE) UCL	0.867

Gamma Distribution Test		**Data Distribution**
k star (bias corrected)	2.395	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	0.15	
MLE of Mean	0.359	
MLE of Standard Deviation	0.232	
nu star	62.27	
Approximate Chi Square Value (.05)	45.12	**Nonparametric Statistics**
Adjusted Level of Significance	0.0301	95% CLT UCL 0.489
Adjusted Chi Square Value	43.05	95% Jackknife UCL 0.499
		95% Standard Bootstrap UCL 0.483
Anderson-Darling Test Statistic	2.015	95% Bootstrap-t UCL 0.976
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL 1.021
Kolmogorov-Smirnov Test Statistic	0.367	95% Percentile Bootstrap UCL 0.494
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL 0.546
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.703
		97.5% Chebyshev(Mean, Sd) UCL 0.852
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 1.145
95% Approximate Gamma UCL	0.495	
95% Adjusted Gamma UCL	0.519	
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL 0.703

Benzo(b)fluoranthene - Surface Soil (AP 1)

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics

Minimum	0.205
Maximum	1.205
Mean	0.396
Median	0.243
SD	0.358
Coefficient of Variation	0.905
Skewness	2.093

Log-transformed Statistics

Minimum of Log Data	-1.585
Maximum of Log Data	0.186
Mean of log Data	-1.159
SD of log Data	0.618

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.547
Shapiro Wilk Critical Value	0.866

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.573

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	0.621
95% Modified-t UCL	0.583

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.649
Shapiro Wilk Critical Value	0.866

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	0.568
95% Chebyshev (MVUE) UCL	0.663
97.5% Chebyshev (MVUE) UCL	0.788
99% Chebyshev (MVUE) UCL	1.034

Gamma Distribution Test

k star (bias corrected)	1.825
Theta Star	0.217
MLE of Mean	0.396
MLE of Standard Deviation	0.293
nu star	47.45
Approximate Chi Square Value (.05)	32.64
Adjusted Level of Significance	0.0301
Adjusted Chi Square Value	30.9
Anderson-Darling Test Statistic	2.418
Anderson-Darling 5% Critical Value	0.742
Kolmogorov-Smirnov Test Statistic	0.385
Kolmogorov-Smirnov 5% Critical Value	0.239

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.575
95% Adjusted Gamma UCL	0.608

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	0.559
95% Jackknife UCL	0.573
95% Standard Bootstrap UCL	0.553
95% Bootstrap-t UCL	1.424
95% Hall's Bootstrap UCL	1.638
95% Percentile Bootstrap UCL	0.549
95% BCA Bootstrap UCL	0.619
95% Chebyshev(Mean, Sd) UCL	0.829
97.5% Chebyshev(Mean, Sd) UCL	1.016
99% Chebyshev(Mean, Sd) UCL	1.385

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL 0.829

Indeno(1,2,3-cd)pyrene - Surface Soil (AP 1)

General Statistics

Number of Valid Observations	13
Number of Distinct Observations	12

Raw Statistics

Minimum	0.205
Maximum	1.815
Mean	0.443
Median	0.243
SD	0.489
Coefficient of Variation	1.105
Skewness	2.44

Log-transformed Statistics

Minimum of Log Data	-1.585
Maximum of Log Data	0.596
Mean of log Data	-1.127
SD of log Data	0.697

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.54
Shapiro Wilk Critical Value	0.866

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.685

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	0.764
95% Modified-t UCL	0.7

Gamma Distribution Test

k star (bias corrected)	1.395
Theta Star	0.317
MLE of Mean	0.443
MLE of Standard Deviation	0.375
nu star	36.27
Approximate Chi Square Value (.05)	23.49
Adjusted Level of Significance	0.0301
Adjusted Chi Square Value	22.03
Anderson-Darling Test Statistic	2.459
Anderson-Darling 5% Critical Value	0.747
Kolmogorov-Smirnov Test Statistic	0.395
Kolmogorov-Smirnov 5% Critical Value	0.24

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.684
95% Adjusted Gamma UCL	0.729

Potential UCL to Use

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.647
Shapiro Wilk Critical Value	0.866

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	0.665
95% Chebyshev (MVUE) UCL	0.76
97.5% Chebyshev (MVUE) UCL	0.915
99% Chebyshev (MVUE) UCL	1.217

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	0.666
95% Jackknife UCL	0.685
95% Standard Bootstrap UCL	0.662
95% Bootstrap-t UCL	2.311
95% Hall's Bootstrap UCL	2.297
95% Percentile Bootstrap UCL	0.675
95% BCA Bootstrap UCL	0.762
95% Chebyshev(Mean, Sd) UCL	1.034
97.5% Chebyshev(Mean, Sd) UCL	1.29
99% Chebyshev(Mean, Sd) UCL	1.793

Use 95% Chebyshev (Mean, Sd) UCL 1.034

Input for ProUCL
Ash Pit 1 Total Soil

			Aluminum	D_Aluminur	Beryllium	D_Beryllium	Cadmium	D_Cadmiun	Manganese	D_Manganese	Benzo(a)anthracene	D_Benzo(a)	Benzo(a)py	D_Benzo(a)	Benzo(b)fluoranthene	D_Benzo(b)fluoranthe	Indeno(1,2,	D_Indeno(1	Indeno(1,2,3-cd)pyrene
ASH PIT 1-SB01	AP0002	SBS	9230	1	4.87	1	0.514	0	251	1	0.199	0	0.199	0	0.199	0	0.199	0	0.0995
ASH PIT 1-SB01	AP0003	SBS	8980	1	5.82	1	0.415	0	524	1	0.206	0	0.206	0	0.206	0	0.206	0	0.103
ASH PIT 1-SB02	AP0005	SBS	8380	1	5.99	1	0.345	1	543	1	0.2095	0	0.2095	0	0.2095	0	0.2095	0	0.10475
ASH PIT 1-SB02	AP0006	SBS	7780	1	5.23	1	0.463	0	472	1	0.2035	0	0.2035	0	0.2035	0	0.2035	0	0.10175
ASH PIT 1-SB03	AP0008	SBS	2770	1	3.62	1	0.449	0	266	1	0.193	0	0.193	0	0.193	0	0.193	0	0.0965
ASH PIT 1-SB03	AP0009	SBS	8470	1	5.49	1	0.277	1	470	1	0.2005	0	0.2005	0	0.2005	0	0.2005	0	0.10025
ASH PIT 1-SB04	AP0011AP0012	SBS	7125	1	7.305	1	0.2815	1	1055.5	1	0.20125	0	0.20125	0	0.20125	0	0.20125	0	0.100625
ASH PIT 1-SB04	AP0013	SBS	10200	1	8.48	1	0.276	1	4470	1	0.206	0	0.206	0	0.206	0	0.206	0	0.103
ASH PIT 1-SB05	AP0015	SBS	6260	1	12.9	1	0.269	1	954	1	0.2005	0	0.2005	0	0.2005	0	0.2005	0	0.10025
ASH PIT 1-SB05	AP0016	SBS	8810	1	7	1	0.492	0	484	1	0.2075	0	0.2075	0	0.2075	0	0.2075	0	0.10375
ASH PIT 1-SB06	AP0018	SBS	13000	1	6.55	1	0.455	0	701	1	0.202	0	0.202	0	0.202	0	0.202	0	0.101
ASH PIT 1-SB06	AP0019	SBS	8870	1	6.71	1	7.66	1	373	1	0.192	0	0.192	0	0.192	0	0.192	0	0.096
ASH PIT 1-SB08	AP0024	SBS	6700	1	11.5	1	0.531	0	469	1	0.0642	1	0.0534	1	0.0829	1	0.312	1	0.312
ASH PIT 1-SB08	AP0025	SBS	11700	1	7.18	1	0.51	0	347	1	0.206	0	0.206	0	0.206	0	0.206	0	0.103
ASH PIT 1-SB09	AP0027	SBS	7640	1	5.85	1	0.467	0	506	1	0.2015	0	0.2015	0	0.2015	0	0.2015	0	0.10075
ASH PIT 1-SB09	AP0058AP0028	SBS	8390	1	6.905	1	0.4615	0	453	1	0.18625	0	0.18625	0	0.18625	0	0.18625	0	0.093125
PBOW99-SBA103B	PBOW99SBA103B	SBS	12600	1	0.315	0	0.25	0	409	1	0.21	0	0.21	0	0.21	0	0.21	0	0.105
ASH PIT 1-SB01	AP0001	SS	6190	1	5.74	1	0.23	1	263	1	0.205	0	0.205	0	0.205	0	0.205	0	0.1025
ASH PIT 1-SB02	AP0004	SS	9360	1	10.8	1	0.2975	1	306	1	0.245	0	0.245	0	0.245	0	0.245	0	0.1225
ASH PIT 1-SB03	AP0007	SS	9940	1	13.9	1	0.263	1	252	1	0.2425	0	0.2425	0	0.2425	0	0.2425	0	0.12125
ASH PIT 1-SB04	AP0010	SS	12700	1	16.5	1	0.2655	1	241	1	0.229	0	0.229	0	0.229	0	0.229	0	0.1145
ASH PIT 1-SB05	AP0014	SS	10700	1	13.6	1	0.2755	1	305	1	1.185	0	1.185	0	1.185	0	1.185	0	0.5925
ASH PIT 1-SB06	AP0017	SS	10500	1	11.5	1	0.2885	1	199	1	0.224	0	0.224	0	0.224	0	0.224	0	0.112
ASH PIT 1-SB08	AP0023AP0063	SS	7555	1	11.1	1	0.26025	0	342	1	0.8555	1	0.721	1	1.205	1	1.815	1	1.815
ASH PIT 1-SB09	AP0026	SS	7650	1	8.94	1	0.305	1	2810	1	0.268	0	0.268	0	0.268	0	0.268	0	0.134
PBOW99-SBA101A	PBOW99SBA101A/101A-DUP	SS	7550	1	0.71	0	0.14	1	825	1	0.2325	0	0.2325	0	0.2325	0	0.2325	0	0.11625
PBOW99-SBA102A	PBOW99SBA102A	SS	12700	1	0.65	0	0.26	1	199	1	0.215	0	0.215	0	0.215	0	0.215	0	0.1075
PBOW99-SBA103A	PBOW99SBA103A	SS	8310	1	0.84	0	0.165	1	125	1	0.275	0	0.275	0	0.275	0	0.275	0	0.1375
PBOW99-SBA104B	PBOW99SBA104B	SS	8820	1	0.65	0	0.13	1	181	1	0.215	0	0.215	0	0.215	0	0.215	0	0.1075
PBOW99-SSA101	PBOW99SSA101	SS	16600	1	1.5	1	0.245	1	1370	1	0.405	0	0.405	0	0.405	0	0.405	0	0.2025

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	AP 1 ts UCL input.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum - Total Soil (AP 1)

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	29

Raw Statistics

Minimum	2770
Maximum	16600
Mean	9183
Median	8815
SD	2639
Coefficient of Variation	0.287
Skewness	0.509

Log-transformed Statistics

Minimum of Log Data	7.927
Maximum of Log Data	9.717
Mean of log Data	9.081
SD of log Data	0.319

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.927

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.927

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	10001

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	10023
95% Modified-t UCL (Johnson-1978)	10009

Assuming Lognormal Distribution

95% H-UCL	10297
95% Chebyshev (MVUE) UCL	11615
97.5% Chebyshev (MVUE) UCL	12647
99% Chebyshev (MVUE) UCL	14676

Gamma Distribution Test

k star (bias corrected)	10.35
Theta Star	887.6
MLE of Mean	9183
MLE of Standard Deviation	2855
nu star	620.8
Approximate Chi Square Value (.05)	564
Adjusted Level of Significance	0.041
Adjusted Chi Square Value	560.8
Anderson-Darling Test Statistic	0.584
Anderson-Darling 5% Critical Value	0.745
Kolmogorov-Smirnov Test Statistic	0.127
Kolmogorov-Smirnov 5% Critical Value	0.16

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	10107
95% Adjusted Gamma UCL	10164

Data Distribution

Data appear Normal at 5% Significance Level

Nonparametric Statistics

95% CLT UCL	9975
95% Jackknife UCL	10001
95% Standard Bootstrap UCL	9965
95% Bootstrap-t UCL	10034
95% Hall's Bootstrap UCL	10099
95% Percentile Bootstrap UCL	10002
95% BCA Bootstrap UCL	10004
95% Chebyshev(Mean, Sd) UCL	11283
97.5% Chebyshev(Mean, Sd) UCL	12192
99% Chebyshev(Mean, Sd) UCL	13977

Potential UCL to Use

Use 95% Student's-t UCL 10001

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium - Total Soil (AP 1)

General Statistics

Number of Valid Data	30	Number of Detected Data	25
Number of Distinct Detected Data	24	Number of Non-Detect Data	5
		Percent Non-Detects	16.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.5	Minimum Detected	0.405
Maximum Detected	16.5	Maximum Detected	2.803
Mean of Detected	8.199	Mean of Detected	1.997
SD of Detected	3.625	SD of Detected	0.507
Minimum Non-Detect	0.315	Minimum Non-Detect	-1.155
Maximum Non-Detect	0.84	Maximum Non-Detect	-0.174

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	25
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	16.67%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.945	Shapiro Wilk Test Statistic	0.916
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.885	Mean	1.464
SD	4.45	SD	1.304
95% DL/2 (t) UCL	8.266	95% H-Stat (DL/2) UCL	20.33
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	6.562	Mean in Log Scale	1.82
SD	4.966	SD in Log Scale	0.613
95% MLE (t) UCL	8.103	Mean in Original Scale	7.258
95% MLE (Tiku) UCL	8.163	SD in Original Scale	3.932
		95% t UCL	8.478
		95% Percentile Bootstrap UCL	8.418
		95% BCA Bootstrap UCL	8.528

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.272	**Data appear Normal at 5% Significance Level**	
Theta Star	1.919		
nu star	213.6		
A-D Test Statistic	0.464	**Nonparametric Statistics**	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.747	Mean	7.083
5% K-S Critical Value	0.175	SD	4.092
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.763
		95% KM (t) UCL	8.378
Assuming Gamma Distribution		95% KM (z) UCL	8.337
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.285
Minimum	1.5	95% KM (bootstrap t) UCL	8.351
Maximum	16.5	95% KM (BCA) UCL	8.864
Mean	7.331	95% KM (Percentile Bootstrap) UCL	8.522
Median	6.63	95% KM (Chebyshev) UCL	10.41
SD	3.851	97.5% KM (Chebyshev) UCL	11.84
k star	3.181	99% KM (Chebyshev) UCL	14.67

Theta star	2.305		
Nu star	190.9	**Potential UCLs to Use**	
AppChi2	159.9	95% KM (t) UCL	8.378
95% Gamma Approximate UCL	8.751	95% KM (Percentile Bootstrap) UCL	8.522
95% Adjusted Gamma UCL	8.841		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Cadmium - Total Soil (AP 1)

General Statistics

Number of Valid Data	30	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	23
		Percent Non-Detects	76.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.26	Minimum Detected	-1.346
Maximum Detected	7.66	Maximum Detected	2.036
Mean of Detected	1.338	Mean of Detected	-0.789
SD of Detected	2.788	SD of Detected	1.249
Minimum Non-Detect	0.13	Minimum Non-Detect	-2.04
Maximum Non-Detect	0.531	Maximum Non-Detect	-0.633

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.67%

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.461	Shapiro Wilk Test Statistic	0.51
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.444	Mean	-1.598
SD	1.365	SD	0.815
95% DL/2 (t) UCL	0.867	95% H-Stat (DL/2) UCL	0.397
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.388
		SD in Log Scale	1.111
		Mean in Original Scale	0.358
		SD in Original Scale	1.382
		95% t UCL	0.787
		95% Percentile Bootstrap UCL	0.863
		95% BCA Bootstrap UCL	1.136
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.424	**Data do not follow a Discernable Distribution (0.05)**	

Theta Star	3.157
nu star	5.935
A-D Test Statistic	1.979
5% A-D Critical Value	0.747
K-S Test Statistic	0.747
5% K-S Critical Value	0.326

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data

Minimum	0.26
Maximum	7.66
Mean	2.737
Median	2.094
SD	1.973
k star	1.245
Theta star	2.199
Nu star	74.67
AppChi2	55.77
95% Gamma Approximate UCL	3.665
95% Adjusted Gamma UCL	3.728

Nonparametric Statistics

Kaplan-Meier (KM) Method

Mean	0.515
SD	1.327
SE of Mean	0.262
95% KM (t) UCL	0.96
95% KM (z) UCL	0.946
95% KM (jackknife) UCL	0.929
95% KM (bootstrap t) UCL	38.86
95% KM (BCA) UCL	1.261
95% KM (Percentile Bootstrap) UCL	1.01
95% KM (Chebyshev) UCL	1.656
97.5% KM (Chebyshev) UCL	2.149
99% KM (Chebyshev) UCL	3.119

Potential UCLs to Use

95% KM (BCA) UCL	1.261

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Manganese - Total Soil (AP 1)

General Statistics

Number of Valid Observations	30
Number of Distinct Observations	29

Raw Statistics

Minimum	125
Maximum	4470
Mean	672.2
Median	431
SD	881
Coefficient of Variation	1.311
Skewness	3.45

Log-transformed Statistics

Minimum of Log Data	4.828
Maximum of Log Data	8.405
Mean of log Data	6.119
SD of log Data	0.782

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical Value	0.927

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	945.5

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	1045
95% Modified-t UCL (Johnson-1978)	962.4

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.927

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	851.5
95% Chebyshev (MVUE) UCL	1025
97.5% Chebyshev (MVUE) UCL	1205
99% Chebyshev (MVUE) UCL	1559

Gamma Distribution Test	
k star (bias corrected)	1.301
Theta Star	516.6
MLE of Mean	672.2
MLE of Standard Deviation	589.3
nu star	78.08
Approximate Chi Square Value (.05)	58.72
Adjusted Level of Significance	0.041
Adjusted Chi Square Value	57.75
Anderson-Darling Test Statistic	2.008
Anderson-Darling 5% Critical Value	0.765
Kolmogorov-Smirnov Test Statistic	0.25
Kolmogorov-Smirnov 5% Critical Value	0.163

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution	
95% Approximate Gamma UCL	893.8
95% Adjusted Gamma UCL	908.7

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics	
95% CLT UCL	936.7
95% Jackknife UCL	945.5
95% Standard Bootstrap UCL	931.5
95% Bootstrap-t UCL	1429
95% Hall's Bootstrap UCL	2115
95% Percentile Bootstrap UCL	952.6
95% BCA Bootstrap UCL	1096
95% Chebyshev(Mean, Sd) UCL	1373
97.5% Chebyshev(Mean, Sd) UCL	1677
99% Chebyshev(Mean, Sd) UCL	2273

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL 1373

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Benzo(a)anthracene - Total Soil (AP 1)

General Statistics

Number of Valid Data	30	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	28
		Percent Non-Detects	93.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0642	Minimum Detected	-2.746
Maximum Detected	0.856	Maximum Detected	-0.156
Mean of Detected	0.46	Mean of Detected	-1.451
SD of Detected	0.56	SD of Detected	1.831
Minimum Non-Detect	0.186	Minimum Non-Detect	-1.681
Maximum Non-Detect	1.185	Maximum Non-Detect	0.17

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.15	Mean	-2.107
SD	0.161	SD	0.514
95% DL/2 (t) UCL	0.2	95% H-Stat (DL/2) UCL	0.167
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0915
5% K-S Critical Value	N/A	SD	0.144
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0379
		95% KM (t) UCL	0.156
Assuming Gamma Distribution		95% KM (z) UCL	0.154
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.61
Minimum	N/A	95% KM (bootstrap t) UCL	0.0927
Maximum	N/A	95% KM (BCA) UCL	0.856
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.856
Median	N/A	95% KM (Chebyshev) UCL	0.257
SD	N/A	97.5% KM (Chebyshev) UCL	0.328
k star	N/A	99% KM (Chebyshev) UCL	0.469
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.328
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(a)pyrene - Total Soil (AP 1)

General Statistics

Number of Valid Data	30	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	28
		Percent Non-Detects	93.33%

Raw Statistics	Log-transformed Statistics

Minimum Detected	0.0534	Minimum Detected	-2.93
Maximum Detected	0.721	Maximum Detected	-0.327
Mean of Detected	0.387	Mean of Detected	-1.629
SD of Detected	0.472	SD of Detected	1.84
Minimum Non-Detect	0.186	Minimum Non-Detect	-1.681
Maximum Non-Detect	1.185	Maximum Non-Detect	0.17

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A

Data not Normal at 5% Significance Level

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	0.145
SD	0.142
95% DL/2 (t) UCL	0.189
Maximum Likelihood Estimate(MLE) Method	N/A

MLE method failed to converge properly

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	-2.119
SD	0.501
95% H-Stat (DL/2) UCL	0.163
Log ROS Method	
Mean in Log Scale	N/A
SD in Log Scale	N/A
Mean in Original Scale	N/A
SD in Original Scale	N/A
95% t UCL	N/A
95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A

Data Distribution Test with Detected Values Only

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	0.0764
SD	0.122
SE of Mean	0.032
95% KM (t) UCL	0.131
95% KM (z) UCL	0.129
95% KM (jackknife) UCL	0.514
95% KM (bootstrap t) UCL	N/A

Maximum	N/A	95% KM (BCA) UCL	0.721
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.721
Median	N/A	95% KM (Chebyshev) UCL	0.216
SD	N/A	97.5% KM (Chebyshev) UCL	0.276
k star	N/A	99% KM (Chebyshev) UCL	0.395
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	0.276
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Benzo(b)fluoranthene - Total Soil (AP 1)

General Statistics

Number of Valid Data	30	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	28
		Percent Non-Detects	93.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.0829	Minimum Detected	-2.49
Maximum Detected	1.205	Maximum Detected	0.186
Mean of Detected	0.644	Mean of Detected	-1.152
SD of Detected	0.793	SD of Detected	1.893
Minimum Non-Detect	0.186	Minimum Non-Detect	-1.681
Maximum Non-Detect	1.185	Maximum Non-Detect	0.17

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.67%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.162	Mean	-2.087
SD	0.217	SD	0.552

95% DL/2 (t) UCL	0.23

95% H-Stat (DL/2) UCL	0.177

Maximum Likelihood Estimate(MLE) Method	N/A

MLE method failed to converge properly

Log ROS Method	
Mean in Log Scale	N/A
SD in Log Scale	N/A
Mean in Original Scale	N/A
SD in Original Scale	N/A
95% t UCL	N/A
95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A

Data not Gamma Distributed at 5% Significance Level

Data Distribution Test with Detected Values Only

Data do not follow a Discernable Distribution (0.05)

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data

Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	0.12
SD	0.201
SE of Mean	0.052
95% KM (t) UCL	0.209
95% KM (z) UCL	0.206
95% KM (jackknife) UCL	0.856
95% KM (bootstrap t) UCL	N/A
95% KM (BCA) UCL	1.205
95% KM (Percentile Bootstrap) UCL	1.205
95% KM (Chebyshev) UCL	0.347
97.5% KM (Chebyshev) UCL	0.445
99% KM (Chebyshev) UCL	0.638

Potential UCLs to Use

97.5% KM (Chebyshev) UCL	0.445

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	AP 1 ts UCL input.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Indeno(1,2,3-cd)pyrene - Total Soil (AP 1)

General Statistics

Number of Valid Observations	30
Number of Distinct Observations	26

Raw Statistics

Minimum	0.0931
Maximum	1.815
Mean	0.19
Median	0.104

Log-transformed Statistics

Minimum of Log Data	-2.374
Maximum of Log Data	0.596
Mean of log Data	-2.029
SD of log Data	0.629

SD	0.322
Coefficient of Variation	1.69
Skewness	4.821

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.318
Shapiro Wilk Critical Value	0.927

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.29

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	0.342
95% Modified-t UCL (Johnson-1978)	0.299

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.927

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	0.204
95% Chebyshev (MVUE) UCL	0.244
97.5% Chebyshev (MVUE) UCL	0.281
99% Chebyshev (MVUE) UCL	0.353

Gamma Distribution Test

k star (bias corrected)	1.369
Theta Star	0.139
MLE of Mean	0.19
MLE of Standard Deviation	0.163
nu star	82.15
Approximate Chi Square Value (.05)	62.27
Adjusted Level of Significance	0.041
Adjusted Chi Square Value	61.27
Anderson-Darling Test Statistic	7.003
Anderson-Darling 5% Critical Value	0.763
Kolmogorov-Smirnov Test Statistic	0.405
Kolmogorov-Smirnov 5% Critical Value	0.163

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.251
95% Adjusted Gamma UCL	0.255

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	0.287
95% Jackknife UCL	0.29
95% Standard Bootstrap UCL	0.283
95% Bootstrap-t UCL	0.827
95% Hall's Bootstrap UCL	0.74
95% Percentile Bootstrap UCL	0.294
95% BCA Bootstrap UCL	0.404
95% Chebyshev(Mean, Sd) UCL	0.446
97.5% Chebyshev(Mean, Sd) UCL	0.557
99% Chebyshev(Mean, Sd) UCL	0.774

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL 0.446

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Input for ProUCL
Ash Pit 1 Overburden Well Gorundwater

	Cobalt	D_Cobalt	Iron	D_Iron	Manganese	D_Mangane	Sulfate	D_Sulfate	Thallium	Chloroform
AP1-MW01 AP3050	22.2	1	4610	1	32300	1	585000	1	34.6	0.48
AP1-MW01 AP3070	6.8	1	4410	1	8290	1	311000	1	5	0.5
AP1-MW02 AP3051	3	1	300	0	351	1	589000	1	5	0.5
AP1-MW02 AP3071	3.6	1	300	0	436	1	358000	1	5	0.5
AP1-MW03 AP3052	1	1	1090	1	136	1	127000	1	5	0.5
AP1-MW03 AP3072	2.7	1	300	0	463	1	109000	1	5	0.5

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	MW GW AP1.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Cobalt - MW Groundwater (AP 1)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	1	Minimum of Log Data	0
Maximum	22.2	Maximum of Log Data	3.1
Mean	6.55	Mean of log Data	1.398
Median	3.3	SD of log Data	1.038
SD	7.898		
Coefficient of Variation	1.206		
Skewness	2.152		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.706	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	13.05	95% H-UCL	50.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.39
95% Adjusted-CLT UCL (Chen-1995)	14.88	97.5% Chebyshev (MVUE) UCL	22.24
95% Modified-t UCL (Johnson-1978)	13.52	99% Chebyshev (MVUE) UCL	31.76

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.7	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	9.357		
MLE of Mean	6.55		
MLE of Standard Deviation	7.828		
nu star	8.401		
Approximate Chi Square Value (.05)	2.969	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	11.85
Adjusted Chi Square Value	1.933	95% Jackknife UCL	13.05
		95% Standard Bootstrap UCL	11.45
Anderson-Darling Test Statistic	0.449	95% Bootstrap-t UCL	37.28
Anderson-Darling 5% Critical Value	0.712	95% Hall's Bootstrap UCL	45.11
Kolmogorov-Smirnov Test Statistic	0.272	95% Percentile Bootstrap UCL	12.6

Kolmogorov-Smirnov 5% Critical Value	0.34	95% BCA Bootstrap UCL	13.53
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.61
		97.5% Chebyshev(Mean, Sd) UCL	26.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	38.63
95% Approximate Gamma UCL	18.53		
95% Adjusted Gamma UCL	28.47		
Potential UCL to Use		Use 95% Approximate Gamma UCL	18.53

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron - MW Groundwater (AP 1)

General Statistics

Number of Valid Data	6	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	3
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1090	Minimum Detected	6.994
Maximum Detected	4610	Maximum Detected	8.436
Mean of Detected	3370	Mean of Detected	7.941
SD of Detected	1977	SD of Detected	0.82
Minimum Non-Detect	300	Minimum Non-Detect	5.704
Maximum Non-Detect	300	Maximum Non-Detect	5.704

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.773
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1760	Mean	6.476
SD	2162	SD	1.686
95% DL/2 (t) UCL	3539	95% H-Stat (DL/2) UCL	377429
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	535.3	Mean in Log Scale	6.766
SD	3363	SD in Log Scale	1.454
95% MLE (t) UCL	3302	Mean in Original Scale	1840
95% MLE (Tiku) UCL	3938	SD in Original Scale	2094
		95% t UCL	3563
		95% Percentile Bootstrap UCL	3203
		95% BCA Bootstrap UCL	3243

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	N/A
Maximum	N/A
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
AppChi2	N/A
95% Gamma Approximate UCL	N/A
95% Adjusted Gamma UCL	N/A

Data Distribution Test with Detected Values Only

Data appear Normal at 5% Significance Level

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	2230
SD	1613
SE of Mean	806.6
95% KM (t) UCL	3855
95% KM (z) UCL	3557
95% KM (jackknife) UCL	4617
95% KM (bootstrap t) UCL	2952
95% KM (BCA) UCL	4610
95% KM (Percentile Bootstrap) UCL	4610
95% KM (Chebyshev) UCL	5746
97.5% KM (Chebyshev) UCL	7267
99% KM (Chebyshev) UCL	10256

Potential UCLs to Use

95% KM (t) UCL	3855
95% KM (Percentile Bootstrap) UCL	4610

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Manganese - MW Groundwater (AP 1)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	136	Minimum of Log Data	4.913
Maximum	32300	Maximum of Log Data	10.38
Mean	6996	Mean of log Data	7.066
Median	449.5	SD of log Data	2.133
SD	12798		
Coefficient of Variation	1.829		
Skewness	2.151		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test **Lognormal Distribution Test**

Shapiro Wilk Test Statistic	0.641
Shapiro Wilk Critical Value	0.788

Data not Normal at 5% Significance Level

Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.788

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	17524

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	20492
95% Modified-t UCL (Johnson-1978)	18288

Assuming Lognormal Distribution

95% H-UCL	28267911
95% Chebyshev (MVUE) UCL	23629
97.5% Chebyshev (MVUE) UCL	31449
99% Chebyshev (MVUE) UCL	46810

Gamma Distribution Test

k star (bias corrected)	0.297
Theta Star	23529
MLE of Mean	6996
MLE of Standard Deviation	12830
nu star	3.568
Approximate Chi Square Value (.05)	0.559
Adjusted Level of Significance	0.0122
Adjusted Chi Square Value	0.261
Anderson-Darling Test Statistic	0.711
Anderson-Darling 5% Critical Value	0.756
Kolmogorov-Smirnov Test Statistic	0.385
Kolmogorov-Smirnov 5% Critical Value	0.354

Data follow Appr. Gamma Distribution at 5% Significance Level

Data Distribution

Data Follow Appr. Gamma Distribution at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	44665
95% Adjusted Gamma UCL	95759

Nonparametric Statistics

95% CLT UCL	15590
95% Jackknife UCL	17524
95% Standard Bootstrap UCL	14991
95% Bootstrap-t UCL	646621
95% Hall's Bootstrap UCL	356105
95% Percentile Bootstrap UCL	16327
95% BCA Bootstrap UCL	17682
95% Chebyshev(Mean, Sd) UCL	29770
97.5% Chebyshev(Mean, Sd) UCL	39624
99% Chebyshev(Mean, Sd) UCL	58980

Potential UCL to Use

Use 95% Adjusted Gamma UCL 95759

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Sulfate - MW Groundwater (AP 1)

General Statistics

Number of Valid Observations	6
Number of Distinct Observations	6

Raw Statistics

Minimum	109000
Maximum	589000
Mean	346500
Median	334500
SD	210555
Coefficient of Variation	0.608
Skewness	0.123

Log-transformed Statistics

Minimum of Log Data	11.6
Maximum of Log Data	13.29
Mean of log Data	12.56
SD of log Data	0.732

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.788

Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.788

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	519711
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL (Chen-1995)	492483
95% Modified-t UCL (Johnson-1978)	520428

Assuming Lognormal Distribution

95% H-UCL	1084751
95% Chebyshev (MVUE) UCL	811390
97.5% Chebyshev (MVUE) UCL	1009548
99% Chebyshev (MVUE) UCL	1398791

Gamma Distribution Test

k star (bias corrected)	1.458
Theta Star	237603
MLE of Mean	346500
MLE of Standard Deviation	286931
nu star	17.5
Approximate Chi Square Value (.05)	9.03
Adjusted Level of Significance	0.0122
Adjusted Chi Square Value	6.946
Anderson-Darling Test Statistic	0.416
Anderson-Darling 5% Critical Value	0.702
Kolmogorov-Smirnov Test Statistic	0.217
Kolmogorov-Smirnov 5% Critical Value	0.335

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	671477
95% Adjusted Gamma UCL	872927

Data Distribution

Data appear Normal at 5% Significance Level

Nonparametric Statistics

95% CLT UCL	487890
95% Jackknife UCL	519711
95% Standard Bootstrap UCL	473925
95% Bootstrap-t UCL	543620
95% Hall's Bootstrap UCL	527393
95% Percentile Bootstrap UCL	470500
95% BCA Bootstrap UCL	472167
95% Chebyshev(Mean, Sd) UCL	721186
97.5% Chebyshev(Mean, Sd) UCL	883313
99% Chebyshev(Mean, Sd) UCL	1201779

Potential UCL to Use

Use 95% Student's-t UCL 519711

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	MW GW AP1.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Thallium - MW Groundwater (AP 1)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	2

Raw Statistics

Minimum	5
Maximum	34.6

Log-transformed Statistics

Minimum of Log Data	1.609
Maximum of Log Data	3.544

Mean	9.933	Mean of log Data	1.932
Median	5	SD of log Data	0.79
SD	12.08		
Coefficient of Variation	1.217		
Skewness	2.449		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.496	Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	19.87	95% H-UCL	31.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.24
95% Adjusted-CLT UCL (Chen-1995)	23.32	97.5% Chebyshev (MVUE) UCL	26.6
95% Modified-t UCL (Johnson-1978)	20.7	99% Chebyshev (MVUE) UCL	37.12

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.87	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	11.41		
MLE of Mean	9.933		
MLE of Standard Deviation	10.65		
nu star	10.44		
Approximate Chi Square Value (.05)	4.222	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	18.05
Adjusted Chi Square Value	2.919	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	1.738	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.708	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.516	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.337	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.44
		97.5% Chebyshev(Mean, Sd) UCL	40.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	59.02
95% Approximate Gamma UCL	24.58		
95% Adjusted Gamma UCL	35.54		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	31.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chloroform - MW Groundwater (AP 1)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	2

Raw Statistics

Minimum	0.48
Maximum	0.5
Mean	0.497
Median	0.5
SD	0.00816
Coefficient of Variation	0.0164
Skewness	-2.449

Log-transformed Statistics

Minimum of Log Data	-0.734
Maximum of Log Data	-0.693
Mean of log Data	-0.7
SD of log Data	0.0167

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.788

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.503

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL (Chen-1995)	0.499
95% Modified-t UCL (Johnson-1978)	0.503

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.788

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	N/A
95% Chebyshev (MVUE) UCL	0.511
97.5% Chebyshev (MVUE) UCL	0.518
99% Chebyshev (MVUE) UCL	0.53

Gamma Distribution Test

k star (bias corrected)	2180
Theta Star	0.0002278
MLE of Mean	0.497
MLE of Standard Deviation	0.0106
nu star	26163
Approximate Chi Square Value (.05)	25788
Adjusted Level of Significance	0.0122
Adjusted Chi Square Value	25651
Anderson-Darling Test Statistic	1.718
Anderson-Darling 5% Critical Value	0.696
Kolmogorov-Smirnov Test Statistic	0.506
Kolmogorov-Smirnov 5% Critical Value	0.332

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.504
95% Adjusted Gamma UCL	0.507

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	0.502
95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A
95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A
95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A
95% Chebyshev(Mean, Sd) UCL	0.511
97.5% Chebyshev(Mean, Sd) UCL	0.517
99% Chebyshev(Mean, Sd) UCL	0.53

Potential UCL to Use	Use 95% Student's-t UCL 0.503
	or 95% Modified-t UCL 0.503

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

APPENDIX C

TOXICOLOGICAL PROFILES

Introduction to the Toxicological Profiles

1.0 Purpose and Use of the Toxicological Profiles

Human health toxicological profiles are presented for each chemical of potential concern (COPC), each chemical for which documentation of chemical-specific values is required or about which there are chemical-specific issues that require resolution. The toxicological profiles provide documentation of the chemical-specific physical properties and toxicity values used in the risk assessment (RA). They also discuss the identity, classification and uses of the chemical, the common sources of release to the environment and the fate of the chemical in the environment, including the relevance of aquatic and terrestrial food-chain pathways to human health. A brief review of toxicokinetics discusses absorption, distribution, metabolism or biotransformation, excretion of the parent compound and metabolites, and mechanism of toxicity including identifying the ultimate toxicant – i.e., the moiety (parent chemical or metabolite) identified as most likely responsible for the adverse effects associated with the chemical. This information may be helpful to determine whether laboratory animals may serve as appropriate models for toxicity to humans, and to clarify the nature of toxicological interactions with other chemicals. A discussion of dermal exposure provides perspective on the significance of dermal uptake, and documents the development of dermal toxicity values and the extent or rate of dermal uptake from soil or water according to the latest USEPA (2004) guidance.

The noncancer effects evaluation and carcinogenicity evaluation provide an overall perspective on the nature of the adverse effects associated with the chemical, as well as documentation of the toxicity values. Chemical-specific issues or controversies that may influence the interpretation or application of the results of the RA are also discussed herein. The toxicity values used in the RA are summarized in a table.

The overall purpose of the toxicological profiles is to provide perspective on characteristics of each of the chemicals included in the RA so that the numerical risk estimates can be interpreted and applied wisely in the management of the site.

2.0 Chemical Identity

The identity of the chemical or chemical class is given in the title of each profile; additional information or clarification is provided in the *Introduction and Physical Properties* Section as required. The hyphenated number in parentheses following the chemical name is its unique Chemical Abstract Service (CAS) registration number. The CAS number may be located in the profile title, text, or in the case of multiple isomers or members of a chemical class, in the table that provides the physical properties.

3.0 Physical Properties

The toxicological profiles also provide documentation for the physical properties or constants that are important for chemical transport modeling, such as molecular weight (MW) in grams per mole (g/mole), the log of the octanol/water partition coefficient (log K_{ow}), Henry's Law constant (H) in atmosphere-cubic meters per mole (atm-m^3/mole), the soil/water partition coefficient (K_d) in liters per kilogram (L/kg) for metals, the log of the soil/organic carbon partition coefficient (log K_{oc}) (unitless) for organic chemicals, diffusivity in air (D_a) in square centimeters per second (cm^2/s), diffusivity in water (D_w) in cm^2/s, vapor pressure (VP) in atmospheres (atm), solubility

in water (S) in milligrams per liter (mg/L), and, for volatile organic compounds (VOC), boiling point of pure compound (T_b) in degrees Kelvin (°K), critical temperature (T_c) in °K, and enthalpy of vaporization at the boiling point ($\Delta H_{v,b}$) in calories per mole (cal/mol). Organic chemicals are designated as VOCs or semivolatile organic compounds (SVOC) based on their propensity to volatilize from environmental media. Chemicals designated as VOCs generally have an H greater than 1E-5 atm-m^3/mole (EPA, 2002).

The physical constants generally are taken from the most reliable source (i.e., the source that provides the highest level of documentation). Values for interrelated properties are usually taken from the same source (e.g., H is often estimated from VP and S; therefore, the same source is generally used for all three property values). When one source provides several values for a given property, professional judgment is used to select the most appropriate. Obvious outliers may be dropped from consideration. The average or the midpoint of a range of values may be selected. K_d values for metals and K_{oc} values for ionizing organic compound are based on a default pH of 6.8 (EPA, 2002) if the data are available. VP, S and H values are limited to those provided for normal ambient temperatures (0 to 30 °C) and the reference temperature is provided.

When values for H are not located, they are calculated as follows, provided the requisite information is available (EPA, 1998):

$$H = \frac{VP \bullet MW}{S}$$

where:

H	=	Henry's law constant (atm-m^3/mole, calculated)
VP	=	vapor pressure (atm)
MW	=	molecular weight (g/mole)
S	=	solubility in water (mg/L).

When values for K_{oc} are not located, they are calculated as follows for phthalates and polyaromatic aromatic hydrocarbons (PAH) provided log K_{ow} is available (EPA, 1998):

$$\log K_{oc} = 0.97 \log K_{ow} - 0.094$$

where:

K_{oc}	=	soil/organic carbon partition coefficient (unitless, calculated)
K_{ow}	=	octanol/water partition coefficient (unitless).

K_{oc} for other organic chemicals is calculated as follows provided log K_{ow} is available (EPA, 1998):

$$\log K_{oc} = 0.78 \log K_{ow} + 0.151$$

where:

K_{oc} = soil/organic carbon partition coefficient (unitless, calculated)
K_{ow} = octanol/water partition coefficient (unitless).

When values for D_a are not located, they are calculated as follows (EPA, 1998):

$$D_a = \frac{1.9}{MW^{2/3}}$$

where:

D_a = diffusivity in air (cm^2/s, calculated)
MW = molecular weight (g/mole).

When values for D_w are not located, they are calculated as follows (EPA, 1998):

$$D_w = \frac{22E{-}5}{MW^{2/3}}$$

where:

D_w = diffusivity in water (cm^2/s, calculated)
MW = molecular weight (g/mole).

Values for T_b, T_c and $\Delta H_{v,b}$ for VOCs are preferentially taken from EPA (2004), unless there is evidence that values provided by other sources (HSDB, 2010; NIST, 2010) are more reliable. If values are not located for these variables, they may be estimated by the most appropriate technique for the specific chemical or class to which it belongs as recommended by Lyman et al. (1990). The estimation method used is identified by footnote in the table of physical properties.

4.0 Environmental Release, Fate and Transport

The toxicological profiles also present the predominant sources of release to the environment as well as a qualitative or semi-quantitative description of the fate and transport of the chemical in air, water, sediment, and soil. No attempt is made to present detailed quantitative data because environmental fate is usually highly dependent on climatic conditions and the characteristics of the medium of interest, both of which may differ from location to location and change from time to time. The source and fate information may provide perspective regarding the likelihood that the chemical's presence is related to site activities, that the chemical will migrate across media, or that the chemical will persist at toxicologically significant levels.

Biotransfer factors are provided for chemicals for which food-chain pathways may be significant, which includes a few inorganic chemicals and those organic chemicals that are highly lipophilic, persist in the environment, and are resistant to metabolism by lower trophic organisms in the food chain. High lipophilicity is indicated by a log K_{ow} greater than 3 (Lyman et al., 1990). Lipophilicity enhances partitioning to biomedia and passage across biological

membranes. Persistence in the environment is evidence that the chemical might resist biotransformation and, therefore, remain in edible tissues at toxicologically significant concentrations. Toxicokinetic data, when available, clarify the potential for biotransfer. Biotransformation products may be more toxic than the parent compound, but they tend to be short-lived or more quickly removed from the body, reducing the likelihood of significant bioaccumulation. Similarly, VOCs tend to be mobile and labile (i.e., subject to rapid and extensive biotransformation and excretion), and generally do not participate significantly in food-chain pathways. Therefore, biotransfer factors are not estimated for VOCs, with few exceptions. Some SVOCs, however, are highly lipophilic and may persist. Biotransfer factors generally are not estimated unless empirical data suggest that participation in food-chain pathways is likely to be significant.

The biotransfer factors of interest are water-to-fish bioconcentration factors (BCF) or bioaccumulation factors (BAF), or biota-sediment accumulation factors (BSAF), soil-to-plant biotransfer factors (Bp), cattle ingestion-to-beef factors (Bb) and cattle ingestion-to-milk factors (Bm). Separate soil-to-plant biotransfer factors are available for the reproductive parts of plants (e.g., fruits, seeds) and the vegetative parts of plants (e.g., stems, leaves) for inorganic and some organic chemicals. Soil-to-plant factors for the reproductive parts of plants are designated Bpr; soil-to-plant factors for the vegetative parts of plants are designated Bpv.

Most chemicals in surface water bodies remain predominantly in the dissolved phase in the water column or partition to sediment, which generally settles to the bottom. The difference in concentration between surface water and sediment is usually upwards of an order of magnitude. Theoretically it is appropriate to evaluate biotransfer from both media, using BCF to quantify uptake from water and BSAF to quantify uptake from sediment. Quantification of biotransfer, however, is accompanied by considerable uncertainty and variability because field conditions cannot be readily duplicated in the laboratory where BCF values are generally measured. Therefore, the biotransfer models for either medium are intentionally designed to be very conservative to ensure protection of human health. Consequently, evaluating biotransfer from both water and sediment captures the conservatism of both models and is likely to grossly overestimate total biotransfer. Therefore, most chemicals with the potential to participate significantly in aquatic food chain pathways are evaluated for bioconcentration from surface water *or* bioaccumulation from sediment, depending on which pathway is expected to predominate, but not both.

BCF values are adopted from empirical data when the data are clearly the best choice (i.e., similar results in multiple species of fin fish). When the empirical data are few or inconsistent, BCFs for inorganic chemicals are taken from various sources. BCF values for organic chemicals are generally estimated from the Bintein and Devillers model (Devillers et al., 1996):

$$\log BCF = 0.910 \log K_{ow} - 1.975 \log(6.8E{-}7 K_{ow} + 1) - 0.786$$

where:

BCF = bioconcentration factor (L/kg, calculated)
K_{ow} = octanol/water partition coefficient (unitless).

The Bintein and Devillers model is selected over simpler models adopted by the EPA largely because the Bintein and Devillers approach has undergone scrutiny since first published (Bintein and Devillers, 1993), and considerable effort was expended to validate the model; i.e., to compare modeled and empirical results. The Bintein and Devillers model is probably more realistic than simpler models, particularly for chemicals with higher log K_{ow} values. BSAF values are chosen instead of BCFs for those very highly lipophilic chemicals such as the polychlorinated biphenyls (PCB), polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) and selected organochlorine pesticides expected to partition almost entirely to benthic sediment.

Soil-to-plant biotransfer factors (Bp) for SVOCs are estimated by a simple model by Travis and Arms (1988), which is based only on log K_{ow}:

$$\log Bp = 1.588 - 0.578 \log K_{ow}$$

where:

Bp = soil-to-plant biotransfer factor (unitless, calculated)
K_{ow} = octanol/water partition coefficient (unitless).

Separate biotransfer factors are not estimated for the reproductive parts of plants (Bpr) and the vegetative parts of plants (Bpv) by the Travis and Arms model.

Cattle ingestion-to-beef factors (Bb) for SVOCs are estimated by a simple model by Travis and Arms (1988), which is based only on log K_{ow}:

$$\log Bb = -7.6 + \log K_{ow}$$

where:

Bb = cattle ingestion-to-beef biotransfer factor (days/kg, calculated)
K_{ow} = octanol/water partition coefficient (unitless).

Cattle ingestion-to-milk factors (Bm) for SVOCs are estimated by a simple model by Travis and Arms (1988), which is based only on log K_{ow}:

$$\log Bm = -8.10 + \log K_{ow}$$

where:

Bm = cattle ingestion-to-milk biotransfer factor (days/kg, calculated)
K_{ow} = octanol/water partition coefficient (unitless).

It should be understood that the biotransfer models described above depend only on one or two physical property values that are related largely to the propensity for transfer across biological membranes. Many compounds have relatively large log K_{ow} values, indicating ready passage across membranes; however, they are sufficiently volatile, or are otherwise mobile or labile so

they are unable to persist in biological tissues. For example, many constituents with high log K_{ow} values are efficiently metabolized by lower trophic organisms in the food chain so that significant human exposure does not occur. Such is the case for practically all VOCs and most SVOCs; relatively few compounds participate significantly in food-chain pathways. Therefore, biotransfer is evaluated as a potential pathway only for those chemicals with empirical data that indicate food-chain exposure could be significant.

5.0 Toxicokinetics

A toxicokinetics section was added to the toxicological profiles in early 2004. Toxicokinetics describes the uptake or absorption of the chemical from contact media, the distribution of the chemical (or its metabolites) within the body following absorption, the metabolism or biotransformation of the chemical, and the mechanisms of excretion of the parent compound and its biotransformation products from the body. The toxicokinetics section documents the gastrointestinal (GI) absorption factor (GAF) required to develop toxicity factors for dermal exposure, because dermal risk characterization depends on an absorbed dose rather than an exposure dose. The toxicokinetics section also identifies the compounds that are rapidly metabolized or eliminated, which justifies excluding their evaluation in food-chain pathways even though they may have a large K_{ow} that indicates ready passage across cell membranes. This section also tries to identify the ultimate toxicant and elucidate the most important mechanism(s) of toxicity.

6.0 Dermal Exposure

The toxicological profiles provide the documentation for the GAF, which is used to develop the dermal toxicity values. The toxicological profiles also provide documentation for the dermal absorption factor (ABS), which describes the extent of dermal uptake from soil, and the time for dermal uptake to reach steady state (t*), the permeability coefficient (K_p), the lag time for chemical to cross the stratum corneum (τ), the fraction absorbed (FA), and the ratio of the permeability coefficient for passage across the stratum corneum to the permeability coefficient for passage across the viable epidermis (B), all which are used to estimate the rate of dermal uptake from water. These values are taken from EPA (2010) if available. Otherwise, they are estimated by the EPA (2004) methods.

7.0 Toxicity Evaluation

The toxicological profile contains a brief description of the nature of the adverse effects associated with the chemical. It is important to note that a discussion of adverse effects without a discussion of dose is incomplete and potentially misleading, because virtually any chemical may be toxic at some dose, and many chemicals (e.g., nutritionally required minerals, vitamins, amino acids, etc.) enhance human health at some low dose. An ever growing and compelling body of evidence suggests that many environmental contaminants also enhance health at low doses (Hart and Frame, 1996).

7.1 Noncancer Evaluation

The toxicity values for noncancer effects include a reference dose (RfD) expressed in milligrams per kilogram per day (mg/kg-day) for chronic or subchronic oral exposure, and a reference concentration (RfC), in milligrams per cubic meter (mg/m^3), for chronic or subchronic inhalation exposure. The inhalation RfC in units of mg/m^3 may be converted to an equivalent inhalation

RfD by assuming continuous chronic exposure of humans with a body weight of 70 kg and an inhalation rate of 20 m^3/day (EPA, 1989, 1991). In other words, the RfC expressed as mg/m^3 is multiplied by the inhalation rate of 20 m^3/day, and the result is divided by the assumed adult body weight of 70 kg to yield an inhalation RfD expressed as mg/kg-day.

RfD and RfC values are usually derived from empirical benchmark doses (BMD) or concentrations called no-observed-effect levels (NOEL) or no-observed-adverse-effect levels (NOAEL) from animal toxicity or human epidemiology studies. If the data do not permit identifying a NOEL or NOAEL, a lowest-observed-adverse-effect level (LOAEL) or lowest-effect level (LEL) may be used. A frank-effect level (FEL), e.g., mortality, shortened life span or serious physiologic, neurologic or behavioral disturbances, is generally considered an inappropriate benchmark from which to develop an RfD or RfC. Some RfD and RfC derivations employ a BMD that is a statistically estimated dose for humans at which some low proportion of the population may experience some minimally adverse effect. A BMD at which 10 percent of the population may be expected to experience such an effect is expressed as BMD_{10}. The RfD or RfC is derived by dividing the benchmark level (e.g., NOAEL or BMD_{10}) by a series of uncertainty and modifying factors, which collectively are designated the uncertainty factor (UF).

RfD and RfC values are not currently available for acute toxicity and acute exposure is not evaluated in the RA. Nonetheless, the levels associated with acute lethality and data regarding the effects of acute exposure to levels higher than ordinarily observed in chronic environmental exposure provide additional perspective regarding the toxicity of the chemical. Therefore, information regarding acute toxicity, when available, is included in the profiles. Lethality data for laboratory animals are generally expressed as the oral dose associated with lethality of 50 percent of an exposed population (LD_{50}) or the concentration in air associated with lethality of 50 percent of an exposed population (LC_{50}). Occasionally the dose associated with lethality in a low percentage of an exposed population (LD_{LO}) is presented.

RfD and RfC values are derived for both chronic and subchronic exposure. For purposes of the RA, chronic exposure is defined as equal to or greater than 7 years, i.e., at least 10 percent of expected life span; subchronic exposure is defined as 2 weeks to 7 years.

Under the assumption of monotonicity (i.e., incidence, intensity, or severity of effects can increase, but cannot decrease, with increasing magnitude or duration of exposure), a chronic RfD may be considered sufficiently protective for subchronic exposure, but a subchronic RfD may not be protective for chronic exposure. Currently, verified subchronic RfD values are unavailable. Provisional subchronic RfDs exist for few chemicals and are compiled in the Health Effects Assessment Summary Tables (HEAST) (EPA, 1997) and some National Center for Environmental Assessment (NCEA) or Provisional Peer Reviewed Toxicity Value (PPRTV) derivations. Although once updated semi-annually, the HEAST is no longer updated, because the EPA (2005) Integrated Risk Information System (IRIS) is generally considered the source of the highest quality toxicity values. For some chemicals the PPRTV derivations are more recent and it is known that summaries on IRIS will be replaced with the PPRTV derivations. In these cases the PPRTV values will be selected preferentially to those on IRIS. Subchronic RfD and RfC values are generally obtained from EPA (1997) or more recent NCEA or PPRTV evaluations, or they may be derived *de novo* from the toxicological data set or from chronic RfD values as follows:

- If the UF applied in the derivation of the chronic RfD does not provide for expansion from subchronic to chronic exposure (e.g., if the chronic RfD was derived from a chronic study), the chronic RfD is adopted as being sufficiently protective for subchronic exposure.

- If the UF applied in the derivation of the chronic RfD contains a component to expand from subchronic to chronic exposure, the subchronic RfD is derived by multiplying the chronic RfD by the component of the UF used to expand from subchronic to chronic exposure (e.g., if a factor of 10 was used to expand from subchronic to chronic exposure, the subchronic RfD will be 10 times larger than the chronic RfD).

7.2 Carcinogenicity Evaluation

The evaluation of the potential carcinogenicity of a chemical includes both a qualitative and a quantitative aspect (EPA, 1986, 2005). EPA (2005) recognizes five weight-of-evidence group classifications for carcinogenicity. Formerly, EPA (1986) used a letter-based system to describe the weight of evidence for carcinogenicity. Reference to this former system is included because many of the carcinogenicity assessments listed on the Integrated Risk Information System (IRIS) use the former letter-based system (EPA, 2010). The five EPA weight-of-evidence classifications are as follows:

- ***Carcinogenic to Humans*** (corresponds to the former Group A - Human Carcinogen).

- ***Likely to be Carcinogenic to Humans*** (includes both the former Group B1 and Group B2-Probable Human Carcinogens)

- ***Suggestive Evidence of Carcinogenic Potential*** (corresponds to the former Group C - Possible Human Carcinogen)

- ***Inadequate Information to Assess Carcinogenic Potential*** (corresponds to the former Group D - Not Classifiable as to Human Carcinogenicity)

- ***Not Likely to be Carcinogenic to Humans*** (corresponds to the former Group E - Evidence of Noncarcinogenicity to Humans).

Toxicity values for cancer risk include a slope factor (SF) for oral exposure, expressed as the risk per mg/kg-day ingested dose, and a unit risk factor (URF) for inhalation exposure, expressed as the risk per microgram per cubic meter ($\mu g/m^3$) in ambient air. These quantitative estimates are generally provided for chemicals in EPA weight-of-evidence Groups A, B and C if the data are adequate. The SF or URF is usually estimated as an upper bound on the slope of the dose- or concentration-response curve from animal toxicity or human epidemiology studies. The inhalation URF in units of risk per $\mu g/m^3$ may be converted to an equivalent inhalation SF in units of risk per mg/kg-day by assuming continuous lifetime exposure of humans with a body weight to 70 kg and an inhalation rate of 20 m^3/day. In other words, the URF expressed as risk per $\mu g/m^3$ is divided by the inhalation rate of 20 m^3/day, and multiplied by the assumed body weight of 70 kg and a conversion factor of 1000 μg/mg.

EPA (1986, 2005) generally assumes that there are no thresholds for carcinogenic expression; therefore, any exposure represents some quantifiable risk. A few potential carcinogens are understood to require a threshold for carcinogenic expression. Such chemicals are more appropriately evaluated with an RfD developed as described above.

7.3 Hierarchy for Selecting Toxicity Data

Toxicity values generally are chosen using the following hierarchy:

- The EPA's (2010) on-line IRIS database containing toxicity values that have undergone the most rigorous Agency review.
- PPRTV derivations for the Superfund Technical Support Center (STSC); there may be individual chemicals for which the PPRTV derivations supercede those on IRIS.
- Older NCEA derivations for the STSC, HEAST (EPA, 1997), or other EPA documents or memoranda.

When EPA-derived toxicity values are not located in any of the above sources, Minimal Risk Levels (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR) toxicological profiles may be adopted or adapted for use in the RA. MRLs are derived by a methodology similar to the EPA methodology for RfD derivation. ATSDR toxicological profiles generally identify levels significant to human health with particular emphasis on target organ and mechanism of toxicity. Also, the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) has derived toxicity values for certain chemicals (and their degradation products) associated with military use. Finally, the primary literature may be surveyed to determine whether sufficient data exist to derive a toxicity value using the EPA methodology. The use of surrogate chemicals is also considered if the chemical structure, adverse effects, and toxic potency of the surrogate and chemical of interest are judged to be sufficiently similar.

GAFs, used to derive dermal RfD values and SFs from the corresponding oral toxicity values, are obtained from the following hierarchy:

- EPA (2004)
- Empirical data
- PPRTV summaries or NCEA position papers
- Federal agency reviews of the empirical data, such as ATSDR toxicological profiles and various EPA criteria documents
- Other published reviews of the empirical data.

8.0 References

Bintein, S. and J. Devillers, 1993, "Nonlinear Dependence of Fish Bioconcentration on n-Octanol/Water Partition Coefficient," ***SAR and QSAR in Environmental Research***, 1: 29-39.

Devillers, J., S. Bintein and D. Domine, 1996, "Comparison of BCF Models Based on Log P," ***Chemosphere***, 33(6): 1047-1065.

Hart, R.W. and L.T. Frame, 1996, "Toxicological Defense Mechanisms and How They May Affect the Nature of Dose-Response Relationships," ***Biological Effects of Low Level Exposure (BELLE) Newsletter***, 5(1): 1-16.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Lyman, W. J., W. F. Reehl and D. H. Rosenblatt, 1990, ***Handbook of Chemical Property Estimation Methods, Environmental Behavior of Organic Compounds***, American Chemical Society, Washington, DC.

National Institute of Standards and Technology (NIST), 2010, ***NIST Chemistry WebBook***, on line.

Travis, C.C. and A.D. Arms, 1988, "Bioconcentration of Organics in Beef, Milk and Vegetation," ***Environmental Science and Technology***, 22(3): 271-274.

U.S. Environmental Protection Agency (EPA), 1986, "Guidelines for Carcinogen Risk Assessment," ***Federal Register***, 51(185): 33992-34003.

U.S. Environmental Protection Agency (EPA), 1989, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)***, Interim Final, Office of Emergency and Remedial Response, Washington, DC, EPA/540/1-89/002, December.

U.S. Environmental Protection Agency (EPA), 1991, ***Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors***, Interim Final, Office of Solid Waste and Emergency Response, OSWER Directive: 9285.6-03, 25 March.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 1998, ***Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume Two***, Peer Review Draft, Office of Solid Waste and Emergency Response, Washington, DC, EPA530-D-98-001B, July.

U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, DC, 9355.4-24, December.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2005, ***Guidelines for Carcinogen Risk Assessment***, Risk Assessment Forum, Washington, D.C., March, EPA/630/P-03/001B.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

METALS

ALUMINUM (7429-90-5)

1.0 Introduction and Physical Properties

Aluminum is a naturally occurring **metal** (ATSDR, 2008). It is the third most abundant element in nature, constituting approximately 8 percent of the minerals in the earth's crust. Aluminum is highly reactive; thus, is always found in combination with other substances such as oxygen, fluoride or silica. Aluminum is used in a wide variety of metallurgical applications, including packaging (particularly food items), kitchen utensils, auto bodies and components, airplanes, building components, electrical transmission, and to adsorb occluded gases in making steel (ATSDR, 2008; Elinder and Sjogren, 1986; HSDB, 2010). Aluminum compounds are used in testing for gold, arsenic and mercury, in metal alloys, in protective coatings, paints and printer inks, in cosmetics, food additives and some pharmaceuticals, as coagulating agents in the treatment of drinking water, and in photography flash bulbs and fireworks. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
26.98[a] (Element)	NA	NA	1500[b]	NA	NA	NA	Note 1[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 29 November.
[b]Baes, C.F., R.D. Sharp, A.L. Sjoreen, R.W. Shor, 1984, ***A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture***, Health and Safety Division, Oak Ridge National Laboratory, ORNL-5786, September.
[c]Solubility of aluminum compounds varies from essentially insoluble in hot or cold water to highly soluble to highly reactive (e.g., aluminum chloride reacts explosively with water liberating heat and hydrogen chloride gas). Agency for Toxic Substances and Disease Registry (ATSDR), 2008, ***Update Toxicological Profile for Aluminum***, U.S. Department of Health and Human Services, Atlanta, Georgia, July, on line.

2.0 Environmental Fate and Transport

Aluminum is one of the few elements for which natural release far outweighs anthropogenic release (ATSDR, 2008; HSDB, 2010). The predominant natural process is the weathering and release of dust from soil and rocks into the air. Major anthropogenic sources include aluminum mining and smelting, coal combustion, and other mining or industrial activities that process crustal materials and release aluminum to the atmosphere. Aluminum exists in the air as particulates that presumably are subject to wet and dry deposition. Large particulates predominate, which suggests that deposition occurs not far from the point of release.

Aluminum is deposited on soil from the atmosphere (ATSDR, 2008). Other anthropogenic sources to soil include wastes from mines, smelters and coal combustion. Aluminum in soil exists in several soluble and insoluble forms, depending on pH and the nature of the minerals and organic material present in the soil. Generally, increasing acidity (decreasing pH) mobilizes aluminum and facilitates leaching.

Aluminum exists naturally in water in several hydrated and complexed forms (ATSDR, 2008). Sources include solution from surrounding soil, precipitation, and runoff and erosion from soil. The extent to which aluminum in water settles out is highly variable and depends on pH and the other constituents present in the water with which aluminum may form compounds and complexes. Generally an equilibrium is established between soluble and insoluble forms.

Bioconcentration in fish is largely a function of water quality (e.g., pH and total organic carbon). Highest concentrations of aluminum are generally found in the gills and lowest concentrations are found in edible muscle tissue. Concentrations decrease as the fish pass through the larval and juvenile stages. Therefore, the bioconcentration of aluminum in edible fish tissues is not expected to represent a toxicologically significant source to humans (EPA, 1995).

Acid conditions in soil mobilize aluminum for uptake by plants, but the extent of uptake and the distribution between the roots and the aerial parts is highly dependent on the species of plant (ATSDR, 2008). Teas and some herbs may bioconcentrate aluminum; however, these items are unlikely to contribute significantly to the diet. Aluminum does not accumulate significantly in cow's milk or beef, and is not expected to undergo biomagnification in terrestrial food chains. For these reasons biotransfer is not expected to contribute significantly to human exposure and biotransfer factors are not compiled or estimated.

3.0 Toxicokinetics

Aluminum is poorly absorbed following inhalation exposure (ATSDR, 2008). Evidence suggests that the epithelium of the upper and lower respiratory tract can absorb aluminum, and that absorption is somewhat more efficient for aluminum fumes (occupational exposure) rather than dust. Aluminum can be retained in the lungs for long periods. Also, it has been shown that aluminum absorbed by the olfactory epithelium can reach the brain directly via axonal transfer.

Dietary aluminum is absorbed from the GI tract in the range of 0.1 to 0.3 or perhaps 0.5 percent (ATSDR, 2008). Unusually bioavailable forms such as carboxylic acid complexes may be absorbed at 1 percent of the administered dose. Ingestion of large amounts of aluminum in antacid preparations can increase total absorption, but factors other than the amount ingested appear to reduce the proportion of the total dose that is absorption.

ATSDR (2008) concluded that aluminum is "essentially not absorbed dermally," although the data are confusing and one study in mice verifies that dermal uptake occurs. Quantitative data were not located.

Normal humans have a body burden of aluminum in the 30 to 50 mg range, with approximately one-half located in the skeleton and one-fourth in the lungs (ATSDR, 2008). Body burden generally increases with age. The amount in the lungs probably reflects accumulation from inhalation of aluminum in dust. Levels in brain tissue range from 0.25 to 0.75 mg/kg wet weight in the white matter and approximately twice that in the gray matter.

Aluminum following inhalation exposure is associated largely with the lungs and thoracic lymph nodes (ATSDR, 2008). In humans, increased levels are seen also in the liver and spleen. Increased levels in these tissues have not been seen in animals exposed via inhalation. Some

inhaled particulates are cleared from the respiratory tract by mucocilliary elevation and are swallowed, thereby becoming available for GI absorption.

Animal studies with ingested aluminum suggest that distribution is preferentially to various regions of the brain (ATSDR, 2008). Prolonged studies with rats indicate that distribution also occurs to bone, muscle and kidneys, but that tissue levels return to normal shortly after exposure ceases. Limited evidence in animals suggests that transplacental distribution and excretion via lactation also occur. Vitamin D and related compounds may increase uptake and tissue retention. Distribution studies following administration by various parenteral routes yielded quite variable results, suggesting that the target tissues may be specific to the form of aluminum administered. The brain was clearly not reported as the most predictable target tissue for all forms of aluminum administered to all species by parenteral routes.

Aluminum in the body may occur in the form of free ions (Al^{+3}), low-molecular-weight complexes (particularly stable chelates), macromolecular complexes, or covalently bound macromolecular complexes (ATSDR, 2008). All forms may be metabolically active. Essentially irreversible complexes may be formed in the nucleus and chromatin material of the cell.

The kidney is the primary organ for excretion of absorbed aluminum (ATSDR, 2008). Urinary excretion patterns after inhalation exposure (i.e., prolongation of elevated urinary levels of aluminum) indicate that body burden and excretion half-life both increase with prolonged exposure. Excretion is lower in premature infants than full-term infants, probably because glomerular filtration is underdeveloped before birth. This suggests that the unborn and premature may be unusually sensitive to the effects of aluminum.

4.0 Dermal Exposure

As noted above, ATSDR (2008) concluded that aluminum is essentially not absorbed dermally. Therefore, the likelihood of systemic toxic effects arising from dermal exposure to aluminum is very small, and no attempt is made to quantify dermal uptake or risk.

5.0 Noncancer Effects Evaluation

Aluminum is relatively nontoxic via ingestion to physiologically normal humans, but recently concern has arisen regarding neurological effects, including Alzheimer's disease and similar forms of dementia (EPA, 2006). Much of this concern stems from studies with large oral doses of soluble aluminum salts (e.g., aluminum hydroxide) and from medical procedures that bypass the GI absorption barrier (i.e., parenteral administration). A review of several animal studies with many different forms of aluminum suggests that the developing infant is potentially the most sensitive member of the human population. A provisional chronic oral RfD of 1E+0 mg/kg-day was derived from a LOAEL of 100 mg/kg-day for minimal and equivocal neurological effects in the offspring of mice. The mice were fed diets fortified with aluminum lactate throughout gestation and lactation. An uncertainty factor of 100 (factor of 10 for interspecies extrapolation, and factors of 3 each for a minimal LOAEL and for intraspecies variation) was used. Confidence in the oral RfD is low. The nervous system is the target organ for oral exposure to aluminum. (The nervous system rather than the CNS is chosen as the target organ because it cannot be stated unequivocally that some of the neurologic effects observed do not involve the peripheral nerves.)

EPA (1997) provides no subchronic oral RfD for aluminum, and one cannot be derived from the key study for the chronic oral RfD. Therefore, the chronic oral RfD of 1E+0 mg/kg-day is adopted as sufficiently protective for subchronic oral exposure.

Occupational exposure to aluminum metal dust and aluminum oxide is associated with pulmonary fibrosis and related respiratory effects such as cough, emphysema, pneumonia and decreased pulmonary function (ACGIH, 1991). The toxicity of occupational exposure to dusts of aluminum pyro powders is somewhat higher, and occupational exposure to salts such as the sulfate and chloride may yield hydrolysis to the corresponding acids, which are irritants in their own right. Pulmonary effects were also observed in animals exposed to powders and dusts of metallic aluminum and various aluminum compounds.

Results of testing Canadian gold and uranium miners prophylactically treated with aluminum oxide powders to prevent silicosis associated aluminum exposure with impaired cognitive performance (EPA, 2006). The likelihood of cognitive impairment was directly related to the duration of exposure. Neurological performance was also impaired in aluminum foundry workers exposed to fumes and aluminum dust (4.6 to 11.5 mg aluminum/m^3) for a mean of 12 years. Other studies also implicate aluminum as a cause of neurological impairment and neurophysical effects in exposed smelter workers and aluminum welders. A provisional inhalation RfC is based on the LOAEL of 4.6 mg aluminum/m^3 in the study of foundry workers described above. The lower end of the exposure concentration adjusted for intermittent exposure is 1.64 mg/m^3. Application of an uncertainty factor of 300 (factors of 10 each to estimate a NOAEL from a LOAEL and for interspecies extrapolation, and a factor of 3 to address deficiencies in the inhalation toxicity data base) yields an RfC of 5E-3 mg/m^3, which is equivalent to a chronic inhalation RfD of 1.4E-3 mg/kg-day. Confidence in the inhalation RfC is medium. The nervous system is the target organ for inhalation exposure to aluminum.

EPA (1997) provides no subchronic inhalation RfC for aluminum, nor can one be estimated from the key study used for the chronic RfC. Therefore, the chronic inhalation RfC of 5E-3 mg/m^3 (1.4E-3 mg/kg-day) is adopted as sufficiently protective for subchronic oral exposure.

6.0 Carcinogenicity Evaluation

EPA (2006) reviewed the human and laboratory animal data regarding the potential carcinogenicity of aluminum and concluded that the carcinogenicity cannot be determined. The human data are insufficient for drawing conclusions and the animal data are largely negative. Potency factors are not derived.

7.0 Toxicity Summary

Toxicity values for aluminum are summarized as follows:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
1E+0	1E+0	NS	5E-3/ 1.4E-3	5E-3/ 1.4E-3	NS	D	ND	D	ND	ND
sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per										

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi

kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ or critical effect abbreviations: NS = nervous system.
[a]Dermal exposure is not evaluated.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2008, ***Update Toxicological Profile for Aluminum***, U.S. Department of Health and Human Services, Atlanta, Georgia, September.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, ACGIH, Cincinnati, OH, pp. 46-47.

Elinder, C-G. and B. Sjogren, 1986, "Aluminum," in Friberg, L., G.F. Nordberg and V.B. Vouk, 1986, ***Handbook on the Toxicology of Metals,*** Second Edition, Volume II: Specific Metals, Elsevier Science Publishers, New York, NY, pp. 1-25.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

U.S. Environmental Protection Agency (EPA), 1995, “40 CFR 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System; Final Rule,” ***Federal Register***, 60(56); 15366-15425.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 2006, ***Draft Provisional Peer-Reviewed Toxicity Values for Aluminum (CASRN 7429-90-5)***, National Center for Environmental Assessment, Cincinnati, OH, 23 October.

ANTIMONY (7440-36-0)

1.0 Introduction and Physical Properties

Antimony is a naturally occurring brittle **metal** that is not readily fabricated (ATSDR, 1992). It is alloyed with lead and other metals, imparting hardness, mechanical strength, corrosion resistance, electrochemical stability, and decreased coefficient of friction. Major applications include its use in grid metal in acid storage batteries, solder, sheet metal and pipe, bearing metal, castings, ammunition and type metal. Antimony trioxide is used as a fire retardant in plastics and textiles. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
121.75[a] (Element)	NA	NA	45[b]	NA	NA	NA	Note[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[b]Baes, C.F., R.D. Sharp, A.L. Sjoreen, R.W. Shor, 1984, ***A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture***, Health and Safety Division, Oak Ridge National Laboratory, ORNL-5786, September.
[c]Agency for Toxic Substances and Disease Registry (ATSDR), 1992, ***Toxicological Profile for Antimony***, U.S. Department of Health and Human Services, Atlanta, Georgia, December, on line.
Note 1: Solubility of antimony compounds varies from essentially insoluble to slightly soluble in water. The exception is antimony trichloride (6.0E+6 mg/L at 0°C).

2.0 Environmental Fate and Transport

Antimony is naturally present in the earth's crust and is released to the environment in windblown dust, from volcanic eruptions, sea spray, forest fires, and biogenic sources (HSDB, 2010). The majority of antimony released to the environment arises from anthropogenic sources, including nonferrous metal mining, smelting and refining, and the production, use and disposal of antimony alloys and compounds. Coal combustion and refuse and sludge combustion are other major anthropogenic sources of antimony.

The sorption and mobility of antimony released to soil is determined by the nature of the soil, the form of antimony deposited on the soil, and the pH (ATSDR, 1992; HSDB, 2010). Antimony is strongly sorbed to most soils. After prolonged leaching, the residual antimony appears to convert to a less mobile form, thereby reducing the potential for future leaching. This is reflected in the concentration versus depth profiles in contaminated soil; the concentration of antimony is highest in the surface layer of soil. Adsorption to soil correlates with the iron, manganese, and aluminum content of the soil with which it coprecipitates as hydroxylated oxides. Adsorption of antimony in soil is not correlated with organic carbon content, although this might be expected because of antimony's occurrence in anionic species. Leaching increases markedly at pH excursions above or below neutrality. There is little information on the forms of antimony in soil and the transformations that may occur in soil. During weathering, sulfitic minerals may be converted to oxides. Results of a sequential extraction study of soil at a smelter site showed that three-quarters of the antimony was in a residual form (extractable with aqua regia) and the rest of the antimony

was equally distributed among five more labile forms. At the control site, all of the antimony was in the five more labile forms.

Antimony released into waterways from natural weathering of soils and anthropogenic sources will be transported in streams and rivers and settle out in areas of active sedimentation; e.g., where a river empties into a bay (HSDB, 2010). Antimony appears to be strongly bound to sediment in association with iron, manganese, and aluminum hydroxyoxides. Antimony in the dissolved state in both fresh water and seawater is largely in the +5 oxidation state; the primary species is the anion $[Sb(OH)_6]^-$. A much smaller amount, predominantly in anaerobic waters, occurs in the +3 oxidation state, probably as the neutral species $Sb(OH)_3$. Thiocomplexes of Sb(III) may also occur in the anaerobic zone. Antimony can be reduced and methylated by microorganism in anaerobic sediment, releasing volatile methylated antimony compounds, which are both soluble and readily oxidized. Methylstibonic acid and dimethylstibonic acid have been found in seawater and estuarine water. In a study in the Baltic Sea these species constituted about 10 percent of dissolved antimony in the water column.

Antimony in the ambient air will exist entirely in particulate form or adsorbed to particulate matter (HSDB, 2010). It will be dispersed by the wind and removed from the atmosphere by gravitational settling, dry deposition, washout by rain (attachment to water droplets occurring within a cloud), and rainout (attachment to water droplets occurring below a cloud). The removal rate and distance traveled from the source will depend on source characteristics (e.g., stack height), particle size and density, and meteorological conditions. Gravitational settling governs the removal of large particles (>5 um), such as that associated with wind blown dust, whereas dry and wet deposition govern the removal of small particles. Large particles may have atmospheric half-lives of the order of hours, whereas very small particles may have atmospheric half-lives as long as 30 days.

Most anthropogenic emissions of antimony are from combustion processes. These emissions are primarily associated with small (submicron) particles, because antimony volatilizes during the combustion process and recondenses in the stack. A model that relates particle size to volatility estimates a mean atmospheric half-life for antimony of 1.9 days; for the more volatile antimony trioxide, the half-life is 3.2 days. The ratio of wet-to-dry deposition generally increases with decreasing particle size; therefore, a larger proportion of antimony will be found in rain compared with most other metals. A study of wet and dry deposition on an island in the German Bight far from anthropogenic sources found 87 percent of antimony dissolved in rain, 11 percent as particulate matter in rain, and only 2 percent as dry deposition.

Bioconcentration studies and field studies suggest that antimony does not bioconcentrate significantly in fish and aquatic organisms, and does not participate significantly in food-chain pathways (HSDB, 2010, EPA, 1995). Therefore, biotransfer factors are not developed for antimony.

3.0 Data for Evaluating Dermal Exposure

Estimates of the GI absorption of antimony tartrate and antimony trichloride by animals range from two to seven percent (ATSDR, 1992); ten percent is recommended as a reference value for humans for GI absorption of antimony tartrate. Although empirical data are lacking, one percent is recommend for other forms of antimony. The key study for development of the chronic oral

RfD used potassium antimony tartrate administered to rats and mice (EPA, 2010), for which EPA (2004) estimated a GI absorption efficiency of 15 percent. Therefore, the GAF of 15 percent (0.15) is chosen for this evaluation.

Data were not located regarding the extent of dermal uptake of antimony from soil. EPA (2004) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. Empirical data regarding the uptake of soluble forms of antimony from water were not located. The EPA (2004) default K_p for inorganic chemicals of 1E-3 cm/hour is selected for antimony.

4.0 Noncancer Effects Evaluation

Acute intoxication from ingestion of large doses of antimony induces GI disturbances, dehydration and cardiac effects in humans (Iffland, 1988). Chronic oral exposure studies in laboratory animals include two briefly reported lifetime drinking water studies in rats and mice (EPA, 2003a). The only dose tested, 5 parts per million (ppm) potassium antimony tartrate, resulted in reduced longevity in both species, altered blood chemistry and reduced mean heart weight in the rats. EPA (2010) verified an RfD of 4E-4 mg/kg-day for chronic oral exposure to antimony from the LOAEL of 5 ppm potassium antimony tartrate (0.35 mg antimony/kg body weight-day) in the lifetime study in rats. An uncertainty factor of 1000 was applied; factors of 10 each for inter- and intraspecies variation and to estimate a no-observed-adverse-effect level (NOAEL) from a LOAEL. Confidence in the oral RfD is low. The heart is considered a likely target organ for chronic oral exposure of humans.

EPA (1997) adopted the verified chronic oral RfD of 4E-4 mg/kg-day as sufficiently protective for subchronic oral exposure.

EPA (2010) has not identified an RfC for antimony. EPA (2010) verified an RfC for antimony trioxide of 2E-4 mg/m^3.

5.0 Carcinogenicity Evaluation

Empirical data were not located regarding the carcinogenicity of antimony to humans. Antimony has not undergone a complete EPA (2010) evaluation for human carcinogenic potential.

6.0 Toxicity Summary

Toxicity values for antimony are summarized below. In addition to the EPA (2010) evaluation of oral exposure to antimony and inhalation exposure to antimony trioxide, EPA (1997) previously derived provisional chronic and subchronic oral RfDs for several specific antimony compounds. These RfDs were derived by analogy to antimony (i.e., the EPA [2010] evaluation) by assuming that toxicity was limited to the antimony moiety alone, and by correcting for differences in molecular weight. Ordinarily, antimony is not speciated when analyzed in environmental media, in which case the RfDs for antimony rather than the specific antimony compounds should be used. Nonetheless, the RfDs for the specific antimony compounds are included in the following table:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
Antimony (not otherwise specified)										
4E-4	4E-4	H	ND	ND	NA	D	NA	D	NA	NA
Antimony Pentoxide										
5E-4	5E-4	H	ND	ND	NA	D	NA	D	NA	NA
Antimony Potassium Tartrate										
9E-4	9E-4	H	ND	ND	NA	D	NA	D	NA	NA
Antimony Tetroxide										
4E-4	4E-4	H	ND	ND	NA	D	NA	D	NA	NA
Antimony Trioxide										
4E-4	4E-4	H	ND	2E-4/ 5.7E-5[b]	Lu[b]	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ abbreviations: H = heart; Lu = lung.
[a]sRfDo and cRfDo should be adjusted by the GAF of 0.15 when used for dermal exposure.
[b]Applicable to antimony and all its compounds if it is assumed that all have similar effects following inhalation exposure.

7.0 References:

Agency for Toxic Substances and Disease Registry (ATSDR), 1992, ***Toxicological Profile for Antimony***, U.S. Department of Health and Human Services, Atlanta, Georgia, December, on line.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Iffland, R., 1988, "Antimony, In: Seiler, H.G., H. Sigel and A. Sigel, Eds., ***Handbook on Toxicity of Inorganic Compounds***, New York: Marcel Dekker, Inc., pp. 67-76.

U.S. Environmental Protection Agency (EPA), 1995, “40 CFR 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System; Final Rule,” ***Federal Register***, 60(56); 15366-15425.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Emergency and Remedial Response, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

ARSENIC (7440-38-2)

1.0 Introduction and Physical Properties

Arsenic is a natural **metalloid**, the 20th most abundant element in the earth's crust that occurs in both inorganic and organic forms (ATSDR, 2000; HSDB, 2010). Elemental arsenic is a steel-grey material that may occur naturally. However, arsenic is usually found in the environment combined with other elements such as oxygen, chlorine, and sulfur. Most inorganic and organic arsenic compounds are non-volatile, odorless and tasteless white or colorless powders. Inorganic arsenic occurs naturally in soil and in many kinds of rock, especially in minerals and ores that contain copper or lead. Inorganic arsenic is more toxic than organic forms. Major uses of arsenic in the U.S. include its incorporation into wood preservatives and other agricultural chemicals. It is also used as a metal in various electrical devices and is alloyed with lead and copper in the manufacture of lead bullets or shot (Lewis, 1997). Arsenic is also a component of the chemical warfare agent Lewisite (Opresko et al., 1998). Lewisite is manufactured by the condensation of arsenic trichloride with acetylene in the presence of aluminum, copper or mercuric chloride (Lewis, 1997). Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
74.92[a]	NA	NA	2.9E+1[b]	NA	NA	Note 1[c]	Note 2[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
Note 1: Variable: inorganic arsenic compounds are not likely to volatilize; some organic arsenic compounds are low-boiling liquids or gases at normal temperatures.
Note 2: Variable: inorganic arsenic compounds range from practically insoluble to freely miscible in water; most organic arsenic compounds are not readily soluble, most arsenic acid compounds are soluble to freely miscible.
[a] Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line, accessed 21 April.
[b]U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***,, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, December.
[c]Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Arsenic***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

2.0 Environmental Fate and Transport

The production of arsenic and its use in nonferrous alloys and in the manufacture of semiconductors may result in its release to the environment through various waste streams HSDB, 2010). Other important anthropogenic releases are metal smelting, coal burning, and other industrial activities. Arsenic may be present at military sites as a result of training with or demilitarization or disposal of Lewisite. Most (approximately 80 percent) of anthropogenic releases are initially to soil (ATSDR, 2000).

Arsenic occurs in the air as a combination of trivalent and pentavalent forms almost entirely adsorbed to small particles that permit dispersion over long distances (ATSDR, 2000). Residence time in the atmosphere averages approximately nine days. Removal is largely by wet and dry deposition. Arsenic in surface water can undergo a variety of reactions and exist as several different soluble compounds. Sorption to sediment is often an important removal process, but biotransformation in sediment may return soluble forms to the water. Arsenic in soil generally exists as insoluble forms sorbed to clay or organic matter or complexed with calcium or iron.

Mobility is low and leaching is not generally significant, except that increasing soil pH can dramatically increase solubility and mobility.

Arsenic has been shown to bioconcentrate in aquatic organisms, mainly at the water-algae interface (ATSDR, 2000). There is no evidence for biomagnification through the various trophic levels, nor do there appear to be significant differences between bottom-feeders and predatory fish. Arsenic is among the metals listed as being of no concern for bioaccumulation in fish (EPA, 1995). Empirical data suggest that bioconcentration through terrestrial food chain pathways is unlikely to be significant (ATSDR, 2000). Therefore, biotransfer factors are not developed for arsenic.

3.0 Toxicokinetics

All forms of inorganic arsenic are readily absorbed by the lungs and GI tract; the extent of absorption is greater for more soluble compounds than for more insoluble compounds (ATSDR, 2000). Dermal absorption has not been well characterized but is significantly less than inhalation or oral absorption. GI and dermal absorption of arsenic from soil is much lower than from aqueous solution. Distribution is generally widespread throughout the body following absorption.

Metabolism of inorganic arsenic involves reduction of As^{+5} to As^{+3}, and oxidation of As^{+3} to As^{+5} so that arsenic is present systemically as a mixture of arsenate and arsenite (ATSDR, 2000). Arsenite is readily oxidized and methylated primarily in the liver to form the organic compounds monomethyl arsonic acid and dimethyl arsinic acid, which are rapidly excreted in the urine.

4.0 Dermal Exposure

EPA (2004) concluded that a GAF should not be estimated for the purpose of adjusting oral toxicity values for dermal exposure. Therefore, the oral toxicity values described below are used directly without adjustment for evaluating dermal exposure.

EPA (2004) cites empirical data indicating that dermal uptake of arsenic from soil approximates 3 percent. The ABS of 0.03 recommended by EPA (2004) is used herein. Empirical data regarding the uptake of soluble forms of arsenic from water were not located. The EPA (2004) default K_p for inorganic chemicals of 1E-3 cm/hour is selected for arsenic.

5.0 Noncancer Effects Evaluation

Inorganic arsenic may be an essential nutrient, at least for food-producing domestic animals, exerting beneficial effects on growth, health and feed conversion efficiency (Underwood, 1977). A lethal dose of arsenic trioxide in humans is 70-180 mg, approximately 50 to 140 mg arsenic (Ishinishi et al., 1986). Acute oral exposure of humans to high doses of arsenic produces liver swelling, skin lesions, disturbed heart function and neurological effects. The only noncancer effects in humans clearly attributable to chronic oral exposure to arsenic are dermal hyper pigmentation and keratosis, as revealed by studies of several hundred Chinese exposed to naturally occurring arsenic in well water (EPA, 2010). Similar effects were observed in persons exposed to high levels of arsenic in water in Utah and the northern part of Mexico. EPA (2010) verified an RfD of 3E-4 mg/kg-day for chronic oral exposure, based on a NOAEL of 8E-4 mg/kg-day for hyper pigmentation and kertatosis of the skin from the Chinese data. An uncertainty factor of 3 was applied. An increased incidence of Blackfoot disease was also observed, which may not be related to arsenic alone. Goyer (1991) describes black-foot disease

as a peripheral vascular disorder manifested as acrocyanosis and Raynaud's disease, which may progress to gangrene. EPA (2010) notes that the skin is the more sensitive target organ. Nonetheless, in keeping with EPA (1989) guidance regarding selection of target organ, both the skin and peripheral vascular system are selected as target organs for prolonged oral exposure to arsenic. Confidence in the RfD is medium.

The available data do not suggest a significant difference between chronic and subchronic exposure regarding the threshold for noncancer effects. Therefore, EPA (1997) adopted the chronic oral RfD as the provisional subchronic oral RfD for arsenic.

Occupational (predominantly inhalation) exposure is also associated with neurological deficits, anemia, and vascular effects (Ishinishi et al., 1986). However, concomitant exposure to other chemicals cannot be ruled out in the occupational studies. Therefore, the data are not sufficient for estimation of an inhalation RfC.

6.0 Carcinogenicity Evaluation

Inorganic arsenic is clearly a carcinogen in humans. Inhalation exposure is associated with increased risk of lung cancer in persons employed as smelter workers, in arsenical pesticide applicators, and in a population residing near a pesticide manufacturing plant (EPA, 2010). Oral exposure to high levels in well water is associated with increased risk of skin cancer and several forms of internal cancer, although the role of other chemicals in the internal cancers is unclear. Extensive animal testing with various forms of arsenic given by many routes of exposure to several species, however, has not demonstrated the carcinogenicity of arsenic, indicating that the common laboratory animals are not good models for carcinogenicity to humans. EPA (2010) classified inorganic arsenic in cancer weight-of-evidence Group A (human carcinogen), and recommended an oral SF of 1.5E+0 per mg/kg-day, based on the incidence of skin cancer in the Chinese study. EPA (200) noted that arsenic probably functions via several different mechanisms of toxicity not including direct interaction with DNA. These appear to obey thresholds or to generate a non-linear slope that approaches 0 in the low-dose range. The SF probably exaggerates cancer risk in the low dose range associated with most environmental exposures, although the extent is unclear.

An inhalation URF of 4.3E-3 per $\mu g/m^3$, equivalent to an inhalation SF of 1.5E+1 per mg/kg-day, was derived for inorganic arsenic from the incidence of lung cancer in occupationally exposed men (EPA, 2010).

7.0 Toxicity Summary

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
3E-4	3E-4	S, PVS	ND	ND	NA	A	1.5E+0	A	4.3E-3	1.5E+1

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
data; NA = not applicable. Target organ or critical effect abbreviations: S = skin; PVS = peripheral vascular system. [a]sRfDo, cRfDo and SFo should be used for dermal exposure without adjustment for GI absorption.										

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Arsenic***, Draft for Public Comment, U.S. Public Health Service, Atlanta, Georgia, September, on line.

Goyer, R.A., 1991, "Toxic Effects of Metals," in ***Casarett and Doull's Toxicology, The Basic Science of Poisons***, Fourth Edition, Amdur, M.O., J. Doull and C.D. Klaassen, Eds., Pergamon Press, New York, pp. 623-680.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Ishinishi, N., K. Tsuchiya, M. Vahter and B.A. Fowler, 1986, "Arsenic," In: Friberg, L., G.F. Nordberg and V.B. Vouk, Eds., ***Handbook on the Toxicology of Metals***, Volume II, Second Edition, New York: Elsevier Science Publishers B.V., pp. 43-83.

Lewis, R.J., Sr., 1997, ***Hawley's Condensed Chemical Dictionary***, Thirteenth Edition, John Wiley & Sons, Inc., New York, pp. 92-93.

Opresko, D.M., R.A. Young, R.A. Faust, et al., 1998, "Chemical Warfare Agents: Estimating Oral Reference Doses," ***Reviews in Environmental Contamination and Toxicology***, 156: 1-183.

Underwood, E.J., 1977, ***Trace Elements in Human and Animal Nutrition***, Fourth Edition, New York: Academic Press, pp. 424-429.

U.S. Environmental Protection Agency (EPA), 1989, ***Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)***, Interim Final, Office of Emergency and Remedial Response, Washington, DC, EPA/540/1-89/002, December.

U.S. Environmental Protection Agency (EPA), 1995, "40 CFR 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System; Final Rule," ***Federal Register***, 60(56); 15366-15425.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

BERYLLIUM

Beryllium is a naturally occurring **metal**, which is used in its pure state or as alloys in a wide variety of electrical components, tools, optical components, precision instruments, structural components of aircraft, missiles and satellites, and other metal-fabricating applications (ATSDR, 2000; HSDB, 2010. Beryllium oxide is used in high-technology ceramics, electronic heat sinks, and several refractory applications. Relevant physical properties are compiled below:

MW (g/mole)	log K_{ow} (unitless)	H (atm-m^3/mole)	K_d (L/kg)	D_a (cm^2/s)	D_w (cm^2/s)	VP (atm)	S (mg/L)
9.01[a] (element)	NA	NA	7.9E+2[b]	NA	NA	ND	Note 1[c]

NA = not applicable, ND = no data.
Note 1: Beryllium chloride (typical soluble salt): very soluble.
[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[b]U.S. Environmental Protection Agency (EPA), 2002 ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, December.
[c]Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Beryllium***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

Although beryllium is a naturally occurring metal, the predominant release to the atmosphere is emissions from fossil fuel combustion, particularly coal (ATSDR, 2000; HSDB, 2010). Beryllium production and use in alloys, microelectronics, aerospace technology, as a solid-propellant in rocket fuels, in aircraft brakes, X-ray windows, and neutron reflectors contribute small amounts to the environment. Beryllium exists in air as particulates that are subject to wet and dry deposition. Smaller particles may travel large distances before removal from the air.

Deposition from the atmosphere and waste disposal contributes beryllium to soil (ATSDR, 2000; HSDB, 2010). Beryllium is expected to be essentially immobile in soil regardless of pH or the presence or absence of specific soil constituents; therefore, leaching to groundwater is not expected to be significant. Beryllium in surface water tends to form insoluble beryllium hydroxide or sorb to suspended mineral solids and sediments in water; very little beryllium exists in a soluble form.

Beryllium is not expected to bioconcentrate or reach significance in aquatic or terrestrial chain pathways (ATSDR, 2000). Therefore, biotransfer factors for beryllium are not compiled. A GAF of 0.01 is chosen for this evaluation (EPA, 2004).

Data were not located regarding the extent of dermal uptake of beryllium from soil, and EPA (2004) provides no estimate of the extent of dermal absorption (ABS). EPA (2004) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. Empirical data regarding the uptake of soluble forms of beryllium from water were

not located. The EPA (2004) default PC for inorganic chemicals of 1E-3 cm/hour is selected for beryllium.

A (172-week) dietary study in dogs identified GI lesions as the critical effect of chronic ingestion exposure to beryllium (EPA, 2010). A verified chronic oral RfD of 2E-3 mg/kg-day was based on a BMD_{10} (statistical estimate of a dose level associated with a 10 percent dose rate) of 4.6E-1 mg/kg-day in the dog study. An uncertainty factor of 300 was applied. Confidence in the RfD is low to medium. The GI tract is the target organ for chronic oral exposure.

Occupational exposure is associated with dermatitis, acute pneumonitis and chronic pulmonary granulomatosis (Reeves, 1986), also known as berylliosis or chronic beryllium disease. Berylliosis has also been observed in humans living in the vicinity of a beryllium plant. Similar pulmonary effects were observed in laboratory animals subjected to inhalation exposure. A verified chronic inhalation RfC of 2E-2 mg/m^3 was based on a LOAEL of 2.0E-1 μg/m^3 in an occupational study, and a NOAEL of 1.0E-2 to 1.0E-1 μg/m^3 in a community exposure study (EPA, 2010). The critical endpoint is beryllium sensitization and progression to berylliosis. An uncertainty factor of 10 was used. The target organ for inhalation exposure to airborne beryllium is the lung. Confidence in the inhalation RfC is medium. The RfC is equivalent to a chronic inhalation RfD of 5.7E-6 mg/kg-day.

EPA (2010) classified beryllium in cancer weight-of-evidence Group B1 (probable human carcinogen) based on limited human (occupational) cancer data and sufficient animal data. A significant increase in lung tumors occurred in rats and in rhesus monkeys subjected to inhalation exposure or intratracheal instillation of a variety of beryllium compounds. Osteogenic sarcomas were induced in rabbits and mice, but not in rats or guinea pigs, injected intravenously with various beryllium compounds. A verified inhalation URF of 2.4E-3 per μg/m^3 equivalent to an SF of 8.4E+0 per mg/kg-day was derived from an occupational study. The B1 classification applies only to inhalation exposure. Oral studies in animals yielded inconclusive results. EPA (2010) concluded that the potential carcinogenicity of oral exposure of humans to beryllium cannot be determined.

References for Beryllium

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Beryllium***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, last accessed 19 July.

Reeves, A.L., 1986, "Beryllium," In: L. Friberg, G.F. Nordberg and V.B. Vouk, eds., ***Handbook on the Toxicology of Metals***, Volume II, New York: Elsevier Science Publishers B.V. pp. 95-116.

U.S. Environmental Protection Agency (EPA), 1994, ***Risk Assessment Issue Paper for: Review of Oral and Dermal Absorption Factors and Assessment of Beryllium (CASRN 7440-41-7)***, National Center for Environmental Assessment, Cincinnati, OH, May 12.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

CADMIUM (7440-43-9)

1.0 Introduction and Physical Properties

Cadmium is a metal naturally present in the earth's crust at low concentrations. It occurs frequently with zinc and lead in sulfide ores (Friberg et al., 1986). Cadmium is used in electroplating, alloys, photoelectric cells, storage batteries, ceramics, paints, the nuclear industry, photography, plastics, and, formerly, as a fungicide (ATSDR, 1999). Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
112.41[a] (Element)	NA	NA	7.5E+1[b]	NA	NA	NA	Note 1[a]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
Note 1: Cadmium chloride (typical soluble salt): freely soluble.
[a]Agency for Toxic Substances and Disease Registry, (ATSDR), 1999, ***Update Toxicological Profile for Cadmium***, U.S. Public Health Service, Atlanta, Georgia, July, on line.
[b]U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Final, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, December.

2.0 Environmental Fate and Transport

Anthropogenic releases to the environment include mining and smelting, fuel combustion, disposal of cadmium-containing products, manufacture or application to soil of phosphate fertilizer, application of sewage sludges, industrial uses, waste incineration, and fossil fuel combustion (ATSDR, 1999). Cadmium in the air exists in the form of small particulates that are subject to long distance transport. Wet deposition is the main removal process. Cadmium may exist in surface water largely as soluble salts. It may also form sparingly soluble salts and complex with humic material and eventually be deposited in the sediment, but alterations in redox potential, pH or salinity may cause release from sediment. Cadmium does not sorb strongly to soil constituents and may leach into water, particularly under acidic conditions.

Cadmium has been shown to bioaccumulate in aquatic and terrestrial food chains (ATSDR, 1999). Rapidly growing plants such as the water hyacinth have been proposed as a remedial mechanism to remove cadmium from domestic and industrial effluents. However, bioaccumulation in fin fish is not expected to be significant (ATSDR, 1999). Biotransfer factors for cadmium are compiled below:

BCF	Bpr	Bpv	Bb	Bm
NA	6.20E-2[a]	3.64E-1[a]	1.20E-4[a]	6.50E-6[a]

BCF = bioconcentration factor, L/kg; Bpr = soil-to-plant (reproductive portions) biotransfer factor, unitless; Bpv = soil-to-plant (vegetative portions) biotransfer factor, unitless; Bb = soil-

BCF	Bpr	Bpv	Bb	Bm
to-beef biotransfer factor, days/kg; Bm = soil-to-milk biotransfer factor, days/kg. [a]U.S. Environmental Protection Agency (EPA), 1998, ***Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volume Two***, Peer Review Draft, Office of Solid Waste and Emergency Response, Washington, DC, EPA530-D-98-001B, July.				

3.0 Data for Evaluating Dermal Exposure

GI absorption of ingested cadmium is ordinarily 5 to 8%, but may reach 20% in cases of serious dietary iron deficiency (Friberg et al., 1986). The GAF of 0.025 assumed for uptake of cadmium from food (EPA, 2010, 2004) is used for development of the dermal RfD. The ABS of 1E-3, based on empirical data (EPA, 2004), is used for dermal uptake from soil or sediment. The EPA (2004) recommended K_p of 1.1E-3 cm/hour for cadmium compounds based on empirical data for cadmium chloride is selected for this evaluation.

4.0 Noncancer Effects Evaluation

Acute inhalation exposure to fumes or particles of cadmium induces respiratory symptoms, general weakness, and, in severe cases, respiratory insufficiency, shock and death (Friberg et al., 1986). Acute oral exposure induces gastrointestinal disturbances. Chronic inhalation exposure induces pulmonary emphysema, and chronic exposure by either inhalation or oral exposure consistently produces renal tubular disease in humans and laboratory animals. Proteinuria is a reliable early indicator of cadmium-induced kidney disease. The combination of pulmonary emphysema and renal tubular disease, if severe, may result in early mortality. Painful osteomalacia and osteoporosis may arise from altered metabolism of bone minerals secondary to renal damage. The combination of renal and skeletal damage is called *itai-itai* (“ouch-ouch") disease in Japan. Cadmium exposure is associated also with liver damage, but the liver appears to be less sensitive than the kidney. The kidney tubule is the primary target organ of cadmium toxicity. Free cadmium ions may interfere with the subcellular enzymatic processes of the renal tubular cells (ATSDR, 1999). EPA (2010) verified chronic oral RfD values of 5E-4 mg/kg-day for cadmium ingested in water and 1E-3 mg/kg-day for cadmium ingested in food, based on a toxicokinetic model that predicts NOAELs from renal cortical concentrations of cadmium and an uncertainty factor of 10. The different RfD values reflect assumed differences in GI absorption of cadmium from water (5 percent) and food (2.5 percent). The RfD of 1E-3 mg/kg-day is used for all solid media and food-chain pathways, and serves as the basis for development of the dermal RfD. The RfD of 5E-4 mg/kg-day is used only for water ingestion. Confidence in the oral RfD values is high.

No subchronic oral RfDs were located for exposure to cadmium. Therefore, the chronic oral RfD of 1E-3 for all solid media and food-chain pathways, and 5E-4 for water ingestion is adopted as sufficiently protective for subchronic exposure as well.

No verified RfC is listed on IRIS. ATSDR (2008) lists a chronic inhalation minimal risk level (MRL) of 1E-5 mg/m^3. This MRL was modeled from occupational studies, based on the air concentration (combined with other sources) that would result in a 10 percent increase in β2-microglobulin proteinuria expressed as µg/g urinary cadmium in creatinine. This urinary cadmium concentration corresponds to 1.35 µg/g creatinine. The lower 95 percent confidence limit on this value is 0.5 µg/g (cadmium/creatinine). The environmental model predicted that 0.1

1E-4 µg/m^3 cadmium oxide, combined with a dietary cadmium intake of 3E-4 mg/kg-day, would result in a urinary cadmium level of 0.4 µg/g creatinine. An uncertainty factor of 3 was used to account for human variability and a modifying factor of 3 was used because of inadequacies in the database (ATSDR, 2008). No subchronic RfC was identified; the chronic RfC is assumed to be adequately protective subchronic exposure.

5.0 Carcinogenicity Evaluation

Carcinogenicity data in humans consist of several occupational studies that associate cadmium exposure with lung cancer, but concomitant exposure to other carcinogenic chemicals and smoking were not adequately controlled (EPA, 2010). Other occupational studies reported significantly increased risk of prostatic cancer, but this effect was not observed in the largest occupational study of workers exposed to high levels. The animal data consist of an inhalation study in rats that showed a significant increase in lung tumors, and several parenteral injection studies that produced injection site tumors. The EPA (2010) classified cadmium a cancer weight-of-evidence Group B1 substance for inhalation exposure on the basis of limited evidence of carcinogenicity in humans and sufficient evidence in animals. EPA (2010) concluded that no positive studies suitable for quantitation were identified for oral administration. EPA (2010) derived an inhalation URF of 1.8E-3 per µg/m^3, equivalent to an SF of 6.3E+0 per mg/kg-day, from an occupational exposure study.

6.0 Toxicity Summary

Toxicity values for cadmium are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
1E-3[a,b]/ 5E-4[c]	1E-3[a,b]/ 5E-4[c]	K	1E-5/ 2.9E-6	1E-5/ 2.9E-6	K	ND	ND	B1	1.8E-3	6.3E+0

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ abbreviations: K = kidney.
[a]Solid media and food-chain pathways
[b]sRfDo and cRfDo should be adjusted for GI absorption by the GAF of 0.025 when used for dermal exposure. Adjusted values are appropriate for dermal exposure to soil or water.
[c]Water ingestion.

Agency for Toxic Substances and Disease Registry (ATSDR), 2008, ***Update Toxicological Profile for Cadmium***, Draft, U.S. Department of Health and Human Services, Atlanta, Georgia, September, on line.

Agency for Toxic Substances and Disease Registry (ATSDR), 1999, ***Update Toxicological Profile for Cadmium***, U.S. Department of Health and Human Services, Atlanta, Georgia, July, on line.

Friberg, L., T. Kjellström and G.F. Nordberg, 1986, "Cadmium," In: Friberg, L., G.F. Nordberg and V.B. Vouk, eds., ***Handbook on the Toxicology of Metals***, Volume II, Second Edition, Elsevier Science Publishers, B.V., New York, pp. 130-184.

U.S. Environmental Protection Agency (EPA), 2004a, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

CHROMIUM (7440-47-3)

1.0 Introduction and Physical Properties

Chromium is a naturally occurring **metal** (ATSDR, 2000). It occurs in several valence states; chromium (III) (16065-83-1) and chromium (VI) (18540-29-9) are the forms most commonly encountered in environmental media. Chromium is used largely in the metallurgical, refractory and chemical industries. The largest amount is used in the metallurgical industry in various steels and nonferrous alloys. The second largest use is by the chemical industry in pigments, metal finishing, leather tanning and wood treatment. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
52.00[a] (element)	NA	NA	1.8E+6 (CrIII) 1.9E+1 (CrVI)[b]	NA	NA	ND	Note 1[a]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable; ND = no data.
Note 1: Chromium compounds vary from insoluble to highly soluble.
[a]Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Toxicological Profile for Chromium***, U.S. Public Health Service, Atlanta, Georgia, September, on line.
U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.

2.0 Environmental Fate and Transport

Chromium is released into the atmosphere from natural gas, oil and coal combustion, and from use by the industries mentioned above (ATSDR, 2000). Other sources include wind transport from road dust, cement producing plants, the wearing down of asbestos brake linings from automobiles, incineration of municipal refuse and sewage sludge, exhaust emission from automotive catalytic converters, and emissions from cooling towers that use chromium compounds as rust inhibitors. Significant quantities of chromium are released to surface water from industrial use. Land disposal of chromium-containing commercial products, solid waste and slag from chromate manufacture, and coal ash, primarily from electric utilities and other operations that burn coal, are the major releases to soil.

Chromium releases from combustion processes and ore processing are generally in the form of chromium (III) oxide; however, chromium (VI) has been identified in fly ash from coal combustion at chromate manufacturing and user sites (ATSDR, 2000). Airborne chromium exists in particulate form that may travel great distances from the point of emissions; wet and dry deposition account for the majority of removal from air.

Most chromium released to surface water eventually adsorbs to particles and becomes deposited in bottom sediment, but small quantities may remain in the water in both soluble and insoluble forms (ATSDR, 2000). The soluble forms are usually chromium (VI) salts and soluble chromium (III) compounds. Chromium (VI) may be found in water, but eventually organic matter and other reducing agents will reduce chromium (VI) to chromium (III). Chromium in soil is present

mainly as insoluble chromium (III) carbonates and oxides that are unlikely to be mobile to any significant extent. However, soluble forms may also be present, depending on the form of the chemical released, that may be quite mobile in soil. Also, lower pH facilitates complexation with organic matter and increases mobility.

Empirical evidence suggests that chromium is unlikely to participate significantly in food chain pathways (ATSDR, 2000; EPA, 1995); therefore, biotransfer factors are not compiled.

3.0 Toxicokinetics

Identification of chromium in urine, serum and tissues of occupationally exposed humans confirms that soluble chromium (III) and chromium (VI) compounds are absorbed from the lung (ATSDR, 2000). The rate of absorption, however, depends largely on the physical and chemical characteristics of the chromium compound involved, as shown in numerous animal inhalation studies. Chromium (VI) compounds are more readily absorbed because the chromate anion participates in facilitated diffusion mechanisms not available to chromium (III).

Absorption of dietary sources of chromium from the GI tract in humans ranges from approximately 0.5 to 2 percent, as inferred from urinary excretion data (ATSDR, 2000). The extent of absorption appears to be inversely related to dietary chromium content. A review of several studies suggests that 0.4 to 14.5 percent of orally administered chromium not related to dietary sources is absorbed by the GI tract of humans, but valence and chemical form and nutritional status (fed vs. fasting) appear to influence efficiency of absorption (ATSDR, 2000). Chromium (VI) sources are more efficiently absorbed than chromium (III) sources as described above for inhalation exposure. Experiments with laboratory animals showed that the stomach has the ability to reduce chromium (VI) to chromium (III), reducing the extent of absorption when chromium (VI) compounds were administered *per os* compared with injection directly into the jejunum.

Both chromium (III) and chromium (VI) can penetrate intact human skin, and dermal uptake is increased if the skin is damaged (ATSDR, 2000). In some cases, dermal uptake was sufficient to result in signs of toxicity. The form and the vehicle greatly influence the rate of dermal uptake.

Inhaled particles of chromium compounds can remain in the lungs for years (ATSDR, 2000). Chromium absorbed into the blood is distributed throughout the body with highest levels frequently located in the kidneys. Chromium has been shown to cross the placenta and to be excreted via lactation. Autopsy studies in the US show that highest concentrations in newborns occur in the kidney, liver, aorta, heart, pancreas and spleen, and that tissue levels decline with age.

The main feature of the metabolism of chromium involves reduction of chromium (VI) to chromium (III) via the formation of chromium (V) and chromium (IV) intermediates (ATSDR, 2000). Reduction of chromium (VI) to chromium (III) occurs in the acid milieu of the stomach, primarily by reaction with ascorbate. Ascorbate, glutathione and other substrates effectively reduce absorbed chromium (VI) to chromium (III). Chromium (III) is considered a nutritionally essential element required for the proper metabolism of glucose, proteins and lipids. It acts as part of a complex known as GTF, which facilitates the action of insulin. Although chromium (III) complexes are generally thought to be inert, there is recent evidence that chromium (III)

may be reduced to chromium (II), which could catalyze the Haber-Weiss reaction resulting in the production of genotoxic hydroxyl radicals.

Absorbed chromium is excreted primarily in the urine (ATSDR, 2000).

4.0 Dermal Exposure

EPA (2004a) recommends GAFs of 0.013 for chromium (III) and 0.025 for chromium (VI), generally consistent with the toxicokinetic data reviewed above, which are used in this evaluation. The GAF of 0.013 for chromium (III) should be used for total chromium, which is assumed to consist of 6 parts of chromium (III) to 1 part of chromium (VI) (EPA, 2004b, 2010).

Data were not located regarding the extent of dermal uptake of chromium from soil, and EPA (2004a) provides no estimate of the extent of dermal absorption (ABS). EPA (2004a) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. EPA (2004a) compiled *in vivo* and *in vitro* data from human experiments of dermal uptake of chromium from water. Average K_p values of 1E-4 cm/hour and 1E-3 cm/hour are estimated for chromium (III) and chromium (VI), respectively. The K_p of 1E-4 cm/hour for chromium (III) should be used for total chromium as explained above.

5.0 Noncancer Effects Evaluation

As mentioned above, chromium (III) is an essential nutrient involved in maintenance of normal metabolism (ATSDR, 2000). EPA (2010) verified an RfD of 1.5E+0 mg/kg-day for chronic oral exposure to chromium (III) by applying an uncertainty factor of 1000 to a NOEL of 1800 g/kg (1.468 mg/kg body weight/day) as an average total ingested dose in a dietary study in which rats were given 600 feedings of chromic oxide baked into bread. No other dose levels were tested. Confidence in the RfD is low. No target organ or critical effect was identified for the toxicity of oral exposure to chromium (III).

The available data do not suggest a significant difference between chronic and subchronic exposure regarding the threshold for the noncancer effects of chromium (III). Therefore, EPA (1997) adopted the verified chronic oral RfD, which at the time was listed on IRIS as 1E+0 mg/kg-day, as the provisional subchronic oral RfD for chromium (III). Subsequently, EPA (2010) recalculated the average daily dose, which led to revising the chronic oral RfD from 1E+0 to 1.5E+0 mg/kg-day. Since the only change between the earlier and the present verified oral RfD reflects a recalculation, it is recommended that the current verified chronic oral RfD of 1.5E+0 mg/kg-day should also be used for subchronic exposure.

EPA (2010) verified an RfD for chronic oral exposure to chromium (VI) of 3E-3 mg/kg-day based on a NOAEL of 25 mg/L (2.5 mg/kg-day) in the drinking water of rats exposed for one year. An overall uncertainty factor of 900 was applied. The uncertainty factor consists of factors of 10 each for inter- and intra-species variation, a factor of 3 to expand from subchronic to chronic exposure, and a modifying factor of 3 to address concerns that relatively low levels may induce GI effects and possibly some forms of cancer in humans. Inclusion of the modifying factor of 3 was a relatively recent (1998) revision to a previously verified derivation. Nonetheless, EPA (2010) notes that confidence in the chronic oral RfD is low.

EPA (1997) presented a provisional subchronic oral RfD of 2E-2 mg/kg-day for chromium (VI) based on the same drinking water study and an uncertainty factor of 200 (not otherwise explained). Presumably, this derivation reflects the earlier IRIS evaluation before inclusion of the modifying factor of 3. However, the concern for GI effects that gave rise to the modifying factor could apply to subchronic as well as chronic exposure. Therefore, it is recommended that a new preliminary subchronic oral RfD should be calculated for chromium (VI). This is done by applying an overall uncertainty factor of 300 to the NOAEL of 2.5 mg/kg-day from the drinking water study. The uncertainty factor of 300 reflects the overall uncertainty factor of 900 used for the chronic RfD without the factor of 3 to expand from subchronic to chronic exposure. The preliminary subchronic oral RfD for chromium (VI) so calculated is 8E-3 mg/kg-day.

The data summarized by EPA (2010) are insufficient to identify a mechanism of toxicity or target organ(s) for chronic oral exposure to chromium (VI). Data from other sources, however, are sufficient to identify potential target organs. Goyer (1991) reported that renal tubular necrosis is the major effect in humans from ingestion of chromium compounds. The context, however, suggests that this effect is associated with acute exposure to high doses (e.g., accidental or attempted suicide ingestion); therefore, the kidney may not be an acceptable candidate as a target organ for chronic oral exposure. Furthermore, a review of human and animal studies by EPA (1998a) did not implicate the kidney as a target organ for chronic oral exposure. EPA (1998a), however, reported GI effects in a cohort of 155 Chinese villagers who consumed water from a well located adjacent to a chromium alloy plant. Symptoms included oral ulcers, diarrhea, abdominal pain, indigestion, and leukocytosis with a left shift. The dose rate of chromium (VI) was estimated at 0.57 mg/kg-day, nearly 200 times the oral RfD. It is likely that the GI symptoms reflect the irritant nature of chromium (VI).

EPA (1998a) also reviewed several reproductive studies. An early and inadequately conducted study reported no effects in rats fed a diet containing 0.125 percent K_2CrO_4. A diet containing 0.25 percent resulted in “subnormal condition” (including rough coat) and “subnormal” offspring; a diet containing 0.5 percent resulted in diarrhea and sterility. Assuming rats consume food equivalent to 5 percent of their body weight each day (EPA, 1980), dietary levels of 0.125, 0.25 and 0.5 percent correspond to chromium (VI) dose rates of 17, 33, and 67 mg/kg-day, respectively. Drinking water studies consistently report developmental effects and impaired reproduction in rats and mice ingesting approximately 20 mg chromium (VI)/kg-day. A well controlled study reported slightly decreased erythrocyte size and hemoglobin content in rats and mice of either sex fed diets containing 400 ppm potassium chromate. The effects were interpreted as “suggestive of a potential bone marrow/erythroid response.” The 400 ppm diet is equivalent to chromium (VI) dose rates of 6.4 mg/kg-day in rats (EPA, 1998a) and approximately 11 mg/kg-day in mice, assuming that mice consume food equivalent to 10 percent of their body weight/day (EPA, 1980). In addition, cytoplasmic vacuolization of hepatocytes was observed in mice fed diets containing 50, 100 or 400 ppm potassium chromate, but it is not clear if either the incidence or intensity occurred in a dose-related manner. The 50 ppm diet, the lowest associated with hepatocellular vacuolization, is equivalent to a chromium (VI) intake rate of approximately 1.3 mg/kg-day. A subsequent study reported decreased erythrocyte hemoglobin content in female mice fed a diet containing 100 ppm potassium chromate, equivalent to a chromium (VI) dose rate of 6.0 mg/kg-day.

The GI signs reported in humans are clearly an indication of adverse effects; therefore, the GI tract is selected as a target organ. The mechanism of toxicity is assumed to be the irritation

induced by tissue contact with chromium (VI). The slight hematologic changes observed in rats and mice and the hepatocellular vacuolization observed in mice do not appear to be sufficiently threatening to be considered adverse. Therefore, target organs selected for chronic oral exposure to chromium (VI) include the GI tract, unborn child (fetus), and reproductive system.

Inhalation (occupational) exposure to chromium may induce respiratory symptoms, changes in lung function and irritation, erosion or perforation of the nasal septum, depending in part on the exposure level (EPA, 2010). No adverse effects were observed in workers exposed to 1E-3 mg/m^3 for 0.2 to 23.6 years (average 2.5 years). EPA (1998b, 2010) reviewed several human and animal studies, and determined that effects observed from inhalation exposure to chromium (VI) are not relevant to exposure to chromium (III). EPA (1998c) concluded that chromium (VI) is the only form of chromium of concern for inhalation exposure.

EPA (2010) developed separate chronic inhalation RfC values for human exposure to chromic acid mists and dissolved chromium (VI) aerosols, and for exposure to chromium (VI) particulates. A verified chronic inhalation RfC of 8E-6 mg/m^3 for chromic acid mists and dissolved chromium (VI) aerosols is based on an adjusted LOAEL of 7.14E-4 mg/m^3 associated with atrophy of the nasal septum in subchronically occupationally exposed humans. An overall uncertainty factor of 90 was used, consisting of factors of 10 for intraspecies variation, 3 to estimate a NOAEL from a LOAEL, and 3 to expand from subchronic to chronic exposure. Confidence in the inhalation RfC is low. The upper respiratory tract is considered the target organ for inhalation exposure to chromic acid mists and dissolved chromium (VI) aerosols. The chronic inhalation RfC is equivalent to a chronic inhalation RfD of 2.3E-6 mg/kg-day.

Inhalation exposure to chromium (VI) particulates is associated with pneumocyte toxicity; i.e., with effects on the lungs themselves. EPA (2010) derived an RfC of 1E-4 mg/m^3 for chronic inhalation exposure to chromium (VI) particulates from an adjusted benchmark concentration of 3.4E-2 mg/m^3 associated with altered enzyme activity in bronchioalveolar lavage fluid from rats exposed to sodium dichromate dust intermittently for up to 90 days. An uncertainty factor of 300 was used, consisting of a factor of 10 to provide additional protection to unusually sensitive individuals, and factors of 3 each to cover for physiologic differences between rats and humans, and to expand from subchronic to chronic exposure. Confidence in the RfC is medium. The RfC is equivalent to a chronic inhalation RfD of 2.9E-5 mg/kg-day. The lung is considered to be the target organ for chronic inhalation exposure to chromium (VI) particulates.

No current EPA-derived subchronic inhalation evaluation exists for chromic acid mists and dissolved chromium (VI) aerosols. However, a preliminary subchronic inhalation RfC can be derived by excluding the uncertainty factor of 3 for expanding from subchronic to chronic exposure. Application of the remaining overall uncertainty factor of 30 to the adjusted LOAEL of 7.14E-4 mg/m^3 yields a preliminary subchronic inhalation RfC of 2E-5 mg/m^3 for chromic acid mists and dissolved chromium (VI) aerosols. The preliminary subchronic inhalation RfC is equivalent to a subchronic inhalation RfD of 6.8E-6 mg/kg-day.

No current EPA-derived subchronic inhalation evaluation exists for chromium (VI) particulates. However, a preliminary subchronic inhalation RfC can be derived by excluding the uncertainty factor of 3 for expanding from subchronic to chronic exposure. Application of the remaining overall uncertainty factor of 100 to the adjusted LOAEL benchmark concentration of 3.4E-2 mg/m^3 yields a preliminary subchronic inhalation RfC of 3E-4 mg/m^3 for chromium (VI)

particulates. The preliminary subchronic inhalation RfC is equivalent to a subchronic inhalation RfD of 9.7E-5 mg/kg-day.

EPA (1998c) noted that exposure to chromic acid mists and dissolved chromium (VI) aerosols is likely to be restricted to occupational settings and that most environmental exposures would involve exposure to chromium (VI) particulates. Therefore, the chronic inhalation RfC and RfD for chromium particulates will be used in this evaluation.

6.0 Carcinogenicity Evaluation

EPA (2010) classified chromium (III) in cancer weight-of-evidence group D – not classified as to carcinogenicity to humans – because of inadequate data. Chromium (VI) is classified in cancer weight-of-evidence group A – known human carcinogen – based on the consistent finding of lung cancer in epidemiologic studies of occupationally exposed workers in chromate production and the chrome pigment industry (EPA, 2010). Conclusions regarding the human data are corroborated by data from animal experiments. There is no evidence that oral exposure to chromium (VI) induces cancer, and EPA (2010) assigned chromium (VI) to Group D for oral exposure.

An inhalation URF of 1.2E-2 per ug/m^3, equivalent to an inhalation SF of 4.2E+1 per mg/kg-day, was based on increased risk of lung cancer deaths in chromate production workers (EPA, 2010). It should be noted that the quantitative assessment is based on the concentration of total chromium to which the workers were exposed, including insoluble (trivalent) and soluble (hexavalent) forms. It was assumed that chromium (VI) constituted not less than one-seventh of the total chromium; i.e., a ratio of 1 part of chromium (VI) to 6 parts of chromium (III). However, the forms of chromium in the air were not identified, and chromium (VI) may have constituted a significantly much greater portion of total airborne chromium. EPA (200) presented the URF of 1.2E-2 per ug/m^3 as a verified potency estimate for chromium (VI), but noted that this estimate may underestimate the potency of exposure to pure chromium (VI) by as much as seven-fold.

7.0 Toxicity Summary

Toxicity values for chromium (III) and chromium (VI) are summarized below. Theoretical noncancer toxicity values are calculated for total chromium assuming a chromium (III)/chromium (VI) ratio of 6 to 1. Note that the URF is based on a mixture of chromium (III) and chromium (VI).

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
Chromium (III)										
1.5E+0	1.5E+0	ND	ND	ND	NA	D	ND	D	ND	ND
Chromium (VI)[b]										
8E-3	3E-3	GI, F, Re	3E-4/ 9.7E-5	1E-4/ 2.9E-5	Lu	D	ND	A	1.2E-2	4.2E+1
Total Chromium[c]										
NA	2.1E-2	GI, F, Re	NA	7E-4/ 2.0E-4	Lu	D	ND	A	1.2E-2	4.2E+1
sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference										

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi

concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: GI = gastrointestinal tract, F = unborn child (fetus), Re = reproductive system, Lu = lung.
[a]sRfDo and cRfDo should be adjusted by the appropriate GAF values described above when used for dermal exposure.
[b]Inhalation RfC/RfD values listed are those for chromium (VI) particulates. Values for chromic acid mists and dissolved chromium (VI) aerosols are not relevant to environmental exposures.
[c]For noncancer effects is based on the assumption that total chromium consists of 1 part of chromium (VI) and 6 parts of chromium (III); note that the URF assumed a mixture of chromium (III) to chromium (VI) at a ratio of approximately 6:1 (EPA 2010; EPA, 2004b).

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Chromium***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

Goyer, R.A., 1991, "Toxic Effects of Metals," in ***Casarett and Doull's Toxicology The Basic Science of Poisons***, Fourth Edition, M.O Amdur, J. Doull and C.D. Klaassen, eds., Pergamon Press, New York, pp. 623-680.

U.S. Environmental Protection Agency (EPA), 1980, "Appendix C – Guidelines and Methodology Used in the Preparation of Health Effect Assessment Chapters of the Consent Decree Water Criteria Documents," ***Federal Register***, 45(231): 79347-79357.

U.S. Environmental Protection Agency (EPA), 1995, "40 CFR 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System; Final Rule," ***Federal Register***, 60(56); 15366-15425.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 1998a, ***Toxicological Review of Hexavalent Chromium (CAS No. 18540-29-9) In Support of Summary Information on the Integrated Risk Information System (IRIS)***, August, on line.

U.S. Environmental Protection Agency (EPA), 1998b, ***Combustion Technical Assistance Center (CTAC) Request No. 70: Chromium Values***, National Center for Environmental Assessment, Cincinnati, OH, 22 September.

U.S. Environmental Protection Agency (EPA), 1998c, ***Combustion Technical Assistance Center (CTAC) Request No. 77: Information Regarding Chromium (III) and (VI) for Site-Specific Risk Assessment***, National Center for Environmental Assessment, Cincinnati, OH, 5 October.

U.S. Environmental Protection Agency (EPA), 2003, Telephone conversation between Ted Simon, EPA Region IV, and P. Goetchius, Shaw E & I, 10 October.

U.S. Environmental Protection Agency (EPA), 2004a, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

COBALT (7440-48-4)

1.0 Introduction and Physical Properties

Cobalt is a relatively scarce **metal**, constituting about 0.001 percent of the earth's crust (Elinder and Friberg, 1986). It often occurs in association with nickel, silver, lead, copper and iron ores. Cobalt is used in forming special metal alloys with unusual and useful properties (ATSDR, 2004; HSDB, 2010). It is also used in cutting materials, lacquers, varnishes, paint driers, enamels, inks, glazes, glass manufacture, as a catalyst in petroleum refining, and as a supplement in animal and human nutrition. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
58.93[a]	NA	NA	45[b]	NA	NA	ND	Note 1[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable; ND = no data.
Note 1: Cobaltous chloride as a typical cobalt salt: soluble.
[a]Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line.
[b]Baes, C.F., R.D. Sharp, H. Sjoreen, and R.W. Shor, ***A Review and Analysis for Assessing Transport of Environmentally Released Radionuclides through Agriculture, ORNL-5786, Oak Ridge National Laboratory*** .
[c]Budavari, S, Ed., 1989, ***The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals***, Eleventh Edition, Merck & Co., Rahway, NJ.

2.0 Environmental Fate and Transport

Cobalt is released to the environment, particularly to the air, largely from industrial processes that involve grinding or polishing hard metal devices that contain cobalt (HSDB, 2010). Other anthropogenic sources include fossil fuel burning, vehicular and aircraft exhaust, production and use of cobalt-containing alloys and chemicals, copper and nickel smelting and refining, disposal of sewage sludge, and application of fertilizers derived from phosphate rock (ATSDR, 2004). Natural sources include soil and soil dust, seawater spray, and volcanic eruptions. Natural releases to the atmosphere slightly exceed anthropogenic releases.

Ionic cobalt compounds exist in the particulate phase in air and these compounds may be removed from the air by wet and dry deposition (HSDB, 2010).

HSDB (2010) reports that K_d values for cobalt range from 0.2 to 3,800 L/kg. The value of 45 L/kg presented above appears to be a reasonable intermediate point. Soils with higher pH and content of clay, natural organics, and hydrous manganese and iron oxides, bind cobalt to a greater degree; as these factors decrease, the mobility of cobalt increases. Microbial activity may increase the solubility of cobalt in soil. Chelating agents increase the solubility of cobalt and enhance its mobility in soil. Cobalt compounds do not volatilize from moist or dry soil surfaces due to their ionic character.

The transport and speciation of cobalt in natural waters and sediments is complicated by many factors (HSDB, 2010). The presence of sewage-derived organics appears to enhance the solubility of cobalt in freshwater by forming soluble complexes. Cobalt exists in the +2 or +3 oxidation state for the majority of its compounds and complexes. Volatilization from water surfaces is not expected, due to the ionic nature of dissolved cobalt compounds.

A few plant species are known to accumulate cobalt; however, translocation to aerial parts is generally insignificant (ATSDR, 2004; HSDB, 2010). Cobalt is bioaccumulated by aquatic organisms, particularly at the lower trophic levels. Biomagnification, however, does not occur and cobalt localizes in the viscera and on the skin, rather than in edible tissues. Therefore, cobalt is not expected to impact human health through the food-chain pathways and biotransfer factors are not provided.

3.0 Toxicokinetics

Inhaled cobalt particles deposit in the upper or lower respiratory tract, depending largely on particulate size (ATSDR, 2004). Uptake may occur by dissolution or phagocytosis; larger particles are removed by ciliary clearance. The extent of pulmonary uptake depends largely on particle size distribution.

GI absorption of ingested cobalt in humans ranges from 18 to 97 percent, depending on the form and dose, and on the nutritional status of the subjects (ATSDR, 2004). Cobalt is absorbed more efficiently in cases of iron deficiency. Animal studies show that soluble forms such as cobalt chloride are absorbed to a much greater extent (13 to 34 percent) than insoluble cobalt oxide (1 to 3 percent).

Experiments with humans indicate that cobalt in hard metal dust can be absorbed through the skin, although the rate or extent of uptake were not quantified (ATSDR, 2004). Experiments in animals indicate that cobalt is absorbed much more efficiently through abraded than intact skin.

Distribution of cobalt within body tissues depends in large measure on the route of exposure (ATSDR, 2004). Cobalt as a component of cyanocobalamin (vitamin B12) is generally distributed among the body tissues. Highest levels following inhalation exposure are found in the tissues and lymph nodes of the respiratory tract. Lesser but elevated levels are found in liver, spleen and kidney. Highest levels are found in the liver following ingestion exposure.

Elimination also depends on route of exposure (ATSDR, 2004). Inhaled particulates are cleared by mucociliary elevation, phagocytosis and dissolution. Elevated particles are swallowed and subjected to GI absorption or throughput in the feces. Absorbed cobalt is excreted primarily through the urine.

4.0 Dermal Exposure

The provisional chronic oral RfD of 3E-4 for cobalt was derived from a study in which humans were treated orally with cobalt (EPA, 2008). A GAF of 1, as recommended by EPA (2004) is selected for cobalt.

Data were not located regarding the extent of dermal uptake of cobalt from soil, and EPA (2004) provides no estimate of the extent of dermal absorption (ABS). EPA (2004) recommends that

dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. The EPA (2004) K_p for cobalt of 4E-4 cm/hour is selected for cobalt.

5.0 Noncancer Effects Evaluation

Human health effects following oral exposure to cobalt include decreased iodine uptake by the thyroid, dermatitis in sensitized individuals, increased erythrocyte production and hemoglobin levels, and cardiomyopthy. Related effects to each of these, except dermatitis, are supported by animal studies. Other effects observed in animal studies include neurobehavioral and testicular; these effects were observed only at relatively high doses. Thyroid toxicity was selected as the critical effect for the derivation of provisional oral reference doses.
Cobalt is nutritionally essential as a cofactor in cyanocobalamin ATSDR, 2004). The element is ubiquitous and universally present in the diet. Data from a dietary survey performed in the 1980s indicate that daily U.S. dietary intakes of cobalt are in the range of 3E-3 to 1.1E-2 mg/day (4E-5 to 2E-4 mg/kg-day, assuming an average body weight of 70 kg). Chronic ingestion from the consumption of beer containing high concentrations of cobalt is associated with "beer-cobalt cardiomyopathy," which includes polycythemia and goiter, as well as marked myocardial degeneration and mortality. However, confounding variables were identified and a dose-response could not be derived from the associated studies (EPA, 2008).

A consistently produced effect of exogenously administered cobalt in humans is the erythropoietic effect of stimulating erythrocyte production resulting in increased blood hemoglobin concentration (EPA, 2002). Cobalt chloride has been used therapeutically at dose rates of 1.6E-1 to 3.2E-1 mg cobalt/kg-day in anemic, anephric dialysis patients for 12 to 32 weeks to induce a significant, but reversible, rise in blood hemoglobin concentration. Clinical studies demonstrating this effect identified an effect level of 1.8E-1 mg/kg-day, which EPA (2002) had previously designated a LOAEL. However, EPA (2008) has since identified confounding variables, and has judged the effects of cobalt in some of the patients in pertinent studies as beneficial rather than adverse.
A LOAEL of 1 mg/kg-day for subchronic thyroid toxicity as the critical oral effect was identified by EPA (2008) from a subchronic study by Roche and Layrisse (1956). A provisional subchronic RfD of 3E-3 mg/kg-day was derived assuming a composite UF of 300. This assumes a UF of 10 for LOAEL to NOAEL conversion, and a UF of 10 for inter-individual variability. An additional UF of 3 was added due to a lack of multigenerational studies, since testicular degeneration and sperm function were noted in some animal studies.

The provisional chronic oral RfD of 3E-4 mg/kg-day was derived as described for the subchronic RfD, with an additional UF of 10 added to extrapolate from subchronic to chronic exposure for a composite UF of 3,000 (EPA, 2008). Confidence in the principal study is described as low-to-medium.

The human and animal database indicate that symptoms of inhaled cobalt include respiratory tract irritation and altered pulmonary function. There were identified as the critical effects for exposure to inhaled cobalt for the derivation of RfDs. A NOAEL adjusted for continuous exposure of 1.9 $\mu g/m^3$ was identified by EPA (2008). A subchronic RfC of 2E-5 mg/m^3 was derived by EPA (2008) assuming a composite UF of 100, assuming a UF of 10 for database

insufficiencies and a UF of 10 for inter-individual variability. The preliminary subchronic inhalation RfC is equivalent to a preliminary subchronic inhalation RfD of 5.7E-5 mg/kg-day.

A provisional chronic RfC of 6E-6 mg/m3 was derived as described above for the subchronic RfC, but with an additional UF of 3 for the extrapolation from subchronic to chronic exposure (EPA, 2008). Thus, the composite UF is 300. This provisional RfC equals an inhalation RfD of 1.7E-6 mg/kg-day.

6.0 Carcinogenicity Evaluation

Human or animal studies examining the carcinogenicity of cobalt associated with oral exposure were not located. Therefore, cobalt is classified as having "inadequate information to assess carcinogenic potential" via the oral pathway, thus no cancer slope factor was derived (EPA, 2008).

Cobalt is described as "likely to be carcinogenic to humans by the inhalation route," based on limited evidence of carcinogenicity in humans (occupational studies) and sufficient evidence of carcinogenicity in animals (EPA, 2008). Respiratory tract tumors have been suggested in occupational studies as the result of inhaled cobalt. Statistically increased incidence of respiratory tract tumors have been observed in animal studies. Limited evidence supports genotoxicity and cytotoxicity, followed by cellular regeneration as potential modes of cobalt tumorigenicity. A mutagenic effect may be plausible for inhaled cobalt, but has not been clearly established (EPA, 2008).

Human inhalation studies were not sufficiently detailed to use in the derivation of a URF. Rats and mice exposed via inhalation to cobalt sulfate heptahydrate for 2 years developed alveolar and bronchial lung tumors (neoplasms and adenomas). EPA (2008) identified a benchmark dose level of In the absence of an identified mode of action, EPA developed a provisional URF by linear extrapolation of benchmark dose level of 0.011 mg/m^3. Using a benchmark response of 10 percent in extra risk, a provisional URF of 9E-3$(\mu g/m^3)^{-1}$ was derived for cobalt sulfate. This equals an inhalation SF of 3.2E+1 $(mg/kg\text{-}day)^{-1}$.

7.0 Toxicity Summary

Toxicity values for cobalt are summarized as follows:

Noncancer Effects						Carcinogenicity				
Oral Exposure			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
3E-3	3E-4	Thyroid	2E-5/5.7E-5	6E-6/ 1.7E-6	RT	ND	ND	B	9E-3	3.2E+1

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: RT = respiratory tract.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2004, ***Toxicological Profile for Cobalt***, Draft for Public Comment, U.S. Department of Health and Human Services, Atlanta, Georgia, April.

Elinder, C.-G and L. Friberg, 1986, "Cobalt," In: Friberg, L., G.F. Nordberg and V.B. Vouk, Eds., ***Handbook on the Toxicology of Metals,*** Second Edition, Volume II: Specific Metals, Elsevier Science Publishers, New York, NY, pp. 211-232.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Roche, M., and M. Layrisse, 1956, "The Effect of Cobalt on Thyroidal Uptake of I^{131}", ***Journal of Clinical Endocrinology and Metabolism***, Volume 16, pp. 831-833.

U.S. Environmental Protection Agency (EPA), 2002, ***Risk Assessment Issue Paper for: Derivation of a Provisional RfD for Cobalt and Compounds (CASRN 7440-48-4)***, National Center for Environmental Assessment, Cincinnati, OH, 15 January.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Emergency and Remedial Response, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2008, ***Provisional Peer-Reviewed Toxicity Values for Cobalt (CASRN 7440-48-4)***, National Center for Environmental Assessment, Cincinnati, OH, 25 August.

IRON (7439-89-6)

1.0 Introduction and Physical Properties

Iron is a very abundant, ubiquitous, naturally occurring **metal** that constitutes approximately 5 percent of the earth's crust (Spivey Fox and Rader, 1988). It is the second most prevalent metal in the earth's crust following aluminum (HSDB, 2010). Its primary use is in making steels and other metals that have a wide range of application. Less than one percent of iron is used to make iron compounds that have application in dyes and pigments, water treatment, organic chemical synthesis, and medicinal preparations. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
55.85[a] (Element)	NA	NA	25[b]	NA	NA	ND	Note 1[a]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable; ND = no data.
Note 1: Ferrous sulfate as a typical iron salt: soluble.
[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[b] Baes, C.F., R.D. Sharp, H. Sjoreen, and R.W. Shor, ***A Review and Analysis for Assessing Transport of Environmentally Released Radionuclides through Agriculture, ORNL-5786, Oak Ridge National Laboratory*** .

2.0 Environmental Fate and Transport

There is little information available regarding the anthropogenic release of iron and its fate in the environmental, probably because of its prevalence in nature. Clearly, however, mining and handling of iron ores releases dust containing iron oxides (HSDB, 2010). Presumably the manufacture and use of iron compounds may result in release to the environment, but data were not located.

Insoluble iron compounds are most likely to occur in air as particulates, and are expected to deposit to soil and surface water (HSDB, 2010). Although data are unavailable, soluble compounds are expected to leach to groundwater, and to remain in solution in both groundwater and surface water. The extent of partitioning to sediment is expected to depend on water pH, organic matter and reduction-oxidation potential of the water system.

Biouptake of iron is known to occur, because the element is a nutritionally required trace element that is a structural component of heme proteins and some enzymes, which are common to mammals and several other orders of living organisms (Spivey Fox and Rader, 1988). However, there is no evidence that iron bioconcentrates in either aquatic or terrestrial food chain pathways. Therefore, biotransfer factors for iron are not presented.

3.0 Toxicokinetics

The GI absorption of iron is regulated by homeostatic mechanisms sited largely in the intestinal mucosa (Goyer, 1991; EPA, 2006). Approximately 2 to 15 percent of dietary iron is ordinarily absorbed; however, several dietary factors may increase or decrease absorption (HSDB, 2010). Dietary iron from animal sources is absorbed more readily (10 to 25 percent) than iron from

vegetables and grains (1 to 10 percent) (Elinder, 1986). Absorption is greatly increased at times of unusual need (rapid growth of childhood, pregnancy, blood loss). Divalent (ferrous) iron is absorbed into the intestinal mucosal cells and released to the blood plasma where it is oxidized to the trivalent (ferric) form, which binds with a specific protein, transferrin, for transport to storage sites.

Approximately 67 percent of iron in the body is associated with hemoglobin in the erythrocytes, 10 percent is associated with myoglobin and various iron-containing enzymes, and the remainder is bound to ferritin or hemosiderin, which are intracellular storage forms (Goyer, 1991). Ferritin and hemosiderin bind iron in a manner that renders it inactive for beneficial use (e.g., hemoglobin synthesis) and inactive as a toxicant. Some of the iron taken up by the cells of the reticuloendothelial system remains stored and some enters a labile pool that is available for erythropoiesis.

Excess iron is generally excreted, in part in shed intestinal epithelial cells, or in the bile or urine (Goyer, 1991). In cases of very high iron intake, excretion may be unable to remove iron as quickly as it is absorbed. Iron overload results, which stimulates increased synthesis of ferritin and increased iron storage, particularly in the liver, pancreas, spleen, various endocrine organs and the heart.

4.0 Dermal Exposure

As noted above, the GI absorption of iron appears to be under homeostatic control in normal humans (EPA, 2006), which suggests that GI absorption could vary widely between individuals depending on nutritional status. Given the uncertainty about the GI absorption of iron, a default GAF of 1 (EPA, 2004) is chosen for this evaluation.

Data were not located regarding the extent of dermal uptake of iron from soil, and EPA (2004) provides no estimate of the extent of dermal absorption (ABS). EPA (2004) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. Empirical data regarding the uptake of soluble forms of iron from water were not located. The EPA (2004) default K_p for inorganic chemicals of 1E-3 cm/hour is selected for iron.

5.0 Noncancer Effects Evaluation

Iron is a nutritionally required trace element that forms an integral part of hemoglobin, myoglobin and several enzymes (Spivey Fox and Rader, 1988). The NAS (1989) Recommended Daily Allowance (RDA) for iron is 10 mg/day (0.13 mg/kg-day) for adult males; 15 mg/day (0.24 to 0.33 mg/kg-day) for females aged 11 to 50 years; 30 mg/day (0.443 mg/kg-day) for pregnant females; and 10 mg/day (0.36 to 1.11 mg/kg-day) for children aged 6 months to 10 years.

Both acute and chronic toxicity syndromes are associated with ingestion exposure to iron. Acute toxicity generally involves children (Goyer, 1991). Acute ingestion of large quantities (e.g., children may ingest several ferrous sulfate tablets with candy-like coating) results in severe GI irritation and, in some cases, liver damage. Liver cirrhosis and blood coagulation defects (indicative of reduced circulating levels of blood clotting factors produced by the liver) are observed as sequellae to severe acute toxicity.

Three chronic toxicity syndromes that result in iron overload have been observed in humans (Goyer et al., 1991). The first chronic syndrome is idiopathic hemochromotosis, which arises from a genetic derangement of the homeostatic mechanisms that control iron absorption. This syndrome involves greatly increased GI absorption of iron, regardless of the level of iron in the diet, which results in massive iron overload.

The second chronic syndrome is iron overload resulting from high dietary intake (Goyer, 1991). Although high dietary intake seldom results in iron overload in humans with normal homeostatic control of iron absorption, rare exceptions occur (EPA, 2006). One such exception is the occurrence of iron overload in Bantus who regularly consumed Kaffir beer, an acid beer brewed in iron vessels. This syndrome is not entirely understood; however, the iron in Kaffir beer appears to have exceptionally high bioavailability – equivalent to that of nutritional iron supplements especially formulated for bioavailability – which may account for the increased absorption and iron overload. Other exceptions include persons who take large amounts of tonics or nutritional supplements containing iron.

The third chronic syndrome involves persons requiring multiple blood transfusions over a period of time (Goyer, 1991). This results in the parenteral administration of large quantities of iron that are released as the transfused erythrocytes expire and are removed from the circulation by the reticuloendothelial system. As noted above, excretion cannot keep up with unusually high circulating levels of iron, such as results from multiple blood transfusions. Clearly, the third syndrome has no relevance to environmental exposure.

Regardless of the chronic syndrome that produces it, the effects of iron overload involve the same pathogenesis (Goyer, 1991). Iron stores in the body increase from the normal level of 3 to 5 g, to levels of 20 to 40 g. The cells are induced to increase production of ferritin, which binds the iron cation inactivating its toxicity. Increasingly larger proportions of iron are located in hemosiderin than in ferritin. Hemosiderin is a larger storage protein, probably formed primarily from ferritin. The iron in hemosiderin is essentially completely unavailable and nontoxic. Hemosiderosis is the term given to large accumulations of hemosiderin that do not result in adverse effects because the iron is unavailable. Extremely large accumulations of hemosiderin that result in impaired cellular function is termed hemochromotosis. Hemochromotosis of the liver, endocrine glands and heart is associated with reduced liver function, eventually liver cirrhosis, pancreatic fibrosis, diabetes mellitus, other endocrine disruption and cardiovascular effects.

Goyer (1991) and EPA (2006) reviewed the available data regarding the toxicity of iron. Neither source located any data clearly associating *environmental* exposure with toxicity. EPA (1996) reviewed a study associating high circulating ferritin levels and high dietary iron intakes with myocardial infarction in Finnish men, but association with other factors (e.g., high levels of red meat consumption) confounds interpretation of this study. Furthermore, attempts to produce an animal model of chronic iron toxicity have failed, presumably because of the efficacy of the homeostatic mechanisms that regulate iron absorption from the GI tract.

EPA (1996) reasoned previously that a NOEL for chronic iron overload could be inferred from the estimates of dietary intake and iron status (circulating ferritin levels) established by the second National Health and Nutrition Examination Survey (NHANES II) data base. The

NHANES II study determined that average dietary iron intakes, which ranged from 0.15 to 0.27 mg/kg-day, were associated with normal iron status. More recently, EPA (2006) has concluded that the assignment of a LOAEL based on iron overload for normal individuals cannot be determined based on existing data because of confounding factors in the studies.

EPA (2006) has determined that gastrointestinal toxicity, commonly associated with therapeutic use of iron supplements, is the critical effect. A provisional subchronic and chronic oral RfD of 0.7 mg/kg-day was derived, based on a LOAEL of 1 mg/kg-day and a UF of 1.5 (EPA, 2006). The same value was derived for both subchronic and chronic exposures because clinical experience with iron supplements indicates that the gastrointestinal irritation is associated with treatment and does not intensify with duration. Further, the effect is reversible once treatment is discontinued. A higher UF was not selected because of the reversibility and the effect is not regarded as serious (EPA, 2006).

Inhalation (occupational) exposure to iron oxide fumes may lead to radiographic densities in the lungs without demonstrable clinical effects (ACGIH, 1991). Inhalation of dusts or mists of ferric salts may irritate the respiratory tract. Inhalation data are insufficient for derivation of an inhalation RfC or RfD (EPA, 2005a).

6.0 Carcinogenicity Evaluation

Data regarding the potential carcinogenicity of iron were not located. Neither a cancer weight-of-evidence classification nor cancer potency factors are available (EPA, 2005b).

7.0 Toxicity Summary

Toxicity values for iron are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
7E-1	7E-1	GI	ND	ND	NA	ND	ND	ND	ND	ND

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: GI = gastrointestinal.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

In most cases, it is inappropriate to apply the toxicity values summarized above to environmental exposure.

8.0 References

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, ACGIH, Cincinnati, OH, pp. 803-809.

Elinder, C.-G., 1986, "Iron," in Friberg, L., G.F. Nordberg and V.B. Vouk, eds., ***Handbook on the Toxicology of Metals,*** Second Edition, Volume II: Specific Metals, Elsevier Science Publishers, New York, NY, pp. 276-297.

Goyer, R.A., 1991, "Toxic Effects of Metals," in ***Casarett and Doull's Toxicology, The Basic Science of Poisons, Fourth Edition***, M.O. Amdur, J. Doull and C.D. Klaassen, eds., Pergamon Press, New York, pp 623-680.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

National Academy of Sciences (NAS), 1989, ***Recommended Daily Allowances, 10th Edition***, National Academy Press, Washington, DC. (Cited in EPA, 1996).

Spivey Fox, M.R. and J.I. Rader, 1988, "Iron," in Seiler, H.G. and H. Sigel, eds., ***Handbook on Toxicity of Inorganic Compounds***, Marcel Dekker, Inc., New York, pp. 345-354.

U.S. Environmental Protection Agency (EPA), 1996, ***Risk Assessment Issue Paper for: Derivation of a Provisional RfD for Iron (CASRN 7439-89-6)***, National Center for Environmental Assessment, Cincinnati, OH, 23 July. 2008

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Emergency and Remedial Response, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2005a, ***Provisional Peer-Reviewed Toxicity Values for Iron and Compounds (CASRN 7439-89-6), Derivation of a Carcinogenicity Assessment***, National Center for Environmental Assessment, Cincinnati, OH, 29 July.

U.S. Environmental Protection Agency (EPA), 2005b, ***Provisional Peer-Reviewed Toxicity Values for Iron and Compounds (CASRN 7439-89-6), Derivation of n Inhalation RfC***, National Center for Environmental Assessment, Cincinnati, OH, 16 June.

U.S. Environmental Protection Agency (EPA), 2006, ***Provisional Peer-Reviewed Toxicity Values for Iron and Compounds (CASRN 7439-89-6), Derivation of Chronic and Subchronic Oral RfDs***, National Center for Environmental Assessment, Cincinnati, OH, 29 July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

INORGANIC MANGANESE (7439-96-5)

1.0 Introduction and Physical Properties

Manganese is a naturally occurring **metal** found in the earth's crust in the form of numerous minerals such as pyrolusite, romanechite, manganite and hausmannite (ATSDR, 2000; HSDB, 2010; Keen and Leach, 1988). It occurs ubiquitously in the environment, constituting approximately 0.085 percent of the earth's crust, commonly in valence states of +2, +4 and +7; valences of +1, +3, +5 and +6 are rare. Manganese is used in the manufacture of steel, and in other metallurgical processes, batteries, and various manganese-containing chemicals including matches, glass and porcelain, fireworks, varnishes, ceramics, diagnostic contrast media and fungicides. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
54.938[a] (Elemental)	NA	NA	65[b]	NA	NA	NA	Note 1[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
Note 1: Metallic manganese decomposes in the presence of water. Manganous chloride as a typical manganese salt: 7.23E+5 mg/L (25˚ C).
[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[b]Baes, C.F., R.D. Sharp, A.L. Sjoreen, R.W. Shor, 1984, ***A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture***, Health and Safety Division, Oak Ridge National Laboratory, ORNL-5786, September.
[c]Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Manganese***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

2.0 Environmental Fate and Transport

Inorganic manganese compounds enter the atmosphere and other environmental compartments from the weathering of rocks and windblown soil (HSDB, 2010). Anthropogenic sources of atmospheric manganese include metal processing, disposal and use of manganese-containing materials (antiseptics, catalysts, dietary supplements, dry cells, feed additives, fertilizers, pesticides and pigments), resuspension of manganese-containing soil dust, and fly ash emissions from incinerators (ATSDR, 2000; HSDB, 2010). Another source of atmospheric manganese is the combustion of gasoline containing organic manganese anti-knock ingredients such as methylcyclopentadienyl manganese tricarbonyl (MMT). It is unclear whether manganese from this source remains as an organic form or is converted to an inorganic form. The use of MMT in gasoline has been discontinued because of deleterious effects on catalytic converters. Manganese may be released to water by discharge from industrial facilities or in leachate from landfills and soil. Landfill disposal of manganese-containing wastes is the predominant source of manganese release to soil.

Manganese exists in the air bound to particles; dry deposition is the primary removal mechanism, although wet deposition may also be significant (ATSDR, 2000). Manganese in fly ash exists as chlorides and oxides that are relatively soluble and mobile in the environment.

Manganese in water exists as any of several sparingly soluble salts that attach to suspended sediment (ATSDR, 2000). Sedimentation is the primary removal process. Soluble forms also exist, depending on pH of the water, and may be released from sediment. The extent of

absorption to constituents of soil is highly variable. Low concentrations may irreversibly bind to clay, but higher concentrations often manifest considerable mobility.

Manganese may accumulate in various kinds of plants such as legumes, nuts, heather, and tea, and in the lower aquatic trophic levels, but not significantly in the higher aquatic trophic levels or most terrestrial animals (ATSDR, 2000; HSDB, 2010). This indicates that food-chain pathways are unlikely to be significant for human health; therefore, biotransfer factors are not compiled or estimated.

3.0 Toxicokinetics

Manganese is nutritionally essential for humans (ATSDR, 2000). Stable tissue levels are maintained by homeostatic regulation of GI absorption and biliary excretion.

Manganese is absorbed by the respiratory tract (ATSDR, 2000), although data quantifying the extent of absorption were not located. Smaller particles are probably retained in the lung eventually to be absorbed; larger particles are probably removed by mucocilliary elevation and swallowed so that they become available for GI absorption. The more soluble compounds are more readily absorbed by the respiratory tract. Studies in rats given radiolabeled manganese by intranasal administration suggest that olfactory uptake and direct transmission to the brain may occur.

GI absorption of manganese in humans averages 3 to 5 percent, but homeostatic mechanisms reduce the extent of absorption at higher doses (ATSDR, 2000). The more soluble compounds are more readily absorbed. Iron deficiency enhances manganese uptake. Absorption appears to be more efficient and resulting tissue levels appear to be higher in infants than adults.

Quantitative data regarding dermal uptake of manganese were not located.

Normal tissue levels of manganese in humans range from 0.1 to 1 mg/kg wet weight with highest levels in liver, pancreas and kidney, and lowest levels in bone and fat (ATSDR, 2000). Animal studies (inhalation, intranasal, intratracheal and oral administration) confirm that many tissues including the brain, and in some instances specific regions of the brain, show significant increases in manganese levels after treatment. Tissue levels recede toward normal after treatment ceases.

Metabolism of manganese appears to be limited to oxidation-reduction changes in valence state (ATSDR, 2000). The evidence suggests that manganese (+2) is oxidized to manganese (+3), which alters its tissue distribution and slows excretion. Manganese is removed from the blood in the liver and is excreted principally through the bile. Urine, sweat and milk represent minor excretory routes. Animal studies show that the young are less efficient than adults in excreting manganese, although the young do not appear to be more sensitive to its effects.

4.0 Dermal Exposure

Data were not located regarding the extent of dermal uptake of manganese from soil, and EPA (2004) provides no estimate of the extent of dermal absorption (ABS). EPA (2004) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of

uncertainty. Empirical data regarding the uptake of soluble forms of manganese from water were not located. ATSDR (2000), however, notes that the uptake of manganese across intact skin is "extremely limited," suggesting that uptake of toxicologically significant amounts is unlikely. EPA (2004) provides no chemical-specific estimate of K_p for manganese; therefore, the default K_p value of 1E-3 cm/hr is used to estimate dermal uptake of manganese from water.

5.0 Noncancer Effects Evaluation

Manganese is nutritionally required by humans for normal growth and health (EPA, 2010). Humans exposed to approximately 0.8 mg manganese/kg-day in drinking water (28 mg/L) exhibited lethargy, increased muscle tonus, tremor and mental disturbances. The elderly appeared to be more sensitive than children. Oral treatment of laboratory rodents induces biochemical changes in the brain, but rodents do not exhibit the neurological signs exhibited by humans.

EPA (2010) verified a chronic oral RfD for manganese of 1.4E-1 mg/kg-day from a NOAEL of 1.4E-1 mg/kg-day for neurologic effects from human dietary studies and an uncertainty factor of 1. Confidence in the RfD is medium. The oral RfD of 1.4E-1 mg/kg-day will be used for dietary items other than drinking water. EPA (2010) recommends that the contribution of background diet should be subtracted and that a modifying factor of 3 should be used to adjust for use when oral exposure involves drinking water and non-dietary ingestion. The oral RfD resulting from these manipulations is 2.4E-2 mg/kg-day, which will be used for drinking water and incidental ingestion of non-dietary items. The CNS is the target organ for chronic oral exposure to manganese. EPA (1997) effectually adopts the chronic oral RfD as sufficiently protective for subchronic oral exposure.

The NOAEL described above is associated with a dose rate of approximately 10 mg/day for an adult. However, EPA (2002) notes that normal intake levels may well exceed 10 mg/day, especially with diets containing substantial amounts of whole-grain cereals, nuts, green leafy vegetables, and tea. Adverse effects have not been reported at dietary levels of 10 mg/day. It is likely that larger dose rates are innocuous as well.

Occupational exposure to high concentrations in air induces a generally typical spectrum of neurological effects, and increased incidence of pneumonia (ACGIH, 1991). EPA (2010) presents a verified chronic inhalation RfC of 5E-5 mg/m^3 (equivalent to an inhalation RfD of 1.4E-5 mg/kg-day) based on a LOAEL for neurological effects in occupationally exposed humans and an uncertainty factor of 1000. The uncertainty factor consists of three factors of 10 each to provide additional protection for unusually sensitive individuals, to extrapolate a NOAEL from a LOAEL, and to address database limitations including the less-than-chronic periods of exposure, the lack of developmental toxicity data, and uncertainty regarding potential but unquantified differences in the toxicity of different forms of manganese. Confidence in the RfC is medium. The CNS is the target organ for inhalation exposure to manganese. The chronic inhalation RfC is adopted as sufficiently protective for subchronic inhalation exposure.

6.0 Carcinogenicity Evaluation

EPA (2010) classified manganese in cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans). Quantitative cancer risk estimates are not derived for Group D chemicals.

7.0 Toxicity Summary

Noncancer Effects						Carcinogenicity				
Oral Exposure			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
1.4E-1[a]/ 2.4E-2[b]	1.4E-1[a]/ 2.4E-2[b]	CNS	5E-5/ 1.4E-4	5E-5/ 1.4E-5	CNS	D	ND	D	ND	ND

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ or critical effect abbreviations: CNS = central nervous system.
[a]Dietary items other than drinking water.
[b]Ingestion of environmental media and drinking water.

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Manganese***, U.S. Public Health Service, Atlanta, Georgia, September, on line.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, ACGIH, Cincinnati, OH, pp. 876-878.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Keen and Leach, 1988, "Manganese," in Seiler, H.G. and H. Sigel, eds., ***Handbook on Toxicity of Inorganic Compounds***, Marcel Dekker, Inc., New York, pp. 405-415.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

THALLIUM (7440-28-0)

1.0 Introduction and Physical Properties

Thallium is a naturally occurring metal with an abundance of about 0.3-0.6 ppm in the earth's crust (HSDB, 2010). Thallium compounds are used in a variety of applications, including pharmaceuticals, semiconductors, photoelectric cells, optical systems, ore separation, glass production, and as oxidizing agents in organic synthesis (ATSDR, 1992; HSDB, 2010). An important former use of thallium and its compounds (before 1972) was in pesticide formulations for the control of insects and rodents. Relevant physical properties are compiled below:

MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
204.38[a] (Elemental)	NA	NA	7.1E+1[b,c]	NA	NA	NA	Note 1[a]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
Note 1: Thallium sulfate as a typical thallium salt: 4.87E+4 mg/L (20˚ C).
[a]Agency for Toxic Substances and Disease Registry, (ATSDR), 1992, ***Toxicological Profile for Thallium***, U.S. Public Health Service, Atlanta, Georgia, July, on line.
[b]U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, December.
[c]pH = 6.8.

2.0 Environmental Fate and Transport

Thallium is released to the atmosphere largely from coal-burning power plants, cement factories, and ferrous and nonferrous smelting operations (ATSDR, 1992; HSDB, 2010). Facilities that produce or use thallium or its compounds account for a much smaller part of the total release.

Thallium in air exists as oxide, hydroxide, sulfate or sulfide particles (ATSDR, 1992; HSDB, 2010). The hydroxide and sulfate are water soluble and may partition to water vapor for eventual removal in precipitation. The less soluble particulate forms are probably removed by dry deposition.

Thallium released to surface water usually occurs as the monovalent ion that forms soluble salts with several anions (ATSDR, 1992; HSDB, 2010). Adsorption to suspended particulates may also occur, but the soluble forms remain in the water column.

Although empirical data are sparse, the high solubility of several thallium salts suggests that mobility in soil could be high and the potential for leaching could be significant (ATSDR, 1992).

Terrestrial plants have been shown to absorb thallium from soil, but there is no evidence that biomagnification occurs. EPA (1995) identifies thallium as a chemical unlikely to be of concern for bioaccumulation in aquatic food chains. For these reasons it is concluded that thallium is unlikely to participate significantly in food-chain pathways and biotransfer factors are not estimated or compiled.

3.0 Toxicokinetics

Data regarding absorption from the respiratory tract following inhalation exposure were not located; however, small particles are probably absorbed to some extent and larger particles are probably removed by mucocilliary clearance and swallowed, where they become available for GI absorption. Thallium compounds appear to be completely absorbed from the GI tract in humans and laboratory animals (ATSDR, 1992). Quantitative data regarding dermal uptake of thallium were not located, although HSDB (2010) states that absorption through the skin occurs readily.

Tissue levels in acutely poisoned humans appear to be highest in the brain in regions dense with neurons, such as the gray matter (HSDB, 2010). Tissue distribution testing in a single human volunteer cancer patient treated orally with a small dose of radiolabeled thallium indicated that highest concentrations were located in scalp hair followed by kidney, heart, bone, spleen and brain (ATSDR, 1992). Distribution in orally treat laboratory animals is rapid and widespread, with higher levels generally associated with the kidney. The rank of levels in other tissues is more variable (ATSDR, 1992), but high levels are ordinarily found in the testis (HSDB, 200).

The biological half-life in rats in one study was 3.3 days, indicating that excretion is efficient (ATSDR, 1992). Excretion in humans may be somewhat slower. Excretion appears to be primarily through the urine in humans, and through the urine and feces. However, the data are somewhat confusing because animal studies indicate that the ratio of fecal to urinary excretion increases with time. This suggests that biliary excretion and enterohepatic recirculation may be operative, which could result in underestimation of fecal excretion in the human study.

4.0 Dermal Exposure

As noted above, GI absorption of thallium is essentially complete. EPA (2004) concluded that a GAF should not be estimated for thallium for the purpose of adjusting oral toxicity values for dermal exposure. Therefore, the oral toxicity values described below are used directly without adjustment for evaluating dermal exposure.

Thallium may be readily absorbed by the skin (HSDB, 2010); however, data were not located regarding the extent of dermal uptake of thallium from soil, and EPA (2004) provides no estimate of the extent of dermal absorption (ABS). EPA (2004) recommends that dermal uptake from soil should not be quantified for chemicals without ABS recommendations, but that these chemicals should be discussed qualitatively as a source of uncertainty. Empirical data regarding the uptake of soluble forms of thallium from water were not located. The EPA (2004) default K_p for inorganic chemicals of 1E-3 cm/hour is selected for thallium.

5.0 Noncancer Effects Evaluation

Thallium is highly toxic. Acute oral exposure to thallium and its compounds may cause death preceded by neurological disturbances and effects on the lungs, heart and liver (ATSDR, 1992). Formerly, thallium was used medicinally to induce alopecia to facilitate treatment of ringworm of the scalp, sometimes with disastrous results. The critical effect of chronic oral exposure to low levels of thallium compounds in animals and humans is alopecia (ACGIH, 1992; EPA, 2010). EPA (2010) had previously verified chronic oral RfDs for several thallium salts (thallium acetate, thallium carbonate, thallium chloride, thallium nitrate and thallium sulfate) based on a study with thallium sulfate; these RfDs were removed from IRIS in September 2009. Currently, no RfD exists for thallium, thallium salts, or thallium compounds (EPA, 2010). The previous oral

RfD that had been listed on IRIS for thallium sulfate of 8E-5 mg/kg-day was based on a NOAEL of 0.25 mg/kg-day in rats treated by gavage with thallium sulfate for 90 days. No adverse effects were seen in this study. An uncertainty factor of 3000 was used, consisting of factors of 10 each to extrapolate from subchronic to chronic data, for intraspecies extrapolation and to account for interspecies variability, and a factor of 3 to account for lack of reproductive and chronic toxicity data. Confidence in the chronic RfD is low. The skin (alopecia) and liver (altered blood biochemistry) are considered the target organs for oral exposure to thallium, based on other data reviewed by EPA (2010). Effects on the testis and kidney were observed in rats exposed to higher dose rates. The chronic oral RfD for thallium sulfate of 8E-5, when adjusted for differences in molecular weight, is equivalent to a chronic oral RfD for thallium of 6.5E-5 mg/kg-day. This adjustment is based on the assumption that the toxicity of thallium sulfate is due entirely to thallium, rather than to the sulfate moiety. The oral RfD for thallium of 6.5E-5 mg/kg-day will be used in this evaluation.

EPA (1997) provides a provisional subchronic oral RfD for thallium sulfate of 8E-4 mg/kg-day, equivalent to a subchronic oral RfD for thallium of 6.5E-4 mg/kg-day, based on the study discussed above and an uncertainty factor of 300, eliminating the factor of 10 to expand from subchronic to chronic exposure. EPA (1997) provides provisional subchronic chronic oral RfDs for several thallium salts (thallium acetate, thallium carbonate, thallium chloride, thallium nitrate and thallium sulfate) based on the same study with thallium sulfate.

Inhalation exposure data are very limited. An occupational study suggests that neurological effects may develop following prolonged inhalation exposure (ATSDR, 1992). The nervous system appears to be more sensitive than the skin as a target organ for inhalation exposure. The data are inadequate for estimation of an inhalation RfC or RfD.

6.0 Carcinogenicity Evaluation

Several thallium compounds (thallium oxide, thallium acetate, thallium carbonate, thallium chloride, thallium nitrate, thallium sulfate) are classified as cancer weight-of-evidence Group D substances (not classifiable as to carcinogenicity to humans) (EPA, 2010). No weight-of-evidence classification was located for thallium alone, but the Group D classification can be applied to thallium. Quantitative cancer risk estimates are not derived for Group D chemicals.

7.0 Toxicity Summary

Toxicity values for thallium are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
6.5E-4	6.5E-5	S, L	ND	ND	NA	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: L = liver; S = skin.

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.										

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 1992, ***Toxicological Profile for Thallium***, U.S. Public Health Service, Atlanta, Georgia, July, on line.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

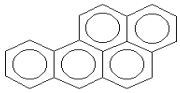
U.S. Environmental Protection Agency (EPA), 1995, □40 CFR 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System; Final Rule,□ ***Federal Register***, 60(56); 15366-15425.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

Semivolatile Organic Compounds

POLYNUCLEAR AROMATIC HYDROCARBONS a.k.a. POLYCYCLIC AROMATIC HYDROCARBONS a.k.a. POLYAROMATIC HYDROCARBONS (PAH) (130498-29-2)



Benzo(a)Pyrene
(A representative and the most studied member of this class of compounds.)

1.0 Introduction and Physical Properties

The PAHs regularly observed in environmental media and addressed in this profile include acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene. All exist as solids at room temperature. Classification as **SVOC** or **VOC** is made in the following table. PAHs are the products of incomplete combustion of fossil fuels or other organic matter, hence include both natural and anthropogenic sources (ATSDR, 1995a; HSDB, 2010). Several are also components of crude oil. Naphthalene is used in the synthesis of phthalic anhydride, the insecticide carbaryl, leather tanning agents and surface active agents, and is a component of diesel and other fuels (ATSDR, 1995b). Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
Acenaphthene (83-32-9) **(VOC)**										
154.21[a]	3.92[a]	1.55E-4[b] (25°C)	3.85[b]	4.21E-2[b] (25°C)	7.69E-6[b] (25°C)	3.29E-6[a] (25°C)	4.24E+0[b] (20-25°C)	550.54[c]	803.15[c]	1.22E+4[c]
Acenaphthylene (208-96-8) **(VOC)**										
152.20[a]	4.07[a]	1.13E-5[a] (25°C)	3.42[a]	6.67E-2[d] (25°C)[e]	7.72E-6[d] (25°C)[e]	1.20E-6[a] (25°C)	3.93E+0[a] (25°C)	543.2[a]	797[f]	1.1E+4[g]
Anthracene (120-12-7) **VOC)**										
178.23[a]	4.45[a]	6.51E-5[b] (25°C)	4.47[b]	3.24E-2[b] (25°C)	7.74E-6[b] (25°C)	3.51E-9[a] (25°C)	4.34E-2[b] (20-25°C)	615.18[c]	873.00[c]	1.31E+4[c]
Benzo(a)anthracene (56-55-3) **(SVOC)**										
228.3[h]	5.66[h]	3.34E-6[b] (25°C)	5.60[b]	5.10E-2[b] (25°C)	9.00E-6[b] (25°C)	2.50E-9[a] (25°C)	9.40E-3[b] (20-25°C)	708.15[c]	1004.8[c]	1.60E+4[c]
Benzo(a)pyrene (50-32-8) **(SVOC)**										
252.3[a]	6.10[h]	4.57E-7[k] (25°C)	6.01[b]	4.30E-2[b] (25°C)	9.00E-6[b] (25°C)	7.22E-12[a] (25°C)	1.62E-3[b] (20-25°C)	715.90[c]	969.27[c]	1.90+4[c]
Benzo(b)fluoranthene (205-99-2) **(VOC)**										
252.3[h]	6.12[h]	6.57E-7[k] (25°C)	6.09[b]	2.26E-2[b] (25°C)	5.56E-6[b] (25°C)	6.58E-10[a] (20°C)	1.50E-3[b] (20-25°C)	715.90[c]	969.27[c]	1.70+4[c]
Benzo(k)fluoranthene (207-08-9) **(SVOC)**										
252.32[a]	6.84[a]	8.29E-7[b] (25°C)	6.09[b]	2.26E-2[b] (25°C)	5.56E-6[b] (25°C)	1.28E-12[a] (25°C)	8.00E-4[b] (20-25°C)	753.15[c]	1019.7[c]	1.80E+4[c]
Benzo(g,h,i)perylene (191-24-2) **(SVOC)**										
276.34[a]	6.63[a]	2.66E-7[a] (20°C)	4.98[a]	4.48E-2[d] (25°C)[e]	5.19E-6[d] (25°C)[e]	1.3E-13[a] (25°C)	2.6E-4[a] (25°C)	823[a]	1097[f]	1.96E+4[g]
Chrysene (218-01-9) **(VOC)**										
228.3[h]	5.66[h]	9.46E-5[b] (25°C)	5.60[b]	2.48E-2[b] (25°C)	6.21E-6[b] (25°C)	8.20E-12[a] (25°C)	1.60E-3[b] (20-25°C)	714.15[c]	979.0[c]	1.65E+4[c]
Dibenz(a,h)anthracene (53-70-3) **(SVOC)**										
278.4[h]	6.84[h]	1.47E-8[b] (25°C)	6.58[b]	2.02E-2[b] (25°C)	5.18E-6[b] (25°C)	1.32E-13[a] (20°C)	2.49E-3[b] (20-25°C)	743.24[c]	990.41[c]	3.00E+4[c]
Fluoranthene (206-44-0) **(VOC)**										
202.3[h]	4.95[h]	1.61E-5[b] (25°C)	5.03[b]	3.02E-2[b] (25°C)	6.35E-6[b] (25°C)	1.21E-8[a] (25°C)	2.06E-1[b] (20-25°C)	655.95[c]	905.0[c]	1.38E+4[c]

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
Fluorene (86-73-7) **(VOC)**										
166.21[a]	4.18[i]	6.37E-5[b] (25°C)	4.14[b]	3.63E-2[b] (25°C)	7.88E-6[b] (25°C)	4.21E-7[a] (20°C)	1.98E+0[b] (20-25°C)	570.44[c]	870.0[c]	1.27E+4[c]
Indeno(1,2,3-cd)pyrene (193-39-5) **(SVOC)**										
276.3[h]	6.58[h]	1.60E-6[b] (25°C)	6.54[b]	1.90E-2[b] (25°C)	5.66E-6[b] (25°C)	1.71E-13[a] (25°C)	2.20E-5[b] (20-25°C)	809.15[c]	1078.2[c]	1.90E+4[c]
Naphthalene (91-20-3) **(VOC)**										
128.2[h]	3.30[h]	4.40E-4[k] (25°C)	3.30[b]	5.90E-2[b] (25°C)	7.50E-6[b] (25°C)	1.12E-4[a] (25°C)	3.10E+1[b] (20-25°C)	491.14[c]	748.40[c]	1.04E+4[c]
Phenanthrene (85-01-8) **(VOC)**										
178.2[h]	4.46[h]	1.24E-4[a] (25°C)	4.36[a]	6.00E-2[d] (25°C)[e]	6.95E-6[d] (25°C)[e]	8.95E-7[a] (25°C)	1.29E+0[a] (25°C)	613.2[a]	869.2[j]	1.42E+4[a]
Pyrene (129-00-0) **(VOC)**										
202.26[a]	4.88[a]	1.1E-5[b] (25°C)	5.02[b]	2.72E-2[b] (25°C)	7.24E-6[b] (25°C)	1.17E-7[a] (25°C)	1.35E-1[b] (20-25°C)	667.95[c]	936.0[c]	1.44E+4[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K);.$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole); ND = no data.

[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 23 April.

[b]U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.

[c]U.S. Environmental Protection Agency (EPA), 2000, ***User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Revised***, Office of Emergency and Remedial Response, Washington, DC, December.

[d]Calculated as described in Introduction to Toxicological profiles.

[e]Assumed.

[f]Estimated from Equation 12-4 in Lyman, W.J., W.F. Reehl and D.H. Rosenblatt, 1990, ***Handbook of Chemical Property Estimation Methods***, American Chemical Society, Washington, DC.

[g]Estimated from Equation 13-5 in Lyman, W.J., W.F. Reehl and D.H. Rosenblatt, 1990, ***Handbook of Chemical Property Estimation Methods***, American Chemical Society, Washington, DC.

[h]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

[i]Syracuse Research Corporation (SRC), 2004, ***CHEMFATE Search Results***, on line, accessed 23 April.

[j]National Institute of Standards and Technology (NIST), 2004, Standard Reference Data Program, Online Data Bases, accessed 23 April.

[k]U.S. Environmental Protection Agency (EPA), 2010, *EPISuite electronic database*.

2.0 Environmental Fate and Transport

The PAHs are ubiquitous products of incomplete combustion; natural sources include volcanoes and forest fires (ATSDR, 1995a, b; HSDB, 2010). There is some evidence for biosynthesis by plants, bacteria and algae. Some of the PAHs occur naturally in fossil fuels. Anthropogenic releases to the environment, primarily to the atmosphere, greatly outweigh the natural sources and include any processes that involve incomplete combustion of fossil fuels and organic matter, including wood-burning for home heat (the predominant source), cigarette smoke, internal combustion engine exhaust, and fuel oil emissions. Industrial sources include coal mining, processing and storing, wood treatment (creosote), manufactured gas plants (coal tar), power generation, production of coal tar, coke and asphalt, petroleum cracking and industrial and municipal incineration. Other sources include various crude oils, fresh and used motor oils, gasolines, charcoal-broiled foods, processed foods, various oils, margarine, butter and fats, fruits, vegetables, and cereals, roasted coffee and tea. Indoor sources include unvented kerosene heaters and gas cooking and heating appliances. Naphthalene is released during its manufacture and processes that involve its use (e.g., vaporization from moth balls).

Although PAHs generally occur in mixtures, certain chemicals tend to predominate in different sources so that the PAH pattern observed in a given medium may provide a clue to the source. The following compilation relates individual PAHs and sources:

Source[a]	Individual PAHs
Residential wood burning	Acenaphthylene
Auto emissions	Benzo(g,h,i)perylene, pyrene
Diesel exhaust particulates	Fluoranthene, phenanthrene, pyrene
Diesel exhaust vapors	Phenanthrene, anthracene

Source[a]	Individual PAHs
Diesel total emissions	Acenaphthene, fluorene, phenanthrene
Fly ash & bottom ash from U.S. municipal waste incinerators	Phenanthrene
Fly ash from U.K. municipal waste incinerators	Benzo(g,h,i)perylene
Particulate emissions from municipal waste incinerator	Benzo(a)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene
Municipal/medical waste incinerator	Benzo(a)anthracene, benzo(g,h,i)perylene
Rotary kiln incinerator charged with polyethylene, no afterburner	Fluoranthene, phenanthrene, pyrene (see next entry)
Rotary kiln incinerator charged with polyethylene with afterburner	Benzo(a)anthracene, phenanthrene (total PAH emissions reduced 100-fold compared with no afterburner)
Coal tar pitch emissions	Phenanthrene and pyrene 20 to 80 X > benzo(a)pyrene, benzo(g,h,i)perylene
Natural gas home appliances – fine particulate emissions	Chrysene, fluoranthene, pyrene, triphenylene
Groundwater near coal & oil gasification plant	Acenaphthylene, acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, chrysene
Groundwater near wood treatment facilities	Benzo(a)pyrene, phenanthrene
[a]Agency for Toxic Substances and Disease Registry, (ATSDR), 1995, ***Update Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHs)***, U.S. Public Health Service, Atlanta, Georgia, August, on line.	

Data compiled for soils are not included in the table above because the lists are long and the variation from one site to another is great, so that the information is not useful for identifying sources. Similarly, sediment is a sink for PAHs from all sources including atmospheric deposition from far distant locations, and the patterns observed in sediment do not necessarily reflect a nearby source (ATSDR, 1995a). Generally, PAHs associated with combustion exhibit highly condensed ring structures and little alkylation (i.e., benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(e)pyrene, chrysene, fluoranthene, pyrene).

Crude petroleum and products made from crude petroleum (e.g., asphalts, fuels, oils) contain PAHs, but the patterns observed depend on the location of the source (ATSDR, 1995a; Potter and Simmons, 1998). Phenanthrene and alkylated forms of PAHs, particularly the methylnaphthalenes, often predominate in petroleum products.

The partitioning and fate of the PAHs in environmental media depend largely on VP (tendency to exist in air as a vapor), H (indicator of partitioning between air and water) and K_{oc} (indicator of affinity to bind to organic matter in soil and sediment). ATSDR (1995a) noted that H and K_{oc} are roughly directly related to MW, and that VP is roughly inversely related to MW. Therefore, they grouped the PAHs into the following categories to facilitate understanding their behavior in the environment:

- Low MW (152 to 178 g/mole) – acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene

- Medium MW (approximately 202 g/mole) – fluoranthene, pyrene

- High MW (228 to 278 g/mole) – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene.

PAHs exist in the atmosphere as vapors or adsorbed to particulates, the proportion depending on the vapor pressure of the individual chemical and atmospheric conditions such as temperature and humidity (ATSDR, 1995a, b; HSDB, 2010). Generally, the two- and three-ring compounds (low and medium MW except pyrene) exist predominantly as vapors; the four-ring compounds exist in both the vapor and particulate phase, and compounds with 5 or more rings (benzo[a]pyrene, benzo[g,h,i]perylene exist predominantly as particulates. Increasing atmospheric temperature and relative humidity favors existence in the vapor phase. PAHs may travel short or long distances before removal from the air. Vapor forms are subject to chemical oxidation processes in the air, which reduces the distance they may travel. Residence time and transport distance is inversely related to the size of the particles on which the PAHs are adsorbed. Small particles may have residence times of weeks, permitting transport for hundreds or upwards of a thousand miles. Wet and dry deposition accounts for removal of the particulates.

The predominant sources of PAHs in surface water are deposition from the atmosphere, industrial and sewage effluent and oil spills (ATSDR, 1995a, b). Runoff and erosion can also contribute PAHs to surface water bodies. Volatilization is a significant fate process for PAHs with H values of 1E-5 atm-m^3/mole or greater (generally the low and medium MW compounds). Volatilization is a very limited removal process for most of the high MW compounds. Volatilization is enhanced by high temperature, turbulence and high wind. Sorption to benthic or suspended sediment and biodegradation are competing removal processes. Generally, volatilization and biodegradation are the predominant removal processes for the low MW compounds, and volatilization and sorption are the predominant removal processes for medium and high MW compounds. Naphthalene is relatively water soluble and may remain largely in solution. PAHs in sediment may biodegrade, recycle back to the water column (lower MW compounds) or accumulate in the lower trophic levels of living organisms.

Deposition from the atmosphere is the principal source of PAHs in soil (ATSDR, 1995a, b). Other sources include industrial activities, disposal of sewage sludge, and leaching from coal storage sites. Most PAHs sorb to soil constituents because of their low solubility and high affinity for organic matter. Volatilization is an important removal process for the low molecular weight compounds. Some of the low molecular weight compounds, particularly naphthalene, may leach fairly rapidly to groundwater.

The high lipophilicity of many PAHs evidenced by high log K_{ow} values suggest that the PAHs might cross biologic membranes and participate significantly in food-chain pathways involving fish, fruit and vegetable, and meat and milk consumption. This, however, is not the case. For example, the PAHs are efficiently metabolized and excreted by fin fish, greatly reducing the likelihood of bioconcentration from water or bioaccumulation from sediment (ATSDR, 1995a). Consequently, there are often great discrepancies between modeled BCF values and empirical BCF values, where care was taken to identify the parent compound rather than PAH metabolites in fish tissue. This distinction is necessary because aromatic fragments from PAH metabolism are readily assimilated as normal endogenous components of biological tissue. PAH concentrations in aquatic food-chain systems usually decrease with increasing trophic level, reflecting the generally greater efficiency of metabolism in the higher trophic organisms.

Approximate tissue-to-sediment PAH concentration ratios were reported to be 0.6 to 1.2 for amphipods, 0.1 for clams, and 0.05 for fin fish and shrimp.

It has been reported that terrestrial plants can accumulate PAHs from soil by uptake through the roots (ATSDR, 1995a). More careful investigation, however, reveals that root uptake is quite low, and there is no evidence of bioconcentration or biomagnification. For example, PAH ratios in vegetation to soil in one survey ranged from 0.001 to 0.18 for total PAHs, and from 0.002 to 0.33 for benzo(a)pyrene. It is likely that most of the PAH contamination on the vegetation resulted from atmospheric deposition. Increased concentrations in vegetation have not been observed when soil PAH concentrations were greatly increased by amendment with sewage sludge. Data from carrots (*Daucus carotu*) showed that PAHs adhere to the outer skin of the root but show little tendency to penetrate to deeper layers, and even less tendency to translocate to aerial parts.

The inability of plants to bioconcentrate PAHs from soil reduces concern for bioconcentration in agricultural products such as meat and milk. It should be noted, however, that measurable concentrations of PAHs may accumulate on the aerial parts of plants because of deposition from the atmosphere (ATSDR, 1995a). Also, food-producing animals ingest a substantial amount of soil while grazing or consuming mechanically harvested forage crops. Mammals, however, efficiently metabolize the PAHs to polar compounds that are readily excreted, reducing concern for bioconcentration.

In summary, the PAHs are highly lipophilic, which implies significance in food-chain exposure pathways. Empirical data, however, show that fish and mammals efficiently metabolize and eliminate these compounds. Furthermore, bioconcentration in plants because of uptake from soil is not significant. Therefore, it is unlikely that the PAHs would participate significantly in food-chain pathways, and biotransfer factors are not estimated.

3.0 Toxicokinetics

The PAHs are absorbed by all routes of exposure, but the rate and extent depends on the compound, the species of animal and the vehicle (or nature of the particulates) (ATSDR, 1995a). PAHs are readily absorbed during inhalation exposure; however, intratracheal instillation studies indicate that particle size is the most important determiner of the extent of pulmonary uptake.

Toxicokinetic studies of several PAHs summarized by ATSDR (1995a) provide limited quantitative information regarding the extent of GI absorption. Limitations arise largely because biliary excretion complicates quantification of uptake from the GI tract. A study of benzo(a)pyrene in rats suggests that GI absorption ranges from 38 to 58 percent. A study in rats reported absorption efficiency for anthracene ranging from 53 to 74 percent. GI absorption of pyrene, chrysene and dibenzo(a,h)anthracene is described as high. Administration of the test compound in oil or in a high-fat diet appears to increase the extent of GI absorption.

Empirical data with pure compound dissolved or suspended in various vehicles suggest that dermal uptake of benzo(a)pyrene is extensive (ATSDR, 1995a). One occupational study reported that approximately 75 percent of systemically absorbed pyrene entered the body through dermal uptake rather than through inhalation exposure. Combining PAHs with soil appears to significantly reduce the extent of dermal uptake compared with oleaginous or acetone vehicles.

Anecdotal evidence from using cloth diapers stored in contact with naphthalene indicates that naphthalene is absorbed by the skin, but quantitative data are not available (ATSDR, 1995b).

Distribution of absorbed PAHs is generally widespread, with highest levels located initially in lipid-rich tissues (ATSDR, 1995a). Highest levels of metabolites (radioactivity following administration of radiolabeled compounds) are located in the liver and GI tract, even after inhalation exposure, probably reflecting extensive metabolism in the liver followed by biliary excretion. Ciliary clearance and deglutition probably contribute to levels associated with the GI tract. Concentrations of radioactivity following administration of radiolabeled compound reveal fetal levels approximately 2- to 10-fold lower than maternal levels, although this depends on the specific compound administered.

Metabolism of the PAHs, particularly benzo(a)pyrene, has been extensively studied (ATSDR, 1995a). Metabolism proceeds rapidly, yielding products that are more water soluble and readily excreted than the parent compound. All tissues have the ability to metabolize the PAHs, potentially to carcinogenic intermediates, which probably accounts for the observation that cancers occur at the point of contact. There is considerable variability in tissue metabolic activity; however, the liver is probably the most active in most cases.

ATSDR (1995a) distinguishes between “alternant” and “nonalternant” PAHs, based on the nature of the electron density associated with the molecule, which influences how that compound is metabolized to its ultimate carcinogen. Alternant PAHs (e.g., benzo[a]pyrene, benzo[a]anthracene, chrysene, dibenz[a,h]anthracene) exhibit a uniformly distributed electron density. Nonalternant PAHs (e.g., fluoranthene, benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene) behave more like two separate molecules because of uneven electron distribution.

Alternant PAHs (based on data for benzo[a]pyrene) are initially metabolized by the microsomal cytochrome P-450 system to several arene oxides (ATSDR, 1995a). These may re-arrange spontaneously to phenols or undergo hydration to form the corresponding trans-dihydrodiols. Further oxidation of the dihydrodiols results in formation of quinones, phenol diols and dihydrodiol epoxides. Phenols may be formed by direct insertion of oxygen into a ring. Many of the metabolites resulting from the reactions described above are subject to conjugation with various substrates followed rapidly by excretion. The dihydrodiol epoxides that form in the “bay” region (the three-sided concave region formed by the fusion of three benzene rings) are most likely the ultimate carcinogens that covalently bind to macromolecules such as DNA, resulting in alkylation or other adducts that yield genetic errors.

Metabolism of the nonalternant PAHs differs from the alternant PAHs in that more extensive oxidation to hydroxy-epoxy-diols may be important to achieve genotoxicity (ATSDR, 1995a). Dihydrodiol epoxide formation in the bay region is associated with carcinogenicity of the PAHs generally; however, some of the nonalternant PAHs yield reactive metabolites that deviate from the classical bay region model.

PAH metabolites are readily excreted, largely through the bile, although some metabolites are excreted by the kidney (ATSDR, 1995a). The extent of elimination is species specific. In one inhalation study rats excreted metabolites much more efficiently than dogs or monkeys.

4.0 Dermal Exposure

EPA (2004) recommends that oral toxicity values for the PAHs should not be adjusted when applied to dermal exposure because GI absorption probably exceeds 50 percent. Therefore, no GAF is estimated and the oral toxicity values described below should be used for dermal exposure without adjustment.

Empirical data with pure compound dissolved or suspended in various vehicles suggest that dermal uptake of benzo(a)pyrene is extensive (ATSDR, 1995a). Anecdotal evidence from using cloth diapers stored in contact with naphthalene indicates that naphthalene is absorbed by the skin, but quantitative data are not available (ATSDR, 1995b). EPA (2004) reviewed empirical data regarding dermal uptake of benzo(a)pyrene and recommended an ABS of 0.13 for the PAHs. However, EPA (2004) also notes that VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels. Therefore, the ABS of 0.13 is applied to all the PAHs identified above as SVOCs. Dermal uptake of the PAHs identified as VOCs is not quantified.

Values for t*, K_p, τ, FA and B are provided or estimated as follows:

Chemical	t*	K_p	τ	FA	B
Acenaphthene[a]	1.84	8.39E-2	7.67E-1	1	0.4
Acenaphthylene[a]	1.79	1.08E-1	7.47E-1	1	0.5
Anthracene[a]	4.06	1.38E-1	1.05E+0	1	0.7
Benzo(a)anthracene[b]	8.53	4.7E-1	2.03E+0	1.0	2.8
Benzo(a)pyrene[b]	11.67	7.0E-1	2.69E+0	1.0	4.3
Benzo(b)fluoranthene[b]	12.03	7.0E-1	2.77E+0	1.0	4.3
Benzo(k)fluoranthene[a]	12.40	2.00E+0	2.72E+0	0.4	12
Benzo(g,h,i)perylene[a]	8.89	1.07E+0	3.70E+0	0.7	6.8
Chrysene[b]	8.53	4.7E-1	2.03E+0	1.0	2.8
Dibenz(a,h)anthracene[b]	17.57	1.5E+0	3.88E+0	0.6	9.7
Fluoranthene[b]	5.68	2.2E-1	1.45E+0	1.0	1.2
Fluorene[a]	2.15	1.07E-1	8.95E-1	1	0.5
Indeno(1,2,3-cd)pyrene[b]	16.83	1.0E+0	3.78E+0	0.6	6.7
Naphthalene[b]	1.34	4.7E-2	5.6E-1	1	0.2
Phenanthrene[b]	4.11	1.4E-1	1.06E+0	1	0.7
Pyrene[a]	3.42	1.94E-1	1.43E+0	1	1.1

t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).
[a]Estimated as described in Introduction to Toxicological profiles.
[b]Provided by U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

5.0 Noncancer Effects Evaluation

The PAHs are generally divided into two EPA cancer weight-of-evidence groups: Group D – not classifiable as to carcinogenicity to humans, and Group B2 – probable human carcinogens. The Group D PAHs have not been evaluated for carcinogenicity by toxicity testing; therefore, cancer SFs or URFs cannot be estimated for these compounds (EPA, 1986, 2010). Risk evaluation of these compounds is limited to noncancer effects. It is theoretically possible that cancer risk could be the "driver" for some of these compounds. However, the mechanism of carcinogenicity of the PAHs is fairly well understood to be correlated with molecular morphology and the propensity to

form certain active metabolites (ATSDR, 1995a). The Group D PAHs either do not fit the morphologic mold or have been shown empirically to be unlikely to cause cancer, reducing greatly the uncertainty that significant cancer risk is being overlooked.

Cancer SFs and URFs are available for the Group B2 compounds, but noncancer RfDs or RfCs are not. Therefore, risk evaluation of these compounds is limited to cancer risk. These compounds have the morphologic requirements for carcinogenicity; therefore, it has been thought that cancer risk is the driver, and that noncancer effects are relatively insignificant, although empirical data were lacking until recently.

Recent data support this assumption. De Jong et al. (2008) reported a study in which male rats were treated by gavage with benzo(a)pyrene 5 days per week for 35 days at dose rates of 0 (control), 3, 10, 30 or 90 mg/kg. Significantly reduced rate of body weight gain and altered organ weights were observed in the 90 mg/kg group. Fore stomach lesions were found in the 30 and 90 mg/kg groups. Decreased thymus weights and hematological evidence of erythrocyte toxicity were observed in a dose-related manner in rats treated with 10 mg/kg and above. Subtle alterations in measures of immune function were also observed in these groups, establishing 10 mg/kg as the LOAEL and 3 mg/kg as the NOAEL for this study. The 3 mg/kg dose is equivalent to a NOAEL of 2.1 mg/kg-day when adjusted for continuous exposure. Application of an uncertainty factor of 1000 (factor of 10 to expand from subchronic to chronic exposure, and factors of 10 each to provide additional protection for intra- and interspecies variation) allows development of a preliminary oral RfD of 2E-3 mg/kg-day. Uncertainty surrounding the preliminary oral RfD is very high because the data base for the noncancer effects of benzo(a)pyrene is essentially limited to one study and several toxicological endpoints (e.g., developmental, reproductive, neurological) were not investigated.

The sole purpose for developing this oral RfD is to evaluate the potential for noncancer effects to be the driver for the Group B2 PAHs. The RfD was not developed with sufficient rigor to be used in the risk assessment of the noncancer effects of benzo(a)pyrene. The oral SF for benzo(a)pyrene is 7.3 per mg/kg-day (please see below), from which it is estimated that the oral RfD is equivalent to a cancer risk of 1.5E-2. This cancer risk is orders of magnitude above the EPA (1990) risk management range of 1E-6 to 1E-4, strengthening the position that noncancer effects are unlikely to be the driver for the Group B2 PAHs.

Data regarding the toxicity of acute oral exposure to the PAHs are generally scarce. Prolonged oral exposure to the Group D PAHs is associated with a number of renal, hematologic and other effects, depending on the compound.

Subchronic (90 day) gavage treatment of mice with acenaphthene is associated with histopathologic evidence of liver hypertrophy. A verified RfD of 6E-2 mg/kg-day for chronic oral exposure was derived from the NOAEL of 175 mg/kg-day and an uncertainty factor of 3000 (EPA, 2010). The LOAEL in this study was 350 mg/kg-day. Confidence in the RfD is low. The liver is considered the target organ for prolonged oral exposure to acenaphthene. EPA (1997) derived a provisional subchronic oral RfD for acenaphthene of 6E-1 mg/kg-day from the same mouse study using an uncertainty factor of 300.

A verified RfD of 3E-1 mg/kg-day for chronic oral exposure to anthracene was derived from a NOEL of 1000 mg/kg-day, the highest dose tested, in a 90-day gavage study in mice (EPA,

2010). An uncertainty factor of 3000 was applied. Confidence in the RfD is low. The data are inadequate to identify a target organ for prolonged oral exposure to anthracene. EPA (1997) derived a provisional subchronic oral RfD for anthracene of 3E+0 mg/kg-day from the same mouse study using an uncertainty factor of 300.

Subchronic exposure to fluoranthene induces liver and kidney effects and hematologic alterations in orally treated mice (EPA, 2010). A verified RfD of 4E-2 mg/kg-day for chronic oral exposure was derived from a NOAEL of 125 mg/kg-day in a 13-week gavage study. The LOAEL was 250 mg/kg-day in this study. An uncertainty factor of 3000 was applied. Confidence in the oral RfD is low. The kidney, liver and blood cells are chosen as the target organs for prolonged oral exposure to fluoranthene. EPA (1997) derived a provisional subchronic oral RfD for fluoranthene of 4E-1 mg/kg-day from the same mouse study using an uncertainty factor of 300.

Subchronic exposure to fluorene induces hemolytic anemia in orally treated mice (EPA, 2010). A verified RfD of 4E-2 mg/kg-day for chronic oral exposure was derived from a NOAEL of 125 mg/kg-day in a 13-week gavage study. The LOAEL was 250 mg/kg-day in this study. An uncertainty factor of 3000 was applied. Confidence in the oral RfD is low. The erythrocyte is the target organ for prolonged oral exposure to fluorene. EPA (1997) derived a provisional subchronic oral RfD for fluorene of 4E-1 mg/kg-day from the same mouse study using an uncertainty factor of 300.

Single-dose LD_{50} values for naphthalene include 533 to 710 mg/kg for mice and 2200 to 2400 mg/kg for rats, establishing the mouse as more sensitive to the lethal effects of acute oral exposure (ATSDR, 1995b). Decreased terminal body weights, accompanied by a remarkable absence of hematological and histopathological effects, were observed in rats treated by gavage for 13 weeks (EPA, 2010). The LOAEL in this study was 142 mg/kg-day associated with greater than 10 percent reduction in terminal body weights. The NOAEL was 71 mg/kg-day. The high dose rate, 286 mg/kg-day was a FEL associated with increased mortality. Application of an uncertainty factor of 3000 (10 to extrapolate from rats to humans, 10 to protect sensitive humans, 10 to extrapolate from subchronic to chronic exposure, and 3 for database deficiencies) to the NOAEL of 71 mg/kg-day yields the verified chronic oral RfD of 2E-2 mg/kg-day. Confidence in the RfD is low. A preliminary subchronic oral RfD can be derived for naphthalene by applying an uncertainty factor of 300 to the NOAEL of 71 mg/kg-day described above. The uncertainty factor of 300 reflects the chronic uncertainty factor of 3000 without the factor of 10 to expand from subchronic to chronic exposure. The preliminary subchronic oral RfD so derived is 2E-1 mg/kg-day.

The key study described above is not sufficient to identify target organs for prolonged oral exposure to naphthalene. Adults, children and neonates exposed to moth balls exhibit hemolytic anemia, evidence of liver disease and neurological deficits (EPA, 1993a, 1998). The liver effects and neurological deficits may be secondary to hemolytic anemia and reduced oxygen-carrying capacity of the blood. Hemolytic anemia and cataract formation have been seen also in orally exposed humans (EPA, 1998). The data suggest that the erythrocyte may be the most sensitive tissue in humans. Among common species of laboratory mammals, hemolytic anemia is seen only in dogs (EPA, 1998). Cataracts are seen in several laboratory mammals, but only at relatively high doses. The key study identifies reduced body weight as the critical effect in rats. Rats, however, do not exhibit hemolytic anemia, and exhibit cataracts only at very high doses,

suggesting that rats may not be a totally acceptable model for the toxicity of naphthalene to humans. Therefore, based on the effects observed in humans, the erythrocyte and eye are selected as target organs for prolonged oral exposure to naphthalene. Reduced body weight is also included as a critical effect because this was the only endpoint observed in rats in the key study.

EPA (1993a, 2010) reported a 2-year study in which mice were exposed to naphthalene vapors for 6 hours/day on 5 days/week. Inflammation of the nasal and olfactory epithelium was the most consistently observed sign; granulomatous lesions in the lungs were also observed. There was equivocal evidence of hematologic involvement. The lowest exposure concentration, 10 ppm, was a LOAEL for the nasal effects, which are considered the critical effects of inhalation exposure. The LOAEL is equivalent to a human equivalent concentration of 9.3 mg/m^3 (EPA, 2010). Application of an uncertainty factor of 3000 yields a verified chronic inhalation RfC of 3E-3 mg/m^3, which is equivalent to a chronic inhalation RfD of 8.6E-4 mg/kg-day. The nasal and olfactory epithelia are the target organs for inhalation exposure to naphthalene. Confidence in the RfC is medium. The chronic inhalation RfC of 3E-3 mg/m^3, equivalent to an inhalation RfD of 8.6E-4 mg/kg-day, is adopted as sufficiently protective for subchronic inhalation exposure as well.

Subchronic exposure to pyrene induces mild renal tubular degeneration and reduced kidney weight in orally treated mice (EPA, 2010). A verified RfD of 3E-2 mg/kg-day for chronic oral exposure was derived from a NOAEL of 75 mg/kg-day in a 13-week gavage study. The LOAEL was 125 mg/kg-day in this study. An uncertainty factor of 3000 was applied. Confidence in the oral RfD is low. The kidney tubule is chosen as the target organ for chronic oral exposure to pyrene. EPA (1997) derived a provisional subchronic oral RfD for pyrene of 3E-1 mg/kg-day from the same mouse study using an uncertainty factor of 300.

Data regarding prolonged oral exposure are not available for several of the Group D PAHs, which hinders estimation of an RfD or RfC and compromises evaluation of the potential for noncancer effects. Therefore, surrogates are used to develop toxicity values for the noncancer effects.

Generally surrogates are chosen on the basis of the following hierarchy:

- Toxicological similarity (effects and dose-response relationship).
- Toxicokinetic similarity, assuming that likeness in absorption, distribution and especially products of biotransformation suggests toxicological similarity.
- Structural similarity, assuming that likeness in structure suggests similarity in toxicokinetics.

Selection of defensible surrogates for the PAHs is compromised because toxicological and toxicokinetic data are virtually non-existent (except for benzo[a]pyrene), and the structural similarities often are not very convincing, which imparts a great deal of uncertainty to the effort. Therefore, the most defensible approach for some of the PAHs is to select the most conservative surrogate; i.e., the PAH with the smallest verified oral RfD, which happens to be pyrene.

Data regarding the effects of chronic or subchronic exposure to acenaphthylene were not located in the available literature. Acenaphthene is adopted as a reasonable surrogate for acenaphthylene based on structural similarity, since the surrogate differs from the principal chemical only in the presence of two hydrogen atoms and the absence of a double bond. Therefore, the verified chronic oral RfD of 6E-2 mg/kg-day for acenaphthene is adopted as the RfD for chronic oral exposure to acenaphthylene. The liver, which is the target organ for acenaphthene, is adopted for oral exposure to acenaphthylene. Similarly, the provisional subchronic oral RfD of 6E-1 mg/kg-day for acenaphthene is adopted as the RfD for subchronic oral exposure to acenaphthylene.

Data regarding the effects of chronic or subchronic exposure to benzo(g,h,i)perylene were not located in the available literature. Pyrene is adopted as a reasonable surrogate for benzo(g,h,i)perylene based somewhat on structural similarity, but more on the selection of a conservative approach as justified above. Therefore, the verified oral RfD of 3E-2 mg/kg-day for pyrene is adopted as the oral RfD for chronic exposure to benzo(g,h,i)perylene. Similarly, the provisional subchronic oral RfD of 3E-1 mg/kg-day for pyrene is adopted as the RfD for subchronic oral exposure to benzo(g,h,i)perylene. The kidney tubule, which is the target organ for pyrene, is adopted for oral exposure to benzo(g,h,i)perylene.

Relevant data regarding chronic or subchronic exposure to phenanthrene were not located. Potential surrogates based on similarity in chemical structure include anthracene and pyrene. Pyrene is selected as the surrogate only because it is the more conservative choice. Therefore, the verified oral RfD of 3E-2 mg/kg-day for pyrene is adopted as the oral RfD for chronic exposure to phenanthrene. Similarly, the provisional subchronic oral RfD of 3E-1 mg/kg-day for pyrene is adopted as the RfD for subchronic oral exposure to phenanthrene. The kidney tubule, which is the target organ for pyrene, is adopted for oral exposure to phenanthrene.

Data regarding inhalation exposure sufficient for development of inhalation RfCs were not located for any of the PAHs with the exception of naphthalene as noted above.

6.0 Carcinogenicity Evaluation

Acenaphthylene, anthracene, benzo(g,h,i)perylene, fluoranthene, fluorene, phenanthrene and pyrene are classified in EPA cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans) because of a lack of human data and inadequate animal data (EPA, 2010). Data regarding the carcinogenicity of acenaphthene were not located. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, , chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene are classified in EPA weight-of-evidence Group B2 (probable human carcinogens) (EPA, 1997, 2010). Benzo(a)pyrene is the most extensively studied member of the class, inducing tumors in tissues at the point of contact of practically all laboratory species tested by all routes of exposure.

Although epidemiology studies suggested that complex mixtures that contain PAHs (coal tar, soots, coke oven emissions, cigarette smoke) are carcinogenic to humans, the carcinogenicity cannot be attributed to PAHs alone because of the presence of other potentially carcinogenic substances in these mixtures (ATSDR, 1995a). In addition, recent investigations showed that the PAH fraction of roofing tar, cigarette smoke and coke oven emissions accounted for only 0.1-8% of the total mutagenic activity in *Salmonella* of the unfractionated complex mixture (Lewtas, 1988). Aromatic amines, nitrogen heterocyclic compounds, highly oxygenated quinones, diones,

and nitrooxygenated compounds, none of which would be expected to arise from in vivo metabolism of PAHs, probably accounts for the majority of the mutagenicity of coke oven emissions and cigarette smoke. Furthermore, coal tar, which contains a mixture of many PAHs, has a long history of use in the clinical treatment of a variety of skin disorders in humans (ATSDR, 1995a).

Because of the lack of human cancer data, assignment of individual PAHs to EPA cancer weight-of-evidence groups is based largely on the results of animal studies with large doses of purified compound (EPA, 2010). Frequently, unnatural routes of exposure, including implants of the test chemical in beeswax and trioctanoin in the lungs of female rats, intratracheal instillation, and subcutaneous or intraperitoneal injection, were used. Although the carcinogenicity of benzo(a)pyrene in animals managed in an unnatural manner in laboratory conditions has been well established, the potential for carcinogenicity to humans in environmental settings involving exposure to low concentrations remains unclear.

EPA (200) verified a SF for oral exposure to benzo(a)pyrene of 7.3E+0 per mg/kg-day, based on several dietary studies in mice and rats. Recent reevaluations of the carcinogenicity and mutagenicity of the Group B2 PAHs suggest that there are large differences between individual PAHs in cancer potency (Krewski et al., 1989). Based on the available cancer and mutagenicity data, and assuming that there is a constant relative potency between different potential carcinogens across different bioassay systems and that the PAHs under consideration have similar dose-response curves, EPA (1993b) adopted relative potency values for several PAHs. These values and the corresponding oral SFs, based on a relative potency for benzo(a)pyrene of 1.0, are presented below:

Relative Potency Estimates for PAHs				
			Inhalation	
PAH	Relative Potency	Oral Slope Factor (per mg/kg-day)	Unit Risk Factor (per µg/m^3)	Slope Factor (per mg/kg-day)
Benzo(a)pyrene	1.0	7.3E+0	8.8E-4	3.1E+0
Benzo(a)anthracene	0.1	7.3E-1	8.8E-5	3.1E-1
Benzo(b)fluoranthene	0.1	7.3E-1	8.8E-5	3.1E-1
Benzo(k)fluoranthene	0.01	7.3E-2	8.8E-6	3.1E-2
Chrysene	0.001	7.3E-3	8.8E-7	3.1E-3
Dibenz(a,h)anthracene	1.0	7.3E+0	8.8E-4	3.1E+0
Indeno(1,2,3-cd)pyrene	0.1	7.3E-1	8.8E-5	3.1E-1

Although the EPA has not verified SFs for Group B2 PAHs other than benzo(a)pyrene, the SFs above represent reasonable estimates based on the data available. The relative potency approach employed here meets criteria considered to be desirable for this type of analysis (Lewtas, 1988). For example, the chemicals compared have similar chemical structures and would be expected to have similar toxicokinetic fate in mammalian systems. In addition, the available data suggest that the Group B2 PAHs have a similar mechanism of action, inducing frameshift mutations in *Salmonella* and tumor initiation in the mouse skin painting assay. Similar noncancer effects (minor changes in the blood, liver, kidneys) of the Group D PAHs support the hypothesis of a common mechanism of toxicity. Finally, the same endpoints of toxicity, i.e., potency in various cancer assays, and related data, were used to derive the relative potency values (Krewski et al., 1989). The oral SF for benzo(a)pyrene of 7.3E+0 per mg/kg-day, and the SFs presented above for the other Group B2 PAHs are adopted for the purposes of this evaluation.

An EPA (1994) evaluation of the inhalation cancer data suggests adoption of an inhalation SF for benzo(a)pyrene of 3.1E+0 per mg/kg-day, based on the incidence of upper respiratory and digestive tract tumors in hamsters. Applying the relative potency estimates presented above yield the inhalation URFs and SFs for the other Group B2 PAHs presented above.

EPA (2010) classified naphthalene in EPA cancer weight-of-evidence group C – possible human carcinogen – based on benign respiratory tumors and one carcinoma in female mice exposed to naphthalene by inhalation. Cancer potency factors are not available because the data are not sufficient.

7.0 Toxicity Summary

Toxicity values for the PAHs are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
Acenaphthene										
6E-1	6E-2	L	ND	ND	NA	ND	NA	ND	NA	NA
Acenaphthylene										
6E-1	6E-2	L	ND	ND	NA	D	NA	D	NA	NA
Anthracene										
3E+0	3E-1	ND	ND	ND	NA	D	NA	D	NA	NA
Benzo(a)anthracene										
ND	ND	NA	ND	ND	NA	B2	7.3E-1	B2	8.8E-5	3.1E-1
Benzo(a)pyrene										
ND	ND	NA	ND	ND	NA	B2	7.3E+0	B2	8.8E-4	3.1E+0
Benzo(b)fluoranthene										
ND	ND	NA	ND	ND	NA	B2	7.3E-1	B2	8.8E-5	3.1E-1
Benzo(k)fluoranthene										
ND	ND	NA	ND	ND	NA	B2	7.3E-2	B2	8.8E-6	3.1E-2
Benzo(g,h,i)perylene										
3E-1	3E-2	K	ND	ND	NA	D	NA	D	NA	NA
Chrysene										
ND	ND	NA	ND	ND	NA	B2	7.3E-3	B2	8.8E-7	3.1E-3
Dibenz(a,h)anthracene										
ND	ND	NA	ND	ND	NA	B2	7.3E+0	B2	8.8E-4	3.1E+0
Fluoranthene										
4E-1	4E-2	L,K,B	ND	ND	NA	D	NA	D	NA	NA
Fluorene										
4E-1	4E-2	E	ND	ND	NA	D	NA	D	NA	NA
Indeno(1,2,3-cd)pyrene										
ND	ND	NA	ND	ND	NA	B2	7.3E-1	B2	8.8E-5	3.1E-1
Naphthalene										
2E-1	2E-2	E, Ey, BW	3E-3/ 8.6E-4	3E-3/ 8.6E-4	Ne, Oe	C	ND	C	ND	ND
Phenanthrene										
3E-1	3E-2	K	ND	ND	NA	D	NA	D	NA	NA
Pyrene										
3E-1	3E-2	K	ND	ND	NA	D	NA	D	NA	NA

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: B = blood cells; BW = reduced body weight; E = erythrocyte; Ey = eye; L = liver; K = kidney; Ne = nasal epithelium; Oe = olfactory epithelium.
[a]sRfDo, cRfDo and SFo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 1995a, ***Update Toxicological Profile for Polycyclic Aromatic Hydrocarbons (PAHs)***, U.S. Public Health Service, Atlanta, Georgia, August, on line.

Agency for Toxic Substances and Disease Registry, (ATSDR), 1995b, ***Update Toxicological Profile for Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene***, U.S. Public Health Service, Atlanta, Georgia, August, on line.

De Jong, W.H., E.D. Kroes, J.G. Vos and H. Van Loveren, 1999, “Detection of Immunotoxicity of Benzo[a]pyrene in a Subacute Toxicity Study after Oral Exposure in Rats,” ***Toxicological Sciences*** 50: 214-220.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

Krewski, D., T. Thorslund and J. Withey, 1989, "Carcinogenic Risk Assessment of Complex Mixtures," ***Toxicology and Industrial Health***, 5: 851-867.

Lewtas, J., 1988, "Genotoxicity of Complex Mixtures: Strategies for the Identification and Comparative Assessment of Airborne Mutagens and Carcinogens from Combustion Sources," ***Fundamental and Applied Toxicology***, 10: 571-589.

Potter, T.L. and K.E. Simmons, 1998, ***Composition of Petroleum Mixtures***, Volume 2, Total Petroleum Hydrocarbon Criteria Working Group Series, University of Massachusetts, Amherst, May.

U.S. Environmental Protection Agency (EPA), 1986, “Guidelines for Carcinogen Risk Assessment,” ***Federal Register*** 51(185): 33992-34003.

U.S. Environmental Protection Agency (EPA), 1990, “National Oil and Hazardous Substances Pollution Contingency Plan,” ***Federal Register*** 55(46): 8666-8865.

U.S. Environmental Protection Agency (EPA), 1993a, ***Risk Assessment Issue Paper for: Derivation of a Subchronic RfC for Naphthalene (CASRN 91-20-3)***, National Center for Environmental Assessment, Cincinnati, Ohio, March 12.

U.S. Environmental Protection Agency (EPA), 1993b, ***Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons***, Office of Health and Environmental Assessment, Cincinnati, OH, EPA/600/R-93/089, March.

U.S. Environmental Protection Agency (EPA), 1994, ***Risk Assessment Issue Paper: Status of Inhalation Cancer Unit Risk for Benzo(a)Pyrene (CAS No. 50-32-8)***, National Center for Environmental Assessment, Cincinnati, OH, November 18.

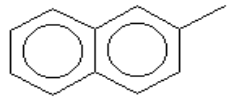
U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 1998, ***Toxicological Review of Naphthalene (CAS No. 91-20-3) In Support of Summary Information on the Integrated Risk Information System (IRIS)***, August.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

METHYLNAPHTHALENES



2-Methylnaphthalene

1.0 Introduction and Physical Properties

The methylnaphthalenes are the simplest alkylated polyaromatic hydrocarbons (PAH). Two monomethylnaphthalene isomers are possible: 1-methylnaphthalene (occasionally incorrectly called 4-methylnaphthalene) (90-12-0) and 2-methylnaphthalene (91-57-6). A commercial preparation of mixed isomers (1321-94-4) is mentioned (ATSDR, 2005; HSDB, 2010), but the proportion of the individual isomers was not reported. Both 1- and 2-methylnaphthalene are **VOCs**. 1-Methylnaphthalene occurs as a colorless liquid in the pure form at ambient temperatures (HSDB, 2010). 2-Methylnaphthalene reportedly occurs as a solid, but the melting point is 34.6 °C (approximately 94 °F), indicating that at high ambient temperatures the compound would occur as a liquid.

1-Methylnaphthalene is a component of petroleum and a product of incomplete combustion (HSDB, 2010). The compound is also used as a chemical intermediate and a general solvent. 2-Methylnaphthalene is used as an intermediate in organic chemical synthesis, as a dye carrier, in the manufacture of pesticides, as an adjuvant in pesticide formulations, and, in its pure form, in the manufacture of vitamin K. 2-Methylnaphthalene also is a component of crude oil and a product of combustion, which is produced and released to the environment during natural fires. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
1-Methylnaphthalene (90-12-0)										
142.19[a]	3.87[a]	5.14E-4[a] (25°C)	3.36[a]	6.97E-2[b] (25°C)[c]	8.08E-6[b] (25°C)[c]	8.82E-5[a] (25°C)	2.58E+1[a] (25°C)	515[d]	772[d]	1.37E+4[d]
2-Methylnaphthalene (91-57-6)										
142.20[a]	3.86[e]	5.18E-4[e] (25°C)[c]	3.60[ae]	6.97E-2[b] (25°C)[c]	8.08E-6[b] (25°C)[c]	7.24E-5[a] (25°C)	41.4E+1[e] (25°C)	514[d]	761[d]	1.08E+4[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K); $H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole); ND = no data.

[a]Hazard Substances Data Bank (HSDB), 2010, National Library of Medicine.
[b]Calculated as described in Introduction to Toxicity Profiles.
[c]Assumed.
[d]National Institute of Standards and Technology (NIST), 2010, *NIST Chemistry WebBook*, on line.
[e] U.S. Environmental Protection Agency (EPA), 2010, *EPISuite electronic database*.

2.0 Environmental Fate and Transport

Emissions from petroleum refining, coal tar distillation, and gasoline and diesel fueled engines are major contributors of methylnaphthalenes to the environment (HSDB, 2010). Because of the widespread use of the methylnaphthalenes in a variety of products, they are also released to the environment in manufacturing effluents, the disposal of waste byproducts, through landfills,

municipal waste water treatment facilities and waste incinerators. Forest fires and uncontrolled combustion are relatively insignificant contributors (ATSDR, 2005).

Based upon their relatively high vapor pressure, the methylnaphthalenes are expected to exist entirely in the vapor phase in ambient air (HSDB, 2010). Direct photolysis of the methylnaphthalenes is likely to occur; however, only aqueous photolysis data are available. Reactions of the methylnaphthalenes with photochemically produced hydroxyl radicals (half-life = 7.4 hours) and ozone (half-life = 29 to 88 days) are likely to be important removal processes in ambient air. The formation of nitro derivatives in night-time air is also likely to be an important removal process for these compounds.

Data regarding the biodegradation of the methylnaphthalenes in soil were not available (HSDB, 2010). However, based upon aqueous screening test data and die-away tests for ground and marine water, the methylnaphthalenes are expected to biodegrade fairly rapidly in soils acclimated to PAHs and at a moderate rate in unacclimated soils. The methylnaphthalenes are not expected to undergo hydrolysis in soils; however, they are expected to undergo direct photolysis in sunlit surface soils. Mobility in soil is likely to be very low. Volatilization from moist soils may be a significant removal mechanism, although it will be attenuated by adsorption.

The methylnaphthalenes will partition from the water column to organic matter contained in sediments and suspended solids (HSDB, 2010). Volatilization is likely to be an important removal process for these compounds. Volatilization half-lives for a model river and model lake were estimated to be 5.5 hours and 5.3 days, respectively. The methylnaphthalenes are expected to degrade rapidly in marine water and waters acclimated to PAHs. Degradation is expected to be less rapid in unacclimated aquatic systems. The methylnaphthalenes are not expected to undergo hydrolysis in water; however, direct photolysis in sunlit waters is likely to be a significant removal process. The direct photolysis half-life for midday, midsummer sunlight at 40˚ N latitude was predicted to be 22 and 54 hours for 1- and 2-methylnaphthalene, respectively, in water solution.

The methylnaphthalenes are not expected to participate significantly in food-chain pathways (ATSDR, 2005; HSDB, 2010); therefore, biotransfer factors are not provided.

3.0 Toxicokinetics

Data regarding the toxicokinetics of the methylnaphthalenes are very limited. Data regarding the toxicokinetics of naphthalene, often used as a surrogate for the methylnaphthalenes, is somewhat more complete.

The observation that inhalation exposure to naphthalene leads to adverse effects in humans suggests that the methylnaphthalenes are also absorbed by the respiratory tract (ATSDR, 2005).

An excretion study with radiolabeled 2-methylnaphthalene in guinea pigs suggests that GI absorption is rapid and nearly complete, as 80 percent of the administered dose of radioactivity was recovered from the urine within 24 hours (ATSDR, 2005).

Data were not located regarding dermal uptake of the methylnaphthalenes. However, serious adverse health effects have been observed in humans dermally exposed to naphthalene, and animal studies show that naphthalene is rapidly and extensively absorbed through the skin, although using soil as the vehicle slows dermal absorption (ATSDR, 2005). These observations suggest that dermal uptake of the methylnaphthalenes may be significant.

Limited distribution data following oral administration of radiolabeled 2-methylnaphthalene to guinea pigs revealed the presence of radioactivity in the liver almost immediately after treatment (ATSDR, 2005). Relatively high levels were located in the gall bladder, liver and kidney, all of which represent excretion. Data from orally administered naphthalene suggests that distribution to adipose tissue is probably substantial, and that the methylnaphthalenes will probably cross the placenta and distribute to milk. As stated above, naphthalene is often used as a surrogate for the methylnaphthalenes because of structural similarity. Similarity in structure implies similarity in physical, chemical, toxicokinetic and toxicological characteristics.

The sole initial step in naphthalene metabolism is oxidation at the 1,2-position to form the epoxide, 1,2-naphthalene oxide (ATSDR, 2005). The epoxide may rearrange spontaneously to form 1- and 2-naphthol, or undergo enzymatic conversion to 1,2-dihydroxy, 1,2-dihydronaphthalene. The epoxide formed in the first step is recognized as an intermediate that reacts with tissue macromolecules inducing toxic effects, particularly in the lung. 1-Naphthol may undergo further oxidation to form 1,4-naphthoquinone, which has also been shown to interact with macromolecules, particularly in the liver. 1,2-Dihydroxy, 1,2-dihydronaphthalene may undergo further oxidation to form 1,2-naphthoquinone or 1,2-dihydroxy-3,4-epoxy-1,2,3,4-tetrahydronaphthalene. 1,2-Naphthoquinone may be the ultimate toxicant associated with naphthalene-induced cataracts. The toxicological significance of 1,2-dihydroxy-3,4-epoxy-1,2,3,4-tetrahydronaphthalene is unclear.

The presence of the methyl group on 1- or 2-methylnaphthalene may greatly alter the metabolic scheme for these chemicals compared with naphthalene. Data are available only for 2-methylnaphthalene, but the metabolism of 1-methylnaphthalene may be similar. The predominant pathway of 2-methylnaphthalene metabolism involves stepwise oxidation of the methyl group to form 2-hydroxymethylnaphthalene and 2-naphthoic acid, possibly through the aldehyde intermediate (ATSDR, 2005). This pathway accounts for 50 to 80 percent of 2-methylnaphthalene, depending on the species. The end products of this pathway are conjugated with glycine or glucuronic acid and excreted. Ring epoxidation at the 3,4-, 5,6- or 7,8- positions accounts for 15 to 20 percent of 2-methylnaphthalene. These epoxides may be subject to conjugation or may be further oxidized to form the corresponding dihydrols and other derivatives, which in turn undergo conjugation. Experiments with mice suggest that glutathione conjugation may be an important detoxication mechanism. Although data regarding the biological activity of methylnaphthalene metabolites is not as complete as data regarding the biological activity of the naphthalene metabolites, the differences in the metabolites formed are considerable.

Data regarding excretion of the methylnaphthalenes is limited to a study of 2-methylnaphthalene in guinea pigs. Approximately 80 percent of the radiolabel from a single oral dose was recovered within 24 hours in the urine; approximately 10 percent was recovered from the feces. Conjugated metabolites of the products of methyl group oxidation accounted for approximately 76 percent of

the recovered radioactivity. Approximately 18 percent of the recovered radiolabel represented epoxidation at the 7,8- positions.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly (50 percent) less than complete. Therefore, no GAF is developed for the methylnaphthalenes and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

Data were not located regarding the dermal uptake of the methylnaphthalenes from soil. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of the methylnaphthalenes from soil is not evaluated. t*, K_p, τ, FA and B values are estimated by the EPA (2004) method as follows:

Chemical	t*	K_p	τ	FA	B
1-Methylnaphthalene	1.58	9.08E-2	0.657	1	0.42
2-Methylnaphthalene	1.58	8.94E-2	0.657	1	0.41
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Data regarding the effects of human exposure to 1-methylnaphthalene were not located. Subchronic and chronic dietary studies with 1-methylnaphthalene in mice suggest that the toxic potency is low. An increased incidence of pulmonary alveolar proteinosis was the only lesion observed in mice treated at a dose rate of 73 mg/kg-day (lowest dose rate tested) in an 81-week study, but not in mice treated at a dose rate of approximately 1200 mg/kg-day (highest dose rate tested) in a 13-week study (EPA, 1998). These observations suggest that duration of exposure is very important in the toxicity of 1-methylnaphthalene. No RfD is identified for 1-methylnaphthalene. Therefore, it is recommended that 2-methylnaphthalene be used as a surrogate and discussed qualitatively in human health risk assessment.

Effects in humans from exposure to low levels of 2-methylnaphthalene appear to be limited to skin irritation and photosensitization (HSDB, 2010). Acute exposure to high levels may induce headaches, nausea, vomiting, diarrhea, anemia, jaundice, euphoria, dermatitis, visual disturbances, convulsions and coma.

EPA (2010) has provided a verified RfD of 4E-3 mg/kg-day based on pulmonary alveolar proteinosis in an 81-week oral study in mice (Murata et al., 1997). The 2-methylnaphthalene was administered at various dose levels in food. A statistically significant increase in the critical effect was observed in the lowest dose administered (50.3/54.3 mg/kg-day [female/male]). A benchmark dose level assuming 5 percent extra risk of pulmonary alveolar proteinosis of 4.7 mg/kg-day, with a 95 percent lower confidence limit of 3.5 mg/kg-day. UF values of 10 each were applied for interspecies differences, intraspecies variation, and database deficiencies for a composite UF of 1,000. Confidence in the RfD is regarded as low (EPA. 2010). No EPA-derived

subchronic oral RfD is available for the methylnaphthalenes. However, a preliminary subchronic oral RfD is assumed to be equal to the chronic RfD.

Data regarding chronic inhalation exposure of humans or animals to 1- or 2-methylnaphthalene were not located in the available literature. EPA (2010) concluded that an RfC cannot be calculated for 2-methylnaphthalene due to inadequate data. Neither were any epidemiological studies or case studies located which examined the potential effects of 1-methylnaphthalene or 2-methylnaphthalene (EPA, 2010). Therefore, no RfC is identified for either compound.

6.0 Carcinogenicity Evaluation

Under EPA's guidelines for carcinogen risk assessment, the database regarding the carcinogenicity of 2-methylnaphthalene in mice and the lack of human carcinogenicity data are inadequate to assess human carcinogenic potential (EPA, 2010). Therefore no oral SF has been idenifed. Although Murata et al., (1997) identified an increased incidence of pulmonary tumors in male mice at the lowest dose, the results of the study did not indicate an increased incidence of tumors at the high dose, nor were increased incidences of tumor observed in female mice. No studies were identified that suggest that inhalation exposure to 2-methylnaphthelene may cause cancer. Therefore, no unit risk has been verified (EPA, 2010). Neither was any information located to suggest that 1-methylnaphthalene is carcinogenic.

7.0 Toxicity Summary

Toxicity values for 1- and 2-methylnaphthalene are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
2E-1	2E-2	Lung	ND	NA	NA	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); NA = not applicable.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2005, ***Update Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene***, U.S. Department of Health and Human Services, Atlanta, GA, August

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 14 December.

Murata, Y., A. Denda, H. Maruyama et al., 1997, "Short Communication: Chronic Toxicity and Carcinogenicity Studies of 2-Methylnapthalene in B6C3F1 Mice," ***Fundamental and Applied Toxicology***, Volume 36, pp. 90-93.

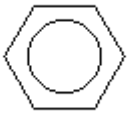
U.S. Environmental Protection Agency (EPA), 1998, ***Toxicological Review of Naphthalene (CAS No. 91-20-3) In Support of Summary Information on the Integrated Risk Information System (IRIS)***, August.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

VOLATILE ORGANIC COMPOUNDS

BENZENE (71-43-2)



1.0 Introduction and Physical Properties

Benzene is a naturally occurring **VOC**, present in low levels in many plants and animals, as well as a synthetic compound derived from petroleum (ATSDR, 1997). It occurs as a colorless or slightly yellow liquid, or as a solid at temperatures below approximately 5.5 EC (HSDB, 2010). Benzene is widely used as a solvent and in the manufacturing of other organic compounds such as styrene, phenol, detergents, pesticides, explosives, polychlorinated biphenyls, flavors, perfumes, paints and coatings, nylon intermediates and photographic chemicals, among others. It is also used in food processing and leather tanning and occurs as a component of gasoline. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
78.1[a]	2.13[a]	5.56E-3[b] (25°C)	1.77[b]	8.80E-2[b] (25°C)	9.80E-6[b] (25°C)	1.25E-1[c] (25°C)	1.75E+3[b] (20-25°C)	353.24[d]	562.16[d]	7.34E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K);.$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).

[a]U.S. Environmental Protection Agency (EPA), 2004a, *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)*, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

[b]U.S. Environmental Protection Agency (EPA), 2001, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, Peer Review Draft, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, March.

[c]Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line, accessed 21 April.

[d]U.S. Environmental Protection Agency (EPA), 2003, *Users Guide for Evaluating Subsurface Vapor Intrusion into Buildings*, Office of Emergency and Remedial Response, Washington, DC, 19 June.

2.0 Environmental Fate and Transport

Benzene enters the atmosphere primarily from fugitive emissions and automobile exhaust because of its presence in gasoline (ATSDR, 1997; HSDB, 2010). Other important sources are emissions associated with its production and use as a solvent, as an industrial intermediate in the production of the materials mentioned above, and coke oven blast furnaces and coke by-product recovery plants. In addition, there are discharges into water from industrial effluents and losses during spills. Sources of release to soil include land disposal of benzene-containing wastes, industrial discharge, and leaks from underground storage tanks and associated plumbing.

Benzene released to the atmosphere will exist almost exclusively in the vapor phase (ATSDR, 1997; HSDB, 2010). It is not subject to direct photolysis but it will react with photochemically produced hydroxyl radicals with a half-life of approximately 13 days. The reaction time in polluted atmospheres containing nitrogen oxides or sulfur dioxide is accelerated with the half-life being reported as 4 to 6 hours. Products of photooxidation include phenol, nitrophenols,

nitrobenzene, formic acid, and peroxyacetyl nitrate. Benzene is fairly soluble in water and is removed from the atmosphere in rain.

Benzene released to soil will be subject to rapid volatilization near the surface; that which does not evaporate will be highly to very highly mobile in the soil and may leach to groundwater (ATSDR, 1997; HSDB, 2010). Benzene may be subject to biodegradation under aerobic conditions. Microbial transformation proceeds through formation of cis-dihydrodiols to catechols, which lead to destruction of the aromatic ring.

Benzene may be subject to photooxidation and biodegradation in shallow, aerobic groundwaters, but probably not significantly under deeper or anaerobic conditions (ATSDR, 1997; HSDB, 2010). Benzene released to surface water will be subject to rapid volatilization. It is not expected to sorb to sediment or to hydrolyze significantly. Biodegradation is unlikely to be a significant fate process in sediment.

Benzene is not expected to participate significantly in food-chain pathways (ATSDR, 1997; EPA, 1995; HSDB, 2010); therefore, biotransfer factors are not provided.

3.0 Toxicokinetics

Benzene is rapidly and readily absorbed during inhalation exposures of humans or laboratory animals to vapors (ATSDR, 1997). However, the extent of uptake and retention decrease with increasing concentration or time of exposure, reflecting saturation of the metabolic processes that remove the substance from the blood. Excretion data from laboratory animals show that absorption is rapid and essentially complete following oral administration. Dermal uptake of liquid benzene through intact skin has been demonstrated in humans and may be toxicologically significant. The extent of dermal uptake of benzene vapor has not been quantified in humans, but experiments in laboratory animals suggest this exposure route also may be toxicologically significant.

Benzene is widely distributed following any route of exposure (ATSDR, 1997). Highest levels were located in adipose and other tissues high in fat such as the brain following inhalation exposure. Highest levels following oral administration were located in liver, kidney and bone marrow.

Quantitative aspects of the metabolism of benzene are somewhat species-, exposure route- and dose-dependent (ATSDR, 1997), but certain relevant generalizations pertain. The first metabolic step appears to be cytochrome P-450-catalyzed oxidation of benzene to benzene epoxide in the liver, which rearranges to phenol. Phenol is transformed to hydroxyquinone, which is further oxidized to benzoquinone, considered to be a major toxicant in bone marrow. Alternatively, phenol may be further oxidized to catechol and possibly to trihydroxybenzene. Phenol and all its derivatives except benzoquinone have been shown to undergo detoxication by conjugation with glucuronide or sulfate, followed by excretion.

A second general pathway involves the further oxidation of benzene oxide to benzene dihydrodiol, which leads to ring-opening and the formation of muconic dialdehyde, a known hematotoxin, primarily in the liver (ATSDR, 1997).

Absorbed benzene is excreted through the lungs as unchanged compound, and through the urinary tract as conjugated metabolites (ATSDR, 1997). Urinary excretion predominates.

Nothing in this review of toxicokinetics suggests that laboratory animals would not serve as appropriate models for the toxicity of benzene to humans.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Therefore, no GAF is developed for benzene and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

As mentioned above, benzene in the liquid and vapor form are absorbed through the skin (ATSDR, 1997). Combining benzene with soil slows dermal uptake. EPA (2004) notes that VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels. Therefore, dermal uptake of benzene from soil is not evaluated. EPA (2003) provides t*, K_p, τ, B and FA values as follows:

Chemical	t*	K_p	τ	FA	B
Benzene	0.70	1.5E-2	0.29	1	0.1
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Short-term exposure to benzene induces central nervous system (CNS) effects such as drowsiness, dizziness and headaches; long-term exposure may induce anemia (ATSDR, 1997). Oral dosing in animals induces hematopoietic and immune effects. EPA (2010) verified a chronic oral RfD of 4E-3 mg/kg-day, based on hematological effects (reduced lymphocyte count) in a cross-sectional occupational study of 44 workers exposed to benzene. The workers were exposed for 0.7 to 16 years, with a mean of 6.3 years. Because the mean fell below 7 years, the minimal length considered to be chronic, the study is judged to be subchronic in duration. The control group consisted of an equal number of age- and gender-matched unexposed workers. The exposed workers were divided into two equal groups of 22: those exposed to airborne concentrations below and those exposed to airborne concentrations above the median concentration for all workers of 99 mg/m^3. An exposure-adjusted benchmark concentration (BMC) for minimal hematologic effects of 8.2 mg/m^3 was estimated. Assuming that uptake from the respiratory tract is approximately 50 percent of that from the GI tract allowed application of inhalation-to-oral extrapolation to estimate a benchmark dose (BMD) of 1.2 mg/kg-day. Application of an uncertainty factor of 300 to the BMD yielded the verified chronic oral RfD of 4E-3 mg/kg-day. The uncertainty factor of 300 consists of factors of 3 each for extrapolation from a BMC for minimal adverse effects to a BMC for no adverse effects, to expand from subchronic to chronic exposure, and to reflect deficiencies in the data base; a factor of 10 was used to provide additional protection for more sensitive human subpopulations. The blood cells (specifically inhibited hematopoiesis) are the target for prolonged oral exposure to benzene. Confidence in the chronic oral RfD is medium.

A preliminary subchronic oral RfD can be developed from the BMD described above. The subchronic oral RfD is derived by applying an uncertainty factor of 100 to the BMD of 1.2 mg/kg-day. The uncertainty factor of 100 reflects the uncertainty factor of 300 developed by EPA (2010) without the factor of 3 to expand from subchronic to chronic exposure. The preliminary subchronic oral RfD so derived is 1.2E-2 mg/kg-day, which is rounded to 1E-2 mg/kg-day.

A verified chronic inhalation RfC of 3E-2 mg/m^3 for benzene was based on the exposure-adjusted BMC of 8.2 mg/m^3 in the occupational exposure study from which the oral RfD values were derived (EPA, 2010). Application of the uncertainty factor of 300 (as described for the verified chronic oral RfD) to the BMC of 8.2 mg/m^3 yielded the chronic RfC of 3E-2 mg/m^3. The RfC is equivalent to an inhalation RfD of 8.6E-3 mg/kg-day. Confidence in the chronic inhalation RfC is medium. The blood cells (specifically inhibited hematopoiesis) are the target for prolonged inhalation exposure to benzene. A preliminary subchronic inhalation RfC can be derived by application of an uncertainty factor of 100 to the BMC of 8.2 mg/m^3 in the same manner as was done to derive the subchronic oral RfD. The subchronic inhalation RfC so derived is 8.2E-2 mg/m^3, rounded to 8E-2 mg/m^3. The preliminary subchronic inhalation RfC is equivalent to an inhalation RfD of 2.3E-2 mg/kg-day.

6.0 Carcinogenicity Evaluation

Benzene is classified as an EPA cancer weight-of-evidence Group A chemical – a known human carcinogen for all routes of exposure based upon convincing human evidence as well as supporting evidence from animal studies (EPA, 2010). Epidemiologic studies and case studies provide clear evidence of a causal association between exposure to benzene and acute nonlymphocytic leukemia, and also provide supportive evidence for chronic nonlymphocytic leukemia and chronic lymphocytic leukemia. Other neoplastic conditions in humans that are associated with benzene exposure include hematologic neoplasms, blood disorders such as preleukemia and aplastic anemia, Hodgkin's lymphoma, and myelodysplastic syndrome. Experimental animal data add to the weight of evidence that exposure to benzene increases the risk of cancer in multiple species at multiple organ sites (hematopoietic, oral and nasal, liver, forestomach, preputial gland, lung, ovary, and mammary gland). A verified URF range for inhalation exposure of 2.2E-6 to 7.8E-6 per µg/m^3 was based on the incidence of leukemia in humans exposed to benzene while employed in the Pliofilm industry (EPA, 2010). A low-dose linearity model utilizing maximum likelihood estimates was used to estimate the URF. The range reflects differences in the exposure assumptions estimated from the study. EPA (2010) concluded that neither any specific URF value nor either end of the range is more defensible than the other. Therefore, the upper end of the range, 7.8E-6 per µg/m^3, is conservatively selected for this evaluation. The URF of 7.8E-6 per µg/m^3 is equivalent to an inhalation SF of 2.7E-2 per mg/kg/day.

The occupational data that serve as the basis for the inhalation URF also serve as the basis for a verified oral SF for benzene (EPA, 2010). The inhalation URF range was mathematically converted to an equivalent oral SF range by applying standard inhalation rate and body weight assumptions, and by adjusting for route-specific differences in absorption as described for the chronic oral RfD derivation. The oral SF range so derived is 1.5E-2 to 5.5E-2 per mg/kg-day.

The upper end of the range, 5.5E-2 per mg/kg-day, is conservatively selected as the oral SF for this evaluation.

7.0 Toxicity Summary

Toxicity values for benzene are summarized as follows:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
1E-2	4E-3	Bc	8E-2/ 2.3E-2	3E-2/ 8.6E-3	Bc	A	5.5E-2	A	7.8E-6	2.7E-2

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day).
Target organ abbreviations: Bc = blood cells.
[a]sRfDo, cRfDo and SFo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 1997, ***Update Toxicological Profile for Benzene***, U.S. Department of Health and Human Services, Atlanta, Georgia, September, on line.

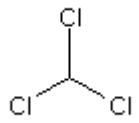
Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 21 April.

U.S. Environmental Protection Agency (EPA), 1995, "Final Water Quality Guidance for the Great Lakes System; Final Rule," (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

CHLOROFORM (67-66-3)



1.0 Introduction and Physical Properties

Chloroform is a **VOC** that occurs as a clear, colorless, heavy volatile liquid at ambient temperatures (HSDB, 2010). It occurs naturally in the environment, being made by certain forms of algae, seaweed, and the ecological community in peat bogs. Chloroform has been used as a solvent or extraction solvent, dry cleaning fluid, in fire extinguishers, and as an intermediate in the manufacture of dyes and pesticides (ATSDR, 1997). Major current uses include organic synthesis, particularly fluorocarbon-22. It is also formed in the chlorination of drinking water. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
119.4[b]	1.97[a]	3.67E-3[b] (25°C)	1.60[b]	1.04E-1[b] (25°C)	1.00E-5[b] (25°C)	2.59E-1[c] (25°C)	7.92E+3[b] (20-25°C)	334.32[d]	536.40[d]	6.99E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point of pure liquid compound (°K); T_c = critical temperature (°K);)$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).
data.
[a]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.
[b]U.S. Environmental Protection Agency (EPA), 2001, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Peer Review Draft, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, March.
[c]Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line, accessed 9 January.
[d]U.S. Environmental Protection Agency (EPA), 2003, ***Users Guide for Evaluating Subsurface Vapor Intrusion into Buildings***, Office of Emergency and Remedial Response, Washington, DC, 19 June.

2.0 Environmental Fate and Transport

Chloroform has been shown to occur naturally in the environment, and its release to the atmosphere from tropical oceans amounts to hundreds of thousands of tons per year (HSDB, 2010). Chloroform also enters the environment associated with its use as an industrial solvent, extractant and chemical intermediate as well as from its inadvertent production in the chlorination of drinking water, municipal sewage and cooling water (ATSDR, 1997; HSDB, 2010). Most environmental releases from industrial uses occur directly to the atmosphere.

Chloroform is expected to exhibit moderate mobility in soil (HSDB, 2010), potentially leaching to groundwater. Volatilization from moist soil surfaces is expected to be an important removal process, given its relatively large Henry's Law constant. Volatilization from dry soil surfaces may also be an important removal process. In one study of chloroform residence time in soils, the compound was found to have a half-life of 0.3 days when applied 1 cm deep into soil, and 1.4

days when applied 10 cm deep. It is classified as a "very short-lived" chemical in soil matrices primarily due to its high volatility. Under normal environmental conditions, chloroform is not expected to undergo biodegradation in soils, although the compound has been shown to be anaerobically degraded by methanogenic bacteria in the presence of a primary substrate such as acetic acid, and even more readily under sulfate reducing conditions.

Chloroform is not expected to adsorb significantly to sediment or suspended solids in water (HSDB, 2010). Volatilization from water surfaces is expected to be the major process for removing chloroform from surface water. Volatilization half-lives for a model river and model lake have been estimated at 1.3 hours and 4.4 days, respectively. A field study found that the volatilization half-life from the Rhine River was 1.2 days, while in a lake located in the Rhine basin the half-life was 31 days. In another study, chloroform from a municipal treatment plant injected into an estuarine arm of Chesapeake Bay entirely disappeared within 4 km in the spring and within 11 km in the winter under ice. The decrease in concentration could not be attributed entirely to dilution. Based on available experimental data, aquatic degradation is not expected to be a major removal process, although the data are somewhat conflicting. Although base-catalyzed hydrolysis of chloroform is expected to occur, the estimated kinetics predict that this will not be an environmentally important degradation process.

Chloroform is expected to exist solely as a vapor in the ambient atmosphere (HSDB, 2010). Vapor-phase chloroform is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 151 days. Data regarding the potential for other mechanisms to play an important role in chloroform removal were not located. It is likely that wet deposition or washout may occur, but volatilization would probably readily return the compound to the atmosphere. The tropospheric half-life for chloroform has been estimated at 3 years.

The relatively low log K_{ow} value for chloroform suggests that its participation in food-chain pathways is unlikely to be significant (HSDB, 2010). Measured values for BCF, as well as the observation that the compound is rapidly metabolized confirm this suggestion (ATSDR, 1997; HSDB, 2010; EPA, 1995). Therefore, biotransfer factors are not derived for chloroform.

3.0 Toxicokinetics

Several toxicokinetic studies in animals and humans suggest that chloroform is virtually completely absorbed from the GI tract (ATSDR, 1997). Peak blood levels were higher and attained more quickly from an aqueous vehicle than from an oleaginous vehicle. Although several physiological factors (blood/air partition coefficient, ventilation rate, cardiac output, total body weight and fat content) influence the kinetics of uptake from the respiratory tract, generally arterial blood concentrations are directly proportional to the exposure concentration, suggesting that uptake occurs readily, particularly at concentrations below the saturation point. Experiments with humans indicate that dermal uptake of chloroform in water or ethanol readily occurs.

Absorbed chloroform is rapidly and widely distributed throughout the body, readily crossing the blood-brain and placental barriers (ATSDR, 1997). Highest levels are located in tissues with higher fat content, including adipose tissue, nervous system and liver.

Excretion data suggest that chloroform metabolism is quite species-dependent. Following oral dosing with radiolabeled compound, monkeys excreted most of the dose as unchanged compound in expired air, mice excreted most of the dose as carbon dioxide, and rats excreted both unchanged compound and carbon dioxide (HSDB, 2010). Urinary metabolites included urea (probably formed from carbon dioxide).

The predominant pathway for chloroform metabolism involves the generation of phosgene in the liver, kidney and other tissues as an intermediate in the formation of carbon dioxide (ATSDR, 1997). Phosgene is a toxicant in its own right, combining covalently with microsomal proteins to disrupt cellular integrity and induce necrosis. Humans appear to be less efficient than laboratory rodents in metabolizing chloroform to phosgene, suggesting that a comparable dose might be less toxic to humans. Trihalomethanes as a group are metabolized to carbon monoxide by most species as a result of reductive dechlorination and hydrolysis (ATSDR, 1997; HSDB, 2010). This, however, represents a relatively minor metabolic pathway, and chloroform is somewhat less efficient in forming carbon monoxide than the other trihalomethanes. Carbon monoxide is also toxic, resulting in the formation of carboxyhemoglobin, which is incapable of releasing oxygen to the tissues and transporting carbon dioxide from the tissues.

The routes and kinetics of chloroform excretion depend on the species, percent of body fat, route of exposure and dose. Excretion occurs primarily as carbon dioxide or unchanged compound via exhaled air; minor metabolites are eliminated through the urine and, to a lesser extent, the feces.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Therefore, no GAF is developed for chloroform and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

A hypothetical dermal absorption rate of 29.7 mg/minute was modeled for human hands immersed in liquid chloroform, based on absorption data measured in mice (ATSDR, 1997). Data were not located for dermal uptake from soil. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of chloroform from soil is not evaluated. t*, K_p, τ, FA and B values are provided by EPA (2004) as follows:

Chemical	t*	K_p	τ	FA	B
Chloroform	1.19	6.8E-3	0.50	1.0	0
t* = Time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Oral or inhalation exposure of animals to chloroform is associated with liver and kidney damage (ACGIH, 1991; ATSDR, 1997; EPA, 2010). The case for kidney effects associated with prolonged oral exposure in humans, however, is equivocal. In humans, acute inhalation exposure

to high levels induces narcosis, ventricular fibrillation and death (ACGIH, 1991). Limited occupational data associate chronic exposure to chloroform with CNS depression, digestive disturbances and enlarged livers, but not with olfactory epithelial involvement, which has been seen in laboratory animals.

Chloroform has been the subject of continued investigation and reevaluation because of its nearly ubiquitous nature as an anthropogenic chemical and the potential for widespread exposure. An earlier EPA (2004b) evaluation derived a chronic oral RfD of 1E-2 mg/kg-day based on a LOAEL for fatty cyst formation in the livers and biochemical evidence of liver damage in a 1979 study in which dogs were treated orally for 7.5 years. An uncertainty factor of 1000 was applied. In this dog study, the chemical was given orally in a toothpaste base in gelatin capsules in an effort to test the long-term effects of chloroform in toothpaste. Confidence in this earlier oral RfD was medium to low. The liver was considered the target organ for chronic oral exposure to chloroform.

Other studies analyzed in a recent reevaluation include a 1995 drinking water study in mice, a 1995 gavage study in rats, and a 2000 drinking water study in rats. Subtle effects on the kidney appear to be the critical effects of prolonged exposure in rodents. The liver lesions in the 1979 dog study remain the more sensitive endpoint of chloroform exposure and the more appropriate basis for an oral RfD. EPA (2010) developed a benchmark dose limit associated with a 10 percent extra risk for the liver lesions and biochemical evidence described above ($BMDL_{10}$) of 1.2 mg/kg-day. Application of an uncertainty factor of 100 and rounding to one significant figure yields the more recently verified oral RfD of 1E-2 mg/kg-day. The uncertainty factor of 100 consists of factors of 10 each for inter- and intra-species variation. Confidence in the new oral RfD is medium; slightly higher than the level of confidence in the earlier derivation because the BMDL approach is considered somewhat more reliable than the LOAEL/NOAEL approach to RfD development. The rodent studies provide sufficient information to identify both the liver and the kidney as target organs for prolonged oral exposure to chloroform.

Previously, EPA (1997a) adopted the earlier chronic oral RfD of 1E-2 mg/kg-day as the provisional RfD for subchronic oral exposure. As noted above, the earlier chronic oral RfD derivation has been revised, although the value of the RfD remains the same. Therefore, the new verified chronic oral RfD of 1E-2 mg/kg-day is adopted as sufficiently protective for subchronic exposure, but EPA (1997a) is no longer cited as the source.

Prolonged inhalation exposure of rats is associated with atrophy of the ethmoid epithelium at concentrations lower than those associated with liver or kidney effects (EPA, 1997b, 2003). An earlier provisional subchronic inhalation RfC was derived from a 13-week intermittent exposure study in rats based on effects on the ethmoid epithelium. More recently, EPA (2003) determined that atrophy of the nasal epithelium in rats is not an appropriate model for human toxicity, in part because this effect has not been observed in humans. The effects on the liver and kidney appear consistently to be the critical effects in humans following inhalation or oral exposure. Subchronic studies in rats and mice showed that mice were somewhat more sensitive than rats to these effects.

A large study of B6C3F1 strain mice was conducted in which groups of 15 mice of each sex were exposed to chloroform in air at concentrations of 0 (control), 0.3, 2, 10, 30 or 90 ppm on 6 hours per day, 7 days per week, for a total of 13 weeks (EPA, 2003). Other groups of 13 to 15

mice of each sex were exposed to 10 or 90 ppm 6 hours per day, 5 days per week, for a total of 13 weeks to see if there were differences between exposure on 5 or 7 days per week in the intensity of the response. Still other groups of 5 to 13 female mice were exposed to 0, 0.3, 2, 10, 30 or 90 ppm on 6 hours per day for 4, 21 or 42 continuous days to investigate the time-course development of chloroform-induced liver lesions. Finally, groups of 8 mice of each sex were exposed to 30 or 90 ppm 6 hours per day for 6 weeks followed by a 6-week recovery period in which they were held without exposure, to test the reversibility of the liver and kidney effects.

Kidney lesions were observed only in the male mice exposed to 30 or 90 ppm chloroform (EPA, 2003). There appeared to be little difference between mice exposed on 5 days per week and those exposed for 7 days per week. The kidney lesions did not appear to be reversible, at least during the 6-week recovery period afforded certain groups. Liver lesions were observed in both male and female mice exposed to 30 or 90 ppm chloroform. Severity was greater in those exposed on 7 days per week compared with those exposed on 5 days per week. The liver lesions appeared to be largely reversible during the 6-week recovery period. This study identified 10 ppm as the NOAEL and 30 ppm as the LOAEL for liver and kidney effects in mice. However, a "labeling index" was slightly increased in the kidneys of male mice exposed to 10 ppm. The labeling index suggests that chloroform metabolites may have bound to macromolecules in the kidney cells at levels below those with discernable pathological change. A smaller study in BDF1 mice identified 5 ppm as a NOAEL and 30 ppm as the LOAEL for kidney and liver effects in a second strain of mice.

EPA (2003) chose the 5 ppm NOAEL in mice described above as the basis for developing subchronic and chronic RfCs for chloroform. The 5 ppm concentration, equivalent to 25 mg/m^3, was adjusted to a human equivalent concentration for continuous exposure of 4.5 mg/m^3. Application of an uncertainty factor of 100 yields a provisional inhalation RfC, rounded to one significant figure, of 5E-2 mg/m^3. The uncertainty factor consists of a factor of 10 to provide additional protection to unusually sensitive members of the population, and factors of 3 each to account for physiological differences between mice and humans, and to reflect uncertainty about the data base. The major uncertainty surrounds the potential for neurological effects to occur at levels lower than the NOAEL for kidney and liver effects. The provisional RfC is equivalent to 1.4E-2 mg/kg-day. The provisional RfC is appropriate for either subchronic or chronic exposure, because the large study in B6C3F1 mice did not indicate increased incidence or severity of effects with increased duration of exposure. The liver and kidney are the target organs for prolonged inhalation exposure to chloroform. Confidence in the RfC is low to medium.

6.0 Carcinogenicity Evaluation

The carcinogenicity of chloroform has recent undergone reevaluation and updating on the IRIS record (EPA, 2010). Chloroform was formerly classified as a cancer weight-of-evidence Group B2 compound (probable human carcinogen), based on increased incidence of several tumor types in rats and liver tumors in mice. Human carcinogenicity data are inadequate. A verified oral SF of 6.1E-3 per mg/kg-day was derived from the incidence of kidney tumors in rats treated with chloroform in drinking water for two years. A verified inhalation URF of 2.3E-5 per ug/m^3, developed in 1987, was based on the incidence of hepatocellular carcinomas in mice treated by gavage for 78 weeks. The inhalation URF is equivalent to 8.1E-2 per mg/kg-day.

The more recent cancer evaluation describes chloroform *as likely to be carcinogenic to humans by all routes of exposure under high-exposure conditions that lead to cytotoxicity and regenerative hyperplasia in susceptible tissues (i.e., liver and kidney)* (EPA, 2010). On the other hand, chloroform is unlikely to be carcinogenic to humans by any route of exposure under exposure conditions that do not cause cytotoxicity and cell regeneration. Chloroform appears to exert its carcinogenicity through epigenetic mechanism(s) that are inoperative unless cellular damage in susceptible tissues is sufficient to result in cell regeneration. Since there are thresholds for cytotoxicity, the carcinogenic expression of chloroform is generally assessed as a threshold phenomenon. In other words, the chronic oral RfD of 1E-2 mg/kg-day is considered to be sufficiently protective against carcinogenicity by oral or dermal exposure, and the inhalation RfC of 5E-2 mg/m^3 (1.4E-2 mg/kg-day) is considered to be sufficiently protective against carcinogenicity for inhalation exposure. It should be noted that the previously verified oral SF has been removed from the IRIS record. The previously verified inhalation URF still appears on the IRIS record, but it is preceded by the caveat that it is based on a 1987 evaluation and does not incorporate newer data or reflect updated cancer assessment guidelines. The inhalation carcinogenicity assessment is currently under revision (EPA, 2010).

In most cases it is not necessary to evaluate the carcinogenicity of chloroform using either the oral or inhalation SFs described above, because the noncancer effects would drive decision-making. In fact, it would be inappropriate to base selection of chloroform as a chemical of concern, or to develop remedial goal options for chloroform, based on cancer risk. However, it may be useful to estimate the cancer risk associated with chloroform for the baseline condition. This could be done using the oral and inhalation SFs described above, but it should only be done if the route-specific exposure dose on a daily basis exceeds the route-specific RfD.

7.0 Toxicity Summary

Toxicity values for chloroform are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfc/ sRfD	cRfC/ cRfD	TO	WOE	SFo	WOE	URFi	SFi
1E-2	1E-2	L, K	5E-2/ 1.4E-2	5E-2/ 1.4E-2	L, K	See Section 6	ND[b]	See Section 6	ND[b]	ND[b]

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ abbreviations: L = liver; K = kidney.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.
[b]Chloroform is determined to be a threshold carcinogen more appropriately evaluated by the RfD and RfC values derived for protection against threshold phenomena.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 1997, ***Update Toxicological Profile for Chloroform***, U.S. Department of Health and Human Services, Atlanta, Georgia, September.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, ACGIH, Cincinnati, OH, pp. 289-291.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 9 January.

U.S. Environmental Protection Agency (EPA), 1995, "Final Water Quality Guidance for the Great Lakes System; Final Rule," (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 1997a, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, PB97-921199, July.

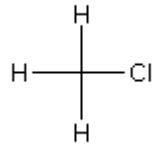
U.S. Environmental Protection Agency (EPA), 1997b, ***Risk Assessment Issue Paper for: Derivation of Provisional Subchronic and Chronic RfCs for Chloroform (CASRN 67-66-3)***, National Center for Environmental Assessment, Cincinnati, OH, 1 December.

U.S. Environmental Protection Agency (EPA), 2003, ***Risk Assessment Issue Paper for: Derivation of Provisional Subchronic and Chronic RfCs for Chloroform (CASRN 67-66-3)***, National Center for Environmental Assessment, Cincinnati, OH, 22 January.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*** Final, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

CHLOROMETHANE (METHYL CHLORIDE) (74-87-3)



1.0 Introduction and Physical Properties

Chloromethane is a **VOC** that exists as a colorless gas at ambient temperatures (HSDB, 2010). It is used largely as a methylating agent in the production of silicones, tetramethyl lead, methyl cellulose, methylene chloride, methyl mercaptan, plastics, pesticides, pharmaceuticals, dyes, perfumes, ethers, resins, agricultural chemicals, quaternary amines and butyl rubber (ACGIH, 1991; ATSDR, 1998; HSDB, 2010). It is also used as an extractant for fats, oils and resins, as a blowing agent and as a refrigerant. It was formerly used as a propellant in various aerosol products. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
50.5[a]	0.91[a]	8.82E-3[b] (25□C)	1.15[b]	1.39E-1[c] (25□C)[d]	1.49E-5[e] (20□C)	5.66E+0[b] (25□C)	5.32E+3[b] (25 □C)	247[f]	416[f]	5.15E+3[f]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K);,.$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).

[a]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

[b]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

[c]Calculated as described in Introduction to Toxicological profiles.

[d]Assumed.

[e]Montgomery, J.H., 1996, ***Groundwater Chemicals Desk Reference, Second Edition***, Lewis Publishers, New York, pp. 664-666.

[f]National Institute of Standards and Technology (NIST), 2010, ***NIST Chemistry WebBook***, on line.

2.0 Environmental Fate and Transport

Chloromethane is one of the few halogenated organic chemicals for which natural sources are significant. Natural sources include volcanoes, volatilization from plants, and forest fires (HSDB, 2010). It is produced in seawater by the reaction of methyl iodide with chloride ions. Methyl iodide is produced photosynthetically by several marine organisms, and there may be other oceanic sources as well. The mean air flux of 1.3E-6 g/cm^2-year for the eastern Pacific Ocean, when extrapolated to global waters, provides an adequate source to explain the atmospheric reservoir of chloromethane. Chloromethane is released from brush and forest fires. The estimated 0.6 g of chloromethane released per kg of vegetation burned is believed to make a significant impact on the global burden of the compound.

The production and many uses of chloromethane may result in its release to the environment through various waste streams (HSDB, 2010). It is also released in tobacco smoke and turbine exhaust. Just as forest fires contribute to natural sources, wood burning, field burning, and backyard burning also contribute to atmospheric burdens. Chloromethane is formed in the chlorination of drinking water and sewage effluent, and is found in the effluent of some publically owned treatment works.

Most chloromethane is released to the atmosphere where it is expected to exist solely as a gas (HSDB, 2010). Gas-phase chloromethane is degraded in the atmosphere by reaction with

photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 310 days, which provides opportunity for widespread dispersion. The dominant process for removal from the troposphere is upward diffusion, although washout by rain may also be important. From the tropopause to about 30 km, both upward diffusion and reaction with hydroxyl radicals will be of approximately equal importance, and above 30 km in the stratosphere, diffusion, reaction with hydroxyl radicals, and photodissociation will have approximately equal importance. The surface half-life resulting from upward diffusion is approximately 80 days.

Based on its very low estimated K_{oc} value, chloromethane is expected to have very high mobility in soil (HSDB, 2010). Its relatively high water solubility suggests the compound released in sufficient quantity in the liquid phase or dissolved in water could leach readily to groundwater. Volatilization from moist soil surfaces is expected to be an important removal process for small quantities released to the surface. Volatilization from dry soil surfaces may also be important. Field and laboratory studies demonstrate that several halogenated aliphatics may biodegrade slowly under anaerobic conditions, but not under aerobic conditions. Biodegradation is not expected to be a significant removal process.

Chloromethane is not expected to adsorb to suspended solids and sediment in surface water (HSDB, 2010). Volatilization from water surfaces is expected to be a significant removal mechanism; volatilization half-lives for a model river and model lake are 46 minutes and 3 days, respectively. Field and laboratory studies demonstrate that several halogenated aliphatics may biodegrade slowly under anaerobic conditions, but not under aerobic conditions. Biodegradation is not expected to be a significant removal process. Hydrolysis may occur, but very slowly, with a half-life of approximately 2 years (ATSDR, 1998). Hydrolysis will not be a significant removal process for chloromethane in surface water, but may be the only significant removal process for the compound in groundwater, where it has been shown to persist.

Chloromethane is water soluble, volatile and labile, and is not expected to participate significantly in food-chain pathways (ATSDR, 1998; HSDB, 2010). Therefore, biotransfer factors are not estimated for this compound.

3.0 Toxicokinetics

Studies regarding the toxicokinetics of chloromethane are limited to inhalation exposure. Chloromethane is readily absorbed by the respiratory system and equilibrium conditions are reached in approximately one hour in exposed humans and laboratory animals (ATSDR, 1998). Data regarding the extent of respiratory absorption were not located. Although data were not located for GI absorption, it is expected that GI absorption would be rapid and extensive because the compound is a low MW organic substance that is readily absorbed by the respiratory system. HSDB (2010) stated that dermal absorption can occur, but no other information was provided.

Radioactivity is rapidly and extensively distributed throughout the body following inhalation exposure to radiolabeled chloromethane, with highest levels of radioactivity measured in liver, kidney, testis and lung (ATSDR, 1998). Approximately 20 percent of the radiolabel in liver and testis was found to have been metabolically incorporated into the cellular structure, reflecting uptake and utilization from the one-carbon atom pool of the body.

The primary and predominant metabolic pathway of chloromethane involves enzymatic conjugation with glutathione to form S-methylglutathione (ATSDR, 1998). Further metabolism involves deamination to yield S-methylcysteine and other sulfur-containing conjugation derivatives, which are excreted in the urine. Another metabolic pathway involves dehalogenation of chloromethane to form formaldehyde (a toxicant in its own right) and formic acid. These intermediates contribute to the one-carbon atom pool that is available for incorporation into the tissues or for mineralization to carbon dioxide followed by excretion through the lungs.

Studies have shown that adult humans, unlike laboratory animals, may be divided into two groups – fast or slow metabolizers – depending on the activity in their erythrocytes of glutathione-S-transferase, which is responsible for the first conjugation reaction (ATSDR, 1998). Fast metabolizers clear chloromethane from the body more rapidly than slow metabolizers. Whether the unborn, new born or young children exhibit this characteristic is unknown. The implications of glutathione-S-transferase activity regarding population differences in toxic potency are unclear. On the one hand, it may appear that fast metabolizers should be more tolerant of chloromethane because of their enhanced ability to clear the compound from the body. On the other hand, experiments in laboratory animals suggest that a metabolite of S-methylglutathione may be the ultimate toxicant, in which case fast metabolizers may be more sensitive to chloromethane toxicity.

Chloromethane residues are rapidly cleared from the body following the cessation of inhalation exposure (ATSDR, 1998). Clearance in laboratory animals and humans is biphasic, consistent with a linear 2-compartment model. The half-lives for both phases were measured in minutes, indicating the rapidity with which clearance occurs. The exception is that the β-phase in some humans (slow metabolizers) approximated 1.5 hours.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Chloromethane is assumed to be absorbed readily from the GI tract; therefore, no GAF is developed.

Data regarding the dermal uptake of chloromethane were not located, except that HSDB (2010) stated that dermal absorption could occur. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of chloromethane from soil is not quantified. EPA (2004a) provides t*, K_p, τ, FA and B values as follows:

Chemical	t*	K_p	τ	FA	B
Chloromethane	0.49	3.3E-3	0.20	1	0
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Data regarding the toxicity of oral exposure to chloromethane consist of the statement that liver effects were not observed in rats given a single oral dose of 420 mg/kg (ATSDR, 1998; EPA, no date). EPA (no date) derived a provisional chronic oral RfD of 4E-3 mg/kg-day based on a LOAEL of 69.32 mg/m^3 for subtle neurobehavioral effects from an occupational (inhalation) study. Subsequently, EPA (2010) reviewed the data and determined that ingestion exposure is not applicable because the compound exists as a gas at ambient temperatures. They also noted that the oral exposure data are insufficient to develop an oral RfD. Therefore, the EPA (no date) derivation is considered to be not applicable and no oral RfD is offered herein.

EPA (2010) verified a chronic inhalation RfC of 9E-2 mg/m^3 based on a NOAEL of 50 ppm (103.2 mg/m^3) from an 11-day continuous exposure study in mice. The NOAEL corresponds to a human equivalent concentration (HEC) of 94.6 mg/m^3. The LOAEL in this study, 100 ppm (206.4 mg/m^3 or a HEC of 189.2 mg/m^3) was associated with slight to moderate degenerative changes in the granule cells of the cerebellum. EPA (2010) applied an uncertainty factor of 1000 to the NOAEL HEC of 94.6 mg/m^3 to derive the RfC of 9E-2 mg/m^3. The uncertainty factor consists of factors of 10 each to provide additional protection for unusually sensitive humans and to expand from a short-term to lifetime exposure, and factors of 3 each to extrapolate from mice to humans and to address the uncertainty regarding the potential for CNS effects in the developing young. Confidence in the verified chronic inhalation RfC is medium. The verified inhalation RfC is equivalent to an inhalation RfD of 2.6E-2 mg/kg-day. The CNS is the target organ for prolonged inhalation exposure to chloromethane.

EPA (1996) developed a provisional chronic RfC based on subtle neurobehavioral effects from an occupational (inhalation) study. They adopted the provisional chronic RfC for subchronic application, noting no significant differences in response between chronic and subchronic exposure. However, given the EPA (2010) reevaluation and verification of a more conservative chronic RfC, it is deemed prudent to adopt the verified chronic RfC rather than the provisional chronic RfC as sufficiently protective for subchronic exposure.

6.0 Carcinogenicity Evaluation

Previous EPA (1997, 1998) evaluations classified chloromethane in EPA weight-of-cancer Group C (possible human carcinogen), and developed an oral SF and an inhalation URF. More recently, EPA (2010) reevaluated the data, noting that chloromethane is a naturally occurring compound, and concluded that it is more appropriately classified in Group D (not classifiable as to its human carcinogenicity). Applying more recent cancer assessment guidelines, EPA (2010) concluded that the available data suggest that chloromethane would be classified as an agent whose carcinogenic potential *cannot be determined*. Previously developed potency factors are considered to be not applicable; no potency factors are offered herein for chloromethane.

7.0 Toxicity Summary

Toxicity values for chloromethane are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
			9E-2/	9E-2/						

Noncancer Effects						Carcinogenicity				
Oral Exposure			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
ND	ND	NA	2.6E-2	2.6E-2	CNS	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data; NA = not applicable.
Target organ or critical effect abbreviations: CNS = central nervous system.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 1998, ***Update Toxicological Profile for Chloromethane***, U.S. Department of Health and Human Services, Atlanta, GA, December, on line.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, Cincinnati, OH, pp. 953-957.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

U.S. Environmental Protection Agency (EPA), no date, ***Risk Assessment Issue Paper for: Derivation of a Provisional RfD for Chloromethane (CASRN 74-87-3)***, National Center for Environmental Assessment, Cincinnati, OH.

U.S. Environmental Protection Agency (EPA), 1996, ***Risk Assessment Issue Paper for: Derivation of a Provisional Chronic and Subchronic RfC for Chloromethane (CASRN 74-87-3)***, National Center for Environmental Assessment, Cincinnati, OH, 23 July.

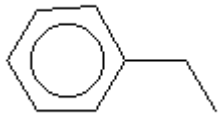
U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, Washington, DC, 9200.6-303(97-1), EPA 540/R-97-036, PB97-921199.

U.S. Environmental Protection Agency (EPA), 1998, ***Draft Risk Assessment Issue Paper for: Updating the Quantitative Carcinogenicity Evaluation of Chloromethane (CASRN 74-87-3)***, National Center for Environmental Assessment, Cincinnati, OH, 18 December.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*** Final, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

ETHYLBENZENE (PHENYLETHANE) (100-41-4)



1.0 Introduction and Physical Properties

Ethylbenzene, also known as phenylethane, is a **VOC** that exists in the pure state as a colorless liquid at ambient temperatures (HSDB, 2010). It is used primarily as a precursor in the manufacture of styrene (ATSDR, 1999). It is also used as a solvent and diluent, and as an intermediate in the manufacturing of cellulose acetate, rubber and other organic compounds (ATSDR, 1999; HSDB, 2010). It is also a constituent of asphalt, naphtha, and automotive and aviation fuels. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
106.2[a]	3.15[a]	7.88E-3[b] (25°C)	2.56[b]	7.50E-2[b] (25°C)	7.80E-6[b] (25°C)	1.26E-2[c] (25°C)	1.69E+2[b] (20-25°C)	409.34[d]	617.20[d]	8.50E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K); $H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).
[a]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.
[b]U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.
[c]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[d]U.S. Environmental Protection Agency (EPA), 2003, ***User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings***, Office of Emergency and Remedial Response, Washington, DC, June 19.

2.0 Environmental Fate and Transport

Ethylbenzene enters the atmosphere primarily from fugitive emissions and exhaust connected with its use in gasoline (ATSDR, 1999; HSDB, 2010). More localized sources to the air and other environmental media include fugitive emissions, waste water and spills from its production and industrial use, leaking underground storage tanks, land disposal of ethylbenzene-containing waste, and municipal and hazardous waste combustion.

Ethylbenzene exists in the air in the vapor phase (ATSDR, 1999; HSDB, 2010). It is somewhat water soluble and may be removed by precipitation; however, it is likely to reenter the air by volatilization. Ethylbenzene is transformed in air by various oxidative processes to yield ethylphenols, benzaldehyde, acetophenone, and m- and p-nitroethylbenzene. Reaction with photolytically generated hydroxyl radicals is probably the most significant reaction, with a half-life estimated to be 55 hours, suggesting that ethylbenzene will not persist in the air or travel long distances.

Ethylbenzene released to soil will volatilize rapidly (ATSDR, 1999; HSDB, 2010). That which infiltrates is expected to be quite mobile in soil and may leach to groundwater because sorption to soil particles is not sufficiently strong to retard movement. Biodegradation in soil in aerobic conditions involves oxidation of the ethyl side chain, ring hydroxylation and ring cleavage, and may be a significant source of removal. Anaerobic degradation is expected to be insignificant.

Ethylbenzene released to surface water will volatilize rapidly to air (ATSDR, 1999; HSDB, 2010). Biodegradation in aerobic conditions will significantly reduce water-borne concentrations. Photolysis and hydrolysis are unlikely to be significant. Ethylbenzene partitions weakly to sediment.

Ethylbenzene is not expected to participate significantly in food-chain pathways (ATSDR, 1999; EPA, 1995; HSDB, 2010); therefore, biotransfer factors are not provided.

3.0 Toxicokinetics

Ethylbenzene is rapidly absorbed during inhalation exposure, with retention near or exceeding 50 percent of the inhaled concentration (ATSDR, 1999). The compound is similarly rapidly absorbed following oral administration. Excretion data in rabbits suggest that a minimum of 72 to 92 of an oral dose is absorbed. Liquid ethylbenzene applied to the skin of humans is rapidly absorbed, but ethylbenzene vapor is poorly absorbed.

Ethylbenzene appears to be efficiently and widely distributed throughout the body following inhalation exposure (ATSDR, 1999). The same is expected following oral and dermal exposure, but data are lacking.

Metabolism in humans of absorbed ethylbenzene following either inhalation or oral exposure predominantly involves successive oxidation of the ethyl side-chain through 1-phenylethanol, acetophenone, ω-hydroxyacetophenone, and 1-phenyl-1,2-ethanediol to form mandelic acid and phenylglyoxylic acid (ATSDR, 1999). Small quantities of the first 4 intermediates are conjugated and excreted in the urine. Mandelic acid and phenylglyoxylic acid are excreted without conjugation and comprise the majority of excreted metabolites. A minor metabolic pathway involves epoxide formation and hydroxylation of the phenyl ring with or without oxidation of the ethyl group to yield small quantities of metabolites that are conjugated and excreted. Experiments with laboratory animals reveal species differences in the predominance of certain metabolites, but the pathways described above appear to hold. There is no evidence that the metabolites are more toxic than the parent compound.

Excretion of metabolites, primarily through the urine, is rapid and extensive in humans and laboratory animals (ATSDR, 1999). Pulmonary excretion of carbon dioxide is a minor pathway.

Nothing in this review of toxicokinetics suggests that laboratory animals would not serve as appropriate models for the toxicity of ethylbenzene to humans.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. GI absorption of ethylbenzene is extensive as discussed in Section 3.0. Therefore, no GAF is developed for ethylbenzene and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

Data were not located for dermal uptake of ethylbenzene from soil. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels

(EPA, 2004). Therefore, dermal uptake of ethylbenzene from soil is not evaluated. Values for t*, K_p, τ, FA and B are provided by EPA (2004) as follows:

Chemical	t*	K_p	τ	FA	B
Ethylbenzene	1.01	4.9E-2	0.42	1.0	0.2
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

An oral LD_{50} in rats of 5.46 g/kg (HSDB, 2010) suggests that the acute toxicity of ingested ethylbenzene is low. Subchronic to chronic oral exposure of laboratory animals to ethylbenzene induces mild liver and kidney lesions (EPA, 2010). EPA (2010) presents a verified chronic oral RfD for ethylbenzene of 1E-1 mg/kg-day based on a NOEL for liver and kidney lesions in female rats of 136 mg/kg-day in a six-month gavage study. The LOAEL in this study was 408 mg/kg-day. An uncertainty factor of 1000 was applied to the NOEL to derive the chronic oral RfD. The uncertainty factor consists of factors of 10 each to extrapolate from animals to humans, to provide additional protection for more sensitive humans, and to expand from subchronic to chronic exposure. Confidence in the oral RfD is low. The liver and kidney are the target organs for prolonged oral exposure to ethylbenzene.

No EPA-derived subchronic oral RfD is available for ethylbenzene. A preliminary subchronic oral RfD can be made, however, by applying an uncertainty factor of 100 to the NOEL of 136 mg/kg-day in the 6-month rat study described above. The uncertainty factor of 100 reflects the chronic uncertainty factor of 1000 without the factor of 10 for expansion from subchronic to chronic exposure. The preliminary subchronic oral RfD so derived is 1E+0 mg/kg-day.

Acute inhalation exposure induces irritation of the mucous membranes in animals and humans (ACGIH, 1991). Prolonged inhalation exposure induces liver enzymes and results in elevated liver and kidney weights; prolonged exposure to relatively high levels is associated with mild histopathological lesions of the liver, kidney and testes (ACGIH, 1991; EPA, 2010). EPA (2010) considered that the effects on the liver at the lower exposure concentrations are adaptive rather than adverse. EPA (2010) presented a verified chronic inhalation RfC of 1E+0 mg/m^3 derived from a human equivalent adjusted NOAEL of 434 mg/m^3 from studies on developmental effects in rats and rabbits. An uncertainty factor of 300 was used. The human equivalent adjusted LOAEL of 4340 mg/m^3 was associated with equivocal evidence of reduced fetal size in rabbits, an increased incidence of extra ribs in rat fetuses, and increased liver, kidney and spleen weights in the rats. The inhalation RfC is equivalent to 2.9E-1 mg/kg-day. Confidence in the RfC is low. The chronic inhalation RfC is adopted as being sufficiently conservative for subchronic as well as chronic inhalation exposure.

The key study from which the inhalation RfC is derived does not clearly identify target organ(s) for inhalation exposure to ethylbenzene. The entire inhalation exposure data base, however, suggests that the liver, kidneys and fetus may be the most significant target organs for prolonged inhalation exposure.

6.0 Carcinogenicity Evaluation

Ethylbenzene is currently verified as a cancer weight-of-evidence Group D compound (not classifiable as carcinogenicity to humans) (EPA, 2010) based on an absence of human or animal cancer studies. Cancer potency factors are not estimated for Group D compounds.

7.0 Toxicity Summary

Toxicity values for ethylbenzene are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
1E+0	1E-1	L, K	1E+0/ 2.9E-1	1E+0/ 2.9E-1	L, K, F	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); NA = not applicable.
Target organ or critical effect abbreviations: L = liver; K = kidney; F = fetus.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 1999, ***Update Toxicological Profile for Ethylbenzene***, U.S. Department of Health and Human Services, Atlanta, Georgia, July, on line.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, Cincinnati, OH, p. 581-584.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

U.S. Environmental Protection Agency (EPA), 1995, "Final Water Quality Guidance for the Great Lakes System; Final Rule," (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*** Final, Office of Superfund Remediation and Technology Innovation, EPA/540/R/99/005, OSWER 9285.7-02EP, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

METHYLENE CHLORIDE (DICHLOROMETHANE) (75-09-2)

1.0 Introduction and Physical Properties

Methylene chloride is a **VOC** used predominantly as a paint remover and as a solvent and flammability depressant in aerosol products such as coatings, paint removers, hair sprays, room deodorants, herbicides and insecticides (ATSDR, 2000; HSDB, 2010). Methylene chloride is also used in the foam blowing of polyurethanes, in metal degreasing, stripping and degreasing of electronic components, in resin production, photographic film splicing, adhesive production, and other solvent, cleaning and thinning applications. It occurs as a colorless liquid at ambient temperatures. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
84.9[a]	1.25[a]	3.25E-3[e] (25EC)	1.07[b]	1.01E-1[b] (25EC)	1.17E-5[b] (25EC)	5.72E-1[c] (25EC)	1.30E+4[b] (20-25EC)	313.0[d]	510.0[d]	6.71E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry□s Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point of pure liquid compound (EK); T_c = critical temperature (EK); $\Delta H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole); ND = no data.[a]U.S U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

[b]U.S. Environmental Protection Agency (EPA), 2001, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Peer Review Draft, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, March.
[c]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
[d] U.S. Environmental Protection Agency (EPA), 1997, ***User□s Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings***, prepared by Environmental Quality Management, Inc. for the Office of Emergency and Remedial Response, Washington, DC, September.
[e]U.S. Environmental Protection Agency (EPA), 2010, *EPISuite electronic database*.

2.0 Environmental Fate and Transport

Methylene chloride is highly volatile; therefore, most environmental releases are to the atmosphere (ATSDR, 2000; HSDB, 2010). Large amounts (greater than a hundred million pounds) are released each year during its industrial and consumer use. Methylene chloride exists solely as a vapor in air and may travel long distances before removal. It is subject to reaction with photochemically generated hydroxyl radicals with a half-life of a few months. It is also subject to direct photolysis.

Methylene chloride released to soil will be highly mobile and will infiltrate or leach to greater depths or to groundwater (ATSDR, 2000; HSDB, 2010). Some will also volatilize. Methylene chloride released to water will be rapidly lost primarily by volatilization. It is not expected to partition to sediment. It is subject to hydrolysis and biodegradation, but these processes are less significant than volatilization. Methylene chloride is not expected to participate significantly in food-chain pathways; therefore, biotransfer factors are not provided.

3.0 Data for Evaluating Dermal Exposure

Animal studies indicate that methylene chloride is readily absorbed from the GI tract (ATSDR, 2000). EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Therefore, no GAF is developed for methylene chloride and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of methylene chloride from soil is not evaluated. K_p, τ, FA and B values are provided by EPA (2001) as follows:

Chemical	K_p	τ	FA	B
Methylene chloride	3.5E-3	0.32	1.0	0

K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).

4.0 Noncancer Effects Evaluation

Oral LD_{50} values in rats and mice approximate 2 g/kg, suggesting that the acute toxicity of methylene chloride is moderate (ATSDR, 2000). Prolonged oral exposure induces liver lesions in laboratory animals. EPA (2010) verified an RfD for chronic oral exposure of 6E-2 mg/kg-day by applying an uncertainty factor of 100 to a NOAEL of about 6 mg/kg-day in a two-year drinking water study in rats. The LOAEL, about 55 mg/kg-day, was associated with histopathologic lesions in the liver. Confidence in the RfD is medium. EPA (1997) adopted the verified chronic oral RfD of 6E-2 mg/kg-day as the provisional RfD for subchronic oral exposure.

Occupational exposure to high concentrations of methylene chloride is associated with a wide variety of neurological dysfunctions and elevated blood levels of carbon monoxide (a metabolite of methylene chloride) and carboxyhemoglobin (ACGIH, 1991). Chronic inhalation exposure of laboratory animals induces liver effects. EPA (1997) derived a provisional chronic inhalation RfC of 3E+0 mg/m^3 based on a NOAEL of 695 mg/m^3 in a two-year intermittent exposure study in rats. ATSDR (2000) lists a chronic inhalation minimum risk level (MRL) of 0.3 ppm. A concentration analogous to an RfC can be calculated if this MRL is multiplied by the ratio of the molecular weight of methylene chloride (84.9) to the average molecular weight of air (~29). This result in an "RfC" of 9E-1 mg/m^3. This is equivalent to an inhalation RfC of 0.3 mg/kg-day. The values are also used for subchronic exposure.

5.0 Carcinogenicity Evaluation

Methylene chloride is classified in EPA cancer weight-of-evidence Group B2 (probable human carcinogen), based on inadequate human data and sufficient evidence of carcinogenicity in animals (EPA, 2010). Animal inhalation studies showed increased incidence of hepatocellular neoplasms and alveolar/bronchiolar neoplasms in male and female mice, mammary tumors in rats of either sex, salivary gland sarcomas in male rats and leukemia in female rats. Oral studies were inconclusive. An oral SF of 7.5E-3 per mg/kg-day was based on the incidence of liver

tumors in two inhalation studies in mice. An inhalation URF of 4.7E-7 per $\mu g/m^3$ was based on the incidence of liver and lung tumors in one inhalation study. The inhalation URF is equivalent to 1.6E-3 per mg/kg-day.

6.0 Toxicity Summary

Toxicity values for methylene chloride are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
6E-2	6E-2	L	9E-1/ 3E-1	9E-1/ 3E-1	L	B2	7.5E-3	B2	4.7E-7	1.6E-3

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URF = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ abbreviations: L = liver; K = kidney; NA = not applicable.
[a]sRfDo, cRfDo and SFo should be used for dermal exposure without adjustment for GI absorption.

7.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Methylene Chloride***, U.S. Department of Health and Human Services, Atlanta, Georgia, September, on line.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, ACGIH, Cincinnati, OH, pp. 981-987.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line, accessed 7 February.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, NTIS No. PB97-921199.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

1,1,2,2-TETRACHLOROETHANE (79-34-5)

1.0 Introduction and Physical Properties

1,1,2,2-Tetrachloroethane is a **VOC** that exists in the pure state as a colorless to pale yellow liquid at ambient temperatures (HSDB, 2010). It was once used as a non-flammable solvent in cleaning and degreasing metals, in paint removers, varnishes and lacquers, in photographic film, as an extractant for oils and fats, and as an intermediate in the synthesis of unsaturated chlorinated solvents (ATSDR, 2008; HSDB, 2010). All these uses have declined markedly. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
167.9[a]	2.39[a]	3.67E-4[e] (25 °C)	1.97[b]	7.10E-2[b] (25 °C)	7.90E-6[b] (25 °C)	8.03E-3[c] (25 °C)	297E+3[b] (20-25 °C)	419.60[d]	661.15[d]	9.00E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point of pure liquid compound (°K); T_c = critical temperature (°K); $\Delta H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).

[a]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

[b]U.S. Environmental Protection Agency (EPA), 2001, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Review Draft, Office of Solid Waste and Emergency Response, Washington, DC, 9355.4-24, March.

[c]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

[d]U.S. Environmental Protection Agency (EPA), 1997, ***User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings***, Office of Emergency and Remedial Response, Washington, DC, September.

[e]U.S. Environmental Protection Agency (EPA), 2010, *EPISuite electronic database*.

2.0 Environmental Fate and Transport

Releases of 1,1,2,2-tetrachloroethane include process and fugitive emissions from its production and use as a chemical intermediate and industrial solvent, petroleum refining, incineration of chlorinated solvents, and evaporation from waste water streams (ATSDR, 2008). Most of the released 1,1,2,2-tetrachloroethane enters the atmosphere where it exists solely as a vapor and is very stable (half-life > 2 years) (HSDB, 2010). The chemical eventually diffuses to the stratosphere where it rapidly photodegrades. Wet deposition may remove some 1,1,2,2-tetrachloroethane from air, but volatilization from soil or surface water quickly returns it to the air.

1,1,2,2-Tetrachloroethane released to soil will be highly mobile and will infiltrate or leach to greater depths or to groundwater (ATSDR, 2008; HSDB, 2010). Some will also volatilize. Various hydrolytic, oxidative and biodegradation processes slowly transform the parent compound to 1,1,2-trichloroethane, trichloroethene, dichloroethene and vinyl chloride, all of

which are relatively stable and each of which is a toxicant in its own right. The biotransformation products are also subject to leaching to groundwater.

1,1,2,2-Tetrachloroethane released to water will be lost primarily by volatilization within days to weeks (ATSDR, 2008; HSDB, 2010). The compound is not expected to partition to sediment. Hydrolysis slowly converts the parent compound to trichloroethene.

Theoretical and empirical considerations suggest that participation in food-chain pathways is unlikely to be significant (HSDB, 2010; EPA, 1995); therefore, biotransfer factors are not provided.

3.0 Data for Evaluating Dermal Exposure

ATSDR (2008) summarized several studies that suggest that GI absorption of 1,1,2,2-tetrachloroethane is nearly complete in rats and mice. The most useful study reported excretion in rats and mice given a 150 mg/kg oral dose. Excretion was followed for 72 hours after treatment. Rats excreted 42 percent of the dose in expired air, 23 percent in urine and 4 percent in the feces. Mice excreted 51 percent in the breath, 22 percent in the urine and 6 percent in the feces. These data suggest that a minimum of approximately 95 percent of the oral dose was absorbed in both species, assuming that material recovered from the feces represents unabsorbed compound. EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Therefore, no GAF is developed for 1,1,2,2-tetrachloroethane and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

1,1,2,2-Tetrachloroethane is readily absorbed through the skin (HSDB, 2010), but data regarding the dermal uptake of 1,1,2,2-tetrachloroethane from soil were not located in the available literature. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of 1,1,2,2-tetrachloroethane from soil is not evaluated. K_p, τ, FA and B values are provided by EPA (2004) as follows:

Chemical	K_p	τ	FA	B
1,1,2,2-Tetrachloroethane	6.9E-3	0.93	1.0	0
K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).				

4.0 Noncancer Effects Evaluation

Single dose oral LD_{50} values in rats are grouped at 250 to 800 mg/kg (ATSDR, 2007). It appears that death is due largely to narcosis (probably accompanied by respiratory arrest and/or cardiovascular collapse). Prolonged oral exposure of laboratory animals to 1,1,2,2-tetrachloroethane is associated with liver and kidney effects (ATSDR, 2008).

Acute occupational exposure to high levels is associated with CNS effects; prolonged exposure to more moderate levels is associated with GI disturbances and liver damage (ATSDR, 2008).

The results of numerous subchronic studies were reviewed to derive a subchronic oral pRfD (EPA, 2008) for 1,1,2,2-tetrachloroethane. The lowest LOAEL identified was 40 mg/kg-day, in which increases in liver weights were observed (NTP, 2004). The results of several endpoints from this NTP study were evaluated using benchmark dose modeling, assuming 95% lower confidence limits, to identify potential points of departure to derive a subchronic pRfD. This modeling resulted in the identification of 10.8 mg/kg-day point of departure, based on increases in lever weights of male rats. This value can be regarded as an estimated NOAEL. An oral subchronic pRfD of 1E-2 mg/kg-day was derived by dividing this value by a composite UF of 1,000. This assumes a UF of 10 for each of the following: interspecies variability, intraspecies sensitivity, and deficiencies in the database (EPA, 2008).

Because of deficiencies in chronic animal studies, the subchronic NTP (2004) study used to derive the subchronic pRfD was also selected as the most appropriate to derive a chronic RfD. The chronic oral RfD of 4E-3 mg/kg-day was derived as described for the subchronic RfD, with an additional UF of 3 (for a composite UF of 3,000) to extrapolate from subchronic to chronic duration added to extrapolate from subchronic to chronic exposure for a composite UF of 3,000 (EPA, 2008).

Adequate studies for the derivation of inhalation pRfDs could not be located (EPA 2008)

5.0 Carcinogenicity Evaluation

Oral treatment with 1,1,2,2-tetrachloroethane is associated with a highly significant dose-related increase in hepatocellular carcinomas in rats (ATSDR, 2008). Occupational data regarding carcinogenicity in humans are inadequate. EPA (2010) classified 1,1,2,2-tetrachloroethane as a cancer weight-of-evidence Group C compound (possible human carcinogen), based on liver tumors in mice in a 78-week gavage study in which the test compound was dissolved in corn oil. EPA (2002) verified an oral SF of 2.0E-1 per mg/kg-day from the mouse study. The same data serve as the basis for an inhalation URF of 5.8E-5 per $\mu g/m^3$, which is equivalent to 2.0E-1 per mg/kg-day.

6.0 Toxicity Summary

Toxicity values for 1,1,2,2-tetrachloroethane are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	Sfi
1E-2	4E-3	L	ND	ND	NA	C	2.0E-1	C	5.8E-5	2.0E-1

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure[a]		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	Sfi

inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); ND = no data.
Target organ abbreviations: L = liver; NA = not applicable.
[a]sRfDo, cRfDo and SFo should be used for dermal exposure without adjustment for GI absorption.

7.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2008, ***Toxicological Profile for 1,1,2,2-Tetrachloroethane***, U.S. Department of Health and Human Services, Atlanta, Georgia, September.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

National Toxicology Program (NCP), 2004, ***NTP Technical Report on the Toxicity Studies of 1,1,2,2 Tetrachloroethane Administered in Microcapsules in Feed to F344/N Rats and B6C3F1Mice***, U.S. DHHS, Public Health Service, National Institute of Health. Toxicity Report Series, Number 49.

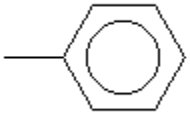
U.S. Environmental Protection Agency (EPA), 1995, Final Water Quality Guidance for the Great Lakes System; Final Rule, (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

U.S. Environmental Protection Agency (EPA), 2008, ***Provisional Peer Reviewed Toxicity Values for 1,1,2,2-Tetrachloroethane (CASRN 79-34-5)***, National Center for Environmental Assessment, Cincinnati, OH, 24 August 14.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

TOLUENE (METHYLBENZENE) (108-88-3)



1.0 Introduction and Physical Properties

Toluene is a **VOC** that occurs as a colorless liquid at ambient temperatures (HSDB, 2010). It is back-blended into gasoline to improve octane rating, used to produce benzene, used as a solvent in paints, coatings, adhesives, inks and cleaning agents, and used in the synthesis of a wide range of organic chemicals, particularly benzene and its derivatives (ATSDR, 2000; HSDB, 2010). Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
92.1[a]	2.73[a]	6.64E-3[b] (25°C)	2.26[b]	8.70E-2[b] (25°C)	8.60E-6[b] (25°C)	3.74E-2[c] (25°C)	5.26E+2[b] (20-25°C)	383.78[d]	591.79[d]	7.93E+3[d]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K); $H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole); ND = no data.

[a]U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final,*** Office of Emergency and Remedial Response, EPA/540/R/99/005, OSWER 9285.7-02EP July.

[b]U.S. Environmental Protection Agency (EPA), 2001, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Peer Review Draft, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, March.

[c]Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line, accessed 23 April.

[d]U.S. Environmental Protection Agency (EPA), 2003, ***Users Guide for Evaluating Subsurface Vapor Intrusion into Buildings***, Office of Emergency and Remedial Response, Washington, DC, 19 June.

2.0 Environmental Fate and Transport

Large amounts of toluene are released into the atmosphere each year, principally from the production, transport and use of gasoline (ATSDR, 2000; HSDB, 2010). Other major sources include volatilization of toluene-based solvents and thinners, and motor vehicle exhaust. Considerable amounts are discharged into waterways or spilled on land during the storage, transport and disposal of fuels and oils. Natural sources include emissions from volcanoes, forest fires and crude oil.

Toluene in the atmosphere will exist predominantly or entirely in the vapor phase, where it is subject to reaction with photochemically produced hydroxyl radicals (ATSDR, 2000; HSDB, 2010). It is also subject to reaction with various oxidizing agents in the atmosphere, but these reactions are far less significant. Wet deposition is another important process for removal of toluene from the atmosphere.

Toluene is expected to be moderately to highly mobile in soil and may leach to groundwater (ATSDR, 2000; HSDB, 2010). Volatilization is an important removal process for toluene near the surface of the soil. Biodegradation may also be significant in soil. Toluene in water will be

lost by both volatilization to the atmosphere and biodegradation. Which process predominates will depend on water temperature, mixing conditions and the existence of acclimated microorganisms at the site. The compound is not expected to sorb significantly to sediment or suspended organic matter in water.

Toluene theoretically may be expected to bioconcentrate because of its lipophilicity, but empirical data show that it is subject to rapid biotransformation, which greatly reduces this tendency (ATSDR, 2000). Overall, biotransfer is not expected to be significant (EPA, 1995) and biotransfer factors are not provided.

3.0 Toxicokinetics

Excretion data from humans and laboratory animals indicate that toluene is rapidly and extensively absorbed during inhalation and following oral administration (ATSDR, 2000). Data from humans suggest that pulmonary retention ranges from 50 to 83 percent of the inhaled concentration. GI absorption is practically complete in humans and animals. Administration of toluene in soil slows the rate but does not reduce the extent of GI absorption. Toluene is absorbed by the skin of humans and laboratory animals when applied as a liquid or as a water solution. Dermal uptake of toluene vapor has been demonstrated in animals. Data were not located regarding dermal uptake from soil.

Absorbed toluene is rapidly and widely distributed throughout the body (ATSDR, 2000). Highest levels are generally found in highly vascular and lipid-rich tissues, including the brain, particularly following inhalation, and the liver, particularly following ingestion. Levels in maternal tissues are generally much higher than those in fetal tissues. The nervous system is an important target for exposure to toluene, particularly following inhalation exposure.

The predominant metabolic pathway for toluene involves oxidation of the methyl group to form benzyl alcohol which is further oxidized to benzoic acid, followed by conjugation with glycine to form hippuric acid, which is recovered as the major urinary metabolite (ATSDR, 2000). A minor pathway involves hydroxylation of the benzene ring to form various cresol isomers, which undergo conjugation and excretion by the kidneys. Another minor pathway involves glutathione conjugation of benzyl alcohol to yield a mercapturic acid urinary metabolite. Quantitative differences in the relevance of these pathways have been shown for different species and different human racial groups.

The liver is the primary site of toluene biotransformation. The enzyme activity involved in toluene metabolism is low in the fetal liver, but reaches adult levels soon after birth. Low levels of detoxication activity in the fetus may increase the likelihood of developmental effects.

Toluene metabolites are rapidly excreted from the body, although excretion appears to be multi-phasic, reflecting release of toluene from adipose depots (ATSDR, 2000).

Nothing in this review of toxicokinetics suggests that laboratory animals would not serve as appropriate models for the toxicity of toluene to humans.

4.0 Dermal Exposure

EPA (2004) notes that organic chemicals are generally well absorbed from the GI tract, and recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. As noted above, GI absorption is practically complete. Therefore, no GAF is developed for toluene and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

Data were not located for dermal uptake of toluene from soil. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of toluene from soil is not evaluated. EPA (2003) provides t*, K_p, τ, B and FA values as follows:

Chemical	t*	K_p	τ	FA	B
Toluene	0.84	3.1E-2	0.35	1.0	0.1
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ= lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Acute inhalation (glue sniffing, solvent abuse, industrial accidents) or ingestion exposure to high levels of toluene induces CNS dysfunction and narcosis (ATSDR, 2000). Acute oral LD_{50} values include 2.6 to 7.5 g/kg in rats (HSDB, 2010), suggesting the acute toxicity is not high. Acute ingestion is associated with lesions in the heart, liver, lungs and kidneys (ATSDR, 2000). Prolonged oral exposure to lower levels is associated with pathological changes in the liver, kidney and brain. Changes in liver and kidney weights were observed in rats treated by gavage for 13 weeks at a dose rate of 446 mg/kg-day (NTP, 1990). Overt kidney effects were observed at higher doses (EPA, 2010). A NOAEL of 223 mg/kg-day was also observed in this NTP study.

EPA (2010) derived a verified chronic RfD for toluene, using the benchmark dose approach and the LOAEL of 446 mg/kg-day. The critical effect of absolute kidney weight was used. This approach derived a benchmark dose level of 238 mg/kg-day as the point of departure. The RfD of 8E-2 mg/kg-day is derived by dividing this value by a composite UF of 3000. This assumes a UF of 10 for each of the following: interspecies variability, intraspecies sensitivity, and subchronic to chronic extrapolation. An additional UF of 3 was added to account for deficiencies in the data base (EPA, 2010). The chronic RfD is also conservatively used for subchronic exposure.

Prolonged occupational (inhalation) exposure to toluene at concentrations near 100 ppm induces upper respiratory tract irritation and CNS dysfunction (EPA, 2010). The CNS effects are selected as the critical endpoint for a verified inhalation RfC of 5 mg/m^3. EPA (2010) considered a plethora of human studies in the derivation of this RfC. It is based on an average adjusted NOAEL from several studies of 46 mg/m^3 (EPA, 2010). An RfC of 5 mg/m^3 is derived from this value by dividing by a UF of 10 to account for inter-individual variability. This value equals an inhalation RfD of 1.4 mg/kg-day.

6.0 Carcinogenicity Evaluation

EPA (2010) verified toluene as a cancer weight-of-evidence Group D compound (not classifiable as to carcinogenicity to humans) based on a lack of human data and inadequate animal testing data. Potency factors are not available for Group D compounds.

7.0 Toxicity Summary

Toxicity values for toluene are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
8E-2	8E-2	K,	4E-1/ 1.1E-1	4E-1/ 1.1E-1	CNS	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); NA = not applicable.
Target organ or critical effect abbreviations: K = kidney, CNS = central nervous system.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry, (ATSDR), 2000, ***Update Toxicological Profile for Toluene***, U.S. Public Health Service, Atlanta, Georgia, September.

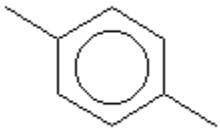
Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.
National Toxicology Program (NTP). 1990, Toxicology and Carcinogenesis Studies of Toluene (CAS No. 108-88-3) in F344/N Rats and B5C3F1 Mice (Inhalation Studies). Public Health Service, U.S. Department of Health and Human Services; NTP TR 371. Available from: National Institute of Environmental Health Sciences, Research Triangle Park, NC.

U.S. Environmental Protection Agency (EPA), 1995, "Final Water Quality Guidance for the Great Lakes System; Final Rule," (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Emergency and Remedial Response, EPA/540/R/99/005, OSWER 9285.7-02EP July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

XYLENES (DIMETHYLBENZENE), TOTAL (1330-20-7)



p-Xylene

1.0 Introduction and Physical Properties

The xylenes, also known as dimethylbenzenes, exist as three isomers: 2-xylene (1,2-dimethylbenzene, ortho- or o-xylene) (95-47-6), 3-xylene (1,3-dimethylbenzene, meta- or m-xylene) (108-38-3) and 4-xylene (1,4-dimethylbenzene, para- or p-xylene) (106-42-3) (HSDB, 2010). The o-, m-, and p-xylene nomenclature will be used herein to be consistent with the manner in which xylene concentrations in environmental media are usually reported by the analytical laboratories.

The xylenes are **VOCs** derived from coal tar, coal gas, and petroleum distillation (ATSDR, 1995; HSDB, 2010). They occur as clear liquids in the pure state at most ambient temperatures, although 4-xylene occurs as colorless plates or prisms at temperatures below 56EF (13.33EC). Natural sources include petroleum, forest fires and volatiles from plants.

Xylenes are used in the manufacture of other organic compounds, dyes, insecticides and pharmaceuticals, and as solvents (ATSDR, 1995; HSDB, 2010). They are components of aviation gasoline, asphalt and naphtha, and automobile exhaust. Technical xylene consists of approximately 44 percent m-xylene, 20 percent o-xylene, 20 percent p-xylene, and 15 percent ethylbenzene. Relevant physical properties are compiled below:

MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
o-Xylene (95-47-6)										
106.16[a]	3.12[a]	5.20E-3[b] (25°C)	2.56[b]	8.70E-2[b] (25°C)	1.00E-5[b] (25°C)	8.70E-3[a] (25°C)	1.78E+2[b] (20-25°C)	417.60[c]	630.30[c]	8.66E+3[c]
m-Xylene (108-38-3)										
106.2[d]	3.20[d]	7.34E-3[b] (25°C)	2.61[b]	7.00E-2[b] (25°C)	7.80E-6[b] (25°C)	1.09E-2[a] (25°C)	1.16E+2[b] (20-25°C)	412.27[c]	617.05[c]	8.52E+3[c]
p-Xylene (106-42-3)										
106.16[a]	3.15[a]	7.66E-3[b] (25°C)	2.59[b]	7.69E-2[b] (25°C)	8.44E-6[b] (25°C)	1.16E-2[a] (25°C)	1.85E+2[b] (20-25°C)	411.52[c]	616.20[c]	8.53E+3[c]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K);.$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).

[a]Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

[b]U.S. U.S. Environmental Protection Agency (EPA), 2002, ***Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites***, Office of Solid Waste and Emergency Response, Washington, D.C., 9355.4-24, December.

[c]U.S. Environmental Protection Agency (EPA), 2000, ***User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings, Revised***, Office of Emergency and Remedial Response, Washington, DC, December.

[d]U.S. Environmental Protection Agency (EPA), 2004a, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

It is recommended that the physical properties for m-xylene should be applied to mixed xylene isomers or data where the specific isomer is not identified, because m-xylene is the major component of the technical mixture and is likely to predominate following xylene releases.

2.0 Environmental Fate and Transport

Naturally occurring sources of xylenes are petroleum, forest fires and volatiles from plants (ATSDR, 1995; HSDB, 2010). The production and use of xylenes in petroleum products and as chemical solvents and intermediates may result in their release to the environment as fugitives and through various waste streams. Off-gassing from landfills and automobile exhaust are other significant sources. Spills, leaking underground storage tanks and associated plumbing, and leaching from landfills may release xylenes to soil and groundwater.

Xylenes will exist solely in the vapor phase in the ambient atmosphere, where they are subject to degradation by reaction with photochemically-produced hydroxyl radicals as the only significant removal process (ATSDR, 1995; HSDB, 2010). The atmospheric lifetime of xylenes is about 1 to 2 days. Products of photooxidation include a wide variety of ring hydroxylation and ring cleavage products.

Volatilization is expected to be the major removal mechanism for xylenes released to surface soil, but, depending on the size and rate of release, the majority of the release may infiltrate to subsurface soil (ATSDR, 1995). Photooxidation may degrade a significant part of the small amount that remains at the surface. Biodegradation is probably the only significant subsurface removal mechanism, but it is expected to be slow. A wide range of experimental K_{oc} values have been reported in soil samples with differing pH and organic carbon content (HSDB, 2010), suggesting a wide range in the extent to which the xylenes adsorb to soil particles. Generally, however, xylene is fairly mobile and may readily leach to groundwater.

Volatilization is probably the most significant removal mechanism for xylenes in surface water (ATSDR, 1995). Biodegradation may occur in surface water, groundwater and landfill leachate, although quite slowly. Oxidative reactions are expected to be insignificant. Xylenes are expected to adsorb somewhat to suspended solids and sediment in water (HSDB, 2010).

Xylenes are not expected to participate significantly in food-chain pathways (ATSDR, 1995; HSDB, 2010); therefore, biotransfer factors are not provided.

3.0 Toxicokinetics

Xylenes are rapidly and extensively absorbed during inhalation and following oral exposure (ATSDR, 1995). In humans, approximately 50 to 73 percent of the inhaled concentration is retained. In laboratory animals, approximately 90 percent of an ingested dose is absorbed. Liquid xylene is absorbed through the skin of humans, but dermal uptake of xylene vapors approximates only 1 percent of inhalation uptake. A study in rats showed that dermal uptake of xylene adsorbed to soil is much slower than dermal uptake of the neat liquid.

Absorbed xylene is largely bound to serum protein in the blood and is distributed rapidly and widely throughout the body, but particularly to highly vascular tissues and those high in lipid content (e.g., blood, brain, liver) (ATSDR, 1995). Levels in fetal tissues approximate 2 percent of those measured in maternal brain.

The predominant metabolic pathway in humans and animals for all xylene isomers is oxidation of one of the methyl groups to the corresponding alcohol, with further oxidation to the

corresponding methylbenzoic acid (ATSDR, 1995). The methylbenzoic acids conjugate with glycine to form the corresponding methylhippuric acids, which are the major urinary metabolites. Much lesser quantities of the alcohols and o-methylbenzoic acid are also excreted in the urine. Methylbenzaldehyde, proposed as the ultimate toxicant because it inactivates enzymes involved in electron transport, has been identified in laboratory animals but not in humans. Metabolism in laboratory animals differs from that in humans largely in the nature of the conjugates that are formed. Ring hydroxylation to form phenolic compounds represents a minor metabolic pathway is both humans and animals.

The xylenes are rapidly excreted from the body, largely in the form of urinary metabolites (ATSDR, 1955) as described above. Approximately 5 percent of an oral dose is eliminated in the breath as unchanged compound. Residues are slightly more persistent in adiposa and muscle tissue than other tissues of the body, but no organ or tissue accumulates xylene residues.

4.0 Dermal Exposure

EPA (2003) recommends that oral toxicity values should not be adjusted when used for dermal exposure unless empirical data demonstrate that GI absorption is significantly less than complete. Xylenes are nearly completely absorbed from the GI tract; therefore, no GAF is developed for the xylenes and the oral toxicity values described below should be used for dermal exposure without adjustment for GI absorption.

Xylene in soil is absorbed by the skin, albeit very slowly, but quantitative data were not located. VOCs tend to volatilize from soil when applied to the skin, reducing dermal uptake to toxicologically insignificant levels (EPA, 2004). Therefore, dermal uptake of xylenes from soil is not evaluated. Values for t*, K_p, τ, FA and B are provided by EPA (2003) for m-xylene as follows:

Chemical	t*	K_p	τ	FA	B
m-Xylene	1.01	5.3E-2	0.42	1.0	0.2
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); τ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

The dermal uptake parameters presented by EPA (2004) for m-xylene are applied to all the xylene isomers as well as to total xylenes.

5.0 Noncancer Effects Evaluation

Oral LD_{50} values for xylenes include 3.5 to 8.6 g/kg in rats and 1.6 to 5.6 g/kg in mice (HSDB, 2010), suggesting that the acute toxicity is low, but that mice may be slightly more sensitive than rats to the acute effects of ingested xylenes. Prolonged oral exposure of animals to xylenes is associated with reduced body weight and survival without histopathological alterations in the internal organs (EPA, 2010). EPA (2010) confirmed a previously verified chronic oral RfD for total xylenes of 2E-1 mg/kg-day based on a NOAEL of 250 mg/kg, equivalent to a continuous dose rate of 179 mg/kg-day, for decreased body weight and survival in male rats in chronic gavage studies with mixed xylenes. The LOAEL was 500 mg/kg, equivalent to 357 mg/kg-day. Mice were also included in the study. The LOAEL in mice was 1000 mg/kg, equivalent to 714 mg/kg-day, associated with hyperactivity, which was consistently observed at 5 to 30 minutes

after treatment. The mice did not exhibit the effects on body weight or survival that was observed with the rats, establishing the rat as the more sensitive species to prolonged oral exposure. An uncertainty factor of 1000 was applied to the rat NOAEL to derive the verified chronic oral RfD. Confidence in the chronic oral RfD is medium.

EPA (1997) presented provisional chronic oral RfDs for o-xylene and m-xylene of 2E+0 mg/kg-day based on an earlier IRIS evaluation of the same rat and mouse gavage study. Given the EPA (2010) re-evaluation of this study and the lowering of the chronic oral RfD by an order of magnitude, it seems prudent to adopt the verified chronic oral RfD of 2E-1 mg/kg-day for use with mixed xylenes and all xylene isomers. The critical effects of prolonged oral exposure to xylenes are reduced body weight and reduced survival. The verified chronic oral RfD is adopted as sufficiently protective for subchronic oral exposure to mixed xylenes and all xylene isomers.

Occupational exposure to xylenes induces CNS effects and GI disturbances (ACGIH, 1991). Other effects attributed to occupational exposure to xylene (blood dyscrasias, and heart, liver and kidney damage) may arise from concurrent exposure to other chemicals. EPA (2010) verified a chronic inhalation RfC of 1E-1 mg/m^3 based on CNS effects. In the key study, male rats were intermittently exposed to m-xylene at airborne concentrations of 0, 50 or 100 ppm for three months. Endpoints evaluated included spontaneous motor activity and motor coordination as measured by performance on a rotorod. Body and organ weights and limited blood chemistry and hematological parameters were also evaluated, but minor alterations in these endpoints were not attributed to exposure to m-xylene. The study identified 50 ppm as the NOAEL and 100 ppm as the LOAEL for impaired rotorod performance. The NOAEL is equivalent to an adjusted human equivalent concentration of 39 mg/m^3. Application of an uncertainty factor of 300 to the NOAEL yields the verified chronic inhalation RfC of 1E-1 mg/m^3, which is equivalent to a chronic inhalation RfD of 2.9E-2 mg/kg-day. The uncertainty factor consists of a factor of 10 to provide greater protection for more sensitive individuals, and factors of 3 each to extrapolate from animals to humans, to expand from subchronic to chronic exposure, and to account for deficiencies in the data base. The CNS is considered to be the target organ for prolonged inhalation exposure to xylenes. Confidence in the chronic inhalation RfC is medium.

No EPA-derived subchronic inhalation RfC is available for exposure to xylene. However, a preliminary subchronic inhalation RfC can be derived by applying an uncertainty factor of 100 to the NOAEL of 39 mg/m^3 in the subchronic rotorod study in rats described above. The uncertainty factor of 100 reflects the chronic uncertainty factor of 300 without the factor of 3 to expand from subchronic to chronic exposure. The preliminary subchronic inhalation RfC so derived is 4E-1 mg/m^3, which is equivalent to a subchronic inhalation RfD of 1.1E-1 mg/kg-day.

6.0 Carcinogenicity Evaluation

Xylene was previously characterized as a cancer weight-of-evidence Group D compound (not classifiable as to carcinogenicity to humans). Using a more descriptive characterization, EPA (2010) concluded that the cancer *data are inadequate for an assessment of the carcinogenic potential of xylenes*. Adequate human data on the carcinogenicity of the xylenes are not available, and the available animal data are inconclusive as to the ability of xylenes to cause a carcinogenic response. Evaluations of the genotoxic effects of xylenes have consistently given negative results. Potency factors are not available.

7.0 Toxicity Summary

Toxicity values for the xylenes are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
2E-1	2E-1	BW, Su	4E-1/ 1.1E-1	1E-1/ 2.9E-2	CNS	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); NA = not applicable.
Target organ or critical effect abbreviations: BW = reduced body weight; Su = reduced survival; CNS = central nervous system.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 1995, ***Update Toxicological Profile for Xylenes***, U.S. Department of Health and Human Services, Atlanta, Georgia, August, on line.

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, ***Documentation of the Threshold Limit Values and Biological Exposure Indices***, Sixth Edition, Cincinnati, OH, pp. 1732-1740.

Hazardous Substance Data Bank (HSDB), 2010, National Library of Medicine, on line.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, NTIS No. PB97-921199.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part E - Supplemental Guidance for Dermal Risk Assessment)***, Final, Office of Superfund Remediation and Technology Innovation, Washington, D.C., EPA/540/R-99/005, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

Miscellaneous

CYANIDE ANION (57-12-5), FREE CYANIDE, HYDROGEN CYANIDE (74-90-8)

Cyanide Anion

1.0 Introduction and Physical Properties

The term cyanide is properly used to mean the cyanide anion illustrated above. The term is also used herein to represent any form of cyanide, particularly if the form was not specified in the literature cited. The term free cyanide generally means the cyanide anion, hydrogen cyanide and some cyanide salts (e.g., sodium cyanide, potassium cyanide) that readily dissociate and release cyanide in water solutions within the biological pH range (ATSDR, 2006). Chlorine-amenable cyanide includes free cyanide as well as most organic complexes and most simple metal complexes. The chlorine-amenable fraction excludes iron cyanides, which resist degradation with release of cyanide. Total cyanide includes all of the above.

Concentrations of cyanide reported by various analytical procedures do not necessarily reflect the amount that is bioavailable, and data are not available with which to quantify bioavailability (ATSDR, 2006). Free cyanide and simple water soluble complexes (part of the chlorine-amenable fraction) are expected to be highly bioavailable. More complicated organic complexes and many metal complexes are expected to be somewhat less bioavailable, but the nature of the specific compound and pH of the matrix will greatly influence bioavailability. A reasonably conservative approach (adopted herein) is to evaluate total cyanide in the RA. A more reasonable approach, including only chlorine-amenable cyanide in the RA, might be justified if there were large differences between concentrations of chlorine-amenable and total cyanide. Large differences (upwards of an order of magnitude) might be expected in mining situations where metal complexes are expected to predominate.

Hydrogen cyanide is used in the synthesis of a wide range of organic chemicals (ATSDR, 2006; HSDB, 2010). Cyanide salts are used in metal treatment, ore extraction, as anticaking agents in road salt, and in a wide variety of other uses. Hydrogen cyanide has been used formerly to fumigate grain to control insects and rodents, and to exterminate rodents in their burrows. The cyanide anion is an **inorganic** substance. Hydrogen cyanide is a liquid, or gas above 26.5 EC (HSDB, 2010), and behaves very much like a **VOC** in the environment. Relevant physical properties of inorganic cyanide and hydrogen cyanide are compiled below:

Cyanide Anion (57-12-5)							
MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
26.02[a]	NA	NA	NA	NA	NA	NA	Note 1[b]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; K_d = soil/water partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; NA = not applicable.
Note 1: Several simple complexes or salts (e.g., hydrogen cyanide, sodium cyanide, potassium cyanide) are highly soluble in water, while other salts and organic complexes are sparingly soluble or practically insoluble in water.
[a]Howard, P.H. and M. Neal, 1992, ***Dictionary of Chemical Names and Synonyms***, Lewis Publishers, Ann Arbor.
[b]Agency for Toxic Substances and Disease Registry (ATSDR), 1997, ***Update Toxicological Profile for Cyanide***,

Cyanide Anion (57-12-5)							
MW	log K_{ow}	H	K_d	D_a	D_w	VP	S
U.S. Department of Health and Human Services, Atlanta, GA, on line, September.							

Hydrogen Cyanide (74-90-8)										
MW	log K_{ow}	H	log K_{oc}	D_a	D_w	VP	S	T_b	T_c	$\Delta H_{v,b}$
27.03[a]	-0.25[a]	1.33E-4[a] (25°C)[b]	-0.044[c]	2.11E-1[c] (25°C)[b]	2.44E-5[c] (25°C)[b]	9.76E-1[a] (25°C)	1E+6[a] (25°C)	298.8[a]	456.7[a]	6.02E+3[a]

MW = molecular weight (g/mole); log K_{ow} = base 10 logarithm of the octanol/water partition coefficient (unitless); H = Henry's Law constant (atm-m^3/mole) at the reference temperature; log K_{oc} = base 10 logarithm of the soil/organic carbon partition coefficient (L/kg); D_a = diffusivity in air (cm^2/second); D_w = diffusivity in water (cm^2/second); VP = vapor pressure (atm) at the reference temperature; S = solubility in water (mg/L) at the reference temperature; T_b = normal boiling point (at 1 atm) of pure liquid compound (°K); T_c = critical temperature (°K);,$H_{v,b}$ = enthalpy of vaporization at the boiling point (cal/mole).
[a]Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line, accessed 22 April.
[b]Assumed.
[c]Calculated as described in Introduction to Toxicity Profiles.

2.0 Environmental Fate and Transport

Cyanide is a naturally occurring substance (ATSDR, 2008; HSDB, 2010). Hydrogen cyanide may be produced naturally by microorganisms as well as from the degradation of cyanogenic glycosides, which are produced naturally by many plants. Several species of blue-green algae liberate hydrogen cyanide in the process of nitrate metabolism. Laetrile and amygdalin, which occur in substantial concentrations in several fruit pits (e.g., cherries, peaches, apricots, apples, pears) liberate cyanide following ingestion.

Major releases to the environment occur from metal treatment and ore extraction (primarily to water) and in automobile exhaust (primarily to the atmosphere) (ATSDR,2008). The production of hydrogen cyanide and its use as a starting material in the manufacture of acrylates, cyanide salts, herbicides and dyes as well as its former use as a fumigant may result in its release to the environment through various waste streams (HSDB, 2010). It also may be liberated from blast furnaces, gas works, coke ovens and oil shale retorting operations. Most hydrogen cyanide is emitted primarily to the atmosphere or waste water. Various cyanide salts may be released during their use in ore extraction and other metallurgic operations. Materials containing cyanide compounds disposed on land may cause elevated levels of cyanide in underlying strata and in groundwater. Cigarette smoke contains low levels of hydrogen cyanide.

Hydrogen cyanide released to the atmosphere is expected to remain solely in the vapor phase and to react slowly with photochemically generated hydroxyl radicals (HSDB, 2010). A half-life of approximately 300 to 550 days has been estimated for this reaction. Hydrogen cyanide is expected to be resistant to direct photolysis. The relatively slow rate of degradation suggests that hydrogen cyanide has the potential for transport over long distances before being removed by physical or chemical processes. Since hydrogen cyanide is miscible in water, wet deposition may be the most important removal process. Metal cyanide particles released to the air in dust are expected to be removed by both wet and dry deposition.

Cyanide may occur in the form of hydrogen cyanide, metal salts, or immobile metallocyanide complexes in soil (ATSDR, 2008; HSDB, 2010). It is expected that volatilization of hydrogen cyanide would be an important mechanism for cyanide removal from dry soil surfaces and from moist soil surfaces with pH less than 9.2. Hydrogen cyanide and many cyanide salts are very water soluble and are expected to be highly mobile in soil, readily leaching to deeper levels and to groundwater. Concentrations sufficiently low so as not to be toxic to microorganisms may undergo biodegradation in subsurface soil. Microbial degradation may yield formamide, or

complete mineralization may yield carbon dioxide and ammonia. Degradation of low concentrations in soil may substantially reduce the potential for leaching to groundwater.

Hydrogen cyanide is not expected to adsorb to suspended solids and sediment in water (HSDB, 2010). Volatilization from water surfaces is expected to be the most important removal mechanism. Biodegradation may be an important removal mechanism for low concentrations that are not toxic to microorganisms as explained for soil.

Hydrogen cyanide is volatile and labile at low concentrations. Its low log K_{ow} suggests that bioconcentration is unlikely to be significant. Some metal complexes have been shown to biotransfer, but the toxicity of these complexes is much less than that of hydrogen cyanide because of their very low solubility (ATSDR, 2008). There is no evidence of biomagnification in the food chain (ATSDR, 2008), and EPA (1995) has determined that cyanide is not a threat to human health through fish consumption. Biotransfer factors are not estimated for cyanide for these reasons.

3.0 Toxicokinetics

Inhalation exposure of humans to hydrogen cyanide results in very rapid absorption and high systemic retention (approximately 58 percent retention) (ATSDR,2008). Absorption is similarly rapid following oral exposure. Excretion data from orally treated animals suggest a minimum absorption factor of approximately 50 percent, but the extent of absorption is probably much higher. Dermal absorption of hydrogen cyanide by humans is inferred from toxicity data and supported by data from experimental animals. It is likely that some cyanide salts may also be absorbed but the extent has not been quantified.

Cyanide is rapidly and widely distributed throughout the body following absorption (ATSDR,2008).

The primary detoxication pathway involves the action of the enzyme rhodanese to combine cyanide with sulfane sulfur to yield thiocyanate, which is rapidly excreted through the urine (ATSDR, 2008). Rhodanese activity is located in most tissues of the body; the relative activity largely dependent on species. Highest levels are not generally found in the liver, which is often the primary site of metabolism for environmental contaminants. Minor detoxication pathways include pulmonary excretion of hydrogen cyanide, conversion of cyanide to carbon dioxide or other constituents that enter the single-carbon pool, and incorporation into cyanocobalamin (vitamin B_{12}). Elimination occurs rapidly, resulting in a half-life for cyanide of approximately 6 hours in humans. The incorporation of carbon into the single-carbon pool may account for the low estimate of extent of GI absorption from excretion data.

Hydrogen cyanide is the toxic moiety, complexing with ferric iron in various metalloenzymes, inhibiting mitochondrial cytochrome c oxidase and resulting in histotoxic anoxia (ATSDR,2008). Several changes follow that exacerbate the original biochemical lesion.

4.0 Dermal Exposure

GI absorption of cyanide almost certainly exceeds 50 percent as noted in Section 3.0. EPA (2004) suggests that oral toxicity values should not be adjusted when used for dermal exposure

unless GI absorption is less than 50 percent. Therefore, the oral toxicity values described below are adopted without modification for use for dermal exposure

EPA (1991) stated that, "performing an oral-to-dermal extrapolation would not be appropriate because of the uncertainty that the oral RfD for cyanide would provide protection for the effects caused by dermal exposure." The available data, however, suggest that the effects following oral and dermal exposure are similar (ATSDR, 2008). Furthermore, nothing in the toxicokinetic data suggest that detoxication would occur more efficiently following oral exposure so that the oral RfD may not be sufficiently protective for dermal exposure. Therefore, it is judged that the oral RfD is an appropriate value with which to evaluate the toxicity of dermal exposure to cyanide.

Two scenarios are relevant to dermal exposure to cyanide. The first scenario is exposure to cyanide in soil. Cyanide present in soil as hydrogen cyanide would be likely to volatilize so that dermal exposure is expected to be insignificant, as noted by EPA (2004) for other VOCs. Therefore, dermal exposure to hydrogen cyanide in soil is not quantified. It is possible that cyanide may exist as various salts or complexes in soil. Although these compounds may be dermally absorbed, the extent has not been quantified, so no ABS is available with which to quantify dermal uptake. Therefore, dermal uptake of cyanide from soil is not quantified, as recommended by EPA (2004).

The second scenario is exposure to cyanide in water, which may occur as hydrogen cyanide or soluble salts. Cyanide in water will be assumed to be present entirely as hydrogen cyanide to simplify the evaluation. Values for t*, K_p, ϑ, B and FA estimated by the EPA (2004) methodology follow:

Chemical	t*	K_p	τ	FA	B
Hydrogen Cyanide	0.36	7.65E-4	0.15	1	0.0
t* = time for dermal uptake to reach steady state (hours); K_p = permeability coefficient (cm/hour); □ = lag time for chemical to cross stratum corneum (hours); FA = fraction absorbed (unitless); B = ratio of the permeability coefficient for passage across the stratum corneum relative to the permeability coefficient for passage across the viable epidermis (unitless).					

5.0 Noncancer Effects Evaluation

Oral LD_{50} values in laboratory animals range from 8 to 22 mg/kg, depending on the particular cyanide compound and laboratory species (ATSDR, 2008; HSDB, 2010), indicating that the acute oral toxicity of cyanide is high. Prolonged oral exposure is associated with weight loss, thyroid effects and nervous system effects, particularly myelin degeneration (EPA, 2010). A verified chronic oral RfD of 2E-2 mg/kg-day for free cyanide and hydrogen cyanide was derived from a NOAEL of 10.8 mg/kg-day in a 2-year study in which rats were fed diets fumigated with hydrogen cyanide. The LOAEL of 30 mg/kg-day in another rat feeding study is associated with the effects described above. An uncertainty factor of 500 was applied. Confidence in the oral RfD is medium. Loss of body weight, thyroid effects and nervous system effects are considered the critical effects for prolonged oral exposure to cyanide. EPA (1997) adopted the verified chronic oral RfD as sufficiently protective for subchronic oral exposure.

EPA (2010) verified a chronic inhalation RfC of 3E-3 mg/m^3 for hydrogen cyanide based on nervous symptoms and thyroid effects in occupationally exposed humans. The key study involved 36 non-smoking male workers employed in the electroplating sections of three factories

in Egypt exposed for 5 to 10 years (1 man exposed for 15 years). Twenty non-smoking unexposed male volunteers served as controls. Breathing-zone cyanide concentrations ranged from 4.63 to 13.69 mg/m^3, with a mean of 7.07 to 11.45 mg/m^3. Symptoms reported more frequently in the exposed workers included (in decreasing order of frequency) headache, weakness, and changes in the senses of taste and smell. Lacrimation, abdominal colic, and precordial (lower stomach) pain, salivation, and nervous instability occurred less frequently. Twenty of the exposed workers had thyroid enlargement to a mild or moderate degree, and thyroid function (iodine uptake) was altered. The lowest mean concentration recorded in the three factories, 7.07 mg/m^3, corresponding to an exposure-adjusted concentration of 2.5 mg/m^3, was designated a LOAEL. Application of an uncertainty factor of 1000 (factors of 10 each to estimate a NOAEL from a LOAEL and to provide additional protection for unusually sensitive individuals, and factors of 3 each for deficiencies in the database [lack of chronic and multigenerational reproduction studies] and for less than chronic duration) yields the verified chronic inhalation RfC of 3E-3 mg/m^3. The chronic RfC is equivalent to a chronic inhalation RfD of 8.6E-4 mg/kg-day. The thyroid and CNS are the targets for prolonged inhalation exposure. Confidence in the verified RfC is low.

A subchronic inhalation RfC of 8E-3 mg/m^3 equivalent to a subchronic inhalation RfD of 2.3E-3 mg/kg-day is derived by applying an uncertainty factor of 300 to the LOAEL of 2.5 mg/m^3 described above. The uncertainty factor of 300 reflects the chronic uncertainty factor of 1000 excluding the factor of 3 to expand from subchronic to chronic exposure.

The chronic and subchronic inhalation RfC and RfD values can be applied to any airborne form of cyanide.

6.0 Carcinogenicity Evaluation

EPA (2010) classified cyanide in EPA cancer weight-of-evidence Group D – not classifiable as to carcinogenicity to humans – because of a lack of data in humans or laboratory animals. Cancer potency factors are not derived for Group D chemicals.

7.0 Toxicity Summary

Toxicity values for cyanide/hydrogen cyanide are summarized below:

Noncancer Effects						Carcinogenicity				
Oral Exposure[a]			Inhalation Exposure			Oral Exposure		Inhalation Exposure		
sRfDo	cRfDo	TO	sRfC/ sRfDi	cRfC/ cRfDi	TO	WOE	SFo	WOE	URFi	SFi
2E-2	2E-2	BW, T, NS	8E-3/ 2.3E-3	3E-3/ 8.6E-4	T, CNS	D	NA	D	NA	NA

sRfDo = subchronic oral reference dose (milligrams per kilogram-day); cRfDo = chronic oral reference dose (milligrams per kilogram-day); TO = target organ(s) or critical effect(s); sRfC = subchronic inhalation reference concentration (milligrams per cubic meter); sRfDi = subchronic inhalation reference dose (milligrams per kilogram-day); cRfC = chronic inhalation reference concentration (milligrams per cubic meter); cRfDi = chronic inhalation reference dose (milligrams per kilogram-day); WOE = cancer weight-of-evidence evaluation; SFo = oral cancer slope factor (risk per milligram per kilogram-day); URFi = inhalation unit risk factor (risk per microgram per cubic meter); SFi = inhalation cancer slope factor (risk per milligram per kilogram-day); NA = not applicable.
Target organ or critical effect abbreviations: BW = reduced body weight; T = thyroid, NS = nervous system; CNS = central nervous system.
[a]sRfDo and cRfDo should be used for dermal exposure without adjustment for GI absorption.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), 2006, ***Toxicological Profile for Cyanide***, U.S. Department of Health and Human Services, Atlanta, GA, June.

Hazardous Substance Data Bank (HSDB), 2004, National Library of Medicine, on line.

U.S. Environmental Protection Agency (EPA), 1991, ***Risk Assessment Issue Paper for: Dermal Absorption of Cyanide (CASRN 57-12-5)***, National Center for Environmental Assessment, Cincinnati, OH, 3 June.

U.S. Environmental Protection Agency (EPA), 1995, "Final Water Quality Guidance for the Great Lakes System; Final Rule," (40 CFR 9, 122, 123, 131, and 132), ***Federal Register***, 60(56): 15365-15425.

U.S. Environmental Protection Agency (EPA), 1997, ***Health Effects Assessment Summary Tables, FY 1997 Update***, Office of Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, PB97-921199, July.

U.S. Environmental Protection Agency (EPA), 2004, ***Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final***, Office of Superfund Remediation and Technology Innovation, Washington, DC, EPA/540/R/99/005, OSWER 9285.7-02EP, NTIS No. PB99-963312, July.

U.S. Environmental Protection Agency (EPA), 2010, ***Integrated Risk Information System (IRIS)***, National Center for Environmental Assessment, Cincinnati, OH, on line.

APPENDIX D

RISK CHARACTERIZATION SPREADSHEETS

Table D-1

Groundskeeper, Current Scenarios, Exposure to Surface Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact				
Chemicals of Potential Concern	EPC mg/kg	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ	Dose Absorbed mg/cm^2-day	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ
Inorganics										
Aluminum	1.13E+04	3.94E-03	1.10E-02	NA	1.10E-02	NA	NA	NA	NA	NA
Beryllium	1.14E+01	3.98E-06	1.12E-05	NA	5.58E-03	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	7.33E-01	2.56E-07	7.17E-07	1.87E-07	NA	1.91E-08	2.20E-07	6.15E-07	1.60E-07	NA
Benzo(a)pyrene	7.03E-01	2.46E-07	6.88E-07	1.79E-06	NA	1.83E-08	2.11E-07	5.90E-07	1.54E-06	NA
Benzo(b)fluoranthene	8.29E-01	2.90E-07	8.11E-07	2.11E-07	NA	2.16E-08	2.49E-07	6.96E-07	1.81E-07	NA
Indeno(1,2,3-cd)pyrene	1.03E+00	3.61E-07	1.01E-06	2.64E-07	NA	2.69E-08	3.10E-07	8.68E-07	2.26E-07	NA
Total ILCR or HI				**2.46E-06**	**1.66E-02**				**2.11E-06**	**NA**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-1

Groundskeeper, Current Scenarios, Exposure to Surface Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

Chemicals of Potential Concern	Concentration in Air C_a mg/m^3	Inhalation Cancer Dose mg/kg-day	Inhalation Noncancer Dose mg/kg-day	Inhalation ILCR	Inhalation HQ	**All Pathways Total ILCR**	**All Pathways Total HI**
Inorganics							
Aluminum	1.13E-03	7.89E-05	2.21E-04	NA	1.58E-01	**NA**	**1.69E-01**
Beryllium	1.14E-06	7.97E-08	2.23E-07	6.69E-07	3.91E-02	**6.69E-07**	**4.47E-02**
Semivolatile Organic Compounds							
Benzo(a)anthracene	7.33E-08	5.12E-09	1.43E-08	1.59E-09	NA	**3.49E-07**	**NA**
Benzo(a)pyrene	7.03E-08	4.91E-09	1.38E-08	1.52E-08	NA	**3.35E-06**	**NA**
Benzo(b)fluoranthene	8.29E-08	5.79E-09	1.62E-08	1.80E-09	NA	**3.95E-07**	**NA**
Indeno(1,2,3-cd)pyrene	1.03E-07	7.23E-09	2.02E-08	2.24E-09	NA	**4.92E-07**	**NA**
Total ILCR or HI				**6.90E-07**	**1.97E-01**	**5.25E-06**	**2.13E-01**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-2

Groundskeeper, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact				
Chemicals of Potential Concern	EPC mg/kg	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ	Dose Absorbed mg/cm^2-day	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ
Inorganics										
Aluminum	1.00E+04	3.49E-03	9.79E-03	NA	9.79E-03	NA	NA	NA	NA	NA
Beryllium	8.52E+00	2.98E-06	8.34E-06	NA	4.17E-03	NA	NA	NA	NA	NA
Cadmium	1.26E+00	4.41E-07	1.23E-06	NA	1.23E-03	NA	NA	NA	NA	NA
Manganese	1.37E+03	4.80E-04	1.34E-03	NA	2.86E-02	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	2.57E-01	8.98E-08	2.51E-07	6.56E-08	NA	6.68E-09	7.71E-08	2.16E-07	5.63E-08	NA
Benzo(a)pyrene	2.16E-01	7.55E-08	2.11E-07	5.51E-07	NA	5.62E-09	6.48E-08	1.81E-07	4.73E-07	NA
Benzo(b)fluoranthene	3.47E-01	1.21E-07	3.40E-07	8.85E-08	NA	9.02E-09	1.04E-07	2.91E-07	7.60E-08	NA
Indeno(1,2,3-cd)pyrene	4.46E-01	1.56E-07	4.36E-07	1.14E-07	NA	1.16E-08	1.34E-07	3.74E-07	9.76E-08	NA
Total ILCR or HI				**8.19E-07**	**4.38E-02**				**7.03E-07**	**NA**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-2

Groundskeeper, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

Chemicals of Potential Concern	Concentration in Air C_a mg/m^3	Inhalation Cancer Dose mg/kg-day	Inhalation Noncancer Dose mg/kg-day	Inhalation ILCR	Inhalation HQ	**All Pathways Total ILCR**	**All Pathways Total HI**
Inorganics							
Aluminum	1.00E-03	6.99E-05	1.96E-04	NA	1.40E-01	**NA**	**1.50E-01**
Beryllium	8.52E-07	5.96E-08	1.67E-07	5.00E-07	2.93E-02	**5.00E-07**	**3.34E-02**
Cadmium	1.26E-07	8.81E-09	2.47E-08	5.55E-08	8.51E-03	**5.55E-08**	**9.74E-03**
Manganese	1.37E-04	9.60E-06	2.69E-05	NA	1.92E+00	**NA**	**1.95E+00**
Semivolatile Organic Compounds							
Benzo(a)anthracene	2.57E-08	1.80E-09	5.03E-09	5.57E-10	NA	**1.22E-07**	**NA**
Benzo(a)pyrene	2.16E-08	1.51E-09	4.23E-09	4.68E-09	NA	**1.03E-06**	**NA**
Benzo(b)fluoranthene	3.47E-08	2.43E-09	6.79E-09	7.52E-10	NA	**1.65E-07**	**NA**
Indeno(1,2,3-cd)pyrene	4.46E-08	3.12E-09	8.73E-09	9.66E-10	NA	**2.12E-07**	**NA**
Total ILCR or HI				**5.63E-07**	**2.10E+00**	**2.08E-06**	**2.14E+00**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-3

Groundskeeper, Future Scenario, Exposure to Bedrock Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact					All Pathways	
		Cancer	Noncancer			Dose	Cancer	Noncancer				
	EPC	Dose	Dose			Absorbed	Dose	Dose			**Total**	**Total**
Chemicals of Potential Concern	mg/L	mg/kg-day	mg/kg-day	ILCR	HQ	mg/cm^2-day	mg/kg-day	mg/kg-day	ILCR	HQ	**ILCR**	**HI**
Inorganics												
Antimony	5.80E-03	2.03E-05	5.68E-05	NA	1.42E-01	5.80E-09	6.69E-08	1.87E-07	NA	3.12E-03	**NA**	**1.45E-01**
Arsenic	1.10E-01	3.84E-04	1.08E-03	5.77E-04	3.59E+00	1.10E-07	1.27E-06	3.55E-06	1.90E-06	1.18E-02	**5.79E-04**	**3.60E+00**
Iron	4.91E+00	1.72E-02	4.80E-02	NA	6.86E-02	4.91E-06	5.66E-05	1.59E-04	NA	NA	**NA**	**6.86E-02**
Manganese	8.57E-01	2.99E-03	8.39E-03	NA	1.78E-01	8.57E-07	9.88E-06	2.77E-05	NA	1.46E-02	**NA**	**1.93E-01**
Thallium	5.30E-03	1.85E-05	5.19E-05	NA	7.98E-01	5.30E-09	6.11E-08	1.71E-07	NA	2.63E-03	**NA**	**8.00E-01**
Semivolatile Organic Compounds												
Methylnaphthalene, 2-	3.62E-02	1.27E-04	3.54E-04	NA	8.86E-02	7.25E-06	8.36E-05	2.34E-04	NA	5.85E-02	**NA**	**1.47E-01**
Naphthalene	3.32E-02	1.16E-04	3.25E-04	NA	1.62E-02	3.23E-06	3.72E-05	1.04E-04	NA	5.21E-03	**NA**	**2.15E-02**
Volatile Organic Compounds												
Benzene	1.30E+00	4.54E-03	1.27E-02	2.50E-04	3.18E+00	2.90E-05	3.35E-04	9.37E-04	1.84E-05	2.34E-01	**2.68E-04**	**3.41E+00**
Chloroform	1.80E-02	6.29E-05	1.76E-04	NA	1.76E-02	2.39E-07	2.76E-06	7.72E-06	NA	7.72E-04	**NA**	**1.84E-02**
Chloromethane (Methyl Chloride	2.16E-01	7.55E-04	2.11E-03	NA	NA	8.81E-07	1.02E-05	2.84E-05	NA	NA	**NA**	**NA**
Ethylbenzene	1.76E-01	6.15E-04	1.72E-03	NA	1.72E-02	1.54E-05	1.78E-04	4.99E-04	NA	4.99E-03	**NA**	**2.22E-02**
Methylene chloride	2.88E-02	1.01E-04	2.82E-04	7.55E-07	4.70E-03	1.58E-07	1.82E-06	5.09E-06	1.36E-08	8.48E-05	**7.68E-07**	**4.78E-03**
Tetrachloroethane, 1,1,2,2-	5.30E-04	1.85E-06	5.19E-06	3.70E-07	1.04E-04	9.75E-09	1.12E-07	3.15E-07	2.25E-08	6.29E-06	**3.93E-07**	**1.10E-04**
Toluene	7.30E-01	2.55E-03	7.14E-03	NA	8.93E-02	3.70E-05	4.27E-04	1.19E-03	NA	1.49E-02	**NA**	**1.04E-01**
Xylenes	1.34E+00	4.68E-03	1.31E-02	NA	6.56E-02	1.27E-04	1.47E-03	4.11E-03	NA	2.05E-02	**NA**	**8.61E-02**
General Chemistry												
Cyanide, Total	1.20E-01	4.19E-04	1.17E-03	NA	5.87E-02	1.20E-07	1.38E-06	3.87E-06	NA	1.94E-04	**NA**	**5.89E-02**
Total ILCR or HI				**8.28E-04**	**8.31E+00**				**2.03E-05**	**3.72E-01**	**8.48E-04**	**8.68E+00**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter

Table D-4

Groundskeeper, Future Scenario, Exposure to Overburden Monitoring Well Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact					All Pathways	
		Cancer	Noncancer			Dose	Cancer	Noncancer				
	EPC	Dose	Dose			Absorbed	Dose	Dose			Total	Total
Chemicals of Potential Concern	mg/L	mg/kg-day	mg/kg-day	ILCR	HQ	mg/cm^2-day	mg/kg-day	mg/kg-day	ILCR	HQ	ILCR	HI
Inorganics												
Cobalt	1.85E-02	6.48E-05	1.81E-04	NA	6.04E-01	7.41E-09	8.55E-08	2.39E-07	NA	7.98E-04	**NA**	**6.05E-01**
Iron	3.86E+00	1.35E-02	3.77E-02	NA	5.39E-02	3.86E-06	4.45E-05	1.24E-04	NA	NA	**NA**	**5.39E-02**
Manganese	3.23E+01	1.13E-01	3.16E-01	NA	6.72E+00	3.23E-05	3.72E-04	1.04E-03	NA	5.49E-01	**NA**	**7.27E+00**
Thallium	3.14E-02	1.10E-04	3.08E-04	NA	4.73E+00	3.14E-08	3.63E-07	1.02E-06	NA	1.56E-02	**NA**	**4.75E+00**
Volatile Organic Compounds												
Chloroform	4.80E-04	1.68E-06	4.70E-06	NA	4.70E-04	6.38E-09	7.36E-08	2.06E-07	NA	2.06E-05	**NA**	**4.90E-04**
General Chemistry												
Sulfate	5.20E+02	1.82E+00	5.09E+00	NA	NA	NA	NA	NA	NA	NA	**NA**	**NA**
Total ILCR or HI				**NA**	**1.21E+01**				**NA**	**5.65E-01**	**NA**	**1.27E+01**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter

Table D-5

Indoor Worker, Future Scenario, Exposure to Surface Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion					
Chemicals of Potential Concern	EPC mg/kg	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ	**Total ILCR**	**Total HI**
Inorganics							
Aluminum	1.13E+04	1.97E-03	5.52E-03	NA	5.52E-03	**NA**	**5.52E-03**
Beryllium	1.14E+01	1.99E-06	5.58E-06	NA	2.79E-03	**NA**	**2.79E-03**
Semivolatile Organic Compounds							
Benzo(a)anthracene	7.33E-01	1.28E-07	3.59E-07	9.35E-08	NA	**9.35E-08**	**NA**
Benzo(a)pyrene	7.03E-01	1.23E-07	3.44E-07	8.97E-07	NA	**8.97E-07**	**NA**
Benzo(b)fluoranthene	8.29E-01	1.45E-07	4.06E-07	1.06E-07	NA	**1.06E-07**	**NA**
Indeno(1,2,3-cd)pyrene	1.03E+00	1.81E-07	5.06E-07	1.32E-07	NA	**1.32E-07**	**NA**
Total ILCR or HI						**1.23E-06**	**8.31E-03**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram

Table D-6

Indoor Worker, Future Scenario, Exposure to Bedrock Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact					All Pathways	
		Cancer	Noncancer			Dose	Cancer	Noncancer				
	EPC	Dose	Dose			Absorbed	Dose	Dose			Total	Total
Chemicals of Potential Concern	mg/L	mg/kg-day	mg/kg-day	ILCR	HQ	mg/cm^2-day	mg/kg-day	mg/kg-day	ILCR	HQ	ILCR	HI
Inorganics												
Antimony	5.80E-03	2.03E-05	5.68E-05	NA	1.42E-01	5.80E-09	6.69E-08	1.87E-07	NA	3.12E-03	**NA**	**1.45E-01**
Arsenic	1.10E-01	3.84E-04	1.08E-03	5.77E-04	3.59E+00	1.10E-07	1.27E-06	3.55E-06	1.90E-06	1.18E-02	**5.79E-04**	**3.60E+00**
Iron	4.91E+00	1.72E-02	4.80E-02	NA	6.86E-02	4.91E-06	5.66E-05	1.59E-04	NA	NA	**NA**	**6.86E-02**
Manganese	8.57E-01	2.99E-03	8.39E-03	NA	1.78E-01	8.57E-07	9.88E-06	2.77E-05	NA	1.46E-02	**NA**	**1.93E-01**
Thallium	5.30E-03	1.85E-05	5.19E-05	NA	7.98E-01	5.30E-09	6.11E-08	1.71E-07	NA	2.63E-03	**NA**	**8.00E-01**
Semivolatile Organic Compounds												
Methylnaphthalene, 2-	3.62E-02	1.27E-04	3.54E-04	NA	8.86E-02	7.25E-06	8.36E-05	2.34E-04	NA	5.85E-02	**NA**	**1.47E-01**
Naphthalene	3.32E-02	1.16E-04	3.25E-04	NA	1.62E-02	3.23E-06	3.72E-05	1.04E-04	NA	5.21E-03	**NA**	**2.15E-02**
Volatile Organic Compounds												
Benzene	1.30E+00	4.54E-03	1.27E-02	2.50E-04	3.18E+00	2.90E-05	3.35E-04	9.37E-04	1.84E-05	2.34E-01	**2.68E-04**	**3.41E+00**
Chloroform	1.80E-02	6.29E-05	1.76E-04	NA	1.76E-02	2.39E-07	2.76E-06	7.72E-06	NA	7.72E-04	**NA**	**1.84E-02**
Chloromethane (Methyl Chloride)	2.16E-01	7.55E-04	2.11E-03	NA	NA	8.81E-07	1.02E-05	2.84E-05	NA	NA	**NA**	**NA**
Ethylbenzene	1.76E-01	6.15E-04	1.72E-03	NA	1.72E-02	1.54E-05	1.78E-04	4.99E-04	NA	4.99E-03	**NA**	**2.22E-02**
Methylene chloride	2.88E-02	1.01E-04	2.82E-04	7.55E-07	4.70E-03	1.58E-07	1.82E-06	5.09E-06	1.36E-08	8.48E-05	**7.68E-07**	**4.78E-03**
Tetrachloroethane, 1,1,2,2-	5.30E-04	1.85E-06	5.19E-06	3.70E-07	1.04E-04	9.75E-09	1.12E-07	3.15E-07	2.25E-08	6.29E-06	**3.93E-07**	**1.10E-04**
Toluene	7.30E-01	2.55E-03	7.14E-03	NA	8.93E-02	3.70E-05	4.27E-04	1.19E-03	NA	1.49E-02	**NA**	**1.04E-01**
Xylenes	1.34E+00	4.68E-03	1.31E-02	NA	6.56E-02	1.27E-04	1.47E-03	4.11E-03	NA	2.05E-02	**NA**	**8.61E-02**
General Chemistry												
Cyanide, Total	1.20E-01	4.19E-04	1.17E-03	NA	5.87E-02	1.20E-07	1.38E-06	3.87E-06	NA	1.94E-04	**NA**	**5.89E-02**
Total ILCR or HI				**8.28E-04**	**8.31E+00**				**2.03E-05**	**3.72E-01**	**8.48E-04**	**8.68E+00**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter

Table D-7

Indoor Worker, Future Scenario, Exposure to Overburden Monitoring Well Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact					All Pathways	
		Cancer	Noncancer			Dose	Cancer	Noncancer				
Chemicals of Potential Concern	EPC mg/L	Dose mg/kg-day	Dose mg/kg-day	ILCR	HQ	Absorbed mg/cm^2-day	Dose mg/kg-day	Dose mg/kg-day	ILCR	HQ	**Total ILCR**	**Total HI**
Inorganics												
Cobalt	1.85E-02	6.48E-05	1.81E-04	NA	6.04E-01	7.41E-09	8.55E-08	2.39E-07	NA	7.98E-04	**NA**	**6.05E-01**
Iron	3.86E+00	1.35E-02	3.77E-02	NA	5.39E-02	3.86E-06	4.45E-05	1.24E-04	NA	NA	**NA**	**5.39E-02**
Manganese	3.23E+01	1.13E-01	3.16E-01	NA	6.72E+00	3.23E-05	3.72E-04	1.04E-03	NA	5.49E-01	**NA**	**7.27E+00**
Thallium	3.14E-02	1.10E-04	3.08E-04	NA	4.73E+00	3.14E-08	3.63E-07	1.02E-06	NA	1.56E-02	**NA**	**4.75E+00**
Volatile Organic Compounds												
Chloroform	4.80E-04	1.68E-06	4.70E-06	NA	4.70E-04	6.38E-09	7.36E-08	2.06E-07	NA	2.06E-05	**NA**	**4.90E-04**
General Chemistry												
Sulfate	5.20E+02	1.82E+00	5.09E+00	NA	NA	NA	NA	NA	NA	NA	**NA**	**NA**
Total ILCR or HI				**NA**	**1.21E+01**				**NA**	**5.65E-01**	**NA**	**1.27E+01**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter

Table D-8

Construction Worker, Current and Future Scenarios, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact				
Chemicals of Potential Concern	EPC mg/kg	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ	Dose Absorbed mg/cm^2-day	Cancer Dose mg/kg-day	Noncancer Dose mg/kg-day	ILCR	HQ
Inorganics										
Aluminum	1.00E+04	2.31E-04	3.22E-02	NA	3.22E-02	NA	NA	NA	NA	NA
Beryllium	8.52E+00	1.97E-07	2.74E-05	NA	1.37E-02	NA	NA	NA	NA	NA
Cadmium	1.26E+00	2.91E-08	4.06E-06	NA	4.06E-03	NA	NA	NA	NA	NA
Manganese	1.37E+03	3.17E-05	4.42E-03	NA	9.41E-02	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	2.57E-01	5.93E-09	8.28E-07	4.33E-09	NA	1.00E-08	2.31E-09	3.23E-07	1.69E-09	NA
Benzo(a)pyrene	2.16E-01	4.98E-09	6.96E-07	3.64E-08	NA	8.42E-09	1.94E-09	2.71E-07	1.42E-08	NA
Benzo(b)fluoranthene	3.47E-01	8.00E-09	1.12E-06	5.84E-09	NA	1.35E-08	3.12E-09	4.36E-07	2.28E-09	NA
Indeno(1,2,3-cd)pyrene	4.46E-01	1.03E-08	1.44E-06	7.51E-09	NA	1.74E-08	4.01E-09	5.60E-07	2.93E-09	NA
Total ILCR or HI				**5.40E-08**	**1.44E-01**				**2.11E-08**	**NA**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-8

Construction Worker, Current and Future Scenarios, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

Chemicals of Potential Concern	Concentration in Air C_a mg/m^3	Inhalation Cancer Dose mg/kg-day	Inhalation Noncancer Dose mg/kg-day	Inhalation ILCR	Inhalation HQ	**All Pathways Total ILCR**	**All Pathways Total HI**
Inorganics							
Aluminum	3.50E-03	4.89E-06	6.83E-04	NA	4.88E-01	**NA**	**5.20E-01**
Beryllium	2.98E-06	4.17E-09	5.82E-07	3.50E-08	1.02E-01	**3.50E-08**	**1.16E-01**
Cadmium	4.41E-07	6.17E-10	8.61E-08	3.89E-09	2.97E-02	**3.89E-09**	**3.38E-02**
Manganese	4.81E-04	6.72E-07	9.38E-05	NA	6.70E+00	**NA**	**6.79E+00**
Semivolatile Organic Compounds							
Benzo(a)anthracene	9.00E-08	1.26E-10	1.76E-08	3.90E-11	NA	**6.05E-09**	**NA**
Benzo(a)pyrene	7.56E-08	1.06E-10	1.48E-08	3.28E-10	NA	**5.09E-08**	**NA**
Benzo(b)fluoranthene	1.21E-07	1.70E-10	2.37E-08	5.26E-11	NA	**8.17E-09**	**NA**
Indeno(1,2,3-cd)pyrene	1.56E-07	2.18E-10	3.05E-08	6.76E-11	NA	**1.05E-08**	**NA**
Total ILCR or HI				**3.94E-08**	**7.32E+00**	**1.15E-07**	**7.46E+00**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/m^3 - milligram per cubic meter

Table D-9

Construction Worker, Current and Future Scenarios, Exposure to Sediment
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion				Dermal Contact					All Pathways	
		Cancer	Noncancer			Dose	Cancer	Noncancer				
	EPC	Dose	Dose			Absorbed	Dose	Dose			**Total**	**Total**
Chemicals of Potential Concern	mg/kg	mg/kg-day	mg/kg-day	ILCR	HQ	mg/cm^2-day	mg/kg-day	mg/kg-day	ILCR	HQ	**ILCR**	**HI**
Inorganics												
Arsenic	1.59E+01	3.67E-07	5.12E-05	5.50E-07	1.71E-01	1.43E-07	3.30E-08	4.61E-06	4.95E-08	1.54E-02	**6.00E-07**	**1.86E-01**
Chromium, total	1.69E+01	3.90E-07	5.44E-05	NA	2.59E-03	NA	NA	NA	NA	NA	**NA**	**2.59E-03**
Semivolatiles Organic Compounds												
Benzo(a)pyrene	1.12E-01	2.58E-09	3.61E-07	1.89E-08	NA	4.37E-09	1.01E-09	1.41E-07	7.35E-09	NA	**2.62E-08**	**NA**
Benzo(b)fluoranthene	1.75E-01	4.04E-09	5.64E-07	2.95E-09	NA	6.83E-09	1.57E-09	2.20E-07	1.15E-09	NA	**4.10E-09**	**NA**
Total ILCR or HI				**5.72E-07**	**1.73E-01**				**5.80E-08**	**1.54E-02**	**6.30E-07**	**1.89E-01**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/cm^2 - milligram per centimeter squared

Table D-10

Construction Worker, Current and Future Scenarios, Exposure to Surface Water
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Dermal Contact				
		Dose	Cancer	Noncancer		
Chemicals of Potential Concern	EPC mg/L	Absorbed mg/cm^2-day	Dose mg/kg-day	Dose mg/kg-day	**Total ILCR**	**Total HI**
Inorganics						
Arsenic	8.30E-03	3.32E-08	7.66E-09	1.07E-06	1.15E-08	3.56E-03
Chromium	1.39E-02	5.56E-08	1.28E-08	1.79E-06	NA	6.63E-03
Lead	1.50E-02	NA	NA	NA	NA	NA
Total ILCR or HI					**1.15E-08**	**1.02E-02**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram

Table D-11

On-Site Resident, Cancer Risk, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion			Dermal Contact				
	EPC	Adult Dose	Child Dose	Resident	Adult Dose Absorbed	Adult Dose	Child Dose Absorbed	Child Dose	Resident
Chemicals of Potential Concern	mg/kg	mg/kg-day	mg/kg-day	ILCR	mg/cm^2-day	mg/kg-day	mg/cm^2-day	mg/kg-day	ILCR
Inorganics									
Aluminum	1.00E+04	4.23E-03	9.86E-03	NA	NA	NA	NA	NA	NA
Beryllium	8.52E+00	3.60E-06	8.41E-06	NA	NA	NA	NA	NA	NA
Cadmium	1.26E+00	5.33E-07	1.24E-06	NA	NA	NA	NA	NA	NA
Manganese	1.37E+03	5.80E-04	1.35E-03	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds									
Benzo(a)anthracene	2.57E-01	1.09E-07	2.53E-07	2.64E-07	2.34E-09	6.26E-08	6.68E-09	1.03E-07	1.21E-07
Benzo(a)pyrene	2.16E-01	9.13E-08	2.13E-07	2.22E-06	1.97E-09	5.26E-08	5.62E-09	8.62E-08	1.01E-06
Benzo(b)fluoranthene	3.47E-01	1.47E-07	3.42E-07	3.57E-07	3.16E-09	8.45E-08	9.02E-09	1.38E-07	1.63E-07
Indeno(1,2,3-cd)pyrene	4.46E-01	1.89E-07	4.40E-07	4.59E-07	4.06E-09	1.09E-07	1.16E-08	1.78E-07	2.09E-07
Total ILCR				**3.30E-06**					**1.51E-06**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/kg - milligram per kilogram
mg/cm^2 - milligram per square meter
mg/m^3 - milligram per cubic meter

Table D-11

On-Site Resident, Cancer Risk, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

Chemicals of Potential Concern	Concentration in Air C_a mg/m^3	Inhalation Adult Dose mg/kg-day	Inhalation Child Dose mg/kg-day	Inhalation Resident ILCR	**All Pathways Total ILCR**
Inorganics					
Aluminum	1.97E-05	1.85E-06	1.08E-06	NA	**NA**
Beryllium	1.68E-08	1.58E-09	9.20E-10	2.10E-08	**2.10E-08**
Cadmium	2.48E-09	2.33E-10	1.36E-10	2.33E-09	**2.33E-09**
Manganese	2.70E-06	2.54E-07	1.48E-07	NA	**NA**
Semivolatile Organic Compounds					
Benzo(a)anthracene	5.06E-10	4.76E-11	2.77E-11	2.33E-11	**3.85E-07**
Benzo(a)pyrene	4.25E-10	4.00E-11	2.33E-11	1.96E-10	**3.24E-06**
Benzo(b)fluoranthene	6.83E-10	6.42E-11	3.75E-11	3.15E-11	**5.20E-07**
Indeno(1,2,3-cd)pyrene	8.78E-10	8.25E-11	4.81E-11	4.05E-11	**6.68E-07**
Total ILCR				**2.36E-08**	**4.83E-06**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/kg - milligram per kilogram
mg/cm^2 - milligram per square meter
mg/m^3 - milligram per cubic meter

Table D-12

On-Site Child Resident, Noncancer Risk, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Concentration	Inhalation		**All**
	EPC	Child Dose	Child Resident	Dose Absorbed	Child Dose	Child Resident	in Air C_a	Child Dose	Child Resident	**Pathways Total**
Chemicals of Potential Concern	mg/kg	mg/kg-day	HQ	mg/cm^2-day	mg/kg-day	HQ	mg/m^3	mg/kg-day	HQ	**HI**
Inorganics										
Aluminum	1.00E+04	1.15E-01	1.15E-01	NA	NA	NA	1.97E-05	1.26E-05	8.99E-03	**1.24E-01**
Beryllium	8.52E+00	9.81E-05	4.90E-02	NA	NA	NA	1.68E-08	1.07E-08	1.88E-03	**5.09E-02**
Cadmium	1.26E+00	1.45E-05	1.45E-02	NA	NA	NA	2.48E-09	1.59E-09	5.48E-04	**1.51E-02**
Manganese	1.37E+03	1.58E-02	3.36E-01	NA	NA	NA	2.70E-06	1.73E-06	1.23E-01	**4.60E-01**
Semivolatile Organic Compounds										
Benzo(a)anthracene	2.57E-01	2.96E-06	NA	6.68E-09	1.20E-06	NA	5.06E-10	3.24E-10	NA	**NA**
Benzo(a)pyrene	2.16E-01	2.49E-06	NA	5.62E-09	1.01E-06	NA	4.25E-10	2.72E-10	NA	**NA**
Benzo(b)fluoranthene	3.47E-01	3.99E-06	NA	9.02E-09	1.61E-06	NA	6.83E-10	4.37E-10	NA	**NA**
Indeno(1,2,3-cd)pyrene	4.46E-01	5.13E-06	NA	1.16E-08	2.08E-06	NA	8.78E-10	5.62E-10	NA	**NA**
Total HI			**5.15E-01**			**NA**			**1.35E-01**	**6.50E-01**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/cm^2 - milligram per square meter
mg/m^3 - milligram per cubic meter

Table D-13

On-Site Adult Resident, Noncancer Risk, Future Scenario, Exposure to Total Soil
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Concentration	Inhalation		**All**
	EPC	Adult Dose	Adult Resident	Dose Absorbed	Adult Dose	Adult Resident	in Air C_a	Adult Dose	Adult Resident	**Pathways Total**
Chemicals of Potential Concern	mg/kg	mg/kg-day	HQ	mg/cm^2-day	mg/kg-day	HQ	mg/m^3	mg/kg-day	HQ	**HI**
Inorganics										
Aluminum	1.00E+04	1.23E-02	1.23E-02	NA	NA	NA	1.97E-05	5.40E-06	3.85E-03	**1.62E-02**
Beryllium	8.52E+00	1.05E-05	5.25E-03	NA	NA	NA	1.68E-08	4.60E-09	8.07E-04	**6.06E-03**
Cadmium	1.26E+00	1.55E-06	1.55E-03	NA	NA	NA	2.48E-09	6.80E-10	2.35E-04	**1.79E-03**
Manganese	1.37E+03	1.69E-03	3.60E-02	NA	NA	NA	2.70E-06	7.41E-07	5.29E-02	**8.89E-02**
Semivolatile Organic Compounds										
Benzo(a)anthracene	2.57E-01	3.17E-07	NA	2.34E-09	1.83E-07	NA	5.06E-10	1.39E-10	NA	**NA**
Benzo(a)pyrene	2.16E-01	2.66E-07	NA	1.97E-09	1.53E-07	NA	4.25E-10	1.17E-10	NA	**NA**
Benzo(b)fluoranthene	3.47E-01	4.28E-07	NA	3.16E-09	2.47E-07	NA	6.83E-10	1.87E-10	NA	**NA**
Indeno(1,2,3-cd)pyrene	4.46E-01	5.50E-07	NA	4.06E-09	3.17E-07	NA	8.78E-10	2.41E-10	NA	**NA**
Total HI			**5.52E-02**			**NA**			**5.78E-02**	**1.13E-01**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/cm^2 - milligram per square meter
mg/m^3 - milligram per cubic meter

Table D-14

On-Site Resident Cancer Risk, Future Scenario, Exposure to Sediment
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion			Dermal Contact					All
		Adult	Child		Dose	Adult	Dose	Child		Pathways
Chemicals of Potential Concern	EPC mg/kg	Dose mg/kg-day	Dose mg/kg-day	Resident ILCR	Absorbed mg/cm^2-day	Dose mg/kg-day	Absorbed mg/cm^2-day	Dose mg/kg-day	Resident ILCR	**Total ILCR**
Inorganics										
Arsenic	1.59E+01	7.47E-07	1.74E-06	3.73E-06	3.34E-09	1.33E-08	9.54E-09	2.17E-08	5.25E-08	**3.79E-06**
Chromium, total	1.69E+01	7.94E-07	1.85E-06	NA	NA	NA	NA	NA	NA	**NA**
Semivolatiles Organic Compounds										
Benzo(a)pyrene	1.12E-01	5.26E-09	1.23E-08	1.28E-07	1.02E-10	4.05E-10	2.91E-10	6.64E-10	7.80E-09	**1.36E-07**
Benzo(b)fluoranthene	1.75E-01	8.22E-09	1.92E-08	2.00E-08	1.59E-10	6.33E-10	4.55E-10	1.04E-09	1.22E-09	**2.12E-08**
Total ILCR				**3.88E-06**					**6.16E-08**	**3.94E-06**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/kg - milligram per kilogram
mg/cm^2 - milligram per centimeter squared

Table D-15

On-Site Child Resident Noncancer Risk, Future Scenario, Exposure to Sediment
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			All
		Child		Dose	Child		**Pathways**
Chemicals of Potential Concern	EPC mg/kg	Dose mg/kg-day	Child HQ	Absorbed mg/cm²-day	Dose mg/kg-day	Child HQ	**Total HI**
Inorganics							
Arsenic	1.59E+01	2.03E-05	6.78E-02	9.54E-09	2.54E-07	8.46E-04	**6.86E-02**
Chromium, total	1.69E+01	2.16E-05	1.03E-03	NA	NA	NA	**1.03E-03**
Semivolatiles Organic Compounds							
Benzo(a)pyrene	1.12E-01	1.43E-07	NA	2.91E-10	7.74E-09	NA	**NA**
Benzo(b)fluoranthene	1.75E-01	2.24E-07	NA	4.55E-10	1.21E-08	NA	**NA**
Total HI			**6.88E-02**			**8.46E-04**	**6.96E-02**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/cm² - milligram per centimeter squared

Table D-16

On-Site Adult Resident Noncancer Risk, Future Scenario, Exposure to Sediment
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			**All**
		Adult		Dose	Adult		**Pathways**
Chemicals of Potential Concern	EPC mg/kg	Dose mg/kg-day	Adult HQ	Absorbed mg/cm^2-day	Dose mg/kg-day	Adult HQ	**Total HI**
Inorganics							
Arsenic	1.59E+01	2.18E-06	7.26E-03	3.34E-09	3.87E-08	1.29E-04	**7.39E-03**
Chromium, total	1.69E+01	2.32E-06	1.10E-04	NA	NA	NA	**1.10E-04**
Semivolatiles Organic Compounds							
Benzo(a)pyrene	1.12E-01	1.53E-08	NA	1.02E-10	1.18E-09	NA	**NA**
Benzo(b)fluoranthene	1.75E-01	2.40E-08	NA	1.59E-10	1.85E-09	NA	**NA**
Total HI			**7.37E-03**			**1.29E-04**	**7.50E-03**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/kg - milligram per kilogram
mg/cm^2 - milligram per centimeter squared

Table D-17

On-Site Resident Cancer Risk, Future Scenario, Exposure to Bedrock Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion			Dermal Contact					Inhalation of VOCs				**All**
		Adult	Child		Dose	Adult	Dose	Child		Concentration	Adult	Child		**Pathways**
	EPC	Dose	Dose		Absorbed	Dose	Absorbed	Dose		in Air	Dose	Dose		**Total**
Chemicals of Potential Concern	mg/L	mg/kg-day	mg/kg-day	ILCR	mg/cm^2-day	mg/kg-day	mg/cm^2-day	mg/kg-day	ILCR	mg/m^3	mg/kg-day	mg/kg-day	ILCR	**ILCR**
Inorganics														
Antimony	5.80E-03	5.45E-05	3.18E-05	NA	1.16E-09	1.09E-07	1.93E-09	6.98E-08	NA	NA	NA	NA	NA	**NA**
Arsenic	1.10E-01	1.03E-03	6.03E-04	2.45E-03	2.20E-08	2.07E-06	3.66E-08	1.32E-06	5.09E-06	NA	NA	NA	NA	**2.46E-03**
Iron	4.91E+00	4.61E-02	2.69E-02	NA	9.82E-07	9.22E-05	1.64E-06	5.91E-05	NA	NA	NA	NA	NA	**NA**
Manganese	8.57E-01	8.05E-03	4.70E-03	NA	1.71E-07	1.61E-05	2.85E-07	1.03E-05	NA	NA	NA	NA	NA	**NA**
Thallium	5.30E-03	4.98E-05	2.90E-05	NA	1.06E-09	9.96E-08	1.76E-09	6.38E-08	NA	NA	NA	NA	NA	**NA**
Semivolatile Organic Compounds														
Methylnaphthalene, 2-	3.62E-02	3.40E-04	1.98E-04	NA	1.62E-06	1.52E-04	2.09E-06	7.57E-05	NA	1.81E-02	1.70E-03	9.90E-04	NA	**NA**
Naphthalene	3.32E-02	3.12E-04	1.82E-04	NA	7.22E-07	6.78E-05	9.31E-07	3.37E-05	NA	1.66E-02	1.56E-03	9.08E-04	2.96E-04	**2.96E-04**
Volatile Organic Compounds														
Benzene	1.30E+00	1.22E-02	7.12E-03	1.06E-03	6.49E-06	6.10E-04	8.37E-06	3.03E-04	5.02E-05	6.50E-01	6.10E-02	3.56E-02	2.61E-03	**3.72E-03**
Chloroform	1.80E-02	1.69E-04	9.86E-05	NA	5.35E-08	5.02E-06	6.90E-08	2.50E-06	NA	9.00E-03	8.45E-04	4.92E-04	NA	**NA**
Chloromethane (Methyl Chloride)	2.16E-01	2.03E-03	1.18E-03	NA	1.97E-07	1.85E-05	2.54E-07	9.19E-06	NA	1.08E-01	1.01E-02	5.91E-03	NA	**NA**
Ethylbenzene	1.76E-01	1.65E-03	9.64E-04	NA	3.45E-06	3.24E-04	4.46E-06	1.61E-04	NA	8.80E-02	8.26E-03	4.81E-03	NA	**NA**
Methylene chloride	2.88E-02	2.71E-04	1.58E-04	3.21E-06	3.52E-08	3.31E-06	4.55E-08	1.64E-06	3.72E-08	1.44E-02	1.35E-03	7.88E-04	3.42E-06	**6.67E-06**
Tetrachloroethane, 1,1,2,2-	5.30E-04	4.98E-06	2.90E-06	1.58E-06	2.18E-09	2.05E-07	2.81E-09	1.02E-07	6.13E-08	2.65E-04	2.49E-05	1.45E-05	NA	**1.64E-06**
Toluene	7.30E-01	6.86E-03	4.00E-03	NA	8.27E-06	7.77E-04	1.07E-05	3.86E-04	NA	3.65E-01	3.43E-02	2.00E-02	NA	**NA**
Xylenes	1.34E+00	1.26E-02	7.34E-03	NA	2.84E-05	2.67E-03	3.67E-05	1.33E-03	NA	6.70E-01	6.29E-02	3.67E-02	NA	**NA**
General Chemistry														
Cyanide, Total	1.20E-01	1.13E-03	6.58E-04	NA	2.40E-08	2.25E-06	4.00E-08	1.45E-06	NA	NA	NA	NA	NA	**NA**
Total ILCR				**3.52E-03**					**5.54E-05**				**2.91E-03**	**6.48E-03**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-18

Child On-Site Resident Noncancer Risk, Future Scenario, Exposure to Bedrock Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Inhalation of VOCs			**All**
		Child		Dose	Child		Concentration	Child		**Pathways**
	EPC	Dose		Absorbed	Dose		in Air	Dose		**Total**
Chemicals of Potential Concern	mg/L	mg/kg-day	HQ	mg/cm^2-day	mg/kg-day	HQ	mg/m^3	mg/kg-day	HQ	**HI**
Inorganics										
Antimony	5.80E-03	3.71E-04	9.27E-01	1.93E-09	8.15E-07	1.36E-02	NA	NA	NA	**9.41E-01**
Arsenic	1.10E-01	7.03E-03	2.34E+01	3.66E-08	1.55E-05	5.15E-02	NA	NA	NA	**2.35E+01**
Iron	4.91E+00	3.14E-01	4.48E-01	1.64E-06	6.90E-04	NA	NA	NA	NA	**4.48E-01**
Manganese	8.57E-01	5.48E-02	1.17E+00	2.85E-07	1.20E-04	6.34E-02	NA	NA	NA	**1.23E+00**
Thallium	5.30E-03	3.39E-04	5.21E+00	1.76E-09	7.45E-07	1.15E-02	NA	NA	NA	**5.22E+00**
Semivolatile Organic Compounds										
Methylnaphthalene, 2-	3.62E-02	2.31E-03	5.79E-01	2.09E-06	8.83E-04	2.21E-01	1.81E-02	1.16E-02	NA	**7.99E-01**
Naphthalene	3.32E-02	2.12E-03	1.06E-01	9.31E-07	3.93E-04	1.96E-02	1.66E-02	1.06E-02	1.23E+01	**1.24E+01**
Volatile Organic Compounds										
Benzene	1.30E+00	8.31E-02	2.08E+01	8.37E-06	3.53E-03	8.83E-01	6.50E-01	4.15E-01	4.82E+01	**6.99E+01**
Chloroform	1.80E-02	1.15E-03	1.15E-01	6.90E-08	2.91E-05	2.91E-03	9.00E-03	5.74E-03	4.10E-01	**5.28E-01**
Chloromethane (Methyl Chloride)	2.16E-01	1.38E-02	NA	2.54E-07	1.07E-04	NA	1.08E-01	6.89E-02	2.65E+00	**2.65E+00**
Ethylbenzene	1.76E-01	1.13E-02	1.13E-01	4.46E-06	1.88E-03	1.88E-02	8.80E-02	5.62E-02	1.94E-01	**3.25E-01**
Methylene chloride	2.88E-02	1.84E-03	3.07E-02	4.55E-08	1.92E-05	3.20E-04	1.44E-02	9.19E-03	3.06E-02	**6.16E-02**
Tetrachloroethane, 1,1,2,2-	5.30E-04	3.39E-05	6.78E-04	2.81E-09	1.19E-06	2.37E-05	2.65E-04	1.69E-04	NA	**7.01E-04**
Toluene	7.30E-01	4.67E-02	5.83E-01	1.07E-05	4.50E-03	5.63E-02	3.65E-01	2.33E-01	1.66E-01	**8.06E-01**
Xylenes	1.34E+00	8.57E-02	4.28E-01	3.67E-05	1.55E-02	7.74E-02	6.70E-01	4.28E-01	1.47E+01	**1.53E+01**
General Chemistry										
Cyanide, Total	1.20E-01	7.67E-03	3.84E-01	4.00E-08	1.69E-05	8.43E-04	NA	NA	NA	**3.84E-01**
Total HI			**5.43E+01**			**1.42E+00**			**7.88E+01**	**1.34E+02**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-19

Adult On-Site Resident Noncancer Risk, Future Scenario, Exposure to Bedrock Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Inhalation of VOCs			**All**
		Noncancer		Dose	Adult		Concentration	Adult		**Pathways**
Chemicals of Potential Concern	EPC mg/L	Dose mg/kg-day	HQ	Absorbed mg/cm^2-day	Dose mg/kg-day	HQ	in Air mg/m^3	Dose mg/kg-day	HQ	**Total HI**
Inorganics										
Antimony	5.80E-03	1.59E-04	3.97E-01	1.16E-09	3.18E-07	5.30E-03	NA	NA	NA	**4.03E-01**
Arsenic	1.10E-01	3.01E-03	1.00E+01	2.20E-08	6.03E-06	2.01E-02	NA	NA	NA	**1.01E+01**
Iron	4.91E+00	1.35E-01	1.92E-01	9.82E-07	2.69E-04	NA	NA	NA	NA	**1.92E-01**
Manganese	8.57E-01	2.35E-02	5.00E-01	1.71E-07	4.70E-05	2.47E-02	NA	NA	NA	**5.24E-01**
Thallium	5.30E-03	1.45E-04	2.23E+00	1.06E-09	2.90E-07	4.47E-03	NA	NA	NA	**2.24E+00**
Semivolatile Organic Compounds										
Methylnaphthalene, 2-	3.62E-02	9.92E-04	2.48E-01	1.62E-06	4.44E-04	1.11E-01	1.81E-02	4.96E-03	NA	**3.59E-01**
Naphthalene	3.32E-02	9.10E-04	4.55E-02	7.22E-07	1.98E-04	9.89E-03	1.66E-02	4.55E-03	5.29E+00	**5.34E+00**
Volatile Organic Compounds										
Benzene	1.30E+00	3.56E-02	8.90E+00	6.49E-06	1.78E-03	4.45E-01	6.50E-01	1.78E-01	2.07E+01	**3.00E+01**
Chloroform	1.80E-02	4.93E-04	4.93E-02	5.35E-08	1.47E-05	1.47E-03	9.00E-03	2.46E-03	1.76E-01	**2.27E-01**
Chloromethane (Methyl Chloride)	2.16E-01	5.92E-03	NA	1.97E-07	5.40E-05	NA	1.08E-01	2.96E-02	1.14E+00	**1.14E+00**
Ethylbenzene	1.76E-01	4.82E-03	4.82E-02	3.45E-06	9.46E-04	9.46E-03	8.80E-02	2.41E-02	8.31E-02	**1.41E-01**
Methylene chloride	2.88E-02	7.89E-04	1.32E-02	3.52E-08	9.66E-06	1.61E-04	1.44E-02	3.94E-03	1.31E-02	**2.65E-02**
Tetrachloroethane, 1,1,2,2-	5.30E-04	1.45E-05	2.90E-04	2.18E-09	5.97E-07	1.19E-05	2.65E-04	7.26E-05	NA	**3.02E-04**
Toluene	7.30E-01	2.00E-02	2.50E-01	8.27E-06	2.27E-03	2.83E-02	3.65E-01	1.00E-01	7.14E-02	**3.50E-01**
Xylenes	1.34E+00	3.67E-02	1.84E-01	2.84E-05	7.79E-03	3.90E-02	6.70E-01	1.83E-01	6.33E+00	**6.55E+00**
General Chemistry										
Cyanide, Total	1.20E-01	3.29E-03	1.64E-01	2.40E-08	6.58E-06	3.29E-04	NA	NA	NA	**1.65E-01**
Total HI			**2.33E+01**			**6.99E-01**			**3.38E+01**	**5.78E+01**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-20

On-Site Resident Cancer Risk, Future Scenario, Exposure to Overburden Monitoring Well Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion			Dermal Contact					Inhalation of VOCs				**All**
		Adult	Child		Dose	Adult	Dose	Child		Concentration	Adult	Child		**Pathways**
Chemicals of Potential Concern	EPC mg/L	Dose mg/kg-day	Dose mg/kg-day	ILCR	Absorbed mg/cm^2-day	Dose mg/kg-day	Absorbed mg/cm^2-day	Dose mg/kg-day	ILCR	in Air mg/m^3	Dose mg/kg-day	Dose mg/kg-day	ILCR	**Total ILCR**
Inorganics														
Cobalt	1.85E-02	1.74E-04	1.02E-04	NA	1.48E-09	1.39E-07	2.47E-09	8.93E-08	NA	NA	NA	NA	NA	**NA**
Iron	3.86E+00	3.62E-02	2.11E-02	NA	7.71E-07	7.24E-05	1.28E-06	4.64E-05	NA	NA	NA	NA	NA	**NA**
Manganese	3.23E+01	3.03E-01	1.77E-01	NA	6.46E-06	6.07E-04	1.08E-05	3.89E-04	NA	NA	NA	NA	NA	**NA**
Thallium	3.14E-02	2.95E-04	1.72E-04	NA	6.29E-09	5.91E-07	1.05E-08	3.79E-07	NA	NA	NA	NA	NA	**NA**
Volatile Organic Compounds														
Chloroform	4.80E-04	4.51E-06	2.63E-06	NA	1.43E-09	1.34E-07	1.84E-09	6.66E-08	NA	2.40E-04	2.25E-05	1.31E-05	NA	**NA**
General Chemistry														
Sulfate	5.20E+02	4.88E+00	2.85E+00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**
Total ILCR				**NA**					**NA**				**NA**	**NA**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-21

Child On-Site Resident Noncancer Risk, Future Scenario, Exposure to Overburden Monitoring Well Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Inhalation of VOCs			**All**
		Child		Dose	Child		Concentration	Child		**Pathways**
	EPC	Dose		Absorbed	Dose		in Air	Dose		**Total**
Chemicals of Potential Concern	mg/L	mg/kg-day	HQ	mg/cm^2-day	mg/kg-day	HQ	mg/m^3	mg/kg-day	HQ	**HI**
Inorganics										
Cobalt	1.85E-02	1.18E-03	3.95E+00	2.47E-09	1.04E-06	3.47E-03	NA	NA	NA	**3.95E+00**
Iron	3.86E+00	2.46E-01	3.52E-01	1.28E-06	5.42E-04	NA	NA	NA	NA	**3.52E-01**
Manganese	3.23E+01	2.06E+00	4.39E+01	1.08E-05	4.54E-03	2.39E+00	NA	NA	NA	**4.63E+01**
Thallium	3.14E-02	2.01E-03	3.09E+01	1.05E-08	4.42E-06	6.80E-02	NA	NA	NA	**3.10E+01**
Volatile Organic Compounds										
Chloroform	4.80E-04	3.07E-05	3.07E-03	1.84E-09	7.77E-07	7.77E-05	2.40E-04	1.53E-04	1.09E-02	**1.41E-02**
General Chemistry										
Sulfate	5.20E+02	3.32E+01	NA	NA	NA	NA	NA	NA	NA	**NA**
Total HI			**7.92E+01**			**2.46E+00**			**1.09E-02**	**8.16E+01**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-22

Adult On-Site Resident Noncancer Risk, Future Scenario, Exposure to Overburden Monitoring Well Groundwater
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Incidental Ingestion		Dermal Contact			Inhalation of VOCs			**All**
		Noncancer		Dose	Adult		Concentration	Adult		**Pathways**
Chemicals of Potential Concern	EPC mg/L	Dose mg/kg-day	HQ	Absorbed mg/cm^2-day	Dose mg/kg-day	HQ	in Air mg/m^3	Dose mg/kg-day	HQ	**Total HI**
Inorganics										
Cobalt	1.85E-02	5.08E-04	1.69E+00	1.48E-09	4.06E-07	1.35E-03	NA	NA	NA	**1.69E+00**
Iron	3.86E+00	1.06E-01	1.51E-01	7.71E-07	2.11E-04	NA	NA	NA	NA	**1.51E-01**
Manganese	3.23E+01	8.85E-01	1.88E+01	6.46E-06	1.77E-03	9.32E-01	NA	NA	NA	**1.98E+01**
Thallium	3.14E-02	8.61E-04	1.33E+01	6.29E-09	1.72E-06	2.65E-02	NA	NA	NA	**1.33E+01**
Volatile Organic Compounds										
Chloroform	4.80E-04	1.32E-05	1.32E-03	1.43E-09	3.91E-07	3.91E-05	2.40E-04	6.57E-05	4.69E-03	**6.05E-03**
General Chemistry										
Sulfate	5.20E+02	1.42E+01	NA	NA	NA	NA	NA	NA	NA	**NA**
Total HI			**3.39E+01**			**9.59E-01**			**4.69E-03**	**3.49E+01**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram
mg/m^3- milligram per cubic meter

Table D-23

On-Site Resident Cancer Risk, Future Scenario, Exposure to Surface Water
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Dermal Contact				
		Adult Dose	Adult	Child Dose	Child	
	EPC	Absorbed	Dose	Absorbed	Dose	**Total**
Chemicals of Potential Concern	mg/L	mg/cm^2-day	mg/kg-day	mg/cm^2-day	mg/kg-day	**ILCR**
Inorganics						
Arsenic	8.30E-03	2.49E-08	1.22E-07	2.49E-08	5.68E-08	2.68E-07
Chromium	1.39E-02	4.17E-08	2.04E-07	4.17E-08	9.51E-08	NA
Lead	1.50E-02	NA	NA	NA	NA	NA
Total ILCR						**2.68E-07**

EPC - Exposure Point Concentration
ILCR - Incremental Lifetime Cancer Risk
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram

Table D-24

Child On-Site Resident, Noncancer Risk, Future Scenario, Exposure to Surface Water
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Dermal Contact		
		Child Dose	Child	
Chemicals of Potential Concern	EPC mg/L	Absorbed mg/cm^2-day	Dose mg/kg-day	HQ
Inorganics				
Arsenic	8.30E-03	2.49E-08	6.62E-07	2.21E-03
Chromium	1.39E-02	4.17E-08	1.11E-06	4.11E-03
Lead	1.50E-02	NA	NA	NA
Total HI				**6.31E-03**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram

`

Table D-25

Adult On-Site Resident, Noncancer Risk, Future Scenario, Exposure to Surface Water
Ash Pit 1 Area
Plum Brook Ordnance Works, Sandusky, Ohio

		Dermal Contact		
		Adult Dose	Adult	
Chemicals of Potential Concern	EPC mg/L	Absorbed mg/cm^2-day	Dose mg/kg-day	HQ
Inorganics				
Arsenic	8.30E-03	2.49E-08	3.55E-07	1.18E-03
Chromium	1.39E-02	4.17E-08	5.94E-07	2.20E-03
Lead	1.50E-02	NA	NA	NA
Total HI				**3.38E-03**

EPC - Exposure Point Concentration
HQ - Hazard Quotient; HI - Hazard Index
mg/L - milligram per liter
mg/cm^2 - milligram per square meter
mg/kg - milligram per kilogram

APPENDIX E

ANALYTICAL DATA USED IN BASELINE HUMAN HEALTH RISK ASSESSMENT

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Acenaphthene	83-32-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00739
Acenaphthene	83-32-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00882
Acenaphthene	83-32-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00873
Acenaphthene	83-32-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00826
Acenaphthene	83-32-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0427
Acenaphthene	83-32-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00807
Acenaphthene	83-32-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0376
Acenaphthene	83-32-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00966
Acenaphthene	83-32-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Acenaphthene	83-32-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthene	83-32-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Acenaphthene	83-32-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthene	83-32-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Acenaphthylene	208-96-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Acenaphthylene	208-96-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Acenaphthylene	208-96-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Acenaphthylene	208-96-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Acenaphthylene	208-96-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Acenaphthylene	208-96-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Acenaphthylene	208-96-8	0.2785	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.02505
Acenaphthylene	208-96-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Acenaphthylene	208-96-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Acenaphthylene	208-96-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthylene	208-96-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Acenaphthylene	208-96-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthylene	208-96-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Aluminum	7429-90-5	6190	mg/kg	3.97	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		1.99
Aluminum	7429-90-5	9360	mg/kg	4.61	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		2.3
Aluminum	7429-90-5	9940	mg/kg	4.18		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		2.09
Aluminum	7429-90-5	12700	mg/kg	4.09		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		2.05
Aluminum	7429-90-5	10700	mg/kg	4.12		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		2.06
Aluminum	7429-90-5	10500	mg/kg	4.54	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		2.27
Aluminum	7429-90-5	7555	mg/kg	3.81		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		1.9
Aluminum	7429-90-5	7650	mg/kg	4.84	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		2.42
Aluminum	7429-90-5	7550	mg/kg	28.25		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		28.25
Aluminum	7429-90-5	12700	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Aluminum	7429-90-5	8310	mg/kg	33.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		33.4
Aluminum	7429-90-5	8820	mg/kg	25.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		25.9
Aluminum	7429-90-5	16600	mg/kg	48.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		48.9
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Anthracene	120-12-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00887
Anthracene	120-12-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Anthracene	120-12-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Anthracene	120-12-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Anthracene	120-12-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Anthracene	120-12-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Anthracene	120-12-7	0.2155	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0451
Anthracene	120-12-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Anthracene	120-12-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Anthracene	120-12-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Anthracene	120-12-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Anthracene	120-12-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Anthracene	120-12-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Antimony	7440-36-0	0.23	mg/kg	0.46	UJ	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Antimony	7440-36-0	0.2975	mg/kg	0.595	UJ	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Antimony	7440-36-0	0.347	mg/kg	0.526	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	J	0.263
Antimony	7440-36-0	0.352	mg/kg	0.531	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.266
Antimony	7440-36-0	0.416	mg/kg	0.551	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.276
Antimony	7440-36-0	0.2885	mg/kg	0.577	UJ	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Antimony	7440-36-0	0.838	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.2375
Antimony	7440-36-0	0.305	mg/kg	0.61	UJ	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Antimony	7440-36-0	0.7	mg/kg	1.4	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	1.4
Antimony	7440-36-0	1.3	mg/kg	2.6	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	2.6
Antimony	7440-36-0	0.85	mg/kg	1.7	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	1.7
Antimony	7440-36-0	0.65	mg/kg	1.3	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	1.3
Antimony	7440-36-0	1.2	mg/kg	2.4	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	2.4
Aroclor 1016	12674-11-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1016	12674-11-2	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1016	12674-11-2	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1016	12674-11-2	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1221	11104-28-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1221	11104-28-2	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1221	11104-28-2	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1221	11104-28-2	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1221	11104-28-2	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1221	11104-28-2	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1221	11104-28-2	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1221	11104-28-2	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1232	11141-16-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1232	11141-16-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1232	11141-16-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1232	11141-16-5	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1232	11141-16-5	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1232	11141-16-5	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1232	11141-16-5	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1232	11141-16-5	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1242	53469-21-9	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1242	53469-21-9	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1242	53469-21-9	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1242	53469-21-9	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1242	53469-21-9	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1242	53469-21-9	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1242	53469-21-9	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1242	53469-21-9	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1248	12672-29-6	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1248	12672-29-6	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1248	12672-29-6	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1248	12672-29-6	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1248	12672-29-6	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1248	12672-29-6	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1248	12672-29-6	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1248	12672-29-6	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1254	11097-69-1	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1254	11097-69-1	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1254	11097-69-1	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1254	11097-69-1	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1254	11097-69-1	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1254	11097-69-1	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1254	11097-69-1	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1254	11097-69-1	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1260	11096-82-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1260	11096-82-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1260	11096-82-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1260	11096-82-5	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1260	11096-82-5	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1260	11096-82-5	0.1025	mg/kg	0.21	JU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	JU	0.04205
Aroclor 1260	11096-82-5	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Arsenic	7440-38-2	6.7	mg/kg	0.919	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.46
Arsenic	7440-38-2	9.14	mg/kg	1.19	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.595
Arsenic	7440-38-2	13.2	mg/kg	1.05		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.526
Arsenic	7440-38-2	11.7	mg/kg	1.06		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.531
Arsenic	7440-38-2	9.06	mg/kg	1.1		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.551
Arsenic	7440-38-2	6.4	mg/kg	1.15	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.577
Arsenic	7440-38-2	10.95	mg/kg	0.9515		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.476
Arsenic	7440-38-2	12.6	mg/kg	1.22	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.61
Arsenic	7440-38-2	8.1	mg/kg	1.4		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		1.4
Arsenic	7440-38-2	19.6	mg/kg	2.6		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		2.6
Arsenic	7440-38-2	9.4	mg/kg	1.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		1.7
Arsenic	7440-38-2	14	mg/kg	1.3		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		1.3
Arsenic	7440-38-2	31.2	mg/kg	2.4		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		2.4
Barium	7440-39-3	32.7	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Barium	7440-39-3	83.3	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Barium	7440-39-3	107	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Barium	7440-39-3	105	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Barium	7440-39-3	82.7	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Barium	7440-39-3	62.6	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Barium	7440-39-3	84.4	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Barium	7440-39-3	84.9	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Barium	7440-39-3	43	mg/kg	28.25		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		28.25
Barium	7440-39-3	163	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Barium	7440-39-3	41.3	mg/kg	33.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		33.4
Barium	7440-39-3	160	mg/kg	25.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		25.9
Barium	7440-39-3	132	mg/kg	48.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		48.9
Benzo(a)anthracene	56-55-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.027
Benzo(a)anthracene	56-55-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0322
Benzo(a)anthracene	56-55-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0319
Benzo(a)anthracene	56-55-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Benzo(a)anthracene	56-55-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.156
Benzo(a)anthracene	56-55-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0294
Benzo(a)anthracene	56-55-3	0.8555	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.137
Benzo(a)anthracene	56-55-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0353
Benzo(a)anthracene	56-55-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(a)anthracene	56-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)anthracene	56-55-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(a)anthracene	56-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)anthracene	56-55-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(a)pyrene	50-32-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.027
Benzo(a)pyrene	50-32-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0322
Benzo(a)pyrene	50-32-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0319
Benzo(a)pyrene	50-32-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Benzo(a)pyrene	50-32-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.156
Benzo(a)pyrene	50-32-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0294
Benzo(a)pyrene	50-32-8	0.721	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.137
Benzo(a)pyrene	50-32-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0353
Benzo(a)pyrene	50-32-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(a)pyrene	50-32-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)pyrene	50-32-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(a)pyrene	50-32-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)pyrene	50-32-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(b)fluoranthene	205-99-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0684
Benzo(b)fluoranthene	205-99-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0816
Benzo(b)fluoranthene	205-99-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0808
Benzo(b)fluoranthene	205-99-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0764
Benzo(b)fluoranthene	205-99-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.395
Benzo(b)fluoranthene	205-99-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0746
Benzo(b)fluoranthene	205-99-2	1.205	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.3475
Benzo(b)fluoranthene	205-99-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0894
Benzo(b)fluoranthene	205-99-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(b)fluoranthene	205-99-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(b)fluoranthene	205-99-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(b)fluoranthene	205-99-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(b)fluoranthene	205-99-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(ghi)perylene	191-24-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Benzo(ghi)perylene	191-24-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzo(ghi)perylene	191-24-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzo(ghi)perylene	191-24-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzo(ghi)perylene	191-24-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzo(ghi)perylene	191-24-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzo(ghi)perylene	191-24-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzo(ghi)perylene	191-24-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131
Benzo(ghi)perylene	191-24-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(ghi)perylene	191-24-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(ghi)perylene	191-24-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(ghi)perylene	191-24-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(ghi)perylene	191-24-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(k)fluoranthene	207-08-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.124
Benzo(k)fluoranthene	207-08-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.148
Benzo(k)fluoranthene	207-08-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.147
Benzo(k)fluoranthene	207-08-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.139
Benzo(k)fluoranthene	207-08-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.719
Benzo(k)fluoranthene	207-08-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.136
Benzo(k)fluoranthene	207-08-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.633
Benzo(k)fluoranthene	207-08-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.163
Benzo(k)fluoranthene	207-08-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(k)fluoranthene	207-08-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(k)fluoranthene	207-08-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(k)fluoranthene	207-08-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(k)fluoranthene	207-08-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzoic acid	65-85-0	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1
Benzoic acid	65-85-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzoic acid	65-85-0	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzoic acid	65-85-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzoic acid	65-85-0	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzoic acid	65-85-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzoic acid	65-85-0	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzoic acid	65-85-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131
Benzyl alcohol	100-51-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1
Benzyl alcohol	100-51-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzyl alcohol	100-51-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzyl alcohol	100-51-6	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzyl alcohol	100-51-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzyl alcohol	100-51-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzyl alcohol	100-51-6	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzyl alcohol	100-51-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131
Beryllium	7440-41-7	5.74	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Beryllium	7440-41-7	10.8	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Beryllium	7440-41-7	13.9	mg/kg	0.209	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Beryllium	7440-41-7	16.5	mg/kg	0.205	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Beryllium	7440-41-7	13.6	mg/kg	0.206	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Beryllium	7440-41-7	11.5	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Beryllium	7440-41-7	11.1	mg/kg	0.19	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Beryllium	7440-41-7	8.94	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Beryllium	7440-41-7	0.355	mg/kg	0.71	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.71
Beryllium	7440-41-7	0.325	mg/kg	0.65	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.65
Beryllium	7440-41-7	0.42	mg/kg	0.84	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.84
Beryllium	7440-41-7	0.325	mg/kg	0.65	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.65
Beryllium	7440-41-7	1.5	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Bis(2-chloroethoxy)methane	111-91-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00863
Bis(2-chloroethoxy)methane	111-91-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0103
Bis(2-chloroethoxy)methane	111-91-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0102
Bis(2-chloroethoxy)methane	111-91-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00963
Bis(2-chloroethoxy)methane	111-91-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0498
Bis(2-chloroethoxy)methane	111-91-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00941
Bis(2-chloroethoxy)methane	111-91-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.04385
Bis(2-chloroethoxy)methane	111-91-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0113
Bis(2-chloroethoxy)methane	111-91-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroethoxy)methane	111-91-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethoxy)methane	111-91-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroethoxy)methane	111-91-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Bis(2-chloroethoxy)methane	111-91-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-chloroethyl)ether	111-44-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0105
Bis(2-chloroethyl)ether	111-44-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0125
Bis(2-chloroethyl)ether	111-44-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0124
Bis(2-chloroethyl)ether	111-44-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0117
Bis(2-chloroethyl)ether	111-44-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0605
Bis(2-chloroethyl)ether	111-44-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0114
Bis(2-chloroethyl)ether	111-44-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.05325
Bis(2-chloroethyl)ether	111-44-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0137
Bis(2-chloroethyl)ether	111-44-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroethyl)ether	111-44-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethyl)ether	111-44-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroethyl)ether	111-44-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethyl)ether	111-44-4	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-chloroisopropyl)ether	108-60-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0179
Bis(2-chloroisopropyl)ether	108-60-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0213
Bis(2-chloroisopropyl)ether	108-60-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0211
Bis(2-chloroisopropyl)ether	108-60-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.02
Bis(2-chloroisopropyl)ether	108-60-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.103
Bis(2-chloroisopropyl)ether	108-60-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0195
Bis(2-chloroisopropyl)ether	108-60-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0909
Bis(2-chloroisopropyl)ether	108-60-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0234
Bis(2-chloroisopropyl)ether	108-60-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroisopropyl)ether	108-60-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroisopropyl)ether	108-60-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroisopropyl)ether	108-60-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroisopropyl)ether	108-60-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-ethylhexyl)phthalate	117-81-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.038
Bis(2-ethylhexyl)phthalate	117-81-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0453
Bis(2-ethylhexyl)phthalate	117-81-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0448
Bis(2-ethylhexyl)phthalate	117-81-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0424
Bis(2-ethylhexyl)phthalate	117-81-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.219
Bis(2-ethylhexyl)phthalate	117-81-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0414
Bis(2-ethylhexyl)phthalate	117-81-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.193
Bis(2-ethylhexyl)phthalate	117-81-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0496
Bis(2-ethylhexyl)phthalate	117-81-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-ethylhexyl)phthalate	117-81-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-ethylhexyl)phthalate	117-81-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-ethylhexyl)phthalate	117-81-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-ethylhexyl)phthalate	117-81-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bromophenyl phenyl ether, 4-	101-55-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
Bromophenyl phenyl ether, 4-	101-55-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
Bromophenyl phenyl ether, 4-	101-55-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
Bromophenyl phenyl ether, 4-	101-55-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Bromophenyl phenyl ether, 4-	101-55-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
Bromophenyl phenyl ether, 4-	101-55-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
Bromophenyl phenyl ether, 4-	101-55-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
Bromophenyl phenyl ether, 4-	101-55-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
Bromophenyl phenyl ether, 4-	101-55-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bromophenyl phenyl ether, 4-	101-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bromophenyl phenyl ether, 4-	101-55-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bromophenyl phenyl ether, 4-	101-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bromophenyl phenyl ether, 4-	101-55-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Butyl benzyl phthalate	85-68-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0166
Butyl benzyl phthalate	85-68-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0198
Butyl benzyl phthalate	85-68-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0196
Butyl benzyl phthalate	85-68-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0186
Butyl benzyl phthalate	85-68-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0961
Butyl benzyl phthalate	85-68-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0181
Butyl benzyl phthalate	85-68-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08465
Butyl benzyl phthalate	85-68-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0217
Butyl benzyl phthalate	85-68-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Butyl benzyl phthalate	85-68-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Butyl benzyl phthalate	85-68-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Butyl benzyl phthalate	85-68-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Butyl benzyl phthalate	85-68-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Cadmium	7440-43-9	0.23	mg/kg	0.46	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Cadmium	7440-43-9	0.2975	mg/kg	0.595	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Cadmium	7440-43-9	0.263	mg/kg	0.526	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.263
Cadmium	7440-43-9	0.2655	mg/kg	0.531	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.266
Cadmium	7440-43-9	0.2755	mg/kg	0.551	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.276
Cadmium	7440-43-9	0.2885	mg/kg	0.577	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Cadmium	7440-43-9	0.2603	mg/kg	0.476	JU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JU	0.2375
Cadmium	7440-43-9	0.305	mg/kg	0.61	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Cadmium	7440-43-9	0.14	mg/kg	0.28	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.28
Cadmium	7440-43-9	0.26	mg/kg	0.52	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	0.52
Cadmium	7440-43-9	0.165	mg/kg	0.33	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.33
Cadmium	7440-43-9	0.13	mg/kg	0.26	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.26
Cadmium	7440-43-9	0.245	mg/kg	0.49	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	0.49
Calcium	7440-70-2	14400	mg/kg	9.93		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		4.96
Calcium	7440-70-2	18800	mg/kg	11.5		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		5.76
Calcium	7440-70-2	9390	mg/kg	5.23		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		2.61
Calcium	7440-70-2	3330	mg/kg	5.11		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		2.56
Calcium	7440-70-2	35100	mg/kg	5.16		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		2.58
Calcium	7440-70-2	4580	mg/kg	11.3		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		5.67
Calcium	7440-70-2	12400	mg/kg	4.76		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		2.38
Calcium	7440-70-2	15600	mg/kg	12.1		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		6.05
Calcium	7440-70-2	3840	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Calcium	7440-70-2	6600	mg/kg	654		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		654
Calcium	7440-70-2	5590	mg/kg	835		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		835
Calcium	7440-70-2	6080	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648
Calcium	7440-70-2	59100	mg/kg	1220		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1220
Carbazole	86-74-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.041
Carbazole	86-74-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.049
Carbazole	86-74-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0485
Carbazole	86-74-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0458
Carbazole	86-74-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.237
Carbazole	86-74-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0448
Carbazole	86-74-8	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2085
Carbazole	86-74-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0536
Carbazole	86-74-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Carbazole	86-74-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Carbazole	86-74-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Carbazole	86-74-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Carbazole	86-74-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloro-3-methylphenol, 4-	59-50-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0101
Chloro-3-methylphenol, 4-	59-50-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0121
Chloro-3-methylphenol, 4-	59-50-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0119
Chloro-3-methylphenol, 4-	59-50-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0113
Chloro-3-methylphenol, 4-	59-50-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0584
Chloro-3-methylphenol, 4-	59-50-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.011
Chloro-3-methylphenol, 4-	59-50-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0514
Chloro-3-methylphenol, 4-	59-50-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0132
Chloro-3-methylphenol, 4-	59-50-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloro-3-methylphenol, 4-	59-50-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloro-3-methylphenol, 4-	59-50-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloro-3-methylphenol, 4-	59-50-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloro-3-methylphenol, 4-	59-50-7	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloroaniline, 4-	106-47-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0356
Chloroaniline, 4-	106-47-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0425
Chloroaniline, 4-	106-47-8	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0421
Chloroaniline, 4-	106-47-8	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0398
Chloroaniline, 4-	106-47-8	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.206
Chloroaniline, 4-	106-47-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0389
Chloroaniline, 4-	106-47-8	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.181
Chloroaniline, 4-	106-47-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0465
Chloroaniline, 4-	106-47-8	0.2325	mg/kg	0.465	UJUJ	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloroaniline, 4-	106-47-8	0.215	mg/kg	0.43	UJ	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloroaniline, 4-	106-47-8	0.275	mg/kg	0.55	UJ	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloroaniline, 4-	106-47-8	0.215	mg/kg	0.43	UJ	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloroaniline, 4-	106-47-8	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloronaphthalene, 2-	91-58-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00653

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Chloronaphthalene, 2-	91-58-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00779
Chloronaphthalene, 2-	91-58-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00771
Chloronaphthalene, 2-	91-58-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00729
Chloronaphthalene, 2-	91-58-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0377
Chloronaphthalene, 2-	91-58-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00712
Chloronaphthalene, 2-	91-58-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0332
Chloronaphthalene, 2-	91-58-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00854
Chloronaphthalene, 2-	91-58-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloronaphthalene, 2-	91-58-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloronaphthalene, 2-	91-58-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloronaphthalene, 2-	91-58-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloronaphthalene, 2-	91-58-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chlorophenol, 2-	95-57-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00505
Chlorophenol, 2-	95-57-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00603
Chlorophenol, 2-	95-57-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00597
Chlorophenol, 2-	95-57-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00564
Chlorophenol, 2-	95-57-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0292
Chlorophenol, 2-	95-57-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00551
Chlorophenol, 2-	95-57-8	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0257
Chlorophenol, 2-	95-57-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0066
Chlorophenol, 2-	95-57-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chlorophenol, 2-	95-57-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenol, 2-	95-57-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chlorophenol, 2-	95-57-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenol, 2-	95-57-8	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chlorophenyl phenyl ether, 4-	7005-72-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0314
Chlorophenyl phenyl ether, 4-	7005-72-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0375
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0371
Chlorophenyl phenyl ether, 4-	7005-72-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0351
Chlorophenyl phenyl ether, 4-	7005-72-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.182
Chlorophenyl phenyl ether, 4-	7005-72-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0343
Chlorophenyl phenyl ether, 4-	7005-72-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1595
Chlorophenyl phenyl ether, 4-	7005-72-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0411
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chlorophenyl phenyl ether, 4-	7005-72-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenyl phenyl ether, 4-	7005-72-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chlorophenyl phenyl ether, 4-	7005-72-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenyl phenyl ether, 4-	7005-72-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chromium	7440-47-3	10.6	mg/kg	0.496		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.248
Chromium	7440-47-3	12.4	mg/kg	0.576		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.288
Chromium	7440-47-3	13.6	mg/kg	0.523		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.261
Chromium	7440-47-3	12	mg/kg	0.511		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.256
Chromium	7440-47-3	16.4	mg/kg	0.516		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.258
Chromium	7440-47-3	14.6	mg/kg	0.567		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.284
Chromium	7440-47-3	13	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.238
Chromium	7440-47-3	10.7	mg/kg	0.605		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.302
Chromium	7440-47-3	13.2	mg/kg	0.71		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		0.71
Chromium	7440-47-3	12.2	mg/kg	1.3		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		1.3
Chromium	7440-47-3	18.1	mg/kg	0.84		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.84
Chromium	7440-47-3	10.5	mg/kg	0.65		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.65
Chromium	7440-47-3	13.5	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Chrysene	218-01-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0163
Chrysene	218-01-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0194
Chrysene	218-01-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0192
Chrysene	218-01-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0182
Chrysene	218-01-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.094
Chrysene	218-01-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0177
Chrysene	218-01-9	0.85	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0827
Chrysene	218-01-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0213
Chrysene	218-01-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chrysene	218-01-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chrysene	218-01-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chrysene	218-01-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chrysene	218-01-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Cobalt	7440-48-4	5.47	mg/kg	0.199		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Cobalt	7440-48-4	8.57	mg/kg	0.23		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Cobalt	7440-48-4	9.92	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Cobalt	7440-48-4	8.92	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Cobalt	7440-48-4	8.36	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Cobalt	7440-48-4	10.1	mg/kg	0.227		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Cobalt	7440-48-4	6.715	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Cobalt	7440-48-4	6.2	mg/kg	0.242		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Cobalt	7440-48-4	5.75	mg/kg	7.1	/U	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	U	7.1
Cobalt	7440-48-4	6.8	mg/kg	6.5		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		6.5
Cobalt	7440-48-4	4.2	mg/kg	8.4	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	8.4
Cobalt	7440-48-4	8.6	mg/kg	6.5		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		6.5
Cobalt	7440-48-4	26	mg/kg	12.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		12.2
Copper	7440-50-8	15.4	mg/kg	0.496	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.248
Copper	7440-50-8	27.3	mg/kg	0.576	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.288
Copper	7440-50-8	30.5	mg/kg	0.523		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.261
Copper	7440-50-8	50	mg/kg	0.511		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.256
Copper	7440-50-8	47.9	mg/kg	0.516		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.258
Copper	7440-50-8	20.5	mg/kg	0.567	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.284
Copper	7440-50-8	31.9	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.238
Copper	7440-50-8	18.2	mg/kg	0.605	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.302
Copper	7440-50-8	15.25	mg/kg	3.55		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		3.55
Copper	7440-50-8	32.1	mg/kg	3.3		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		3.3
Copper	7440-50-8	13.5	mg/kg	4.2		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		4.2
Copper	7440-50-8	24	mg/kg	3.2		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		3.2
Copper	7440-50-8	34.2	mg/kg	6.1		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		6.1
Dibenz(a,h)anthracene	53-70-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0928
Dibenz(a,h)anthracene	53-70-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.111
Dibenz(a,h)anthracene	53-70-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.11
Dibenz(a,h)anthracene	53-70-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.104
Dibenz(a,h)anthracene	53-70-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.536
Dibenz(a,h)anthracene	53-70-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.101
Dibenz(a,h)anthracene	53-70-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.472
Dibenz(a,h)anthracene	53-70-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.121
Dibenz(a,h)anthracene	53-70-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dibenz(a,h)anthracene	53-70-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenz(a,h)anthracene	53-70-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dibenz(a,h)anthracene	53-70-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenz(a,h)anthracene	53-70-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dibenzofuran	132-64-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0069
Dibenzofuran	132-64-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00823
Dibenzofuran	132-64-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00815
Dibenzofuran	132-64-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00771
Dibenzofuran	132-64-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0399
Dibenzofuran	132-64-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00753
Dibenzofuran	132-64-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0351
Dibenzofuran	132-64-9	0.0757	mg/kg	0.536	QJ	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.00902
Dibenzofuran	132-64-9	0.2325	mg/kg	0.465	UJUJ	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dibenzofuran	132-64-9	0.215	mg/kg	0.43	UJ	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenzofuran	132-64-9	0.275	mg/kg	0.55	UJ	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dibenzofuran	132-64-9	0.215	mg/kg	0.43	UJ	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenzofuran	132-64-9	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,2-	95-50-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00949
Dichlorobenzene, 1,2-	95-50-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0113
Dichlorobenzene, 1,2-	95-50-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0112
Dichlorobenzene, 1,2-	95-50-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0106
Dichlorobenzene, 1,2-	95-50-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0548
Dichlorobenzene, 1,2-	95-50-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0104
Dichlorobenzene, 1,2-	95-50-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.04825
Dichlorobenzene, 1,2-	95-50-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0124
Dichlorobenzene, 1,2-	95-50-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,2-	95-50-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,2-	95-50-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,2-	95-50-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,2-	95-50-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,3-	541-73-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0149
Dichlorobenzene, 1,3-	541-73-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0178
Dichlorobenzene, 1,3-	541-73-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0176

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dichlorobenzene, 1,3-	541-73-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0167
Dichlorobenzene, 1,3-	541-73-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0861
Dichlorobenzene, 1,3-	541-73-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0163
Dichlorobenzene, 1,3-	541-73-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07585
Dichlorobenzene, 1,3-	541-73-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0195
Dichlorobenzene, 1,3-	541-73-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,3-	541-73-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,3-	541-73-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,3-	541-73-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,3-	541-73-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,4-	106-46-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00801
Dichlorobenzene, 1,4-	106-46-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00956
Dichlorobenzene, 1,4-	106-46-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00946
Dichlorobenzene, 1,4-	106-46-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00894
Dichlorobenzene, 1,4-	106-46-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0463
Dichlorobenzene, 1,4-	106-46-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00874
Dichlorobenzene, 1,4-	106-46-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0407
Dichlorobenzene, 1,4-	106-46-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0105
Dichlorobenzene, 1,4-	106-46-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,4-	106-46-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,4-	106-46-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,4-	106-46-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,4-	106-46-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzidine, 3,3'-	91-94-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0407
Dichlorobenzidine, 3,3'-	91-94-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0485
Dichlorobenzidine, 3,3'-	91-94-1	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.048
Dichlorobenzidine, 3,3'-	91-94-1	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0454
Dichlorobenzidine, 3,3'-	91-94-1	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.235
Dichlorobenzidine, 3,3'-	91-94-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0444
Dichlorobenzidine, 3,3'-	91-94-1	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2065
Dichlorobenzidine, 3,3'-	91-94-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0531
Dichlorobenzidine, 3,3'-	91-94-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzidine, 3,3'-	91-94-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzidine, 3,3'-	91-94-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzidine, 3,3'-	91-94-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzidine, 3,3'-	91-94-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorophenol, 2,4-	120-83-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
Dichlorophenol, 2,4-	120-83-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
Dichlorophenol, 2,4-	120-83-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
Dichlorophenol, 2,4-	120-83-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Dichlorophenol, 2,4-	120-83-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
Dichlorophenol, 2,4-	120-83-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
Dichlorophenol, 2,4-	120-83-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
Dichlorophenol, 2,4-	120-83-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
Dichlorophenol, 2,4-	120-83-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorophenol, 2,4-	120-83-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorophenol, 2,4-	120-83-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorophenol, 2,4-	120-83-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorophenol, 2,4-	120-83-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Diethyl phthalate	84-66-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0166
Diethyl phthalate	84-66-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0198
Diethyl phthalate	84-66-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0196
Diethyl phthalate	84-66-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0186
Diethyl phthalate	84-66-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0961
Diethyl phthalate	84-66-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0181
Diethyl phthalate	84-66-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08465
Diethyl phthalate	84-66-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0217
Diethyl phthalate	84-66-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Diethyl phthalate	84-66-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Diethyl phthalate	84-66-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Diethyl phthalate	84-66-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Diethyl phthalate	84-66-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dimethyl phthalate	131-11-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0126
Dimethyl phthalate	131-11-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.015
Dimethyl phthalate	131-11-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0148
Dimethyl phthalate	131-11-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.014

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dimethyl phthalate	131-11-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0726
Dimethyl phthalate	131-11-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0137
Dimethyl phthalate	131-11-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0639
Dimethyl phthalate	131-11-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0164
Dimethyl phthalate	131-11-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dimethyl phthalate	131-11-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethyl phthalate	131-11-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dimethyl phthalate	131-11-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethyl phthalate	131-11-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dimethylphenol, 2,4-	105-67-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0108
Dimethylphenol, 2,4-	105-67-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0129
Dimethylphenol, 2,4-	105-67-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0128
Dimethylphenol, 2,4-	105-67-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0121
Dimethylphenol, 2,4-	105-67-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0626
Dimethylphenol, 2,4-	105-67-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0118
Dimethylphenol, 2,4-	105-67-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.05515
Dimethylphenol, 2,4-	105-67-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0142
Dimethylphenol, 2,4-	105-67-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dimethylphenol, 2,4-	105-67-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethylphenol, 2,4-	105-67-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dimethylphenol, 2,4-	105-67-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethylphenol, 2,4-	105-67-9	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Di-n-butyl phthalate	84-74-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00887
Di-n-butyl phthalate	84-74-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Di-n-butyl phthalate	84-74-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Di-n-butyl phthalate	84-74-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Di-n-butyl phthalate	84-74-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Di-n-butyl phthalate	84-74-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Di-n-butyl phthalate	84-74-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0451
Di-n-butyl phthalate	84-74-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Di-n-butyl phthalate	84-74-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Di-n-butyl phthalate	84-74-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-butyl phthalate	84-74-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Di-n-butyl phthalate	84-74-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-butyl phthalate	84-74-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dinitro-2-methylphenol, 4,6-	534-52-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0413
Dinitro-2-methylphenol, 4,6-	534-52-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0492
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0488
Dinitro-2-methylphenol, 4,6-	534-52-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0461
Dinitro-2-methylphenol, 4,6-	534-52-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.238
Dinitro-2-methylphenol, 4,6-	534-52-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.045
Dinitro-2-methylphenol, 4,6-	534-52-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.21
Dinitro-2-methylphenol, 4,6-	534-52-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.054
Dinitro-2-methylphenol, 4,6-	534-52-1	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Dinitro-2-methylphenol, 4,6-	534-52-1	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitro-2-methylphenol, 4,6-	534-52-1	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Dinitro-2-methylphenol, 4,6-	534-52-1	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitro-2-methylphenol, 4,6-	534-52-1	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Dinitrobenzene, 1,3-	99-65-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrobenzene, 1,3-	99-65-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrobenzene, 1,3-	99-65-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrobenzene, 1,3-	99-65-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrobenzene, 1,3-	99-65-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrobenzene, 1,3-	99-65-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrobenzene, 1,3-	99-65-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Dinitrobenzene, 1,3-	99-65-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrophenol, 2,4-	51-28-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0654
Dinitrophenol, 2,4-	51-28-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0781
Dinitrophenol, 2,4-	51-28-5	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0773
Dinitrophenol, 2,4-	51-28-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0731
Dinitrophenol, 2,4-	51-28-5	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.378
Dinitrophenol, 2,4-	51-28-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0714
Dinitrophenol, 2,4-	51-28-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.3325
Dinitrophenol, 2,4-	51-28-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0855
Dinitrophenol, 2,4-	51-28-5	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Dinitrophenol, 2,4-	51-28-5	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dinitrophenol, 2,4-	51-28-5	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Dinitrophenol, 2,4-	51-28-5	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitrophenol, 2,4-	51-28-5	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Dinitrotoluene, 2,4-	121-14-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0144
Dinitrotoluene, 2,4-	121-14-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrotoluene, 2,4-	121-14-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0172
Dinitrotoluene, 2,4-	121-14-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrotoluene, 2,4-	121-14-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.017
Dinitrotoluene, 2,4-	121-14-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrotoluene, 2,4-	121-14-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0161
Dinitrotoluene, 2,4-	121-14-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrotoluene, 2,4-	121-14-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0833
Dinitrotoluene, 2,4-	121-14-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrotoluene, 2,4-	121-14-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0157
Dinitrotoluene, 2,4-	121-14-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrotoluene, 2,4-	121-14-2	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.11295
Dinitrotoluene, 2,4-	121-14-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0188
Dinitrotoluene, 2,4-	121-14-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrotoluene, 2,4-	121-14-2	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.10585
Dinitrotoluene, 2,4-	121-14-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dinitrotoluene, 2,4-	121-14-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,4-	121-14-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dinitrotoluene, 2,4-	121-14-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,4-	121-14-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dinitrotoluene, 2,6-	606-20-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00986
Dinitrotoluene, 2,6-	606-20-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrotoluene, 2,6-	606-20-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0118
Dinitrotoluene, 2,6-	606-20-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrotoluene, 2,6-	606-20-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0116
Dinitrotoluene, 2,6-	606-20-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrotoluene, 2,6-	606-20-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.011
Dinitrotoluene, 2,6-	606-20-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrotoluene, 2,6-	606-20-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.057
Dinitrotoluene, 2,6-	606-20-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrotoluene, 2,6-	606-20-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0108
Dinitrotoluene, 2,6-	606-20-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrotoluene, 2,6-	606-20-2	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1011
Dinitrotoluene, 2,6-	606-20-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0129
Dinitrotoluene, 2,6-	606-20-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrotoluene, 2,6-	606-20-2	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0945
Dinitrotoluene, 2,6-	606-20-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dinitrotoluene, 2,6-	606-20-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,6-	606-20-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dinitrotoluene, 2,6-	606-20-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,6-	606-20-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Di-n-octyl phthalate	117-84-0	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0773
Di-n-octyl phthalate	117-84-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0922
Di-n-octyl phthalate	117-84-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0912
Di-n-octyl phthalate	117-84-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0863
Di-n-octyl phthalate	117-84-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.446
Di-n-octyl phthalate	117-84-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0843
Di-n-octyl phthalate	117-84-0	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.393
Di-n-octyl phthalate	117-84-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.101
Di-n-octyl phthalate	117-84-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Di-n-octyl phthalate	117-84-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-octyl phthalate	117-84-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Di-n-octyl phthalate	117-84-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-octyl phthalate	117-84-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
DIPHENYLAMINE	122-39-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0407
DIPHENYLAMINE	122-39-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0485
DIPHENYLAMINE	122-39-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.048
DIPHENYLAMINE	122-39-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0454
DIPHENYLAMINE	122-39-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.235
DIPHENYLAMINE	122-39-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0444
DIPHENYLAMINE	122-39-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2065
DIPHENYLAMINE	122-39-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0531

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Fluoranthene	206-44-0	0.0477	mg/kg	0.41	QJ	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	J	0.00887
Fluoranthene	206-44-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Fluoranthene	206-44-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Fluoranthene	206-44-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Fluoranthene	206-44-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Fluoranthene	206-44-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Fluoranthene	206-44-0	1.875	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0451
Fluoranthene	206-44-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Fluoranthene	206-44-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Fluoranthene	206-44-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluoranthene	206-44-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Fluoranthene	206-44-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluoranthene	206-44-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Fluorene	86-73-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0174
Fluorene	86-73-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0207
Fluorene	86-73-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0205
Fluorene	86-73-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0194
Fluorene	86-73-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.1
Fluorene	86-73-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.019
Fluorene	86-73-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08835
Fluorene	86-73-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0227
Fluorene	86-73-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Fluorene	86-73-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluorene	86-73-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Fluorene	86-73-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluorene	86-73-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorobenzene	118-74-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0255
Hexachlorobenzene	118-74-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0304
Hexachlorobenzene	118-74-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Hexachlorobenzene	118-74-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Hexachlorobenzene	118-74-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.147
Hexachlorobenzene	118-74-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0278
Hexachlorobenzene	118-74-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.13
Hexachlorobenzene	118-74-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0333
Hexachlorobenzene	118-74-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorobenzene	118-74-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobenzene	118-74-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorobenzene	118-74-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobenzene	118-74-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorobutadiene	87-68-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0389
Hexachlorobutadiene	87-68-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0465
Hexachlorobutadiene	87-68-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.046
Hexachlorobutadiene	87-68-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0435
Hexachlorobutadiene	87-68-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.225
Hexachlorobutadiene	87-68-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0425
Hexachlorobutadiene	87-68-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.198
Hexachlorobutadiene	87-68-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0509
Hexachlorobutadiene	87-68-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorobutadiene	87-68-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobutadiene	87-68-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorobutadiene	87-68-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobutadiene	87-68-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorocyclopentadiene	77-47-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0131
Hexachlorocyclopentadiene	77-47-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0156
Hexachlorocyclopentadiene	77-47-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0154
Hexachlorocyclopentadiene	77-47-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0146
Hexachlorocyclopentadiene	77-47-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0755
Hexachlorocyclopentadiene	77-47-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0142
Hexachlorocyclopentadiene	77-47-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.06645
Hexachlorocyclopentadiene	77-47-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0171
Hexachlorocyclopentadiene	77-47-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorocyclopentadiene	77-47-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorocyclopentadiene	77-47-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorocyclopentadiene	77-47-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorocyclopentadiene	77-47-4	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachloroethane	67-72-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0126

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Hexachloroethane	67-72-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.015
Hexachloroethane	67-72-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0148
Hexachloroethane	67-72-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.014
Hexachloroethane	67-72-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0726
Hexachloroethane	67-72-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0137
Hexachloroethane	67-72-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0639
Hexachloroethane	67-72-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0164
Hexachloroethane	67-72-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachloroethane	67-72-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachloroethane	67-72-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachloroethane	67-72-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachloroethane	67-72-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
HMX	2691-41-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
HMX	2691-41-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
HMX	2691-41-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
HMX	2691-41-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
HMX	2691-41-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
HMX	2691-41-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
HMX	2691-41-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
HMX	2691-41-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Indeno(1,2,3-cd)pyrene	193-39-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.133
Indeno(1,2,3-cd)pyrene	193-39-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.159
Indeno(1,2,3-cd)pyrene	193-39-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.157
Indeno(1,2,3-cd)pyrene	193-39-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.149
Indeno(1,2,3-cd)pyrene	193-39-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.769
Indeno(1,2,3-cd)pyrene	193-39-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.145
Indeno(1,2,3-cd)pyrene	193-39-5	1.815	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.677
Indeno(1,2,3-cd)pyrene	193-39-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.174
Indeno(1,2,3-cd)pyrene	193-39-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Indeno(1,2,3-cd)pyrene	193-39-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Indeno(1,2,3-cd)pyrene	193-39-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Indeno(1,2,3-cd)pyrene	193-39-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Indeno(1,2,3-cd)pyrene	193-39-5	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Iron	7439-89-6	17200	mg/kg	3.97		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	B	1.99
Iron	7439-89-6	36500	mg/kg	4.61		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	B	2.3
Iron	7439-89-6	63100	mg/kg	20.9		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		10.5
Iron	7439-89-6	90300	mg/kg	20.5		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		10.2
Iron	7439-89-6	64800	mg/kg	20.6		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		10.3
Iron	7439-89-6	41100	mg/kg	4.54		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	B	2.27
Iron	7439-89-6	46500	mg/kg	12.855		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		6.44
Iron	7439-89-6	26500	mg/kg	4.84		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	B	2.42
Iron	7439-89-6	21600	mg/kg	14.15		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		14.15
Iron	7439-89-6	95100	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Iron	7439-89-6	29000	mg/kg	16.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		16.7
Iron	7439-89-6	70300	mg/kg	13		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		13
Iron	7439-89-6	73200	mg/kg	24.4		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		24.4
Isophorone	78-59-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Isophorone	78-59-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Isophorone	78-59-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Isophorone	78-59-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Isophorone	78-59-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Isophorone	78-59-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Isophorone	78-59-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02505
Isophorone	78-59-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Isophorone	78-59-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Isophorone	78-59-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Isophorone	78-59-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Isophorone	78-59-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Isophorone	78-59-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Lead	7439-92-1	6.61	mg/kg	0.46		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.23
Lead	7439-92-1	9.65	mg/kg	0.595		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.297
Lead	7439-92-1	9.59	mg/kg	0.526		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.263
Lead	7439-92-1	11.3	mg/kg	0.531		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.266
Lead	7439-92-1	12.3	mg/kg	0.551		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.276
Lead	7439-92-1	8.3	mg/kg	0.577		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.288
Lead	7439-92-1	27.05	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.2375

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Lead	7439-92-1	6.28	mg/kg	0.61		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.305
Lead	7439-92-1	8.3	mg/kg	0.42		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		0.42
Lead	7439-92-1	5.9	mg/kg	0.79		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		0.79
Lead	7439-92-1	8.1	mg/kg	0.5		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.5
Lead	7439-92-1	4.9	mg/kg	0.39		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.39
Lead	7439-92-1	5.6	mg/kg	0.73		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		0.73
Magnesium	7439-95-4	5030	mg/kg	1.99		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.993
Magnesium	7439-95-4	5830	mg/kg	2.3		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		1.15
Magnesium	7439-95-4	1500	mg/kg	2.09		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		1.05
Magnesium	7439-95-4	782	mg/kg	2.05		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		1.02
Magnesium	7439-95-4	4010	mg/kg	2.06		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		1.03
Magnesium	7439-95-4	1730	mg/kg	2.27		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		1.13
Magnesium	7439-95-4	1915	mg/kg	1.9		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.9535
Magnesium	7439-95-4	3740	mg/kg	2.42		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		1.21
Magnesium	7439-95-4	1660	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Magnesium	7439-95-4	327	mg/kg	654	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	654
Magnesium	7439-95-4	1470	mg/kg	835		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		835
Magnesium	7439-95-4	651	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648
Magnesium	7439-95-4	3770	mg/kg	1220		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1220
Manganese	7439-96-5	263	mg/kg	0.199		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Manganese	7439-96-5	306	mg/kg	0.23		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Manganese	7439-96-5	252	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Manganese	7439-96-5	241	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Manganese	7439-96-5	305	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Manganese	7439-96-5	199	mg/kg	0.227		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Manganese	7439-96-5	342	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Manganese	7439-96-5	2810	mg/kg	0.242		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Manganese	7439-96-5	825	mg/kg	2.15	J	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		2.15
Manganese	7439-96-5	199	mg/kg	3.9		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		3.9
Manganese	7439-96-5	125	mg/kg	2.5		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		2.5
Manganese	7439-96-5	181	mg/kg	1.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		1.9
Manganese	7439-96-5	1370	mg/kg	3.7		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		3.7
Mercury	7439-97-6	0.0123	mg/kg	0.0246	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.0123
Mercury	7439-97-6	0.0357	mg/kg	0.03		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.015
Mercury	7439-97-6	0.0928	mg/kg	0.0296		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.0148
Mercury	7439-97-6	0.383	mg/kg	0.0274		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.0137
Mercury	7439-97-6	0.0756	mg/kg	0.0291		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.0146
Mercury	7439-97-6	0.0146	mg/kg	0.0248	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	J	0.0124
Mercury	7439-97-6	0.157	mg/kg	0.02555		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.0128
Mercury	7439-97-6	0.0383	mg/kg	0.0323		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.0162
Mercury	7439-97-6	0.07	mg/kg	0.14	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.14
Mercury	7439-97-6	0.065	mg/kg	0.13	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.13
Mercury	7439-97-6	0.085	mg/kg	0.17	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.17
Mercury	7439-97-6	0.065	mg/kg	0.13	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.13
Mercury	7439-97-6	0.12	mg/kg	0.24	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	0.24
Methylnaphthalene, 2-	91-57-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.108
Methylnaphthalene, 2-	91-57-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.128
Methylnaphthalene, 2-	91-57-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.127
Methylnaphthalene, 2-	91-57-6	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.12
Methylnaphthalene, 2-	91-57-6	0.942	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.622
Methylnaphthalene, 2-	91-57-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.117
Methylnaphthalene, 2-	91-57-6	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.548
Methylnaphthalene, 2-	91-57-6	0.363	mg/kg	0.536	QJ	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.141
Methylnaphthalene, 2-	91-57-6	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylnaphthalene, 2-	91-57-6	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylnaphthalene, 2-	91-57-6	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylnaphthalene, 2-	91-57-6	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylnaphthalene, 2-	91-57-6	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Methylphenol, 2-	95-48-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00616
Methylphenol, 2-	95-48-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00735
Methylphenol, 2-	95-48-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00728
Methylphenol, 2-	95-48-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00688
Methylphenol, 2-	95-48-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0356
Methylphenol, 2-	95-48-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00672
Methylphenol, 2-	95-48-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0313
Methylphenol, 2-	95-48-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00805

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Methylphenol, 2-	95-48-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylphenol, 2-	95-48-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 2-	95-48-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylphenol, 2-	95-48-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 2-	95-48-7	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Methylphenol, 4-	106-44-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0128
Methylphenol, 4-	106-44-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0153
Methylphenol, 4-	106-44-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0151
Methylphenol, 4-	106-44-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0143
Methylphenol, 4-	106-44-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.074
Methylphenol, 4-	106-44-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.014
Methylphenol, 4-	106-44-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.06515
Methylphenol, 4-	106-44-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0167
Methylphenol, 4-	106-44-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylphenol, 4-	106-44-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 4-	106-44-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylphenol, 4-	106-44-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 4-	106-44-5	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Naphthalene	91-20-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00974
Naphthalene	91-20-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Naphthalene	91-20-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0115
Naphthalene	91-20-3	0.0661	mg/kg	0.458	J	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0109
Naphthalene	91-20-3	0.764	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0562
Naphthalene	91-20-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0106
Naphthalene	91-20-3	0.6595	mg/kg	2.085	JU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JU	0.0495
Naphthalene	91-20-3	0.247	mg/kg	0.536	J	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.0127
Naphthalene	91-20-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Naphthalene	91-20-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Naphthalene	91-20-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Naphthalene	91-20-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Naphthalene	91-20-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Nickel	7440-02-0	3.93	mg/kg	0.298	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.149
Nickel	7440-02-0	0.173	mg/kg	0.346	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.173
Nickel	7440-02-0	0.157	mg/kg	0.314	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.157
Nickel	7440-02-0	0.1535	mg/kg	0.307	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.153
Nickel	7440-02-0	0.1545	mg/kg	0.309	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.155
Nickel	7440-02-0	0.17	mg/kg	0.34	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.17
Nickel	7440-02-0	0.1428	mg/kg	0.2855	UU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	UU	0.143
Nickel	7440-02-0	0.1815	mg/kg	0.363	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.181
Nickel	7440-02-0	28.7	mg/kg	5.65		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		5.65
Nickel	7440-02-0	16.1	mg/kg	5.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		5.2
Nickel	7440-02-0	21.1	mg/kg	6.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		6.7
Nickel	7440-02-0	16.7	mg/kg	5.2		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		5.2
Nickel	7440-02-0	79.2	mg/kg	9.8		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		9.8
Nitroaniline, 2-	88-74-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0177
Nitroaniline, 2-	88-74-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0212
Nitroaniline, 2-	88-74-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.021
Nitroaniline, 2-	88-74-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0198
Nitroaniline, 2-	88-74-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.103
Nitroaniline, 2-	88-74-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0194
Nitroaniline, 2-	88-74-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.09025
Nitroaniline, 2-	88-74-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0232
Nitroaniline, 2-	88-74-4	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitroaniline, 2-	88-74-4	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 2-	88-74-4	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 2-	88-74-4	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 2-	88-74-4	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitroaniline, 3-	99-09-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0139
Nitroaniline, 3-	99-09-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0166
Nitroaniline, 3-	99-09-2	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Nitroaniline, 3-	99-09-2	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0155
Nitroaniline, 3-	99-09-2	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0804
Nitroaniline, 3-	99-09-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0152
Nitroaniline, 3-	99-09-2	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07085
Nitroaniline, 3-	99-09-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0182
Nitroaniline, 3-	99-09-2	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitroaniline, 3-	99-09-2	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 3-	99-09-2	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 3-	99-09-2	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 3-	99-09-2	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitroaniline, 4-	100-01-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.145
Nitroaniline, 4-	100-01-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.173
Nitroaniline, 4-	100-01-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.172
Nitroaniline, 4-	100-01-6	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.162
Nitroaniline, 4-	100-01-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.84
Nitroaniline, 4-	100-01-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.159
Nitroaniline, 4-	100-01-6	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.7395
Nitroaniline, 4-	100-01-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.19
Nitroaniline, 4-	100-01-6	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitroaniline, 4-	100-01-6	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 4-	100-01-6	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 4-	100-01-6	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 4-	100-01-6	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitrobenzene	98-95-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0134
Nitrobenzene	98-95-3	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrobenzene	98-95-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.016
Nitrobenzene	98-95-3	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrobenzene	98-95-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0159
Nitrobenzene	98-95-3	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrobenzene	98-95-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.015
Nitrobenzene	98-95-3	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrobenzene	98-95-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0776
Nitrobenzene	98-95-3	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrobenzene	98-95-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0147
Nitrobenzene	98-95-3	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrobenzene	98-95-3	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1104
Nitrobenzene	98-95-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0176
Nitrobenzene	98-95-3	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrobenzene	98-95-3	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1034
Nitrobenzene	98-95-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Nitrobenzene	98-95-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrobenzene	98-95-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Nitrobenzene	98-95-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrobenzene	98-95-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Nitrophenol, 2-	88-75-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0145
Nitrophenol, 2-	88-75-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0173
Nitrophenol, 2-	88-75-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0172
Nitrophenol, 2-	88-75-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0162
Nitrophenol, 2-	88-75-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.084
Nitrophenol, 2-	88-75-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0159
Nitrophenol, 2-	88-75-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07395
Nitrophenol, 2-	88-75-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.019
Nitrophenol, 2-	88-75-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Nitrophenol, 2-	88-75-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrophenol, 2-	88-75-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Nitrophenol, 2-	88-75-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrophenol, 2-	88-75-5	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Nitrophenol, 4-	100-02-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0333
Nitrophenol, 4-	100-02-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0397
Nitrophenol, 4-	100-02-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0393
Nitrophenol, 4-	100-02-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0372
Nitrophenol, 4-	100-02-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.192
Nitrophenol, 4-	100-02-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0363
Nitrophenol, 4-	100-02-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1695
Nitrophenol, 4-	100-02-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0435
Nitrophenol, 4-	100-02-7	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitrophenol, 4-	100-02-7	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitrophenol, 4-	100-02-7	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitrophenol, 4-	100-02-7	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitrophenol, 4-	100-02-7	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitrotoluene, 2-	88-72-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 2-	88-72-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitrotoluene, 2-	88-72-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 2-	88-72-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 2-	88-72-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 2-	88-72-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 2-	88-72-2	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 2-	88-72-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrotoluene, 3-	99-08-1	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 3-	99-08-1	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrotoluene, 3-	99-08-1	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 3-	99-08-1	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 3-	99-08-1	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 3-	99-08-1	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 3-	99-08-1	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 3-	99-08-1	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrotoluene, 4-	99-99-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 4-	99-99-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrotoluene, 4-	99-99-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 4-	99-99-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 4-	99-99-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 4-	99-99-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 4-	99-99-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 4-	99-99-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
n-Nitrosodimethylamine	62-75-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0123
n-Nitrosodimethylamine	62-75-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0147
n-Nitrosodimethylamine	62-75-9	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0146
n-Nitrosodimethylamine	62-75-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0138
n-Nitrosodimethylamine	62-75-9	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0712
n-Nitrosodimethylamine	62-75-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0134
n-Nitrosodimethylamine	62-75-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0627
n-Nitrosodimethylamine	62-75-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0161
n-Nitroso-di-n-propylamine	621-64-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
n-Nitroso-di-n-propylamine	621-64-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
n-Nitroso-di-n-propylamine	621-64-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
n-Nitroso-di-n-propylamine	621-64-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
n-Nitroso-di-n-propylamine	621-64-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
n-Nitroso-di-n-propylamine	621-64-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
n-Nitroso-di-n-propylamine	621-64-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
n-Nitroso-di-n-propylamine	621-64-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
n-Nitroso-di-n-propylamine	621-64-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
n-Nitroso-di-n-propylamine	621-64-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitroso-di-n-propylamine	621-64-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
n-Nitroso-di-n-propylamine	621-64-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitroso-di-n-propylamine	621-64-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
n-Nitrosodiphenylamine	86-30-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00579
n-Nitrosodiphenylamine	86-30-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00691
n-Nitrosodiphenylamine	86-30-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00684
n-Nitrosodiphenylamine	86-30-6	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00647
n-Nitrosodiphenylamine	86-30-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0335
n-Nitrosodiphenylamine	86-30-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00632
n-Nitrosodiphenylamine	86-30-6	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02945
n-Nitrosodiphenylamine	86-30-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00757
n-Nitrosodiphenylamine	86-30-6	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
n-Nitrosodiphenylamine	86-30-6	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitrosodiphenylamine	86-30-6	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
n-Nitrosodiphenylamine	86-30-6	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitrosodiphenylamine	86-30-6	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Pentachlorophenol	87-86-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0369
Pentachlorophenol	87-86-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.044
Pentachlorophenol	87-86-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0435
Pentachlorophenol	87-86-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0411
Pentachlorophenol	87-86-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.213
Pentachlorophenol	87-86-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0402
Pentachlorophenol	87-86-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1875
Pentachlorophenol	87-86-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0482
Pentachlorophenol	87-86-5	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Pentachlorophenol	87-86-5	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Pentachlorophenol	87-86-5	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Pentachlorophenol	87-86-5	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Pentachlorophenol	87-86-5	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Phenanthrene	85-01-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00998
Phenanthrene	85-01-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0119
Phenanthrene	85-01-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0118
Phenanthrene	85-01-8	0.055	mg/kg	0.458	J	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0111
Phenanthrene	85-01-8	0.275	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0577
Phenanthrene	85-01-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0109
Phenanthrene	85-01-8	0.831	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0508
Phenanthrene	85-01-8	0.156	mg/kg	0.536	J	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.013
Phenanthrene	85-01-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Phenanthrene	85-01-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenanthrene	85-01-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Phenanthrene	85-01-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenanthrene	85-01-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Phenol	108-95-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Phenol	108-95-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Phenol	108-95-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Phenol	108-95-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Phenol	108-95-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Phenol	108-95-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Phenol	108-95-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02505
Phenol	108-95-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Phenol	108-95-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Phenol	108-95-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenol	108-95-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Phenol	108-95-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenol	108-95-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Potassium	7440-09-7	577	mg/kg	24.8	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		12.4
Potassium	7440-09-7	1190	mg/kg	28.8	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		14.4
Potassium	7440-09-7	1260	mg/kg	26.1		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		13.1
Potassium	7440-09-7	1280	mg/kg	25.6		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		12.8
Potassium	7440-09-7	1160	mg/kg	25.8		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		12.9
Potassium	7440-09-7	643	mg/kg	28.4	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		14.2
Potassium	7440-09-7	654	mg/kg	23.8		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		11.9
Potassium	7440-09-7	1040	mg/kg	30.2	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		15.1
Potassium	7440-09-7	873.5	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Potassium	7440-09-7	1090	mg/kg	654		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		654
Potassium	7440-09-7	417.5	mg/kg	835	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	835
Potassium	7440-09-7	781	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648
Potassium	7440-09-7	610	mg/kg	1220	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1220
Pyrene	129-00-0	0.0378	mg/kg	0.41	QJ	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	J	0.0164
Pyrene	129-00-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0196
Pyrene	129-00-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0194
Pyrene	129-00-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0183
Pyrene	129-00-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0947
Pyrene	129-00-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0179
Pyrene	129-00-0	1.32	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.08335
Pyrene	129-00-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0214
Pyrene	129-00-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Pyrene	129-00-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Pyrene	129-00-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Pyrene	129-00-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Pyrene	129-00-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
RDX	121-82-4	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
RDX	121-82-4	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
RDX	121-82-4	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
RDX	121-82-4	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
RDX	121-82-4	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
RDX	121-82-4	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
RDX	121-82-4	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Selenium	7782-49-2	0.4595	mg/kg	0.919	UJ	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.46
Selenium	7782-49-2	0.618	mg/kg	1.19	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	J	0.595
Selenium	7782-49-2	0.567	mg/kg	1.05	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	J	0.526
Selenium	7782-49-2	0.6	mg/kg	1.06	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.531

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Selenium	7782-49-2	0.592	mg/kg	1.1	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.551
Selenium	7782-49-2	0.575	mg/kg	1.15	UJ	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.577
Selenium	7782-49-2	0.4973	mg/kg	0.9515	JU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JU	0.476
Selenium	7782-49-2	0.61	mg/kg	1.22	UJ	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.61
Selenium	7782-49-2	0.665	mg/kg	0.71	/U	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	U	0.71
Selenium	7782-49-2	0.65	mg/kg	1.3	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	1.3
Selenium	7782-49-2	1.2	mg/kg	0.84		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.84
Selenium	7782-49-2	2.7	mg/kg	0.65		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.65
Selenium	7782-49-2	2.6	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Silver	7440-22-4	0.248	mg/kg	0.496	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.248
Silver	7440-22-4	0.288	mg/kg	0.576	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.288
Silver	7440-22-4	0.2615	mg/kg	0.523	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.261
Silver	7440-22-4	0.2555	mg/kg	0.511	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.256
Silver	7440-22-4	0.258	mg/kg	0.516	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.258
Silver	7440-22-4	0.2835	mg/kg	0.567	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.284
Silver	7440-22-4	0.238	mg/kg	0.476	UU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	UU	0.238
Silver	7440-22-4	0.3025	mg/kg	0.605	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.302
Silver	7440-22-4	0.355	mg/kg	0.71	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.71
Silver	7440-22-4	0.325	mg/kg	0.65	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.65
Silver	7440-22-4	0.42	mg/kg	0.84	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.84
Silver	7440-22-4	0.325	mg/kg	0.65	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.65
Silver	7440-22-4	0.6	mg/kg	1.2	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1.2
Sodium	7440-23-5	57.6	mg/kg	9.93		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		4.96
Sodium	7440-23-5	114	mg/kg	11.5		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		5.76
Sodium	7440-23-5	96.8	mg/kg	10.5		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		5.23
Sodium	7440-23-5	119	mg/kg	10.2		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		5.11
Sodium	7440-23-5	165	mg/kg	10.3		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		5.16
Sodium	7440-23-5	70.4	mg/kg	11.3		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		5.67
Sodium	7440-23-5	89.15	mg/kg	9.535	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		4.76
Sodium	7440-23-5	161	mg/kg	12.1		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		6.05
Sodium	7440-23-5	353.5	mg/kg	707	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	707
Sodium	7440-23-5	327	mg/kg	654	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	654
Sodium	7440-23-5	417.5	mg/kg	835	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	835
Sodium	7440-23-5	324	mg/kg	648	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	648
Sodium	7440-23-5	610	mg/kg	1220	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1220
Tetryl	479-45-8	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Tetryl	479-45-8	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Tetryl	479-45-8	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Tetryl	479-45-8	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Tetryl	479-45-8	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Tetryl	479-45-8	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Tetryl	479-45-8	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Tetryl	479-45-8	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Thallium	7440-28-0	0.23	mg/kg	0.46	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Thallium	7440-28-0	0.2975	mg/kg	0.595	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Thallium	7440-28-0	0.563	mg/kg	0.526		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.263
Thallium	7440-28-0	0.356	mg/kg	0.531	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.266
Thallium	7440-28-0	0.303	mg/kg	0.551	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.276
Thallium	7440-28-0	0.2885	mg/kg	0.577	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Thallium	7440-28-0	0.274	mg/kg	0.476	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JJ	0.2375
Thallium	7440-28-0	0.305	mg/kg	0.61	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Thallium	7440-28-0	0.7	mg/kg	1.4	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	1.4
Thallium	7440-28-0	1.3	mg/kg	2.6	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	2.6
Thallium	7440-28-0	0.85	mg/kg	1.7	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	1.7
Thallium	7440-28-0	0.65	mg/kg	1.3	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	1.3
Thallium	7440-28-0	1.2	mg/kg	2.4	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	2.4
Total organic carbon	10-35-5	55.3	mg/kg	24.8	J	ASH PIT 1-SB01	AP0001	TOC-W	REG	8-Dec-08	0.5	1.5	B	0.62
Total organic carbon	10-35-5	65	mg/kg	130	U	PBOW99-SBA102A	PBOW99SBA102A	TOC	REG	10-Jun-99	0	1	U	130
Trichlorobenzene, 1,2,4-	120-82-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0101
Trichlorobenzene, 1,2,4-	120-82-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0121
Trichlorobenzene, 1,2,4-	120-82-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0119
Trichlorobenzene, 1,2,4-	120-82-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0113
Trichlorobenzene, 1,2,4-	120-82-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0584
Trichlorobenzene, 1,2,4-	120-82-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.011
Trichlorobenzene, 1,2,4-	120-82-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0514
Trichlorobenzene, 1,2,4-	120-82-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0132

Table E-1
Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Trichlorobenzene, 1,2,4-	120-82-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorobenzene, 1,2,4-	120-82-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorobenzene, 1,2,4-	120-82-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorobenzene, 1,2,4-	120-82-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorobenzene, 1,2,4-	120-82-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Trichlorophenol, 2,4,5-	95-95-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0352
Trichlorophenol, 2,4,5-	95-95-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.042
Trichlorophenol, 2,4,5-	95-95-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0416
Trichlorophenol, 2,4,5-	95-95-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0394
Trichlorophenol, 2,4,5-	95-95-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.204
Trichlorophenol, 2,4,5-	95-95-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0384
Trichlorophenol, 2,4,5-	95-95-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.179
Trichlorophenol, 2,4,5-	95-95-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0461
Trichlorophenol, 2,4,5-	95-95-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorophenol, 2,4,5-	95-95-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,5-	95-95-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorophenol, 2,4,5-	95-95-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,5-	95-95-4	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Trichlorophenol, 2,4,6-	88-06-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0277
Trichlorophenol, 2,4,6-	88-06-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0331
Trichlorophenol, 2,4,6-	88-06-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0327
Trichlorophenol, 2,4,6-	88-06-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.031
Trichlorophenol, 2,4,6-	88-06-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.16
Trichlorophenol, 2,4,6-	88-06-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0302
Trichlorophenol, 2,4,6-	88-06-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.141
Trichlorophenol, 2,4,6-	88-06-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0362
Trichlorophenol, 2,4,6-	88-06-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorophenol, 2,4,6-	88-06-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,6-	88-06-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorophenol, 2,4,6-	88-06-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,6-	88-06-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Trinitrobenzene, 1,3,5-	99-35-4	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Trinitrobenzene, 1,3,5-	99-35-4	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Trinitrobenzene, 1,3,5-	99-35-4	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Trinitrobenzene, 1,3,5-	99-35-4	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Trinitrobenzene, 1,3,5-	99-35-4	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Trinitrobenzene, 1,3,5-	99-35-4	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Trinitrobenzene, 1,3,5-	99-35-4	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Trinitrobenzene, 1,3,5-	99-35-4	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Trinitrotoluene, 2,4,6-	118-96-7	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Trinitrotoluene, 2,4,6-	118-96-7	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Trinitrotoluene, 2,4,6-	118-96-7	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Trinitrotoluene, 2,4,6-	118-96-7	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Trinitrotoluene, 2,4,6-	118-96-7	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Trinitrotoluene, 2,4,6-	118-96-7	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Trinitrotoluene, 2,4,6-	118-96-7	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Trinitrotoluene, 2,4,6-	118-96-7	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Vanadium	7440-62-2	20.7	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Vanadium	7440-62-2	26.3	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Vanadium	7440-62-2	29.9	mg/kg	0.209	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Vanadium	7440-62-2	32.4	mg/kg	0.205	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Vanadium	7440-62-2	27.9	mg/kg	0.206	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Vanadium	7440-62-2	28.2	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Vanadium	7440-62-2	21.85	mg/kg	0.19	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Vanadium	7440-62-2	20.7	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Vanadium	7440-62-2	20.25	mg/kg	7.1		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		7.1
Vanadium	7440-62-2	17.8	mg/kg	13.1		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		13.1
Vanadium	7440-62-2	39.2	mg/kg	8.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		8.4
Vanadium	7440-62-2	14.4	mg/kg	6.5		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		6.5
Vanadium	7440-62-2	23	mg/kg	12.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		12.2
Zinc	7440-66-6	44.4	mg/kg	2.48		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		1.24
Zinc	7440-66-6	55.2	mg/kg	2.88		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		1.44
Zinc	7440-66-6	57.1	mg/kg	2.61		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		1.31
Zinc	7440-66-6	55.3	mg/kg	2.56		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		1.28
Zinc	7440-66-6	62.8	mg/kg	2.58		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		1.29
Zinc	7440-66-6	85.4	mg/kg	2.84		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		1.42

Table E-1

Surface Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Zinc	7440-66-6	63.4	mg/kg	2.38		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		1.19
Zinc	7440-66-6	34.8	mg/kg	3.02		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		1.51
Zinc	7440-66-6	63.15	mg/kg	2.8		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	MBDMBD	2.8
Zinc	7440-66-6	2.6	mg/kg	5.2	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	MBD	5.2
Zinc	7440-66-6	43.5	mg/kg	3.3		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	MBD	3.3
Zinc	7440-66-6	1.3	mg/kg	2.6	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	MBD	2.6
Zinc	7440-66-6	95.8	mg/kg	4.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	MBD	4.9

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Acenaphthene	83-32-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00882
Acenaphthene	83-32-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00873
Acenaphthene	83-32-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00826
Acenaphthene	83-32-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0427
Acenaphthene	83-32-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0376
Acenaphthene	83-32-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00966
Acenaphthene	83-32-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Acenaphthene	83-32-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthene	83-32-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Acenaphthene	83-32-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthene	83-32-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Acenaphthene	83-32-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00739
Acenaphthene	83-32-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00807
Acenaphthene	83-32-9	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Acenaphthene	83-32-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00755
Acenaphthene	83-32-9	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00696
Acenaphthene	83-32-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.007255
Acenaphthene	83-32-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00722
Acenaphthene	83-32-9	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00843
Acenaphthene	83-32-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00727
Acenaphthene	83-32-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00717
Acenaphthene	83-32-9	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00728
Acenaphthene	83-32-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00743
Acenaphthene	83-32-9	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00733
Acenaphthene	83-32-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00722
Acenaphthene	83-32-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00743
Acenaphthene	83-32-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00748
Acenaphthene	83-32-9	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00691
Acenaphthene	83-32-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00743
Acenaphthene	83-32-9	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.006715
Acenaphthylene	208-96-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Acenaphthylene	208-96-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Acenaphthylene	208-96-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Acenaphthylene	208-96-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Acenaphthylene	208-96-8	0.2785	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.02505
Acenaphthylene	208-96-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Acenaphthylene	208-96-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Acenaphthylene	208-96-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthylene	208-96-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Acenaphthylene	208-96-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Acenaphthylene	208-96-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Acenaphthylene	208-96-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Acenaphthylene	208-96-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Acenaphthylene	208-96-8	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Acenaphthylene	208-96-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00503
Acenaphthylene	208-96-8	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00464
Acenaphthylene	208-96-8	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.004835
Acenaphthylene	208-96-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00481
Acenaphthylene	208-96-8	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00562
Acenaphthylene	208-96-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00485
Acenaphthylene	208-96-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00478
Acenaphthylene	208-96-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00485
Acenaphthylene	208-96-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00495
Acenaphthylene	208-96-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00489
Acenaphthylene	208-96-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00481
Acenaphthylene	208-96-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Acenaphthylene	208-96-8	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00498
Acenaphthylene	208-96-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00461
Acenaphthylene	208-96-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Acenaphthylene	208-96-8	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.004475
Aluminum	7429-90-5	9360	mg/kg	4.61	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		2.3
Aluminum	7429-90-5	9940	mg/kg	4.18		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		2.09
Aluminum	7429-90-5	12700	mg/kg	4.09		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		2.05
Aluminum	7429-90-5	10700	mg/kg	4.12		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		2.06
Aluminum	7429-90-5	7555	mg/kg	3.81		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		1.9
Aluminum	7429-90-5	7650	mg/kg	4.84	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		2.42
Aluminum	7429-90-5	7550	mg/kg	28.25		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		28.25

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Aluminum	7429-90-5	12700	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Aluminum	7429-90-5	8310	mg/kg	33.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		33.4
Aluminum	7429-90-5	8820	mg/kg	25.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		25.9
Aluminum	7429-90-5	16600	mg/kg	48.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		48.9
Aluminum	7429-90-5	6190	mg/kg	3.97	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		1.99
Aluminum	7429-90-5	10500	mg/kg	4.54	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		2.27
Aluminum	7429-90-5	12600	mg/kg	25.3		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		25.3
Aluminum	7429-90-5	8380	mg/kg	3.44	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		1.72
Aluminum	7429-90-5	2770	mg/kg	3.92		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		1.96
Aluminum	7429-90-5	7125	mg/kg	3.77		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		1.885
Aluminum	7429-90-5	6260	mg/kg	3.91		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		1.96
Aluminum	7429-90-5	6700	mg/kg	3.87	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		1.94
Aluminum	7429-90-5	7640	mg/kg	3.35	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		1.68
Aluminum	7429-90-5	9230	mg/kg	3.31	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		1.65
Aluminum	7429-90-5	13000	mg/kg	3.61	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		1.81
Aluminum	7429-90-5	8980	mg/kg	3.81	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		1.9
Aluminum	7429-90-5	7780	mg/kg	3.65	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		1.82
Aluminum	7429-90-5	8470	mg/kg	3.57		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		1.79
Aluminum	7429-90-5	10200	mg/kg	3.79		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		1.9
Aluminum	7429-90-5	8810	mg/kg	3.76		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		1.88
Aluminum	7429-90-5	8870	mg/kg	3.78	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		1.89
Aluminum	7429-90-5	11700	mg/kg	3.86		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		1.93
Aluminum	7429-90-5	8390	mg/kg	3.62	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		1.81
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Anthracene	120-12-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Anthracene	120-12-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Anthracene	120-12-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Anthracene	120-12-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Anthracene	120-12-7	0.2155	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0451
Anthracene	120-12-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Anthracene	120-12-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Anthracene	120-12-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Anthracene	120-12-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Anthracene	120-12-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Anthracene	120-12-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Anthracene	120-12-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00887
Anthracene	120-12-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Anthracene	120-12-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Anthracene	120-12-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00906
Anthracene	120-12-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00836
Anthracene	120-12-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0087
Anthracene	120-12-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00867
Anthracene	120-12-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0101
Anthracene	120-12-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00872
Anthracene	120-12-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0086
Anthracene	120-12-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00874
Anthracene	120-12-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00891
Anthracene	120-12-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0088
Anthracene	120-12-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00867
Anthracene	120-12-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Anthracene	120-12-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00897
Anthracene	120-12-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00829
Anthracene	120-12-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Anthracene	120-12-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00805
Antimony	7440-36-0	0.2975	mg/kg	0.595	UJ	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Antimony	7440-36-0	0.347	mg/kg	0.526	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	J	0.263
Antimony	7440-36-0	0.352	mg/kg	0.531	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.266
Antimony	7440-36-0	0.416	mg/kg	0.551	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.276
Antimony	7440-36-0	0.838	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.2375
Antimony	7440-36-0	0.305	mg/kg	0.61	UJ	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Antimony	7440-36-0	0.7	mg/kg	1.4	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	1.4
Antimony	7440-36-0	1.3	mg/kg	2.6	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	2.6
Antimony	7440-36-0	0.85	mg/kg	1.7	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	1.7
Antimony	7440-36-0	0.65	mg/kg	1.3	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	1.3
Antimony	7440-36-0	1.2	mg/kg	2.4	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	2.4
Antimony	7440-36-0	0.23	mg/kg	0.46	UJ	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Antimony	7440-36-0	0.2885	mg/kg	0.577	UJ	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Antimony	7440-36-0	0.65	mg/kg	1.3	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	1.3
Antimony	7440-36-0	0.294	mg/kg	0.479	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	J	0.239
Antimony	7440-36-0	0.2245	mg/kg	0.449	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.224
Antimony	7440-36-0	0.2115	mg/kg	0.423	UU	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4	UU	0.2115
Antimony	7440-36-0	0.2405	mg/kg	0.481	U	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	U	0.241
Antimony	7440-36-0	0.348	mg/kg	0.531	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	J	0.265
Antimony	7440-36-0	0.2335	mg/kg	0.467	UJ	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	U	0.233
Antimony	7440-36-0	0.258	mg/kg	0.514	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	J	0.257
Antimony	7440-36-0	0.2275	mg/kg	0.455	UJ	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	U	0.227
Antimony	7440-36-0	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	U	0.208
Antimony	7440-36-0	0.2315	mg/kg	0.463	UJ	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	U	0.231
Antimony	7440-36-0	0.267	mg/kg	0.509	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	J	0.255
Antimony	7440-36-0	0.304	mg/kg	0.441	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	J	0.221
Antimony	7440-36-0	0.276	mg/kg	0.492	J	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	J	0.246
Antimony	7440-36-0	0.287	mg/kg	0.484	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10	J	0.242
Antimony	7440-36-0	0.26	mg/kg	0.51	J	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	J	0.255
Antimony	7440-36-0	0.2308	mg/kg	0.4615	UJUJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	UU	0.2305
Aroclor 1016	12674-11-2	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1016	12674-11-2	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1016	12674-11-2	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Aroclor 1016	12674-11-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1016	12674-11-2	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1016	12674-11-2	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1016	12674-11-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1016	12674-11-2	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1016	12674-11-2	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1016	12674-11-2	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Aroclor 1221	11104-28-2	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1221	11104-28-2	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1221	11104-28-2	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1221	11104-28-2	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1221	11104-28-2	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1221	11104-28-2	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1221	11104-28-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1221	11104-28-2	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1221	11104-28-2	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1221	11104-28-2	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1221	11104-28-2	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1221	11104-28-2	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1221	11104-28-2	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1221	11104-28-2	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1221	11104-28-2	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Aroclor 1232	11141-16-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1232	11141-16-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1232	11141-16-5	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1232	11141-16-5	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1232	11141-16-5	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1232	11141-16-5	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1232	11141-16-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1232	11141-16-5	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1232	11141-16-5	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1232	11141-16-5	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1232	11141-16-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1232	11141-16-5	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1232	11141-16-5	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1232	11141-16-5	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1232	11141-16-5	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Aroclor 1242	53469-21-9	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1242	53469-21-9	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1242	53469-21-9	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1242	53469-21-9	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1242	53469-21-9	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1242	53469-21-9	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1242	53469-21-9	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1242	53469-21-9	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1242	53469-21-9	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1242	53469-21-9	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1242	53469-21-9	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1242	53469-21-9	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1242	53469-21-9	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1242	53469-21-9	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1242	53469-21-9	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Aroclor 1248	12672-29-6	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1248	12672-29-6	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1248	12672-29-6	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1248	12672-29-6	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1248	12672-29-6	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1248	12672-29-6	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1248	12672-29-6	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1248	12672-29-6	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1248	12672-29-6	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1248	12672-29-6	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1248	12672-29-6	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1248	12672-29-6	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1248	12672-29-6	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1248	12672-29-6	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1248	12672-29-6	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Aroclor 1254	11097-69-1	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1254	11097-69-1	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1254	11097-69-1	0.1145	mg/kg	0.229	U	ASH PIT 1-SB04	AP0010	PCBS	REG	9-Dec-08	0	1	U	0.0459
Aroclor 1254	11097-69-1	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1254	11097-69-1	0.105	mg/kg	0.21	UU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	UU	0.04205
Aroclor 1254	11097-69-1	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1254	11097-69-1	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1254	11097-69-1	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1254	11097-69-1	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1254	11097-69-1	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1254	11097-69-1	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1254	11097-69-1	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1254	11097-69-1	0.1	mg/kg	0.2	U	ASH PIT 1-SB09	AP0027	PCBS	REG	8-Dec-08	3	4	U	0.04
Aroclor 1254	11097-69-1	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1254	11097-69-1	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Aroclor 1260	11096-82-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB02	AP0004	PCBS	REG	8-Dec-08	0	1	U	0.0487
Aroclor 1260	11096-82-5	0.1215	mg/kg	0.243	U	ASH PIT 1-SB03	AP0007	PCBS	REG	9-Dec-08	0	1	U	0.0487
Aroclor 1260	11096-82-5	0.1185	mg/kg	0.237	U	ASH PIT 1-SB05	AP0014	PCBS	REG	9-Dec-08	0	1	U	0.0475
Aroclor 1260	11096-82-5	0.1025	mg/kg	0.21	JU	ASH PIT 1-SB08	AP0023AP0063	PCBS	AVGD	9-Dec-08	0	1	JU	0.04205
Aroclor 1260	11096-82-5	0.1345	mg/kg	0.269	U	ASH PIT 1-SB09	AP0026	PCBS	REG	8-Dec-08	0	1	U	0.0539
Aroclor 1260	11096-82-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB01	AP0001	PCBS	REG	8-Dec-08	0.5	1.5	U	0.0404
Aroclor 1260	11096-82-5	0.114	mg/kg	0.228	U	ASH PIT 1-SB06	AP0017	PCBS	REG	8-Dec-08	0.8	1.8	U	0.0456
Aroclor 1260	11096-82-5	0.0955	mg/kg	0.191	U	ASH PIT 1-SB03	AP0008	PCBS	REG	9-Dec-08	3	5	U	0.0382
Aroclor 1260	11096-82-5	0.02	mg/kg	0.04	UU	ASH PIT 1-SB04	AP0011AP0012	PEST/PCB	AVGD	9-Dec-08	3	4	UU	#DIV/0!
Aroclor 1260	11096-82-5	0.101	mg/kg	0.202	U	ASH PIT 1-SB05	AP0015	PCBS	REG	9-Dec-08	3	3.7	U	0.0404
Aroclor 1260	11096-82-5	0.119	mg/kg	0.238	U	ASH PIT 1-SB08	AP0024	PCBS	REG	9-Dec-08	3	5	U	0.0476
Aroclor 1260	11096-82-5	0.1005	mg/kg	0.201	U	ASH PIT 1-SB01	AP0002	PCBS	REG	8-Dec-08	3.5	5.5	U	0.0402
Aroclor 1260	11096-82-5	0.1025	mg/kg	0.205	U	ASH PIT 1-SB06	AP0018	PCBS	REG	8-Dec-08	5	5.8	U	0.0411
Arsenic	7440-38-2	9.14	mg/kg	1.19	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.595
Arsenic	7440-38-2	13.2	mg/kg	1.05		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.526
Arsenic	7440-38-2	11.7	mg/kg	1.06		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.531
Arsenic	7440-38-2	9.06	mg/kg	1.1		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.551
Arsenic	7440-38-2	10.95	mg/kg	0.9515		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.476
Arsenic	7440-38-2	12.6	mg/kg	1.22	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.61
Arsenic	7440-38-2	8.1	mg/kg	1.4		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		1.4
Arsenic	7440-38-2	19.6	mg/kg	2.6		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		2.6
Arsenic	7440-38-2	9.4	mg/kg	1.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		1.7
Arsenic	7440-38-2	14	mg/kg	1.3		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		1.3
Arsenic	7440-38-2	31.2	mg/kg	2.4		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		2.4
Arsenic	7440-38-2	6.7	mg/kg	0.919	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.46
Arsenic	7440-38-2	6.4	mg/kg	1.15	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.577
Arsenic	7440-38-2	15.8	mg/kg	1.3		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		1.3
Arsenic	7440-38-2	6.17	mg/kg	0.957	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.479
Arsenic	7440-38-2	5.62	mg/kg	0.898		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.449
Arsenic	7440-38-2	3.57	mg/kg	0.8455		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.423
Arsenic	7440-38-2	11.6	mg/kg	0.962		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.481
Arsenic	7440-38-2	9.98	mg/kg	1.06	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.531
Arsenic	7440-38-2	5.13	mg/kg	0.933	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.467
Arsenic	7440-38-2	8.3	mg/kg	1.03	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.514
Arsenic	7440-38-2	7.53	mg/kg	0.909	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.455
Arsenic	7440-38-2	4.54	mg/kg	0.831	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.415
Arsenic	7440-38-2	4.3	mg/kg	0.925	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.463
Arsenic	7440-38-2	6.7	mg/kg	1.02		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.509
Arsenic	7440-38-2	8.59	mg/kg	0.883		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.441
Arsenic	7440-38-2	5.78	mg/kg	0.984		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.492
Arsenic	7440-38-2	10.4	mg/kg	0.968	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.484
Arsenic	7440-38-2	5.65	mg/kg	1.02		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.51
Arsenic	7440-38-2	9.555	mg/kg	0.9225	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.4615
Barium	7440-39-3	83.3	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Barium	7440-39-3	107	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Barium	7440-39-3	105	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Barium	7440-39-3	82.7	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Barium	7440-39-3	84.4	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Barium	7440-39-3	84.9	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Barium	7440-39-3	43	mg/kg	28.25		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		28.25
Barium	7440-39-3	163	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Barium	7440-39-3	41.3	mg/kg	33.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		33.4

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Barium	7440-39-3	160	mg/kg	25.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		25.9
Barium	7440-39-3	132	mg/kg	48.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		48.9
Barium	7440-39-3	32.7	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Barium	7440-39-3	62.6	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Barium	7440-39-3	78.9	mg/kg	25.3		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		25.3
Barium	7440-39-3	35.9	mg/kg	0.172	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.0861
Barium	7440-39-3	13	mg/kg	0.196		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.098
Barium	7440-39-3	92.4	mg/kg	0.1885		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.09425
Barium	7440-39-3	168	mg/kg	0.196		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0978
Barium	7440-39-3	109	mg/kg	0.194		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0969
Barium	7440-39-3	39	mg/kg	0.168	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.0838
Barium	7440-39-3	37.7	mg/kg	0.165	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.0826
Barium	7440-39-3	73.6	mg/kg	0.181	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.0903
Barium	7440-39-3	51.5	mg/kg	0.19	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.0951
Barium	7440-39-3	56.1	mg/kg	0.182	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.0911
Barium	7440-39-3	46.7	mg/kg	0.179		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.0893
Barium	7440-39-3	451	mg/kg	0.19		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.0948
Barium	7440-39-3	45.5	mg/kg	0.188		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.094
Barium	7440-39-3	32.6	mg/kg	0.189	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.0944
Barium	7440-39-3	42.3	mg/kg	0.193		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.0965
Barium	7440-39-3	39.35	mg/kg	0.181	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.0905
Benzo(a)anthracene	56-55-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0322
Benzo(a)anthracene	56-55-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0319
Benzo(a)anthracene	56-55-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Benzo(a)anthracene	56-55-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.156
Benzo(a)anthracene	56-55-3	0.8555	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.137
Benzo(a)anthracene	56-55-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0353
Benzo(a)anthracene	56-55-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(a)anthracene	56-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)anthracene	56-55-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(a)anthracene	56-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)anthracene	56-55-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(a)anthracene	56-55-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.027
Benzo(a)anthracene	56-55-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0294
Benzo(a)anthracene	56-55-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Benzo(a)anthracene	56-55-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0275
Benzo(a)anthracene	56-55-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0254
Benzo(a)anthracene	56-55-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.02645
Benzo(a)anthracene	56-55-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0264
Benzo(a)anthracene	56-55-3	0.0642	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0308
Benzo(a)anthracene	56-55-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0265
Benzo(a)anthracene	56-55-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0262
Benzo(a)anthracene	56-55-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0266
Benzo(a)anthracene	56-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0271
Benzo(a)anthracene	56-55-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0268
Benzo(a)anthracene	56-55-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0264
Benzo(a)anthracene	56-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0271
Benzo(a)anthracene	56-55-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0273
Benzo(a)anthracene	56-55-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0252
Benzo(a)anthracene	56-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0271
Benzo(a)anthracene	56-55-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0245
Benzo(a)pyrene	50-32-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0322
Benzo(a)pyrene	50-32-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0319
Benzo(a)pyrene	50-32-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Benzo(a)pyrene	50-32-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.156
Benzo(a)pyrene	50-32-8	0.721	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.137
Benzo(a)pyrene	50-32-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0353
Benzo(a)pyrene	50-32-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(a)pyrene	50-32-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)pyrene	50-32-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(a)pyrene	50-32-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(a)pyrene	50-32-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(a)pyrene	50-32-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.027
Benzo(a)pyrene	50-32-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0294
Benzo(a)pyrene	50-32-8	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Benzo(a)pyrene	50-32-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0275
Benzo(a)pyrene	50-32-8	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0254

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Benzo(a)pyrene	50-32-8	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.02645
Benzo(a)pyrene	50-32-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0264
Benzo(a)pyrene	50-32-8	0.0534	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0308
Benzo(a)pyrene	50-32-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0265
Benzo(a)pyrene	50-32-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0262
Benzo(a)pyrene	50-32-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0266
Benzo(a)pyrene	50-32-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0271
Benzo(a)pyrene	50-32-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0268
Benzo(a)pyrene	50-32-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0264
Benzo(a)pyrene	50-32-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0271
Benzo(a)pyrene	50-32-8	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0273
Benzo(a)pyrene	50-32-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0252
Benzo(a)pyrene	50-32-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0271
Benzo(a)pyrene	50-32-8	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0245
Benzo(b)fluoranthene	205-99-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0816
Benzo(b)fluoranthene	205-99-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0808
Benzo(b)fluoranthene	205-99-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0764
Benzo(b)fluoranthene	205-99-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.395
Benzo(b)fluoranthene	205-99-2	1.205	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.3475
Benzo(b)fluoranthene	205-99-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0894
Benzo(b)fluoranthene	205-99-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(b)fluoranthene	205-99-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(b)fluoranthene	205-99-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(b)fluoranthene	205-99-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(b)fluoranthene	205-99-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(b)fluoranthene	205-99-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0684
Benzo(b)fluoranthene	205-99-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0746
Benzo(b)fluoranthene	205-99-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0663
Benzo(b)fluoranthene	205-99-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0687
Benzo(b)fluoranthene	205-99-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0698
Benzo(b)fluoranthene	205-99-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0678
Benzo(b)fluoranthene	205-99-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0644
Benzo(b)fluoranthene	205-99-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0668
Benzo(b)fluoranthene	205-99-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.06705
Benzo(b)fluoranthene	205-99-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0687
Benzo(b)fluoranthene	205-99-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0668
Benzo(b)fluoranthene	205-99-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0691
Benzo(b)fluoranthene	205-99-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0674
Benzo(b)fluoranthene	205-99-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0639
Benzo(b)fluoranthene	205-99-2	0.0829	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.078
Benzo(b)fluoranthene	205-99-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0687
Benzo(b)fluoranthene	205-99-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0672
Benzo(b)fluoranthene	205-99-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0621
Benzo(b)fluoranthene	205-99-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Benzo(ghi)perylene	191-24-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzo(ghi)perylene	191-24-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzo(ghi)perylene	191-24-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzo(ghi)perylene	191-24-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzo(ghi)perylene	191-24-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzo(ghi)perylene	191-24-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131
Benzo(ghi)perylene	191-24-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(ghi)perylene	191-24-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(ghi)perylene	191-24-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(ghi)perylene	191-24-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(ghi)perylene	191-24-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(ghi)perylene	191-24-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1
Benzo(ghi)perylene	191-24-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzo(ghi)perylene	191-24-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Benzo(ghi)perylene	191-24-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.102
Benzo(ghi)perylene	191-24-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0942
Benzo(ghi)perylene	191-24-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.09815
Benzo(ghi)perylene	191-24-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0977
Benzo(ghi)perylene	191-24-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.114
Benzo(ghi)perylene	191-24-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0984
Benzo(ghi)perylene	191-24-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.097
Benzo(ghi)perylene	191-24-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0985
Benzo(ghi)perylene	191-24-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.101

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Benzo(ghi)perylene	191-24-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0992
Benzo(ghi)perylene	191-24-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0977
Benzo(ghi)perylene	191-24-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.101
Benzo(ghi)perylene	191-24-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.101
Benzo(ghi)perylene	191-24-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0935
Benzo(ghi)perylene	191-24-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.1
Benzo(ghi)perylene	191-24-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.09085
Benzo(k)fluoranthene	207-08-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.148
Benzo(k)fluoranthene	207-08-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.147
Benzo(k)fluoranthene	207-08-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.139
Benzo(k)fluoranthene	207-08-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.719
Benzo(k)fluoranthene	207-08-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.633
Benzo(k)fluoranthene	207-08-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.163
Benzo(k)fluoranthene	207-08-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Benzo(k)fluoranthene	207-08-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(k)fluoranthene	207-08-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Benzo(k)fluoranthene	207-08-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Benzo(k)fluoranthene	207-08-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Benzo(k)fluoranthene	207-08-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.124
Benzo(k)fluoranthene	207-08-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.136
Benzo(k)fluoranthene	207-08-9	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Benzo(k)fluoranthene	207-08-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.127
Benzo(k)fluoranthene	207-08-9	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.117
Benzo(k)fluoranthene	207-08-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.122
Benzo(k)fluoranthene	207-08-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.122
Benzo(k)fluoranthene	207-08-9	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.142
Benzo(k)fluoranthene	207-08-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.122
Benzo(k)fluoranthene	207-08-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.121
Benzo(k)fluoranthene	207-08-9	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.123
Benzo(k)fluoranthene	207-08-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.125
Benzo(k)fluoranthene	207-08-9	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.123
Benzo(k)fluoranthene	207-08-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.122
Benzo(k)fluoranthene	207-08-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.125
Benzo(k)fluoranthene	207-08-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.126
Benzo(k)fluoranthene	207-08-9	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.116
Benzo(k)fluoranthene	207-08-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.125
Benzo(k)fluoranthene	207-08-9	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.113
Benzoic acid	65-85-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzoic acid	65-85-0	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzoic acid	65-85-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzoic acid	65-85-0	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzoic acid	65-85-0	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzoic acid	65-85-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131
Benzoic acid	65-85-0	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1
Benzoic acid	65-85-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzoic acid	65-85-0	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.102
Benzoic acid	65-85-0	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0942
Benzoic acid	65-85-0	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.09815
Benzoic acid	65-85-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0977
Benzoic acid	65-85-0	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.114
Benzoic acid	65-85-0	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0984
Benzoic acid	65-85-0	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.097
Benzoic acid	65-85-0	0.202	mg/kg	0.404	UJ	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0985
Benzoic acid	65-85-0	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.101
Benzoic acid	65-85-0	0.2035	mg/kg	0.407	UJ	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0992
Benzoic acid	65-85-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0977
Benzoic acid	65-85-0	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.101
Benzoic acid	65-85-0	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.101
Benzoic acid	65-85-0	0.192	mg/kg	0.384	UJ	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0935
Benzoic acid	65-85-0	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.1
Benzoic acid	65-85-0	0.1863	mg/kg	0.3725	UJUJ	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.09085
Benzyl alcohol	100-51-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.119
Benzyl alcohol	100-51-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.118
Benzyl alcohol	100-51-6	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.112
Benzyl alcohol	100-51-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.578
Benzyl alcohol	100-51-6	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.509
Benzyl alcohol	100-51-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.131

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Benzyl alcohol	100-51-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.1
Benzyl alcohol	100-51-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.109
Benzyl alcohol	100-51-6	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.102
Benzyl alcohol	100-51-6	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0942
Benzyl alcohol	100-51-6	0.2013	mg/kg	0.4025	UJUJ	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.09815
Benzyl alcohol	100-51-6	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0977
Benzyl alcohol	100-51-6	0.234	mg/kg	0.468	UJ	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.114
Benzyl alcohol	100-51-6	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0984
Benzyl alcohol	100-51-6	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.097
Benzyl alcohol	100-51-6	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0985
Benzyl alcohol	100-51-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.101
Benzyl alcohol	100-51-6	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0992
Benzyl alcohol	100-51-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0977
Benzyl alcohol	100-51-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.101
Benzyl alcohol	100-51-6	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.101
Benzyl alcohol	100-51-6	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0935
Benzyl alcohol	100-51-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.1
Benzyl alcohol	100-51-6	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.09085
Beryllium	7440-41-7	10.8	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Beryllium	7440-41-7	13.9	mg/kg	0.209	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Beryllium	7440-41-7	16.5	mg/kg	0.205	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Beryllium	7440-41-7	13.6	mg/kg	0.206	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Beryllium	7440-41-7	11.1	mg/kg	0.19	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Beryllium	7440-41-7	8.94	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Beryllium	7440-41-7	0.355	mg/kg	0.71	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.71
Beryllium	7440-41-7	0.325	mg/kg	0.65	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.65
Beryllium	7440-41-7	0.42	mg/kg	0.84	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.84
Beryllium	7440-41-7	0.325	mg/kg	0.65	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.65
Beryllium	7440-41-7	1.5	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Beryllium	7440-41-7	5.74	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Beryllium	7440-41-7	11.5	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Beryllium	7440-41-7	4.87	mg/kg	0.165	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.0826
Beryllium	7440-41-7	5.82	mg/kg	0.19	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.0951
Beryllium	7440-41-7	5.99	mg/kg	0.172	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.0861
Beryllium	7440-41-7	5.23	mg/kg	0.182	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.0911
Beryllium	7440-41-7	3.62	mg/kg	0.196	J	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.098
Beryllium	7440-41-7	5.49	mg/kg	0.179	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.0893
Beryllium	7440-41-7	7.305	mg/kg	0.1885	JJ	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.09425
Beryllium	7440-41-7	8.48	mg/kg	0.19	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.0948
Beryllium	7440-41-7	12.9	mg/kg	0.196	J	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0978
Beryllium	7440-41-7	7	mg/kg	0.188	J	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.094
Beryllium	7440-41-7	6.55	mg/kg	0.181	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.0903
Beryllium	7440-41-7	6.71	mg/kg	0.189	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.0944
Beryllium	7440-41-7	11.5	mg/kg	0.194	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0969
Beryllium	7440-41-7	7.18	mg/kg	0.193	J	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.0965
Beryllium	7440-41-7	5.85	mg/kg	0.168	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.0838
Beryllium	7440-41-7	6.905	mg/kg	0.181	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.0905
Beryllium	7440-41-7	0.315	mg/kg	0.63	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	0.63
Bis(2-chloroethoxy)methane	111-91-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0103
Bis(2-chloroethoxy)methane	111-91-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0102
Bis(2-chloroethoxy)methane	111-91-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00963
Bis(2-chloroethoxy)methane	111-91-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0498
Bis(2-chloroethoxy)methane	111-91-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.04385
Bis(2-chloroethoxy)methane	111-91-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0113
Bis(2-chloroethoxy)methane	111-91-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroethoxy)methane	111-91-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethoxy)methane	111-91-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroethoxy)methane	111-91-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethoxy)methane	111-91-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-chloroethoxy)methane	111-91-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00863
Bis(2-chloroethoxy)methane	111-91-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00941
Bis(2-chloroethoxy)methane	111-91-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Bis(2-chloroethoxy)methane	111-91-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00881
Bis(2-chloroethoxy)methane	111-91-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00812
Bis(2-chloroethoxy)methane	111-91-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00846
Bis(2-chloroethoxy)methane	111-91-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00843
Bis(2-chloroethoxy)methane	111-91-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00984

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Bis(2-chloroethoxy)methane	111-91-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00848
Bis(2-chloroethoxy)methane	111-91-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00837
Bis(2-chloroethoxy)methane	111-91-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0085
Bis(2-chloroethoxy)methane	111-91-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00867
Bis(2-chloroethoxy)methane	111-91-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00856
Bis(2-chloroethoxy)methane	111-91-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00843
Bis(2-chloroethoxy)methane	111-91-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00866
Bis(2-chloroethoxy)methane	111-91-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00872
Bis(2-chloroethoxy)methane	111-91-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00806
Bis(2-chloroethoxy)methane	111-91-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00866
Bis(2-chloroethoxy)methane	111-91-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00783
Bis(2-chloroethyl)ether	111-44-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0125
Bis(2-chloroethyl)ether	111-44-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0124
Bis(2-chloroethyl)ether	111-44-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0117
Bis(2-chloroethyl)ether	111-44-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0605
Bis(2-chloroethyl)ether	111-44-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.05325
Bis(2-chloroethyl)ether	111-44-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0137
Bis(2-chloroethyl)ether	111-44-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroethyl)ether	111-44-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethyl)ether	111-44-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroethyl)ether	111-44-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroethyl)ether	111-44-4	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-chloroethyl)ether	111-44-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0105
Bis(2-chloroethyl)ether	111-44-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0114
Bis(2-chloroethyl)ether	111-44-4	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Bis(2-chloroethyl)ether	111-44-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0107
Bis(2-chloroethyl)ether	111-44-4	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00986
Bis(2-chloroethyl)ether	111-44-4	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0103
Bis(2-chloroethyl)ether	111-44-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0102
Bis(2-chloroethyl)ether	111-44-4	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0119
Bis(2-chloroethyl)ether	111-44-4	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0103
Bis(2-chloroethyl)ether	111-44-4	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0102
Bis(2-chloroethyl)ether	111-44-4	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0103
Bis(2-chloroethyl)ether	111-44-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0105
Bis(2-chloroethyl)ether	111-44-4	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0104
Bis(2-chloroethyl)ether	111-44-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0102
Bis(2-chloroethyl)ether	111-44-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0105
Bis(2-chloroethyl)ether	111-44-4	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0106
Bis(2-chloroethyl)ether	111-44-4	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00979
Bis(2-chloroethyl)ether	111-44-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0105
Bis(2-chloroethyl)ether	111-44-4	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00951
Bis(2-chloroisopropyl)ether	108-60-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0213
Bis(2-chloroisopropyl)ether	108-60-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0211
Bis(2-chloroisopropyl)ether	108-60-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.02
Bis(2-chloroisopropyl)ether	108-60-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.103
Bis(2-chloroisopropyl)ether	108-60-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0909
Bis(2-chloroisopropyl)ether	108-60-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0234
Bis(2-chloroisopropyl)ether	108-60-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-chloroisopropyl)ether	108-60-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroisopropyl)ether	108-60-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-chloroisopropyl)ether	108-60-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-chloroisopropyl)ether	108-60-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-chloroisopropyl)ether	108-60-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0179
Bis(2-chloroisopropyl)ether	108-60-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0195
Bis(2-chloroisopropyl)ether	108-60-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Bis(2-chloroisopropyl)ether	108-60-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0182
Bis(2-chloroisopropyl)ether	108-60-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0168
Bis(2-chloroisopropyl)ether	108-60-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0175
Bis(2-chloroisopropyl)ether	108-60-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0175
Bis(2-chloroisopropyl)ether	108-60-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0204
Bis(2-chloroisopropyl)ether	108-60-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0176
Bis(2-chloroisopropyl)ether	108-60-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0173
Bis(2-chloroisopropyl)ether	108-60-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0176
Bis(2-chloroisopropyl)ether	108-60-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.018
Bis(2-chloroisopropyl)ether	108-60-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0177
Bis(2-chloroisopropyl)ether	108-60-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0175
Bis(2-chloroisopropyl)ether	108-60-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0179

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Bis(2-chloroisopropyl)ether	108-60-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0181
Bis(2-chloroisopropyl)ether	108-60-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0167
Bis(2-chloroisopropyl)ether	108-60-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0179
Bis(2-chloroisopropyl)ether	108-60-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0162
Bis(2-ethylhexyl)phthalate	117-81-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0453
Bis(2-ethylhexyl)phthalate	117-81-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0448
Bis(2-ethylhexyl)phthalate	117-81-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0424
Bis(2-ethylhexyl)phthalate	117-81-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.219
Bis(2-ethylhexyl)phthalate	117-81-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.193
Bis(2-ethylhexyl)phthalate	117-81-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0496
Bis(2-ethylhexyl)phthalate	117-81-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bis(2-ethylhexyl)phthalate	117-81-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-ethylhexyl)phthalate	117-81-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bis(2-ethylhexyl)phthalate	117-81-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bis(2-ethylhexyl)phthalate	117-81-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bis(2-ethylhexyl)phthalate	117-81-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.038
Bis(2-ethylhexyl)phthalate	117-81-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0414
Bis(2-ethylhexyl)phthalate	117-81-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Bis(2-ethylhexyl)phthalate	117-81-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0387
Bis(2-ethylhexyl)phthalate	117-81-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0357
Bis(2-ethylhexyl)phthalate	117-81-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.03725
Bis(2-ethylhexyl)phthalate	117-81-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0371
Bis(2-ethylhexyl)phthalate	117-81-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0433
Bis(2-ethylhexyl)phthalate	117-81-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0373
Bis(2-ethylhexyl)phthalate	117-81-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0368
Bis(2-ethylhexyl)phthalate	117-81-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0374
Bis(2-ethylhexyl)phthalate	117-81-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0381
Bis(2-ethylhexyl)phthalate	117-81-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0376
Bis(2-ethylhexyl)phthalate	117-81-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0371
Bis(2-ethylhexyl)phthalate	117-81-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0381
Bis(2-ethylhexyl)phthalate	117-81-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0384
Bis(2-ethylhexyl)phthalate	117-81-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0355
Bis(2-ethylhexyl)phthalate	117-81-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0381
Bis(2-ethylhexyl)phthalate	117-81-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.03445
Bromophenyl phenyl ether, 4-	101-55-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
Bromophenyl phenyl ether, 4-	101-55-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
Bromophenyl phenyl ether, 4-	101-55-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Bromophenyl phenyl ether, 4-	101-55-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
Bromophenyl phenyl ether, 4-	101-55-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
Bromophenyl phenyl ether, 4-	101-55-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
Bromophenyl phenyl ether, 4-	101-55-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Bromophenyl phenyl ether, 4-	101-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bromophenyl phenyl ether, 4-	101-55-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Bromophenyl phenyl ether, 4-	101-55-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Bromophenyl phenyl ether, 4-	101-55-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Bromophenyl phenyl ether, 4-	101-55-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
Bromophenyl phenyl ether, 4-	101-55-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
Bromophenyl phenyl ether, 4-	101-55-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Bromophenyl phenyl ether, 4-	101-55-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.015
Bromophenyl phenyl ether, 4-	101-55-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0138
Bromophenyl phenyl ether, 4-	101-55-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0144
Bromophenyl phenyl ether, 4-	101-55-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0143
Bromophenyl phenyl ether, 4-	101-55-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0167
Bromophenyl phenyl ether, 4-	101-55-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0144
Bromophenyl phenyl ether, 4-	101-55-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0142
Bromophenyl phenyl ether, 4-	101-55-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0144
Bromophenyl phenyl ether, 4-	101-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0147
Bromophenyl phenyl ether, 4-	101-55-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0145
Bromophenyl phenyl ether, 4-	101-55-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0143
Bromophenyl phenyl ether, 4-	101-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
Bromophenyl phenyl ether, 4-	101-55-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0148
Bromophenyl phenyl ether, 4-	101-55-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0137
Bromophenyl phenyl ether, 4-	101-55-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
Bromophenyl phenyl ether, 4-	101-55-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0133
Butyl benzyl phthalate	85-68-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0198
Butyl benzyl phthalate	85-68-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0196
Butyl benzyl phthalate	85-68-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0186

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Butyl benzyl phthalate	85-68-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0961
Butyl benzyl phthalate	85-68-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08465
Butyl benzyl phthalate	85-68-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0217
Butyl benzyl phthalate	85-68-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Butyl benzyl phthalate	85-68-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Butyl benzyl phthalate	85-68-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Butyl benzyl phthalate	85-68-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Butyl benzyl phthalate	85-68-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Butyl benzyl phthalate	85-68-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0166
Butyl benzyl phthalate	85-68-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0181
Butyl benzyl phthalate	85-68-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Butyl benzyl phthalate	85-68-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.017
Butyl benzyl phthalate	85-68-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0157
Butyl benzyl phthalate	85-68-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0163
Butyl benzyl phthalate	85-68-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0163
Butyl benzyl phthalate	85-68-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.019
Butyl benzyl phthalate	85-68-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0164
Butyl benzyl phthalate	85-68-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0161
Butyl benzyl phthalate	85-68-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0164
Butyl benzyl phthalate	85-68-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0167
Butyl benzyl phthalate	85-68-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0165
Butyl benzyl phthalate	85-68-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0163
Butyl benzyl phthalate	85-68-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0167
Butyl benzyl phthalate	85-68-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0168
Butyl benzyl phthalate	85-68-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0155
Butyl benzyl phthalate	85-68-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0167
Butyl benzyl phthalate	85-68-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0151
Cadmium	7440-43-9	0.23	mg/kg	0.46	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Cadmium	7440-43-9	0.2975	mg/kg	0.595	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Cadmium	7440-43-9	0.263	mg/kg	0.526	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.263
Cadmium	7440-43-9	0.2655	mg/kg	0.531	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.266
Cadmium	7440-43-9	0.2755	mg/kg	0.551	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.276
Cadmium	7440-43-9	0.2885	mg/kg	0.577	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Cadmium	7440-43-9	0.2603	mg/kg	0.476	JU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JU	0.2375
Cadmium	7440-43-9	0.305	mg/kg	0.61	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Cadmium	7440-43-9	0.14	mg/kg	0.28	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.28
Cadmium	7440-43-9	0.26	mg/kg	0.52	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	0.52
Cadmium	7440-43-9	0.165	mg/kg	0.33	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.33
Cadmium	7440-43-9	0.13	mg/kg	0.26	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.26
Cadmium	7440-43-9	0.245	mg/kg	0.49	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	0.49
Cadmium	7440-43-9	0.125	mg/kg	0.25	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	0.25
Cadmium	7440-43-9	0.345	mg/kg	0.479	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	J	0.239
Cadmium	7440-43-9	0.2245	mg/kg	0.449	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.224
Cadmium	7440-43-9	0.2815	mg/kg	0.423	JJ	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4	JJ	0.2115
Cadmium	7440-43-9	0.269	mg/kg	0.481	J	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	J	0.241
Cadmium	7440-43-9	0.2655	mg/kg	0.531	U	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	U	0.265
Cadmium	7440-43-9	0.2335	mg/kg	0.467	U	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	U	0.233
Cadmium	7440-43-9	0.257	mg/kg	0.514	U	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	U	0.257
Cadmium	7440-43-9	0.2275	mg/kg	0.455	U	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	U	0.227
Cadmium	7440-43-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	U	0.208
Cadmium	7440-43-9	0.2315	mg/kg	0.463	U	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	U	0.231
Cadmium	7440-43-9	0.277	mg/kg	0.509	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	J	0.255
Cadmium	7440-43-9	0.276	mg/kg	0.441	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	J	0.221
Cadmium	7440-43-9	0.246	mg/kg	0.492	U	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	U	0.246
Cadmium	7440-43-9	7.66	mg/kg	0.484		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.242
Cadmium	7440-43-9	0.255	mg/kg	0.51	U	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	U	0.255
Cadmium	7440-43-9	0.2308	mg/kg	0.4615	UU	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	UU	0.2305
Calcium	7440-70-2	18800	mg/kg	11.5		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		5.76
Calcium	7440-70-2	9390	mg/kg	5.23		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		2.61
Calcium	7440-70-2	3330	mg/kg	5.11		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		2.56
Calcium	7440-70-2	35100	mg/kg	5.16		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		2.58
Calcium	7440-70-2	12400	mg/kg	4.76		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		2.38
Calcium	7440-70-2	15600	mg/kg	12.1		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		6.05
Calcium	7440-70-2	3840	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Calcium	7440-70-2	6600	mg/kg	654		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		654
Calcium	7440-70-2	5590	mg/kg	835		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		835
Calcium	7440-70-2	6080	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Calcium	7440-70-2	59100	mg/kg	1220		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1220
Calcium	7440-70-2	14400	mg/kg	9.93		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		4.96
Calcium	7440-70-2	4580	mg/kg	11.3		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		5.67
Calcium	7440-70-2	3770	mg/kg	632		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		632
Calcium	7440-70-2	46600	mg/kg	8.61		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		4.31
Calcium	7440-70-2	26700	mg/kg	4.9		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		2.45
Calcium	7440-70-2	2680	mg/kg	4.715		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		2.355
Calcium	7440-70-2	2960	mg/kg	4.89		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		2.44
Calcium	7440-70-2	5380	mg/kg	4.84	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		2.42
Calcium	7440-70-2	46200	mg/kg	8.38		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		4.19
Calcium	7440-70-2	35200	mg/kg	8.26		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		4.13
Calcium	7440-70-2	37800	mg/kg	9.03		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		4.51
Calcium	7440-70-2	50900	mg/kg	9.51		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		4.76
Calcium	7440-70-2	45700	mg/kg	9.11		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		4.56
Calcium	7440-70-2	48600	mg/kg	4.46		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		2.23
Calcium	7440-70-2	2300	mg/kg	4.74		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		2.37
Calcium	7440-70-2	36000	mg/kg	4.7		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		2.35
Calcium	7440-70-2	39300	mg/kg	9.44		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		4.72
Calcium	7440-70-2	40400	mg/kg	4.82		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		2.41
Calcium	7440-70-2	38750	mg/kg	9.05		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		4.525
Carbazole	86-74-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.049
Carbazole	86-74-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0485
Carbazole	86-74-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0458
Carbazole	86-74-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.237
Carbazole	86-74-8	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2085
Carbazole	86-74-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0536
Carbazole	86-74-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Carbazole	86-74-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Carbazole	86-74-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Carbazole	86-74-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Carbazole	86-74-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Carbazole	86-74-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.041
Carbazole	86-74-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0448
Carbazole	86-74-8	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Carbazole	86-74-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0419
Carbazole	86-74-8	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0386
Carbazole	86-74-8	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.04025
Carbazole	86-74-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0401
Carbazole	86-74-8	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0468
Carbazole	86-74-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0403
Carbazole	86-74-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0398
Carbazole	86-74-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0404
Carbazole	86-74-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0412
Carbazole	86-74-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0407
Carbazole	86-74-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0401
Carbazole	86-74-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0412
Carbazole	86-74-8	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0415
Carbazole	86-74-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0384
Carbazole	86-74-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0412
Carbazole	86-74-8	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.03725
Chloro-3-methylphenol, 4-	59-50-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0121
Chloro-3-methylphenol, 4-	59-50-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0119
Chloro-3-methylphenol, 4-	59-50-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0113
Chloro-3-methylphenol, 4-	59-50-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0584
Chloro-3-methylphenol, 4-	59-50-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0514
Chloro-3-methylphenol, 4-	59-50-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0132
Chloro-3-methylphenol, 4-	59-50-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloro-3-methylphenol, 4-	59-50-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloro-3-methylphenol, 4-	59-50-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloro-3-methylphenol, 4-	59-50-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloro-3-methylphenol, 4-	59-50-7	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloro-3-methylphenol, 4-	59-50-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0101
Chloro-3-methylphenol, 4-	59-50-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.011
Chloro-3-methylphenol, 4-	59-50-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chloro-3-methylphenol, 4-	59-50-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0103
Chloro-3-methylphenol, 4-	59-50-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00952
Chloro-3-methylphenol, 4-	59-50-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00991

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Chloro-3-methylphenol, 4-	59-50-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00987
Chloro-3-methylphenol, 4-	59-50-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0115
Chloro-3-methylphenol, 4-	59-50-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00993
Chloro-3-methylphenol, 4-	59-50-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0098
Chloro-3-methylphenol, 4-	59-50-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00995
Chloro-3-methylphenol, 4-	59-50-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0102
Chloro-3-methylphenol, 4-	59-50-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.01
Chloro-3-methylphenol, 4-	59-50-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00987
Chloro-3-methylphenol, 4-	59-50-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0101
Chloro-3-methylphenol, 4-	59-50-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0102
Chloro-3-methylphenol, 4-	59-50-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00944
Chloro-3-methylphenol, 4-	59-50-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0101
Chloro-3-methylphenol, 4-	59-50-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.009175
Chloroaniline, 4-	106-47-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0425
Chloroaniline, 4-	106-47-8	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0421
Chloroaniline, 4-	106-47-8	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0398
Chloroaniline, 4-	106-47-8	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.206
Chloroaniline, 4-	106-47-8	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.181
Chloroaniline, 4-	106-47-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0465
Chloroaniline, 4-	106-47-8	0.2325	mg/kg	0.465	UJUJ	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloroaniline, 4-	106-47-8	0.215	mg/kg	0.43	UJ	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloroaniline, 4-	106-47-8	0.275	mg/kg	0.55	UJ	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloroaniline, 4-	106-47-8	0.215	mg/kg	0.43	UJ	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloroaniline, 4-	106-47-8	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloroaniline, 4-	106-47-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0356
Chloroaniline, 4-	106-47-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0389
Chloroaniline, 4-	106-47-8	0.21	mg/kg	0.42	UJ	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chloroaniline, 4-	106-47-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0364
Chloroaniline, 4-	106-47-8	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0335
Chloroaniline, 4-	106-47-8	0.2013	mg/kg	0.4025	UJUJ	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.03495
Chloroaniline, 4-	106-47-8	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0348
Chloroaniline, 4-	106-47-8	0.234	mg/kg	0.468	UJ	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0406
Chloroaniline, 4-	106-47-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.035
Chloroaniline, 4-	106-47-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0345
Chloroaniline, 4-	106-47-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0351
Chloroaniline, 4-	106-47-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0358
Chloroaniline, 4-	106-47-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0353
Chloroaniline, 4-	106-47-8	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0348
Chloroaniline, 4-	106-47-8	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0358
Chloroaniline, 4-	106-47-8	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.036
Chloroaniline, 4-	106-47-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0333
Chloroaniline, 4-	106-47-8	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0358
Chloroaniline, 4-	106-47-8	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0323
Chloronaphthalene, 2-	91-58-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00779
Chloronaphthalene, 2-	91-58-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00771
Chloronaphthalene, 2-	91-58-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00729
Chloronaphthalene, 2-	91-58-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0377
Chloronaphthalene, 2-	91-58-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0332
Chloronaphthalene, 2-	91-58-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00854
Chloronaphthalene, 2-	91-58-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chloronaphthalene, 2-	91-58-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloronaphthalene, 2-	91-58-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chloronaphthalene, 2-	91-58-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chloronaphthalene, 2-	91-58-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chloronaphthalene, 2-	91-58-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00653
Chloronaphthalene, 2-	91-58-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00712
Chloronaphthalene, 2-	91-58-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chloronaphthalene, 2-	91-58-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00667
Chloronaphthalene, 2-	91-58-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00615
Chloronaphthalene, 2-	91-58-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.006405
Chloronaphthalene, 2-	91-58-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00638
Chloronaphthalene, 2-	91-58-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00745
Chloronaphthalene, 2-	91-58-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00642
Chloronaphthalene, 2-	91-58-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00633
Chloronaphthalene, 2-	91-58-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00643
Chloronaphthalene, 2-	91-58-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00656
Chloronaphthalene, 2-	91-58-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00648

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Chloronaphthalene, 2-	91-58-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00638
Chloronaphthalene, 2-	91-58-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00656
Chloronaphthalene, 2-	91-58-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0066
Chloronaphthalene, 2-	91-58-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0061
Chloronaphthalene, 2-	91-58-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00656
Chloronaphthalene, 2-	91-58-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.005925
Chlorophenol, 2-	95-57-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00603
Chlorophenol, 2-	95-57-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00597
Chlorophenol, 2-	95-57-8	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00564
Chlorophenol, 2-	95-57-8	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0292
Chlorophenol, 2-	95-57-8	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0257
Chlorophenol, 2-	95-57-8	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0066
Chlorophenol, 2-	95-57-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chlorophenol, 2-	95-57-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenol, 2-	95-57-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chlorophenol, 2-	95-57-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenol, 2-	95-57-8	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chlorophenol, 2-	95-57-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00505
Chlorophenol, 2-	95-57-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00551
Chlorophenol, 2-	95-57-8	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chlorophenol, 2-	95-57-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00516
Chlorophenol, 2-	95-57-8	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00476
Chlorophenol, 2-	95-57-8	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.004955
Chlorophenol, 2-	95-57-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00494
Chlorophenol, 2-	95-57-8	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00576
Chlorophenol, 2-	95-57-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00497
Chlorophenol, 2-	95-57-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0049
Chlorophenol, 2-	95-57-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00498
Chlorophenol, 2-	95-57-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00508
Chlorophenol, 2-	95-57-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00501
Chlorophenol, 2-	95-57-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00494
Chlorophenol, 2-	95-57-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00507
Chlorophenol, 2-	95-57-8	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00511
Chlorophenol, 2-	95-57-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00472
Chlorophenol, 2-	95-57-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00507
Chlorophenol, 2-	95-57-8	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.004585
Chlorophenyl phenyl ether, 4-	7005-72-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0375
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0371
Chlorophenyl phenyl ether, 4-	7005-72-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0351
Chlorophenyl phenyl ether, 4-	7005-72-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.182
Chlorophenyl phenyl ether, 4-	7005-72-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1595
Chlorophenyl phenyl ether, 4-	7005-72-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0411
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chlorophenyl phenyl ether, 4-	7005-72-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenyl phenyl ether, 4-	7005-72-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chlorophenyl phenyl ether, 4-	7005-72-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chlorophenyl phenyl ether, 4-	7005-72-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chlorophenyl phenyl ether, 4-	7005-72-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0314
Chlorophenyl phenyl ether, 4-	7005-72-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0343
Chlorophenyl phenyl ether, 4-	7005-72-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0321
Chlorophenyl phenyl ether, 4-	7005-72-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0296
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0308
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0307
Chlorophenyl phenyl ether, 4-	7005-72-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0358
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0309
Chlorophenyl phenyl ether, 4-	7005-72-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0305
Chlorophenyl phenyl ether, 4-	7005-72-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0309
Chlorophenyl phenyl ether, 4-	7005-72-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0316
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0312
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0307
Chlorophenyl phenyl ether, 4-	7005-72-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0316
Chlorophenyl phenyl ether, 4-	7005-72-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0318
Chlorophenyl phenyl ether, 4-	7005-72-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0294
Chlorophenyl phenyl ether, 4-	7005-72-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0316
Chlorophenyl phenyl ether, 4-	7005-72-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.02855
Chromium	7440-47-3	12.4	mg/kg	0.576		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.288

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Chromium	7440-47-3	13.6	mg/kg	0.523		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.261
Chromium	7440-47-3	12	mg/kg	0.511		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.256
Chromium	7440-47-3	16.4	mg/kg	0.516		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.258
Chromium	7440-47-3	13	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.238
Chromium	7440-47-3	10.7	mg/kg	0.605		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.302
Chromium	7440-47-3	13.2	mg/kg	0.71		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		0.71
Chromium	7440-47-3	12.2	mg/kg	1.3		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		1.3
Chromium	7440-47-3	18.1	mg/kg	0.84		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.84
Chromium	7440-47-3	10.5	mg/kg	0.65		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.65
Chromium	7440-47-3	13.5	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Chromium	7440-47-3	10.6	mg/kg	0.496		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.248
Chromium	7440-47-3	14.6	mg/kg	0.567		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.284
Chromium	7440-47-3	20.7	mg/kg	0.63		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		0.63
Chromium	7440-47-3	11.9	mg/kg	0.431		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.215
Chromium	7440-47-3	5.51	mg/kg	0.49		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.245
Chromium	7440-47-3	11.6	mg/kg	0.4715		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.2355
Chromium	7440-47-3	13.5	mg/kg	0.489		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.244
Chromium	7440-47-3	8.34	mg/kg	0.484		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.242
Chromium	7440-47-3	11.7	mg/kg	0.419		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.209
Chromium	7440-47-3	13.9	mg/kg	0.413		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.207
Chromium	7440-47-3	19.5	mg/kg	0.451		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.226
Chromium	7440-47-3	13.4	mg/kg	0.476		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.238
Chromium	7440-47-3	11.5	mg/kg	0.456		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.228
Chromium	7440-47-3	11.7	mg/kg	0.446		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.223
Chromium	7440-47-3	17.7	mg/kg	0.474		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.237
Chromium	7440-47-3	13.7	mg/kg	0.47		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.235
Chromium	7440-47-3	13.4	mg/kg	0.472		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.236
Chromium	7440-47-3	17	mg/kg	0.482		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.241
Chromium	7440-47-3	12.75	mg/kg	0.4525		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.2265
Chrysene	218-01-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0194
Chrysene	218-01-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0192
Chrysene	218-01-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0182
Chrysene	218-01-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.094
Chrysene	218-01-9	0.85	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0827
Chrysene	218-01-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0213
Chrysene	218-01-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Chrysene	218-01-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chrysene	218-01-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Chrysene	218-01-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Chrysene	218-01-9	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Chrysene	218-01-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0163
Chrysene	218-01-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0177
Chrysene	218-01-9	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Chrysene	218-01-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0166
Chrysene	218-01-9	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0153
Chrysene	218-01-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.01595
Chrysene	218-01-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0159
Chrysene	218-01-9	0.0675	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0186
Chrysene	218-01-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.016
Chrysene	218-01-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0158
Chrysene	218-01-9	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.016
Chrysene	218-01-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0163
Chrysene	218-01-9	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0161
Chrysene	218-01-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0159
Chrysene	218-01-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0163
Chrysene	218-01-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0164
Chrysene	218-01-9	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0152
Chrysene	218-01-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0163
Chrysene	218-01-9	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0148
Cobalt	7440-48-4	8.57	mg/kg	0.23		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Cobalt	7440-48-4	9.92	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Cobalt	7440-48-4	8.92	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Cobalt	7440-48-4	8.36	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Cobalt	7440-48-4	6.715	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Cobalt	7440-48-4	6.2	mg/kg	0.242		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Cobalt	7440-48-4	5.75	mg/kg	7.1	/U	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	U	7.1
Cobalt	7440-48-4	6.8	mg/kg	6.5		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		6.5

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Cobalt	7440-48-4	4.2	mg/kg	8.4	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	8.4
Cobalt	7440-48-4	8.6	mg/kg	6.5		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		6.5
Cobalt	7440-48-4	26	mg/kg	12.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		12.2
Cobalt	7440-48-4	5.47	mg/kg	0.199		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Cobalt	7440-48-4	10.1	mg/kg	0.227		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Cobalt	7440-48-4	14.8	mg/kg	6.3		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		6.3
Cobalt	7440-48-4	9.76	mg/kg	0.172		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.0861
Cobalt	7440-48-4	3.23	mg/kg	0.196		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.098
Cobalt	7440-48-4	27.85	mg/kg	0.1885		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.09425
Cobalt	7440-48-4	20.5	mg/kg	0.196		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0978
Cobalt	7440-48-4	5.37	mg/kg	0.194		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0969
Cobalt	7440-48-4	8.95	mg/kg	0.168		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.0838
Cobalt	7440-48-4	6.18	mg/kg	0.165		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.0826
Cobalt	7440-48-4	10.1	mg/kg	0.181		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.0903
Cobalt	7440-48-4	9.22	mg/kg	0.19		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.0951
Cobalt	7440-48-4	8.14	mg/kg	0.182		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.0911
Cobalt	7440-48-4	8.43	mg/kg	0.179		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.0893
Cobalt	7440-48-4	62.2	mg/kg	0.19		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.0948
Cobalt	7440-48-4	10.3	mg/kg	0.188		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.094
Cobalt	7440-48-4	11.2	mg/kg	0.189		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.0944
Cobalt	7440-48-4	10.1	mg/kg	0.193		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.0965
Cobalt	7440-48-4	10.5	mg/kg	0.181		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.0905
Copper	7440-50-8	27.3	mg/kg	0.576	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.288
Copper	7440-50-8	30.5	mg/kg	0.523		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.261
Copper	7440-50-8	50	mg/kg	0.511		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.256
Copper	7440-50-8	47.9	mg/kg	0.516		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.258
Copper	7440-50-8	31.9	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.238
Copper	7440-50-8	18.2	mg/kg	0.605	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.302
Copper	7440-50-8	15.25	mg/kg	3.55		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		3.55
Copper	7440-50-8	32.1	mg/kg	3.3		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		3.3
Copper	7440-50-8	13.5	mg/kg	4.2		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		4.2
Copper	7440-50-8	24	mg/kg	3.2		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		3.2
Copper	7440-50-8	34.2	mg/kg	6.1		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		6.1
Copper	7440-50-8	15.4	mg/kg	0.496	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.248
Copper	7440-50-8	20.5	mg/kg	0.567	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.284
Copper	7440-50-8	27.9	mg/kg	3.2		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		3.2
Copper	7440-50-8	37.7	mg/kg	0.431	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.215
Copper	7440-50-8	7.71	mg/kg	0.49		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.245
Copper	7440-50-8	10.4	mg/kg	0.4715		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.2355
Copper	7440-50-8	10.4	mg/kg	0.489		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.244
Copper	7440-50-8	21.3	mg/kg	0.484		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.242
Copper	7440-50-8	26.6	mg/kg	0.419	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.209
Copper	7440-50-8	25.4	mg/kg	0.413	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.207
Copper	7440-50-8	27	mg/kg	0.451	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.226
Copper	7440-50-8	27.6	mg/kg	0.476	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.238
Copper	7440-50-8	24.4	mg/kg	0.456	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.228
Copper	7440-50-8	27.3	mg/kg	0.446		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.223
Copper	7440-50-8	30.7	mg/kg	0.474		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.237
Copper	7440-50-8	29.2	mg/kg	0.47		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.235
Copper	7440-50-8	32.7	mg/kg	0.472	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.236
Copper	7440-50-8	28.4	mg/kg	0.482		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.241
Copper	7440-50-8	30.75	mg/kg	0.4525	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.2265
Dibenz(a,h)anthracene	53-70-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.111
Dibenz(a,h)anthracene	53-70-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.11
Dibenz(a,h)anthracene	53-70-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.104
Dibenz(a,h)anthracene	53-70-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.536
Dibenz(a,h)anthracene	53-70-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.472
Dibenz(a,h)anthracene	53-70-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.121
Dibenz(a,h)anthracene	53-70-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dibenz(a,h)anthracene	53-70-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenz(a,h)anthracene	53-70-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dibenz(a,h)anthracene	53-70-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenz(a,h)anthracene	53-70-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dibenz(a,h)anthracene	53-70-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0928
Dibenz(a,h)anthracene	53-70-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.101
Dibenz(a,h)anthracene	53-70-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dibenz(a,h)anthracene	53-70-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0947

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dibenz(a,h)anthracene	53-70-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0874
Dibenz(a,h)anthracene	53-70-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.091
Dibenz(a,h)anthracene	53-70-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0906
Dibenz(a,h)anthracene	53-70-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.106
Dibenz(a,h)anthracene	53-70-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0912
Dibenz(a,h)anthracene	53-70-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.09
Dibenz(a,h)anthracene	53-70-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0914
Dibenz(a,h)anthracene	53-70-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0932
Dibenz(a,h)anthracene	53-70-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.092
Dibenz(a,h)anthracene	53-70-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0906
Dibenz(a,h)anthracene	53-70-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0932
Dibenz(a,h)anthracene	53-70-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0938
Dibenz(a,h)anthracene	53-70-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0867
Dibenz(a,h)anthracene	53-70-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0932
Dibenz(a,h)anthracene	53-70-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.08425
Dibenzofuran	132-64-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00823
Dibenzofuran	132-64-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00815
Dibenzofuran	132-64-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00771
Dibenzofuran	132-64-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0399
Dibenzofuran	132-64-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0351
Dibenzofuran	132-64-9	0.0757	mg/kg	0.536	QJ	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.00902
Dibenzofuran	132-64-9	0.2325	mg/kg	0.465	UJUJ	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dibenzofuran	132-64-9	0.215	mg/kg	0.43	UJ	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenzofuran	132-64-9	0.275	mg/kg	0.55	UJ	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dibenzofuran	132-64-9	0.215	mg/kg	0.43	UJ	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dibenzofuran	132-64-9	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dibenzofuran	132-64-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0069
Dibenzofuran	132-64-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00753
Dibenzofuran	132-64-9	0.21	mg/kg	0.42	UJ	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dibenzofuran	132-64-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00704
Dibenzofuran	132-64-9	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0065
Dibenzofuran	132-64-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.006765
Dibenzofuran	132-64-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00674
Dibenzofuran	132-64-9	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00787
Dibenzofuran	132-64-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00678
Dibenzofuran	132-64-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00669
Dibenzofuran	132-64-9	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0068
Dibenzofuran	132-64-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00693
Dibenzofuran	132-64-9	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00684
Dibenzofuran	132-64-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00674
Dibenzofuran	132-64-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00693
Dibenzofuran	132-64-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00698
Dibenzofuran	132-64-9	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00645
Dibenzofuran	132-64-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00693
Dibenzofuran	132-64-9	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.006265
Dichlorobenzene, 1,2-	95-50-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0113
Dichlorobenzene, 1,2-	95-50-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0112
Dichlorobenzene, 1,2-	95-50-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0106
Dichlorobenzene, 1,2-	95-50-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0548
Dichlorobenzene, 1,2-	95-50-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.04825
Dichlorobenzene, 1,2-	95-50-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0124
Dichlorobenzene, 1,2-	95-50-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,2-	95-50-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,2-	95-50-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,2-	95-50-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,2-	95-50-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,2-	95-50-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00949
Dichlorobenzene, 1,2-	95-50-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0104
Dichlorobenzene, 1,2-	95-50-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dichlorobenzene, 1,2-	95-50-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00969
Dichlorobenzene, 1,2-	95-50-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00894
Dichlorobenzene, 1,2-	95-50-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.009305
Dichlorobenzene, 1,2-	95-50-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00927
Dichlorobenzene, 1,2-	95-50-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0108
Dichlorobenzene, 1,2-	95-50-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00933
Dichlorobenzene, 1,2-	95-50-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0092
Dichlorobenzene, 1,2-	95-50-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00934

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dichlorobenzene, 1,2-	95-50-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00953
Dichlorobenzene, 1,2-	95-50-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00941
Dichlorobenzene, 1,2-	95-50-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00927
Dichlorobenzene, 1,2-	95-50-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00953
Dichlorobenzene, 1,2-	95-50-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00959
Dichlorobenzene, 1,2-	95-50-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00887
Dichlorobenzene, 1,2-	95-50-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00953
Dichlorobenzene, 1,2-	95-50-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00861
Dichlorobenzene, 1,3-	541-73-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0178
Dichlorobenzene, 1,3-	541-73-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0176
Dichlorobenzene, 1,3-	541-73-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0167
Dichlorobenzene, 1,3-	541-73-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0861
Dichlorobenzene, 1,3-	541-73-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07585
Dichlorobenzene, 1,3-	541-73-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0195
Dichlorobenzene, 1,3-	541-73-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,3-	541-73-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,3-	541-73-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,3-	541-73-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,3-	541-73-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,3-	541-73-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0149
Dichlorobenzene, 1,3-	541-73-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0163
Dichlorobenzene, 1,3-	541-73-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dichlorobenzene, 1,3-	541-73-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0152
Dichlorobenzene, 1,3-	541-73-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.014
Dichlorobenzene, 1,3-	541-73-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0146
Dichlorobenzene, 1,3-	541-73-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0146
Dichlorobenzene, 1,3-	541-73-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.017
Dichlorobenzene, 1,3-	541-73-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0147
Dichlorobenzene, 1,3-	541-73-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0145
Dichlorobenzene, 1,3-	541-73-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0147
Dichlorobenzene, 1,3-	541-73-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.015
Dichlorobenzene, 1,3-	541-73-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0148
Dichlorobenzene, 1,3-	541-73-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0146
Dichlorobenzene, 1,3-	541-73-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.015
Dichlorobenzene, 1,3-	541-73-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0151
Dichlorobenzene, 1,3-	541-73-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0139
Dichlorobenzene, 1,3-	541-73-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.015
Dichlorobenzene, 1,3-	541-73-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01355
Dichlorobenzene, 1,4-	106-46-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00956
Dichlorobenzene, 1,4-	106-46-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00946
Dichlorobenzene, 1,4-	106-46-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00894
Dichlorobenzene, 1,4-	106-46-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0463
Dichlorobenzene, 1,4-	106-46-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0407
Dichlorobenzene, 1,4-	106-46-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0105
Dichlorobenzene, 1,4-	106-46-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzene, 1,4-	106-46-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,4-	106-46-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzene, 1,4-	106-46-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzene, 1,4-	106-46-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzene, 1,4-	106-46-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00801
Dichlorobenzene, 1,4-	106-46-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00874
Dichlorobenzene, 1,4-	106-46-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dichlorobenzene, 1,4-	106-46-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00818
Dichlorobenzene, 1,4-	106-46-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00754
Dichlorobenzene, 1,4-	106-46-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.007855
Dichlorobenzene, 1,4-	106-46-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00782
Dichlorobenzene, 1,4-	106-46-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00913
Dichlorobenzene, 1,4-	106-46-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00787
Dichlorobenzene, 1,4-	106-46-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00777
Dichlorobenzene, 1,4-	106-46-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00789
Dichlorobenzene, 1,4-	106-46-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00805
Dichlorobenzene, 1,4-	106-46-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00794
Dichlorobenzene, 1,4-	106-46-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00782
Dichlorobenzene, 1,4-	106-46-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00805
Dichlorobenzene, 1,4-	106-46-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0081
Dichlorobenzene, 1,4-	106-46-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00749
Dichlorobenzene, 1,4-	106-46-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00804

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dichlorobenzene, 1,4-	106-46-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00727
Dichlorobenzidine, 3,3'-	91-94-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0485
Dichlorobenzidine, 3,3'-	91-94-1	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.048
Dichlorobenzidine, 3,3'-	91-94-1	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0454
Dichlorobenzidine, 3,3'-	91-94-1	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.235
Dichlorobenzidine, 3,3'-	91-94-1	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2065
Dichlorobenzidine, 3,3'-	91-94-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0531
Dichlorobenzidine, 3,3'-	91-94-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorobenzidine, 3,3'-	91-94-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzidine, 3,3'-	91-94-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorobenzidine, 3,3'-	91-94-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorobenzidine, 3,3'-	91-94-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorobenzidine, 3,3'-	91-94-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0407
Dichlorobenzidine, 3,3'-	91-94-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0444
Dichlorobenzidine, 3,3'-	91-94-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dichlorobenzidine, 3,3'-	91-94-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0415
Dichlorobenzidine, 3,3'-	91-94-1	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0383
Dichlorobenzidine, 3,3'-	91-94-1	0.2013	mg/kg	0.4025	UJUJ	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0399
Dichlorobenzidine, 3,3'-	91-94-1	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0397
Dichlorobenzidine, 3,3'-	91-94-1	0.234	mg/kg	0.468	UJ	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0464
Dichlorobenzidine, 3,3'-	91-94-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.04
Dichlorobenzidine, 3,3'-	91-94-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0394
Dichlorobenzidine, 3,3'-	91-94-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.04
Dichlorobenzidine, 3,3'-	91-94-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0409
Dichlorobenzidine, 3,3'-	91-94-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0403
Dichlorobenzidine, 3,3'-	91-94-1	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0397
Dichlorobenzidine, 3,3'-	91-94-1	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0408
Dichlorobenzidine, 3,3'-	91-94-1	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0411
Dichlorobenzidine, 3,3'-	91-94-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.038
Dichlorobenzidine, 3,3'-	91-94-1	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0408
Dichlorobenzidine, 3,3'-	91-94-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0369
Dichlorophenol, 2,4-	120-83-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
Dichlorophenol, 2,4-	120-83-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
Dichlorophenol, 2,4-	120-83-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Dichlorophenol, 2,4-	120-83-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
Dichlorophenol, 2,4-	120-83-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
Dichlorophenol, 2,4-	120-83-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
Dichlorophenol, 2,4-	120-83-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dichlorophenol, 2,4-	120-83-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorophenol, 2,4-	120-83-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dichlorophenol, 2,4-	120-83-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dichlorophenol, 2,4-	120-83-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dichlorophenol, 2,4-	120-83-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
Dichlorophenol, 2,4-	120-83-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
Dichlorophenol, 2,4-	120-83-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dichlorophenol, 2,4-	120-83-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.015
Dichlorophenol, 2,4-	120-83-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0138
Dichlorophenol, 2,4-	120-83-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0144
Dichlorophenol, 2,4-	120-83-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0143
Dichlorophenol, 2,4-	120-83-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0167
Dichlorophenol, 2,4-	120-83-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0144
Dichlorophenol, 2,4-	120-83-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0142
Dichlorophenol, 2,4-	120-83-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0144
Dichlorophenol, 2,4-	120-83-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0147
Dichlorophenol, 2,4-	120-83-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0145
Dichlorophenol, 2,4-	120-83-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0143
Dichlorophenol, 2,4-	120-83-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
Dichlorophenol, 2,4-	120-83-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0148
Dichlorophenol, 2,4-	120-83-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0137
Dichlorophenol, 2,4-	120-83-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
Dichlorophenol, 2,4-	120-83-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0133
Diethyl phthalate	84-66-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0198
Diethyl phthalate	84-66-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0196
Diethyl phthalate	84-66-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0186
Diethyl phthalate	84-66-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0961
Diethyl phthalate	84-66-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08465
Diethyl phthalate	84-66-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0217

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Diethyl phthalate	84-66-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Diethyl phthalate	84-66-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Diethyl phthalate	84-66-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Diethyl phthalate	84-66-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Diethyl phthalate	84-66-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Diethyl phthalate	84-66-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0166
Diethyl phthalate	84-66-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0181
Diethyl phthalate	84-66-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Diethyl phthalate	84-66-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.017
Diethyl phthalate	84-66-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0157
Diethyl phthalate	84-66-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0163
Diethyl phthalate	84-66-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0163
Diethyl phthalate	84-66-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.019
Diethyl phthalate	84-66-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0164
Diethyl phthalate	84-66-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0161
Diethyl phthalate	84-66-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0164
Diethyl phthalate	84-66-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0167
Diethyl phthalate	84-66-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0165
Diethyl phthalate	84-66-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0163
Diethyl phthalate	84-66-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0167
Diethyl phthalate	84-66-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0168
Diethyl phthalate	84-66-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0155
Diethyl phthalate	84-66-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0167
Diethyl phthalate	84-66-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0151
Dimethyl phthalate	131-11-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.015
Dimethyl phthalate	131-11-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0148
Dimethyl phthalate	131-11-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.014
Dimethyl phthalate	131-11-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0726
Dimethyl phthalate	131-11-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0639
Dimethyl phthalate	131-11-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0164
Dimethyl phthalate	131-11-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dimethyl phthalate	131-11-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethyl phthalate	131-11-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dimethyl phthalate	131-11-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethyl phthalate	131-11-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dimethyl phthalate	131-11-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0126
Dimethyl phthalate	131-11-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0137
Dimethyl phthalate	131-11-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dimethyl phthalate	131-11-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0128
Dimethyl phthalate	131-11-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0118
Dimethyl phthalate	131-11-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0123
Dimethyl phthalate	131-11-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0123
Dimethyl phthalate	131-11-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0143
Dimethyl phthalate	131-11-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0124
Dimethyl phthalate	131-11-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0122
Dimethyl phthalate	131-11-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0124
Dimethyl phthalate	131-11-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0126
Dimethyl phthalate	131-11-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0125
Dimethyl phthalate	131-11-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0123
Dimethyl phthalate	131-11-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0126
Dimethyl phthalate	131-11-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0127
Dimethyl phthalate	131-11-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0117
Dimethyl phthalate	131-11-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0126
Dimethyl phthalate	131-11-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01145
Dimethylphenol, 2,4-	105-67-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0129
Dimethylphenol, 2,4-	105-67-9	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0128
Dimethylphenol, 2,4-	105-67-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0121
Dimethylphenol, 2,4-	105-67-9	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0626
Dimethylphenol, 2,4-	105-67-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.05515
Dimethylphenol, 2,4-	105-67-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0142
Dimethylphenol, 2,4-	105-67-9	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dimethylphenol, 2,4-	105-67-9	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethylphenol, 2,4-	105-67-9	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dimethylphenol, 2,4-	105-67-9	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dimethylphenol, 2,4-	105-67-9	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dimethylphenol, 2,4-	105-67-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0108
Dimethylphenol, 2,4-	105-67-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0118

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dimethylphenol, 2,4-	105-67-9	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dimethylphenol, 2,4-	105-67-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0111
Dimethylphenol, 2,4-	105-67-9	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0102
Dimethylphenol, 2,4-	105-67-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0106
Dimethylphenol, 2,4-	105-67-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0106
Dimethylphenol, 2,4-	105-67-9	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0124
Dimethylphenol, 2,4-	105-67-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0107
Dimethylphenol, 2,4-	105-67-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0105
Dimethylphenol, 2,4-	105-67-9	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0107
Dimethylphenol, 2,4-	105-67-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0109
Dimethylphenol, 2,4-	105-67-9	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0108
Dimethylphenol, 2,4-	105-67-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0106
Dimethylphenol, 2,4-	105-67-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0109
Dimethylphenol, 2,4-	105-67-9	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.011
Dimethylphenol, 2,4-	105-67-9	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0101
Dimethylphenol, 2,4-	105-67-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0109
Dimethylphenol, 2,4-	105-67-9	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.009845
Di-n-butyl phthalate	84-74-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Di-n-butyl phthalate	84-74-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Di-n-butyl phthalate	84-74-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Di-n-butyl phthalate	84-74-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Di-n-butyl phthalate	84-74-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0451
Di-n-butyl phthalate	84-74-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Di-n-butyl phthalate	84-74-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Di-n-butyl phthalate	84-74-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-butyl phthalate	84-74-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Di-n-butyl phthalate	84-74-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-butyl phthalate	84-74-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Di-n-butyl phthalate	84-74-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00887
Di-n-butyl phthalate	84-74-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Di-n-butyl phthalate	84-74-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Di-n-butyl phthalate	84-74-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00906
Di-n-butyl phthalate	84-74-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00836
Di-n-butyl phthalate	84-74-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0087
Di-n-butyl phthalate	84-74-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00867
Di-n-butyl phthalate	84-74-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0101
Di-n-butyl phthalate	84-74-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00872
Di-n-butyl phthalate	84-74-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0086
Di-n-butyl phthalate	84-74-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00874
Di-n-butyl phthalate	84-74-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00891
Di-n-butyl phthalate	84-74-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0088
Di-n-butyl phthalate	84-74-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00867
Di-n-butyl phthalate	84-74-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Di-n-butyl phthalate	84-74-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00897
Di-n-butyl phthalate	84-74-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00829
Di-n-butyl phthalate	84-74-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Di-n-butyl phthalate	84-74-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00805
Dinitro-2-methylphenol, 4,6-	534-52-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0492
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0488
Dinitro-2-methylphenol, 4,6-	534-52-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0461
Dinitro-2-methylphenol, 4,6-	534-52-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.238
Dinitro-2-methylphenol, 4,6-	534-52-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.21
Dinitro-2-methylphenol, 4,6-	534-52-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.054
Dinitro-2-methylphenol, 4,6-	534-52-1	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Dinitro-2-methylphenol, 4,6-	534-52-1	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitro-2-methylphenol, 4,6-	534-52-1	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Dinitro-2-methylphenol, 4,6-	534-52-1	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitro-2-methylphenol, 4,6-	534-52-1	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Dinitro-2-methylphenol, 4,6-	534-52-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0413
Dinitro-2-methylphenol, 4,6-	534-52-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.045
Dinitro-2-methylphenol, 4,6-	534-52-1	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0421
Dinitro-2-methylphenol, 4,6-	534-52-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0389
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0405
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0403
Dinitro-2-methylphenol, 4,6-	534-52-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0471
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0406

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dinitro-2-methylphenol, 4,6-	534-52-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.04
Dinitro-2-methylphenol, 4,6-	534-52-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0407
Dinitro-2-methylphenol, 4,6-	534-52-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0415
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0409
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0403
Dinitro-2-methylphenol, 4,6-	534-52-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0415
Dinitro-2-methylphenol, 4,6-	534-52-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0417
Dinitro-2-methylphenol, 4,6-	534-52-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0386
Dinitro-2-methylphenol, 4,6-	534-52-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0415
Dinitro-2-methylphenol, 4,6-	534-52-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.03745
Dinitrobenzene, 1,3-	99-65-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrobenzene, 1,3-	99-65-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrobenzene, 1,3-	99-65-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrobenzene, 1,3-	99-65-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrobenzene, 1,3-	99-65-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Dinitrobenzene, 1,3-	99-65-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrobenzene, 1,3-	99-65-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrobenzene, 1,3-	99-65-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrobenzene, 1,3-	99-65-0	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Dinitrobenzene, 1,3-	99-65-0	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Dinitrobenzene, 1,3-	99-65-0	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Dinitrobenzene, 1,3-	99-65-0	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Dinitrobenzene, 1,3-	99-65-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Dinitrobenzene, 1,3-	99-65-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Dinitrobenzene, 1,3-	99-65-0	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Dinitrobenzene, 1,3-	99-65-0	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Dinitrobenzene, 1,3-	99-65-0	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Dinitrobenzene, 1,3-	99-65-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Dinitrobenzene, 1,3-	99-65-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Dinitrobenzene, 1,3-	99-65-0	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Dinitrobenzene, 1,3-	99-65-0	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Dinitrobenzene, 1,3-	99-65-0	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Dinitrobenzene, 1,3-	99-65-0	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Dinitrobenzene, 1,3-	99-65-0	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Dinitrophenol, 2,4-	51-28-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0781
Dinitrophenol, 2,4-	51-28-5	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0773
Dinitrophenol, 2,4-	51-28-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0731
Dinitrophenol, 2,4-	51-28-5	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.378
Dinitrophenol, 2,4-	51-28-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.3325
Dinitrophenol, 2,4-	51-28-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0855
Dinitrophenol, 2,4-	51-28-5	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Dinitrophenol, 2,4-	51-28-5	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitrophenol, 2,4-	51-28-5	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Dinitrophenol, 2,4-	51-28-5	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Dinitrophenol, 2,4-	51-28-5	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Dinitrophenol, 2,4-	51-28-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0654
Dinitrophenol, 2,4-	51-28-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0714
Dinitrophenol, 2,4-	51-28-5	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Dinitrophenol, 2,4-	51-28-5	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0668
Dinitrophenol, 2,4-	51-28-5	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0616
Dinitrophenol, 2,4-	51-28-5	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.06415
Dinitrophenol, 2,4-	51-28-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0639
Dinitrophenol, 2,4-	51-28-5	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0746
Dinitrophenol, 2,4-	51-28-5	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0643
Dinitrophenol, 2,4-	51-28-5	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0635
Dinitrophenol, 2,4-	51-28-5	0.202	mg/kg	0.404	UJ	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0644
Dinitrophenol, 2,4-	51-28-5	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0657
Dinitrophenol, 2,4-	51-28-5	0.2035	mg/kg	0.407	UJ	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0649
Dinitrophenol, 2,4-	51-28-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0639
Dinitrophenol, 2,4-	51-28-5	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0657
Dinitrophenol, 2,4-	51-28-5	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0662
Dinitrophenol, 2,4-	51-28-5	0.192	mg/kg	0.384	UJ	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0612
Dinitrophenol, 2,4-	51-28-5	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0657
Dinitrophenol, 2,4-	51-28-5	0.1863	mg/kg	0.3725	UJUJ	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.05935
Dinitrotoluene, 2,4-	121-14-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0172
Dinitrotoluene, 2,4-	121-14-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrotoluene, 2,4-	121-14-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.017

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dinitrotoluene, 2,4-	121-14-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrotoluene, 2,4-	121-14-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0161
Dinitrotoluene, 2,4-	121-14-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrotoluene, 2,4-	121-14-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0833
Dinitrotoluene, 2,4-	121-14-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrotoluene, 2,4-	121-14-2	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.11295
Dinitrotoluene, 2,4-	121-14-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0188
Dinitrotoluene, 2,4-	121-14-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrotoluene, 2,4-	121-14-2	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.10585
Dinitrotoluene, 2,4-	121-14-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dinitrotoluene, 2,4-	121-14-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,4-	121-14-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dinitrotoluene, 2,4-	121-14-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,4-	121-14-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dinitrotoluene, 2,4-	121-14-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0144
Dinitrotoluene, 2,4-	121-14-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrotoluene, 2,4-	121-14-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0157
Dinitrotoluene, 2,4-	121-14-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrotoluene, 2,4-	121-14-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dinitrotoluene, 2,4-	121-14-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0147
Dinitrotoluene, 2,4-	121-14-2	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Dinitrotoluene, 2,4-	121-14-2	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Dinitrotoluene, 2,4-	121-14-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0136
Dinitrotoluene, 2,4-	121-14-2	0.1818	mg/kg	0.3635	UU	ASH PIT 1-SB04	AP0011AP0011	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0881
Dinitrotoluene, 2,4-	121-14-2	0.177	mg/kg	0.354	UU	ASH PIT 1-SB04	AP0012AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.08355
Dinitrotoluene, 2,4-	121-14-2	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Dinitrotoluene, 2,4-	121-14-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0141
Dinitrotoluene, 2,4-	121-14-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0164
Dinitrotoluene, 2,4-	121-14-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Dinitrotoluene, 2,4-	121-14-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0142
Dinitrotoluene, 2,4-	121-14-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Dinitrotoluene, 2,4-	121-14-2	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Dinitrotoluene, 2,4-	121-14-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.014
Dinitrotoluene, 2,4-	121-14-2	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Dinitrotoluene, 2,4-	121-14-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0142
Dinitrotoluene, 2,4-	121-14-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0145
Dinitrotoluene, 2,4-	121-14-2	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Dinitrotoluene, 2,4-	121-14-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0143
Dinitrotoluene, 2,4-	121-14-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Dinitrotoluene, 2,4-	121-14-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0141
Dinitrotoluene, 2,4-	121-14-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Dinitrotoluene, 2,4-	121-14-2	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Dinitrotoluene, 2,4-	121-14-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0145
Dinitrotoluene, 2,4-	121-14-2	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Dinitrotoluene, 2,4-	121-14-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0146
Dinitrotoluene, 2,4-	121-14-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0135
Dinitrotoluene, 2,4-	121-14-2	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Dinitrotoluene, 2,4-	121-14-2	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Dinitrotoluene, 2,4-	121-14-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0145
Dinitrotoluene, 2,4-	121-14-2	0.1643	mg/kg	0.3285	UJU	ASH PIT 1-SB09	AP0028AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07665
Dinitrotoluene, 2,4-	121-14-2	0.1618	mg/kg	0.3235	UJU	ASH PIT 1-SB09	AP0058AP0058	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07645
Dinitrotoluene, 2,6-	606-20-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0118
Dinitrotoluene, 2,6-	606-20-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Dinitrotoluene, 2,6-	606-20-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0116
Dinitrotoluene, 2,6-	606-20-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Dinitrotoluene, 2,6-	606-20-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.011
Dinitrotoluene, 2,6-	606-20-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Dinitrotoluene, 2,6-	606-20-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.057
Dinitrotoluene, 2,6-	606-20-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Dinitrotoluene, 2,6-	606-20-2	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1011
Dinitrotoluene, 2,6-	606-20-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0129
Dinitrotoluene, 2,6-	606-20-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Dinitrotoluene, 2,6-	606-20-2	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0945
Dinitrotoluene, 2,6-	606-20-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Dinitrotoluene, 2,6-	606-20-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Dinitrotoluene, 2,6-	606-20-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Dinitrotoluene, 2,6-	606-20-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Dinitrotoluene, 2,6-	606-20-2	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Dinitrotoluene, 2,6-	606-20-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00986
Dinitrotoluene, 2,6-	606-20-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Dinitrotoluene, 2,6-	606-20-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0108
Dinitrotoluene, 2,6-	606-20-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Dinitrotoluene, 2,6-	606-20-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Dinitrotoluene, 2,6-	606-20-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0101
Dinitrotoluene, 2,6-	606-20-2	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Dinitrotoluene, 2,6-	606-20-2	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Dinitrotoluene, 2,6-	606-20-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00928
Dinitrotoluene, 2,6-	606-20-2	0.1818	mg/kg	0.3635	UU	ASH PIT 1-SB04	AP0011AP0011	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.08584
Dinitrotoluene, 2,6-	606-20-2	0.177	mg/kg	0.354	UU	ASH PIT 1-SB04	AP0012AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.08133
Dinitrotoluene, 2,6-	606-20-2	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Dinitrotoluene, 2,6-	606-20-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00963
Dinitrotoluene, 2,6-	606-20-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0112
Dinitrotoluene, 2,6-	606-20-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Dinitrotoluene, 2,6-	606-20-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00969
Dinitrotoluene, 2,6-	606-20-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Dinitrotoluene, 2,6-	606-20-2	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Dinitrotoluene, 2,6-	606-20-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00956
Dinitrotoluene, 2,6-	606-20-2	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Dinitrotoluene, 2,6-	606-20-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00971
Dinitrotoluene, 2,6-	606-20-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00991
Dinitrotoluene, 2,6-	606-20-2	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Dinitrotoluene, 2,6-	606-20-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00978
Dinitrotoluene, 2,6-	606-20-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Dinitrotoluene, 2,6-	606-20-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00963
Dinitrotoluene, 2,6-	606-20-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Dinitrotoluene, 2,6-	606-20-2	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Dinitrotoluene, 2,6-	606-20-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0099
Dinitrotoluene, 2,6-	606-20-2	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Dinitrotoluene, 2,6-	606-20-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00997
Dinitrotoluene, 2,6-	606-20-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00921
Dinitrotoluene, 2,6-	606-20-2	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Dinitrotoluene, 2,6-	606-20-2	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Dinitrotoluene, 2,6-	606-20-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0099
Dinitrotoluene, 2,6-	606-20-2	0.1643	mg/kg	0.3285	UJU	ASH PIT 1-SB09	AP0028AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07453
Dinitrotoluene, 2,6-	606-20-2	0.1618	mg/kg	0.3235	UJU	ASH PIT 1-SB09	AP0058AP0058	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07442
Di-n-octyl phthalate	117-84-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0922
Di-n-octyl phthalate	117-84-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0912
Di-n-octyl phthalate	117-84-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0863
Di-n-octyl phthalate	117-84-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.446
Di-n-octyl phthalate	117-84-0	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.393
Di-n-octyl phthalate	117-84-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.101
Di-n-octyl phthalate	117-84-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Di-n-octyl phthalate	117-84-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-octyl phthalate	117-84-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Di-n-octyl phthalate	117-84-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Di-n-octyl phthalate	117-84-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Di-n-octyl phthalate	117-84-0	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0773
Di-n-octyl phthalate	117-84-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0843
Di-n-octyl phthalate	117-84-0	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Di-n-octyl phthalate	117-84-0	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0789
Di-n-octyl phthalate	117-84-0	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0728
Di-n-octyl phthalate	117-84-0	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.07575
Di-n-octyl phthalate	117-84-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0755
Di-n-octyl phthalate	117-84-0	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0881
Di-n-octyl phthalate	117-84-0	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.076
Di-n-octyl phthalate	117-84-0	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0749
Di-n-octyl phthalate	117-84-0	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0761
Di-n-octyl phthalate	117-84-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0776
Di-n-octyl phthalate	117-84-0	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0766
Di-n-octyl phthalate	117-84-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0755
Di-n-octyl phthalate	117-84-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0776
Di-n-octyl phthalate	117-84-0	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0781
Di-n-octyl phthalate	117-84-0	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0722
Di-n-octyl phthalate	117-84-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0776

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Di-n-octyl phthalate	117-84-0	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07015
DIPHENYLAMINE	122-39-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0485
DIPHENYLAMINE	122-39-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.048
DIPHENYLAMINE	122-39-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0454
DIPHENYLAMINE	122-39-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.235
DIPHENYLAMINE	122-39-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.2065
DIPHENYLAMINE	122-39-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0531
DIPHENYLAMINE	122-39-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0407
DIPHENYLAMINE	122-39-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0444
DIPHENYLAMINE	122-39-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0415
DIPHENYLAMINE	122-39-4	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0383
DIPHENYLAMINE	122-39-4	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0399
DIPHENYLAMINE	122-39-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0397
DIPHENYLAMINE	122-39-4	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0464
DIPHENYLAMINE	122-39-4	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.04
DIPHENYLAMINE	122-39-4	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0394
DIPHENYLAMINE	122-39-4	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.04
DIPHENYLAMINE	122-39-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0409
DIPHENYLAMINE	122-39-4	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0403
DIPHENYLAMINE	122-39-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0397
DIPHENYLAMINE	122-39-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0408
DIPHENYLAMINE	122-39-4	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0411
DIPHENYLAMINE	122-39-4	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.038
DIPHENYLAMINE	122-39-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0408
DIPHENYLAMINE	122-39-4	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0369
Fluoranthene	206-44-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0106
Fluoranthene	206-44-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0105
Fluoranthene	206-44-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00991
Fluoranthene	206-44-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0513
Fluoranthene	206-44-0	1.875	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0451
Fluoranthene	206-44-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Fluoranthene	206-44-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Fluoranthene	206-44-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluoranthene	206-44-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Fluoranthene	206-44-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluoranthene	206-44-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Fluoranthene	206-44-0	0.0477	mg/kg	0.41	QJ	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	J	0.00887
Fluoranthene	206-44-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00968
Fluoranthene	206-44-0	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Fluoranthene	206-44-0	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00906
Fluoranthene	206-44-0	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00836
Fluoranthene	206-44-0	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0087
Fluoranthene	206-44-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00867
Fluoranthene	206-44-0	0.126	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0101
Fluoranthene	206-44-0	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00872
Fluoranthene	206-44-0	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0086
Fluoranthene	206-44-0	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00874
Fluoranthene	206-44-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00891
Fluoranthene	206-44-0	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0088
Fluoranthene	206-44-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00867
Fluoranthene	206-44-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Fluoranthene	206-44-0	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00897
Fluoranthene	206-44-0	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00829
Fluoranthene	206-44-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00891
Fluoranthene	206-44-0	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00805
Fluorene	86-73-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0207
Fluorene	86-73-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0205
Fluorene	86-73-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0194
Fluorene	86-73-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.1
Fluorene	86-73-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.08835
Fluorene	86-73-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0227
Fluorene	86-73-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Fluorene	86-73-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluorene	86-73-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Fluorene	86-73-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Fluorene	86-73-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Fluorene	86-73-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0174

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Fluorene	86-73-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.019
Fluorene	86-73-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Fluorene	86-73-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0177
Fluorene	86-73-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0164
Fluorene	86-73-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.01705
Fluorene	86-73-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.017
Fluorene	86-73-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0198
Fluorene	86-73-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0171
Fluorene	86-73-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0169
Fluorene	86-73-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0171
Fluorene	86-73-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0175
Fluorene	86-73-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0172
Fluorene	86-73-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.017
Fluorene	86-73-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0175
Fluorene	86-73-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0176
Fluorene	86-73-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0162
Fluorene	86-73-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0174
Fluorene	86-73-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0158
Hexachlorobenzene	118-74-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0304
Hexachlorobenzene	118-74-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0301
Hexachlorobenzene	118-74-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Hexachlorobenzene	118-74-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.147
Hexachlorobenzene	118-74-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.13
Hexachlorobenzene	118-74-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0333
Hexachlorobenzene	118-74-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorobenzene	118-74-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobenzene	118-74-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorobenzene	118-74-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobenzene	118-74-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorobenzene	118-74-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0255
Hexachlorobenzene	118-74-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0278
Hexachlorobenzene	118-74-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Hexachlorobenzene	118-74-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.026
Hexachlorobenzene	118-74-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.024
Hexachlorobenzene	118-74-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.025
Hexachlorobenzene	118-74-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0249
Hexachlorobenzene	118-74-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0291
Hexachlorobenzene	118-74-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0251
Hexachlorobenzene	118-74-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0247
Hexachlorobenzene	118-74-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0251
Hexachlorobenzene	118-74-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0256
Hexachlorobenzene	118-74-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0253
Hexachlorobenzene	118-74-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0249
Hexachlorobenzene	118-74-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0256
Hexachlorobenzene	118-74-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0258
Hexachlorobenzene	118-74-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0238
Hexachlorobenzene	118-74-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0256
Hexachlorobenzene	118-74-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.02315
Hexachlorobutadiene	87-68-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0465
Hexachlorobutadiene	87-68-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.046
Hexachlorobutadiene	87-68-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0435
Hexachlorobutadiene	87-68-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.225
Hexachlorobutadiene	87-68-3	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.198
Hexachlorobutadiene	87-68-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0509
Hexachlorobutadiene	87-68-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorobutadiene	87-68-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobutadiene	87-68-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorobutadiene	87-68-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorobutadiene	87-68-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorobutadiene	87-68-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0389
Hexachlorobutadiene	87-68-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0425
Hexachlorobutadiene	87-68-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Hexachlorobutadiene	87-68-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0397
Hexachlorobutadiene	87-68-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0367
Hexachlorobutadiene	87-68-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0382
Hexachlorobutadiene	87-68-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.038
Hexachlorobutadiene	87-68-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0444

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Hexachlorobutadiene	87-68-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0383
Hexachlorobutadiene	87-68-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0378
Hexachlorobutadiene	87-68-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0383
Hexachlorobutadiene	87-68-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0391
Hexachlorobutadiene	87-68-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0386
Hexachlorobutadiene	87-68-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.038
Hexachlorobutadiene	87-68-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0391
Hexachlorobutadiene	87-68-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0394
Hexachlorobutadiene	87-68-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0364
Hexachlorobutadiene	87-68-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0391
Hexachlorobutadiene	87-68-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.03535
Hexachlorocyclopentadiene	77-47-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0156
Hexachlorocyclopentadiene	77-47-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0154
Hexachlorocyclopentadiene	77-47-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0146
Hexachlorocyclopentadiene	77-47-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0755
Hexachlorocyclopentadiene	77-47-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.06645
Hexachlorocyclopentadiene	77-47-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0171
Hexachlorocyclopentadiene	77-47-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachlorocyclopentadiene	77-47-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorocyclopentadiene	77-47-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachlorocyclopentadiene	77-47-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachlorocyclopentadiene	77-47-4	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachlorocyclopentadiene	77-47-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0131
Hexachlorocyclopentadiene	77-47-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0142
Hexachlorocyclopentadiene	77-47-4	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Hexachlorocyclopentadiene	77-47-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0133
Hexachlorocyclopentadiene	77-47-4	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0123
Hexachlorocyclopentadiene	77-47-4	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0128
Hexachlorocyclopentadiene	77-47-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0128
Hexachlorocyclopentadiene	77-47-4	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0149
Hexachlorocyclopentadiene	77-47-4	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0128
Hexachlorocyclopentadiene	77-47-4	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0127
Hexachlorocyclopentadiene	77-47-4	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0129
Hexachlorocyclopentadiene	77-47-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0131
Hexachlorocyclopentadiene	77-47-4	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.013
Hexachlorocyclopentadiene	77-47-4	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0128
Hexachlorocyclopentadiene	77-47-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0131
Hexachlorocyclopentadiene	77-47-4	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0132
Hexachlorocyclopentadiene	77-47-4	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0122
Hexachlorocyclopentadiene	77-47-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0131
Hexachlorocyclopentadiene	77-47-4	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01185
Hexachloroethane	67-72-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.015
Hexachloroethane	67-72-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0148
Hexachloroethane	67-72-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.014
Hexachloroethane	67-72-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0726
Hexachloroethane	67-72-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0639
Hexachloroethane	67-72-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0164
Hexachloroethane	67-72-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Hexachloroethane	67-72-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachloroethane	67-72-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Hexachloroethane	67-72-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Hexachloroethane	67-72-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Hexachloroethane	67-72-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0126
Hexachloroethane	67-72-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0137
Hexachloroethane	67-72-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Hexachloroethane	67-72-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0128
Hexachloroethane	67-72-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0118
Hexachloroethane	67-72-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0123
Hexachloroethane	67-72-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0123
Hexachloroethane	67-72-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0143
Hexachloroethane	67-72-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0124
Hexachloroethane	67-72-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0122
Hexachloroethane	67-72-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0124
Hexachloroethane	67-72-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0126
Hexachloroethane	67-72-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0125
Hexachloroethane	67-72-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0123
Hexachloroethane	67-72-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0126

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Hexachloroethane	67-72-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0127
Hexachloroethane	67-72-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0117
Hexachloroethane	67-72-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0126
Hexachloroethane	67-72-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01145
HMX	2691-41-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
HMX	2691-41-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
HMX	2691-41-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
HMX	2691-41-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
HMX	2691-41-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
HMX	2691-41-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
HMX	2691-41-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
HMX	2691-41-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
HMX	2691-41-0	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
HMX	2691-41-0	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
HMX	2691-41-0	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
HMX	2691-41-0	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
HMX	2691-41-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
HMX	2691-41-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
HMX	2691-41-0	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
HMX	2691-41-0	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
HMX	2691-41-0	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
HMX	2691-41-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
HMX	2691-41-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
HMX	2691-41-0	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
HMX	2691-41-0	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
HMX	2691-41-0	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
HMX	2691-41-0	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
HMX	2691-41-0	0.1398	mg/kg	0.2795	UJU	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Indeno(1,2,3-cd)pyrene	193-39-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.159
Indeno(1,2,3-cd)pyrene	193-39-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.157
Indeno(1,2,3-cd)pyrene	193-39-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.149
Indeno(1,2,3-cd)pyrene	193-39-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.769
Indeno(1,2,3-cd)pyrene	193-39-5	1.815	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.677
Indeno(1,2,3-cd)pyrene	193-39-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.174
Indeno(1,2,3-cd)pyrene	193-39-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Indeno(1,2,3-cd)pyrene	193-39-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Indeno(1,2,3-cd)pyrene	193-39-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Indeno(1,2,3-cd)pyrene	193-39-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Indeno(1,2,3-cd)pyrene	193-39-5	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Indeno(1,2,3-cd)pyrene	193-39-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.133
Indeno(1,2,3-cd)pyrene	193-39-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.145
Indeno(1,2,3-cd)pyrene	193-39-5	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Indeno(1,2,3-cd)pyrene	193-39-5	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.136
Indeno(1,2,3-cd)pyrene	193-39-5	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.125
Indeno(1,2,3-cd)pyrene	193-39-5	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.1305
Indeno(1,2,3-cd)pyrene	193-39-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.13
Indeno(1,2,3-cd)pyrene	193-39-5	0.312	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.152
Indeno(1,2,3-cd)pyrene	193-39-5	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.131
Indeno(1,2,3-cd)pyrene	193-39-5	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.129
Indeno(1,2,3-cd)pyrene	193-39-5	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.131
Indeno(1,2,3-cd)pyrene	193-39-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.134
Indeno(1,2,3-cd)pyrene	193-39-5	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.132
Indeno(1,2,3-cd)pyrene	193-39-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.13
Indeno(1,2,3-cd)pyrene	193-39-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.134
Indeno(1,2,3-cd)pyrene	193-39-5	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.135
Indeno(1,2,3-cd)pyrene	193-39-5	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.124
Indeno(1,2,3-cd)pyrene	193-39-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.134
Indeno(1,2,3-cd)pyrene	193-39-5	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.1205
Iron	7439-89-6	36500	mg/kg	4.61		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	B	2.3
Iron	7439-89-6	63100	mg/kg	20.9		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		10.5
Iron	7439-89-6	90300	mg/kg	20.5		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		10.2
Iron	7439-89-6	64800	mg/kg	20.6		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		10.3
Iron	7439-89-6	46500	mg/kg	12.855		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		6.44
Iron	7439-89-6	26500	mg/kg	4.84		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	B	2.42
Iron	7439-89-6	21600	mg/kg	14.15		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		14.15
Iron	7439-89-6	95100	mg/kg	26.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		26.2
Iron	7439-89-6	29000	mg/kg	16.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		16.7

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Iron	7439-89-6	70300	mg/kg	13		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		13
Iron	7439-89-6	73200	mg/kg	24.4		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		24.4
Iron	7439-89-6	17200	mg/kg	3.97		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	B	1.99
Iron	7439-89-6	41100	mg/kg	4.54		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	B	2.27
Iron	7439-89-6	45500	mg/kg	12.6		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		12.6
Iron	7439-89-6	21500	mg/kg	3.44		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	B	1.72
Iron	7439-89-6	10600	mg/kg	3.92		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		1.96
Iron	7439-89-6	23050	mg/kg	5.605		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		2.805
Iron	7439-89-6	62000	mg/kg	19.6		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		9.78
Iron	7439-89-6	47000	mg/kg	7.75		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		3.87
Iron	7439-89-6	20600	mg/kg	3.35		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	B	1.68
Iron	7439-89-6	15600	mg/kg	3.31		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	B	1.65
Iron	7439-89-6	22600	mg/kg	3.61		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	B	1.81
Iron	7439-89-6	20200	mg/kg	3.81		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	B	1.9
Iron	7439-89-6	18000	mg/kg	3.65		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	B	1.82
Iron	7439-89-6	18900	mg/kg	3.57		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		1.79
Iron	7439-89-6	32800	mg/kg	7.59		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		3.79
Iron	7439-89-6	23600	mg/kg	3.76		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		1.88
Iron	7439-89-6	23000	mg/kg	3.78		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10	B	1.89
Iron	7439-89-6	24400	mg/kg	3.86		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		1.93
Iron	7439-89-6	24200	mg/kg	3.62		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	BB	1.81
Isophorone	78-59-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Isophorone	78-59-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Isophorone	78-59-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Isophorone	78-59-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Isophorone	78-59-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02505
Isophorone	78-59-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Isophorone	78-59-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Isophorone	78-59-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Isophorone	78-59-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Isophorone	78-59-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Isophorone	78-59-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Isophorone	78-59-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Isophorone	78-59-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Isophorone	78-59-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Isophorone	78-59-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00503
Isophorone	78-59-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00464
Isophorone	78-59-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.004835
Isophorone	78-59-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00481
Isophorone	78-59-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00562
Isophorone	78-59-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00485
Isophorone	78-59-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00478
Isophorone	78-59-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00485
Isophorone	78-59-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00495
Isophorone	78-59-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00489
Isophorone	78-59-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00481
Isophorone	78-59-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Isophorone	78-59-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00498
Isophorone	78-59-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00461
Isophorone	78-59-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Isophorone	78-59-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.004475
Lead	7439-92-1	9.65	mg/kg	0.595		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.297
Lead	7439-92-1	9.59	mg/kg	0.526		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.263
Lead	7439-92-1	11.3	mg/kg	0.531		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.266
Lead	7439-92-1	12.3	mg/kg	0.551		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.276
Lead	7439-92-1	27.05	mg/kg	0.476		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.2375
Lead	7439-92-1	6.28	mg/kg	0.61		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.305
Lead	7439-92-1	8.3	mg/kg	0.42		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		0.42
Lead	7439-92-1	5.9	mg/kg	0.79		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		0.79
Lead	7439-92-1	8.1	mg/kg	0.5		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.5
Lead	7439-92-1	4.9	mg/kg	0.39		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.39
Lead	7439-92-1	5.6	mg/kg	0.73		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		0.73
Lead	7439-92-1	6.61	mg/kg	0.46		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.23
Lead	7439-92-1	8.3	mg/kg	0.577		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.288
Lead	7439-92-1	10.9	mg/kg	0.38		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		0.38
Lead	7439-92-1	14.6	mg/kg	0.479		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.239
Lead	7439-92-1	7.75	mg/kg	0.449		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.224

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Lead	7439-92-1	7.69	mg/kg	0.423		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.2115
Lead	7439-92-1	5.69	mg/kg	0.481		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.241
Lead	7439-92-1	9.36	mg/kg	0.531		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.265
Lead	7439-92-1	9	mg/kg	0.467		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.233
Lead	7439-92-1	12.3	mg/kg	0.514		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.257
Lead	7439-92-1	12.2	mg/kg	0.455		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.227
Lead	7439-92-1	10.9	mg/kg	0.415		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.208
Lead	7439-92-1	11.4	mg/kg	0.463		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.231
Lead	7439-92-1	12.3	mg/kg	0.509		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.255
Lead	7439-92-1	19.2	mg/kg	0.441		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.221
Lead	7439-92-1	12	mg/kg	0.492		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.246
Lead	7439-92-1	13.1	mg/kg	0.484		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.242
Lead	7439-92-1	13.6	mg/kg	0.51		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.255
Lead	7439-92-1	11.9	mg/kg	0.4615		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.2305
Magnesium	7439-95-4	5830	mg/kg	2.3		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		1.15
Magnesium	7439-95-4	1500	mg/kg	2.09		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		1.05
Magnesium	7439-95-4	782	mg/kg	2.05		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		1.02
Magnesium	7439-95-4	4010	mg/kg	2.06		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		1.03
Magnesium	7439-95-4	1915	mg/kg	1.9		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.9535
Magnesium	7439-95-4	3740	mg/kg	2.42		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		1.21
Magnesium	7439-95-4	1660	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Magnesium	7439-95-4	327	mg/kg	654	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	654
Magnesium	7439-95-4	1470	mg/kg	835		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		835
Magnesium	7439-95-4	651	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648
Magnesium	7439-95-4	3770	mg/kg	1220		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1220
Magnesium	7439-95-4	5030	mg/kg	1.99		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.993
Magnesium	7439-95-4	1730	mg/kg	2.27		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		1.13
Magnesium	7439-95-4	4910	mg/kg	632		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		632
Magnesium	7439-95-4	16500	mg/kg	1.72		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.861
Magnesium	7439-95-4	6420	mg/kg	1.96		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.98
Magnesium	7439-95-4	1085	mg/kg	1.885		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.9425
Magnesium	7439-95-4	961	mg/kg	1.96		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.978
Magnesium	7439-95-4	839	mg/kg	1.94		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.969
Magnesium	7439-95-4	16100	mg/kg	1.68		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.838
Magnesium	7439-95-4	13700	mg/kg	1.65		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.826
Magnesium	7439-95-4	11700	mg/kg	1.81		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.903
Magnesium	7439-95-4	18600	mg/kg	1.9		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.951
Magnesium	7439-95-4	20100	mg/kg	1.82		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.911
Magnesium	7439-95-4	17100	mg/kg	1.79		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.893
Magnesium	7439-95-4	3480	mg/kg	1.9		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.948
Magnesium	7439-95-4	15600	mg/kg	1.88		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.94
Magnesium	7439-95-4	11600	mg/kg	1.89		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.944
Magnesium	7439-95-4	12100	mg/kg	1.93		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.965
Magnesium	7439-95-4	10350	mg/kg	1.81		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.905
Manganese	7439-96-5	263	mg/kg	0.199		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Manganese	7439-96-5	306	mg/kg	0.23		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Manganese	7439-96-5	252	mg/kg	0.209		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Manganese	7439-96-5	241	mg/kg	0.205		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Manganese	7439-96-5	305	mg/kg	0.206		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Manganese	7439-96-5	199	mg/kg	0.227		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Manganese	7439-96-5	342	mg/kg	0.19		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Manganese	7439-96-5	2810	mg/kg	0.242		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Manganese	7439-96-5	825	mg/kg	2.15	J	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		2.15
Manganese	7439-96-5	199	mg/kg	3.9		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		3.9
Manganese	7439-96-5	125	mg/kg	2.5		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		2.5
Manganese	7439-96-5	181	mg/kg	1.9		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		1.9
Manganese	7439-96-5	1370	mg/kg	3.7		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		3.7
Manganese	7439-96-5	409	mg/kg	1.9		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		1.9
Manganese	7439-96-5	543	mg/kg	0.172		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.0861
Manganese	7439-96-5	266	mg/kg	0.196		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.098
Manganese	7439-96-5	1055.5	mg/kg	0.1885		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.09425
Manganese	7439-96-5	954	mg/kg	0.196		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0978
Manganese	7439-96-5	469	mg/kg	0.194		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0969
Manganese	7439-96-5	506	mg/kg	0.168		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.0838
Manganese	7439-96-5	251	mg/kg	0.165		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.0826
Manganese	7439-96-5	701	mg/kg	0.181		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.0903
Manganese	7439-96-5	524	mg/kg	0.19		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.0951

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Manganese	7439-96-5	472	mg/kg	0.182		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.0911
Manganese	7439-96-5	470	mg/kg	0.179		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.0893
Manganese	7439-96-5	4470	mg/kg	0.19		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.0948
Manganese	7439-96-5	484	mg/kg	0.188		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.094
Manganese	7439-96-5	373	mg/kg	0.189		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.0944
Manganese	7439-96-5	347	mg/kg	0.193		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.0965
Manganese	7439-96-5	453	mg/kg	0.181		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.0905
Mercury	7439-97-6	0.0357	mg/kg	0.03		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.015
Mercury	7439-97-6	0.0928	mg/kg	0.0296		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.0148
Mercury	7439-97-6	0.383	mg/kg	0.0274		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.0137
Mercury	7439-97-6	0.0756	mg/kg	0.0291		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.0146
Mercury	7439-97-6	0.157	mg/kg	0.02555		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.0128
Mercury	7439-97-6	0.0383	mg/kg	0.0323		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.0162
Mercury	7439-97-6	0.07	mg/kg	0.14	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.14
Mercury	7439-97-6	0.065	mg/kg	0.13	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.13
Mercury	7439-97-6	0.085	mg/kg	0.17	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.17
Mercury	7439-97-6	0.065	mg/kg	0.13	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.13
Mercury	7439-97-6	0.12	mg/kg	0.24	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	0.24
Mercury	7439-97-6	0.0123	mg/kg	0.0246	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.0123
Mercury	7439-97-6	0.0146	mg/kg	0.0248	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	J	0.0124
Mercury	7439-97-6	0.065	mg/kg	0.13	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	0.13
Mercury	7439-97-6	0.0196	mg/kg	0.0242	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	J	0.0121
Mercury	7439-97-6	0.0116	mg/kg	0.0232	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.0116
Mercury	7439-97-6	0.0303	mg/kg	0.02295		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.01145
Mercury	7439-97-6	0.0592	mg/kg	0.0224		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0112
Mercury	7439-97-6	0.0516	mg/kg	0.0265		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0133
Mercury	7439-97-6	0.0124	mg/kg	0.0212	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	J	0.0106
Mercury	7439-97-6	0.0121	mg/kg	0.0241	U	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	U	0.012
Mercury	7439-97-6	0.0118	mg/kg	0.0236	U	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	U	0.0118
Mercury	7439-97-6	0.0162	mg/kg	0.0214	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	J	0.0107
Mercury	7439-97-6	0.0159	mg/kg	0.0215	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	J	0.0108
Mercury	7439-97-6	0.0151	mg/kg	0.0234	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	J	0.0117
Mercury	7439-97-6	0.0195	mg/kg	0.0253	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	J	0.0127
Mercury	7439-97-6	0.0222	mg/kg	0.023	J	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	J	0.0115
Mercury	7439-97-6	0.0148	mg/kg	0.0239	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10	J	0.0119
Mercury	7439-97-6	0.0127	mg/kg	0.0254	U	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	U	0.0127
Mercury	7439-97-6	0.0144	mg/kg	0.02065	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	JJ	0.01033
Methylnaphthalene, 2-	91-57-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.128
Methylnaphthalene, 2-	91-57-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.127
Methylnaphthalene, 2-	91-57-6	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.12
Methylnaphthalene, 2-	91-57-6	0.942	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.622
Methylnaphthalene, 2-	91-57-6	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.548
Methylnaphthalene, 2-	91-57-6	0.363	mg/kg	0.536	QJ	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.141
Methylnaphthalene, 2-	91-57-6	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylnaphthalene, 2-	91-57-6	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylnaphthalene, 2-	91-57-6	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylnaphthalene, 2-	91-57-6	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylnaphthalene, 2-	91-57-6	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Methylnaphthalene, 2-	91-57-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.108
Methylnaphthalene, 2-	91-57-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.117
Methylnaphthalene, 2-	91-57-6	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Methylnaphthalene, 2-	91-57-6	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.11
Methylnaphthalene, 2-	91-57-6	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.101
Methylnaphthalene, 2-	91-57-6	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.106
Methylnaphthalene, 2-	91-57-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.105
Methylnaphthalene, 2-	91-57-6	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.123
Methylnaphthalene, 2-	91-57-6	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.106
Methylnaphthalene, 2-	91-57-6	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.104
Methylnaphthalene, 2-	91-57-6	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.106
Methylnaphthalene, 2-	91-57-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.108
Methylnaphthalene, 2-	91-57-6	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.107
Methylnaphthalene, 2-	91-57-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.105
Methylnaphthalene, 2-	91-57-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.108
Methylnaphthalene, 2-	91-57-6	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.109
Methylnaphthalene, 2-	91-57-6	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.101
Methylnaphthalene, 2-	91-57-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.108
Methylnaphthalene, 2-	91-57-6	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.09775

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Methylphenol, 2-	95-48-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00735
Methylphenol, 2-	95-48-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00728
Methylphenol, 2-	95-48-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00688
Methylphenol, 2-	95-48-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0356
Methylphenol, 2-	95-48-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0313
Methylphenol, 2-	95-48-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00805
Methylphenol, 2-	95-48-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylphenol, 2-	95-48-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 2-	95-48-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylphenol, 2-	95-48-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 2-	95-48-7	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Methylphenol, 2-	95-48-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00616
Methylphenol, 2-	95-48-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00672
Methylphenol, 2-	95-48-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Methylphenol, 2-	95-48-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00629
Methylphenol, 2-	95-48-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0058
Methylphenol, 2-	95-48-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.006045
Methylphenol, 2-	95-48-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00602
Methylphenol, 2-	95-48-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00703
Methylphenol, 2-	95-48-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00606
Methylphenol, 2-	95-48-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00598
Methylphenol, 2-	95-48-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00607
Methylphenol, 2-	95-48-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00619
Methylphenol, 2-	95-48-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00611
Methylphenol, 2-	95-48-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00602
Methylphenol, 2-	95-48-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00619
Methylphenol, 2-	95-48-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00623
Methylphenol, 2-	95-48-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00576
Methylphenol, 2-	95-48-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00619
Methylphenol, 2-	95-48-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00559
Methylphenol, 4-	106-44-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0153
Methylphenol, 4-	106-44-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0151
Methylphenol, 4-	106-44-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0143
Methylphenol, 4-	106-44-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.074
Methylphenol, 4-	106-44-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.06515
Methylphenol, 4-	106-44-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0167
Methylphenol, 4-	106-44-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Methylphenol, 4-	106-44-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 4-	106-44-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Methylphenol, 4-	106-44-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Methylphenol, 4-	106-44-5	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Methylphenol, 4-	106-44-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0128
Methylphenol, 4-	106-44-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.014
Methylphenol, 4-	106-44-5	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Methylphenol, 4-	106-44-5	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0131
Methylphenol, 4-	106-44-5	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0121
Methylphenol, 4-	106-44-5	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0126
Methylphenol, 4-	106-44-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0125
Methylphenol, 4-	106-44-5	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0146
Methylphenol, 4-	106-44-5	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0126
Methylphenol, 4-	106-44-5	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0124
Methylphenol, 4-	106-44-5	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0126
Methylphenol, 4-	106-44-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0129
Methylphenol, 4-	106-44-5	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0127
Methylphenol, 4-	106-44-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0125
Methylphenol, 4-	106-44-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0129
Methylphenol, 4-	106-44-5	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.013
Methylphenol, 4-	106-44-5	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.012
Methylphenol, 4-	106-44-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0129
Methylphenol, 4-	106-44-5	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01165
Naphthalene	91-20-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0116
Naphthalene	91-20-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0115
Naphthalene	91-20-3	0.0661	mg/kg	0.458	J	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0109
Naphthalene	91-20-3	0.764	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0562
Naphthalene	91-20-3	0.6595	mg/kg	2.085	JU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JU	0.0495
Naphthalene	91-20-3	0.247	mg/kg	0.536	J	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.0127
Naphthalene	91-20-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Naphthalene	91-20-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Naphthalene	91-20-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Naphthalene	91-20-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Naphthalene	91-20-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Naphthalene	91-20-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00974
Naphthalene	91-20-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0106
Naphthalene	91-20-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Naphthalene	91-20-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00994
Naphthalene	91-20-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00917
Naphthalene	91-20-3	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00955
Naphthalene	91-20-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00951
Naphthalene	91-20-3	0.0553	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0111
Naphthalene	91-20-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00957
Naphthalene	91-20-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00944
Naphthalene	91-20-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00959
Naphthalene	91-20-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00978
Naphthalene	91-20-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00966
Naphthalene	91-20-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00951
Naphthalene	91-20-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00978
Naphthalene	91-20-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00984
Naphthalene	91-20-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0091
Naphthalene	91-20-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00978
Naphthalene	91-20-3	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.00884
Nickel	7440-02-0	0.173	mg/kg	0.346	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.173
Nickel	7440-02-0	0.157	mg/kg	0.314	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.157
Nickel	7440-02-0	0.1535	mg/kg	0.307	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.153
Nickel	7440-02-0	0.1545	mg/kg	0.309	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.155
Nickel	7440-02-0	0.1428	mg/kg	0.2855	UU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	UU	0.143
Nickel	7440-02-0	0.1815	mg/kg	0.363	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.181
Nickel	7440-02-0	28.7	mg/kg	5.65		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		5.65
Nickel	7440-02-0	16.1	mg/kg	5.2		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		5.2
Nickel	7440-02-0	21.1	mg/kg	6.7		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		6.7
Nickel	7440-02-0	16.7	mg/kg	5.2		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		5.2
Nickel	7440-02-0	79.2	mg/kg	9.8		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		9.8
Nickel	7440-02-0	3.93	mg/kg	0.298	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.149
Nickel	7440-02-0	0.17	mg/kg	0.34	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.17
Nickel	7440-02-0	44.3	mg/kg	5.1		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		5.1
Nickel	7440-02-0	18.7	mg/kg	0.258	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.129
Nickel	7440-02-0	1.71	mg/kg	0.294		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.147
Nickel	7440-02-0	11.66	mg/kg	0.2825		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.1415
Nickel	7440-02-0	0.1465	mg/kg	0.293	U	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	U	0.147
Nickel	7440-02-0	0.1455	mg/kg	0.291	U	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	U	0.145
Nickel	7440-02-0	13.5	mg/kg	0.251	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.126
Nickel	7440-02-0	13.3	mg/kg	0.248	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.124
Nickel	7440-02-0	23.7	mg/kg	0.271	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.135
Nickel	7440-02-0	16.9	mg/kg	0.285	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.143
Nickel	7440-02-0	15	mg/kg	0.273	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.137
Nickel	7440-02-0	14.7	mg/kg	0.268		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.134
Nickel	7440-02-0	43.4	mg/kg	0.285		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.142
Nickel	7440-02-0	16.1	mg/kg	0.282		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.141
Nickel	7440-02-0	21.2	mg/kg	0.283	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.142
Nickel	7440-02-0	18.8	mg/kg	0.289		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.145
Nickel	7440-02-0	17.15	mg/kg	0.2715	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.1355
Nitroaniline, 2-	88-74-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0212
Nitroaniline, 2-	88-74-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.021
Nitroaniline, 2-	88-74-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0198
Nitroaniline, 2-	88-74-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.103
Nitroaniline, 2-	88-74-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.09025
Nitroaniline, 2-	88-74-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0232
Nitroaniline, 2-	88-74-4	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitroaniline, 2-	88-74-4	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 2-	88-74-4	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 2-	88-74-4	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 2-	88-74-4	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitroaniline, 2-	88-74-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0177
Nitroaniline, 2-	88-74-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0194
Nitroaniline, 2-	88-74-4	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitroaniline, 2-	88-74-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0181
Nitroaniline, 2-	88-74-4	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0167
Nitroaniline, 2-	88-74-4	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0174
Nitroaniline, 2-	88-74-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0173
Nitroaniline, 2-	88-74-4	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0202
Nitroaniline, 2-	88-74-4	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0174
Nitroaniline, 2-	88-74-4	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0172
Nitroaniline, 2-	88-74-4	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0175
Nitroaniline, 2-	88-74-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0178
Nitroaniline, 2-	88-74-4	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0176
Nitroaniline, 2-	88-74-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0173
Nitroaniline, 2-	88-74-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0178
Nitroaniline, 2-	88-74-4	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0179
Nitroaniline, 2-	88-74-4	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0166
Nitroaniline, 2-	88-74-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0178
Nitroaniline, 2-	88-74-4	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0161
Nitroaniline, 3-	99-09-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0166
Nitroaniline, 3-	99-09-2	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
Nitroaniline, 3-	99-09-2	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0155
Nitroaniline, 3-	99-09-2	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0804
Nitroaniline, 3-	99-09-2	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07085
Nitroaniline, 3-	99-09-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0182
Nitroaniline, 3-	99-09-2	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitroaniline, 3-	99-09-2	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 3-	99-09-2	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 3-	99-09-2	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 3-	99-09-2	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitroaniline, 3-	99-09-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0139
Nitroaniline, 3-	99-09-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0152
Nitroaniline, 3-	99-09-2	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Nitroaniline, 3-	99-09-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0142
Nitroaniline, 3-	99-09-2	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0131
Nitroaniline, 3-	99-09-2	0.2013	mg/kg	0.4025	UJUJ	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.01365
Nitroaniline, 3-	99-09-2	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0136
Nitroaniline, 3-	99-09-2	0.234	mg/kg	0.468	UJ	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0159
Nitroaniline, 3-	99-09-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0137
Nitroaniline, 3-	99-09-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0135
Nitroaniline, 3-	99-09-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0137
Nitroaniline, 3-	99-09-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.014
Nitroaniline, 3-	99-09-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0138
Nitroaniline, 3-	99-09-2	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0136
Nitroaniline, 3-	99-09-2	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.014
Nitroaniline, 3-	99-09-2	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0141
Nitroaniline, 3-	99-09-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.013
Nitroaniline, 3-	99-09-2	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.014
Nitroaniline, 3-	99-09-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01265
Nitroaniline, 4-	100-01-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.173
Nitroaniline, 4-	100-01-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.172
Nitroaniline, 4-	100-01-6	0.229	mg/kg	0.458	UJ	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.162
Nitroaniline, 4-	100-01-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.84
Nitroaniline, 4-	100-01-6	1.0425	mg/kg	2.085	UJUJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.7395
Nitroaniline, 4-	100-01-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.19
Nitroaniline, 4-	100-01-6	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitroaniline, 4-	100-01-6	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 4-	100-01-6	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitroaniline, 4-	100-01-6	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitroaniline, 4-	100-01-6	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitroaniline, 4-	100-01-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.145
Nitroaniline, 4-	100-01-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.159
Nitroaniline, 4-	100-01-6	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Nitroaniline, 4-	100-01-6	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.148
Nitroaniline, 4-	100-01-6	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.137
Nitroaniline, 4-	100-01-6	0.2013	mg/kg	0.4025	UJUJ	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.1425
Nitroaniline, 4-	100-01-6	0.2005	mg/kg	0.401	UJ	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.142
Nitroaniline, 4-	100-01-6	0.234	mg/kg	0.468	UJ	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.166
Nitroaniline, 4-	100-01-6	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.143
Nitroaniline, 4-	100-01-6	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.141

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitroaniline, 4-	100-01-6	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.143
Nitroaniline, 4-	100-01-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.146
Nitroaniline, 4-	100-01-6	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.144
Nitroaniline, 4-	100-01-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.142
Nitroaniline, 4-	100-01-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.146
Nitroaniline, 4-	100-01-6	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.147
Nitroaniline, 4-	100-01-6	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.136
Nitroaniline, 4-	100-01-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.146
Nitroaniline, 4-	100-01-6	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.132
Nitrobenzene	98-95-3	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.016
Nitrobenzene	98-95-3	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrobenzene	98-95-3	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0159
Nitrobenzene	98-95-3	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrobenzene	98-95-3	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.015
Nitrobenzene	98-95-3	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrobenzene	98-95-3	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0776
Nitrobenzene	98-95-3	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrobenzene	98-95-3	0.608	mg/kg	1.216	UJU	ASH PIT 1-SB08	AP0023AP0023	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1104
Nitrobenzene	98-95-3	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0176
Nitrobenzene	98-95-3	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrobenzene	98-95-3	0.5798	mg/kg	1.1595	UJU	ASH PIT 1-SB08	AP0063AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1034
Nitrobenzene	98-95-3	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Nitrobenzene	98-95-3	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrobenzene	98-95-3	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Nitrobenzene	98-95-3	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrobenzene	98-95-3	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Nitrobenzene	98-95-3	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0134
Nitrobenzene	98-95-3	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrobenzene	98-95-3	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0147
Nitrobenzene	98-95-3	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrobenzene	98-95-3	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Nitrobenzene	98-95-3	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0137
Nitrobenzene	98-95-3	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Nitrobenzene	98-95-3	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Nitrobenzene	98-95-3	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0127
Nitrobenzene	98-95-3	0.1818	mg/kg	0.3635	UU	ASH PIT 1-SB04	AP0011AP0011	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0876
Nitrobenzene	98-95-3	0.177	mg/kg	0.354	UU	ASH PIT 1-SB04	AP0012AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0831
Nitrobenzene	98-95-3	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Nitrobenzene	98-95-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0131
Nitrobenzene	98-95-3	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0153
Nitrobenzene	98-95-3	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Nitrobenzene	98-95-3	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0132
Nitrobenzene	98-95-3	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Nitrobenzene	98-95-3	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Nitrobenzene	98-95-3	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.013
Nitrobenzene	98-95-3	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Nitrobenzene	98-95-3	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0132
Nitrobenzene	98-95-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0135
Nitrobenzene	98-95-3	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Nitrobenzene	98-95-3	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0133
Nitrobenzene	98-95-3	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Nitrobenzene	98-95-3	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0131
Nitrobenzene	98-95-3	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Nitrobenzene	98-95-3	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Nitrobenzene	98-95-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0135
Nitrobenzene	98-95-3	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Nitrobenzene	98-95-3	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0136
Nitrobenzene	98-95-3	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0126
Nitrobenzene	98-95-3	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Nitrobenzene	98-95-3	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Nitrobenzene	98-95-3	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0135
Nitrobenzene	98-95-3	0.1643	mg/kg	0.3285	UJU	ASH PIT 1-SB09	AP0028AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.07615
Nitrobenzene	98-95-3	0.1618	mg/kg	0.3235	UJU	ASH PIT 1-SB09	AP0058AP0058	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.076
Nitrophenol, 2-	88-75-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0173
Nitrophenol, 2-	88-75-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0172
Nitrophenol, 2-	88-75-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0162
Nitrophenol, 2-	88-75-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.084

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitrophenol, 2-	88-75-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07395
Nitrophenol, 2-	88-75-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.019
Nitrophenol, 2-	88-75-5	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Nitrophenol, 2-	88-75-5	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrophenol, 2-	88-75-5	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Nitrophenol, 2-	88-75-5	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Nitrophenol, 2-	88-75-5	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Nitrophenol, 2-	88-75-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0145
Nitrophenol, 2-	88-75-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0159
Nitrophenol, 2-	88-75-5	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Nitrophenol, 2-	88-75-5	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0148
Nitrophenol, 2-	88-75-5	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0137
Nitrophenol, 2-	88-75-5	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.01425
Nitrophenol, 2-	88-75-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0142
Nitrophenol, 2-	88-75-5	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0166
Nitrophenol, 2-	88-75-5	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0143
Nitrophenol, 2-	88-75-5	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0141
Nitrophenol, 2-	88-75-5	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0143
Nitrophenol, 2-	88-75-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0146
Nitrophenol, 2-	88-75-5	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0144
Nitrophenol, 2-	88-75-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0142
Nitrophenol, 2-	88-75-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0146
Nitrophenol, 2-	88-75-5	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0147
Nitrophenol, 2-	88-75-5	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0136
Nitrophenol, 2-	88-75-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0146
Nitrophenol, 2-	88-75-5	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0132
Nitrophenol, 4-	100-02-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0397
Nitrophenol, 4-	100-02-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0393
Nitrophenol, 4-	100-02-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0372
Nitrophenol, 4-	100-02-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.192
Nitrophenol, 4-	100-02-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1695
Nitrophenol, 4-	100-02-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0435
Nitrophenol, 4-	100-02-7	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Nitrophenol, 4-	100-02-7	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitrophenol, 4-	100-02-7	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Nitrophenol, 4-	100-02-7	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Nitrophenol, 4-	100-02-7	1	mg/kg	2	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Nitrophenol, 4-	100-02-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0333
Nitrophenol, 4-	100-02-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0363
Nitrophenol, 4-	100-02-7	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Nitrophenol, 4-	100-02-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.034
Nitrophenol, 4-	100-02-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0313
Nitrophenol, 4-	100-02-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.03265
Nitrophenol, 4-	100-02-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0325
Nitrophenol, 4-	100-02-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0379
Nitrophenol, 4-	100-02-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0327
Nitrophenol, 4-	100-02-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0323
Nitrophenol, 4-	100-02-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0328
Nitrophenol, 4-	100-02-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0334
Nitrophenol, 4-	100-02-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.033
Nitrophenol, 4-	100-02-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0325
Nitrophenol, 4-	100-02-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0334
Nitrophenol, 4-	100-02-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0336
Nitrophenol, 4-	100-02-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0311
Nitrophenol, 4-	100-02-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0334
Nitrophenol, 4-	100-02-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0302
Nitrotoluene, 2-	88-72-2	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrotoluene, 2-	88-72-2	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 2-	88-72-2	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 2-	88-72-2	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 2-	88-72-2	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 2-	88-72-2	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrotoluene, 2-	88-72-2	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 2-	88-72-2	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 2-	88-72-2	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Nitrotoluene, 2-	88-72-2	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Nitrotoluene, 2-	88-72-2	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Nitrotoluene, 2-	88-72-2	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Nitrotoluene, 2-	88-72-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Nitrotoluene, 2-	88-72-2	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Nitrotoluene, 2-	88-72-2	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Nitrotoluene, 2-	88-72-2	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Nitrotoluene, 2-	88-72-2	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Nitrotoluene, 2-	88-72-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Nitrotoluene, 2-	88-72-2	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Nitrotoluene, 2-	88-72-2	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Nitrotoluene, 2-	88-72-2	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Nitrotoluene, 2-	88-72-2	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Nitrotoluene, 2-	88-72-2	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Nitrotoluene, 2-	88-72-2	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Nitrotoluene, 3-	99-08-1	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrotoluene, 3-	99-08-1	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 3-	99-08-1	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 3-	99-08-1	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 3-	99-08-1	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 3-	99-08-1	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrotoluene, 3-	99-08-1	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 3-	99-08-1	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 3-	99-08-1	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Nitrotoluene, 3-	99-08-1	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Nitrotoluene, 3-	99-08-1	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Nitrotoluene, 3-	99-08-1	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Nitrotoluene, 3-	99-08-1	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Nitrotoluene, 3-	99-08-1	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Nitrotoluene, 3-	99-08-1	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Nitrotoluene, 3-	99-08-1	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Nitrotoluene, 3-	99-08-1	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Nitrotoluene, 3-	99-08-1	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Nitrotoluene, 3-	99-08-1	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Nitrotoluene, 3-	99-08-1	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Nitrotoluene, 3-	99-08-1	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Nitrotoluene, 3-	99-08-1	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Nitrotoluene, 3-	99-08-1	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Nitrotoluene, 3-	99-08-1	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Nitrotoluene, 4-	99-99-0	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Nitrotoluene, 4-	99-99-0	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Nitrotoluene, 4-	99-99-0	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Nitrotoluene, 4-	99-99-0	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Nitrotoluene, 4-	99-99-0	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Nitrotoluene, 4-	99-99-0	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Nitrotoluene, 4-	99-99-0	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Nitrotoluene, 4-	99-99-0	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Nitrotoluene, 4-	99-99-0	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Nitrotoluene, 4-	99-99-0	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Nitrotoluene, 4-	99-99-0	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Nitrotoluene, 4-	99-99-0	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Nitrotoluene, 4-	99-99-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Nitrotoluene, 4-	99-99-0	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Nitrotoluene, 4-	99-99-0	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Nitrotoluene, 4-	99-99-0	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Nitrotoluene, 4-	99-99-0	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Nitrotoluene, 4-	99-99-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Nitrotoluene, 4-	99-99-0	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Nitrotoluene, 4-	99-99-0	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Nitrotoluene, 4-	99-99-0	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Nitrotoluene, 4-	99-99-0	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Nitrotoluene, 4-	99-99-0	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Nitrotoluene, 4-	99-99-0	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
n-Nitrosodimethylamine	62-75-9	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0147
n-Nitrosodimethylamine	62-75-9	0.2425	mg/kg	0.485	UJ	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0146
n-Nitrosodimethylamine	62-75-9	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0138
n-Nitrosodimethylamine	62-75-9	1.185	mg/kg	2.37	UJ	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0712
n-Nitrosodimethylamine	62-75-9	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0627
n-Nitrosodimethylamine	62-75-9	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0161

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
n-Nitrosodimethylamine	62-75-9	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0123
n-Nitrosodimethylamine	62-75-9	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0134
n-Nitrosodimethylamine	62-75-9	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0126
n-Nitrosodimethylamine	62-75-9	0.193	mg/kg	0.386	UJ	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0116
n-Nitrosodimethylamine	62-75-9	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0121
n-Nitrosodimethylamine	62-75-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.012
n-Nitrosodimethylamine	62-75-9	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0141
n-Nitrosodimethylamine	62-75-9	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0121
n-Nitrosodimethylamine	62-75-9	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.012
n-Nitrosodimethylamine	62-75-9	0.202	mg/kg	0.404	UJ	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0121
n-Nitrosodimethylamine	62-75-9	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0124
n-Nitrosodimethylamine	62-75-9	0.2035	mg/kg	0.407	UJ	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0122
n-Nitrosodimethylamine	62-75-9	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.012
n-Nitrosodimethylamine	62-75-9	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0124
n-Nitrosodimethylamine	62-75-9	0.2075	mg/kg	0.415	UJ	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0125
n-Nitrosodimethylamine	62-75-9	0.192	mg/kg	0.384	UJ	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0115
n-Nitrosodimethylamine	62-75-9	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0124
n-Nitrosodimethylamine	62-75-9	0.1863	mg/kg	0.3725	UJUJ	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.01115
n-Nitroso-di-n-propylamine	621-64-7	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0175
n-Nitroso-di-n-propylamine	621-64-7	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0173
n-Nitroso-di-n-propylamine	621-64-7	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0164
n-Nitroso-di-n-propylamine	621-64-7	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0847
n-Nitroso-di-n-propylamine	621-64-7	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.07455
n-Nitroso-di-n-propylamine	621-64-7	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0192
n-Nitroso-di-n-propylamine	621-64-7	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
n-Nitroso-di-n-propylamine	621-64-7	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitroso-di-n-propylamine	621-64-7	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
n-Nitroso-di-n-propylamine	621-64-7	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitroso-di-n-propylamine	621-64-7	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
n-Nitroso-di-n-propylamine	621-64-7	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0147
n-Nitroso-di-n-propylamine	621-64-7	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.016
n-Nitroso-di-n-propylamine	621-64-7	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
n-Nitroso-di-n-propylamine	621-64-7	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.015
n-Nitroso-di-n-propylamine	621-64-7	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0138
n-Nitroso-di-n-propylamine	621-64-7	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0144
n-Nitroso-di-n-propylamine	621-64-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0143
n-Nitroso-di-n-propylamine	621-64-7	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0167
n-Nitroso-di-n-propylamine	621-64-7	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0144
n-Nitroso-di-n-propylamine	621-64-7	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0142
n-Nitroso-di-n-propylamine	621-64-7	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0144
n-Nitroso-di-n-propylamine	621-64-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0147
n-Nitroso-di-n-propylamine	621-64-7	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0145
n-Nitroso-di-n-propylamine	621-64-7	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0143
n-Nitroso-di-n-propylamine	621-64-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
n-Nitroso-di-n-propylamine	621-64-7	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0148
n-Nitroso-di-n-propylamine	621-64-7	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0137
n-Nitroso-di-n-propylamine	621-64-7	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0147
n-Nitroso-di-n-propylamine	621-64-7	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0133
n-Nitrosodiphenylamine	86-30-6	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00691
n-Nitrosodiphenylamine	86-30-6	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00684
n-Nitrosodiphenylamine	86-30-6	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00647
n-Nitrosodiphenylamine	86-30-6	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0335
n-Nitrosodiphenylamine	86-30-6	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02945
n-Nitrosodiphenylamine	86-30-6	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00757
n-Nitrosodiphenylamine	86-30-6	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
n-Nitrosodiphenylamine	86-30-6	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitrosodiphenylamine	86-30-6	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
n-Nitrosodiphenylamine	86-30-6	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
n-Nitrosodiphenylamine	86-30-6	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
n-Nitrosodiphenylamine	86-30-6	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00579
n-Nitrosodiphenylamine	86-30-6	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00632
n-Nitrosodiphenylamine	86-30-6	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
n-Nitrosodiphenylamine	86-30-6	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00591
n-Nitrosodiphenylamine	86-30-6	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00545
n-Nitrosodiphenylamine	86-30-6	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00568
n-Nitrosodiphenylamine	86-30-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00566
n-Nitrosodiphenylamine	86-30-6	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00661

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
n-Nitrosodiphenylamine	86-30-6	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00569
n-Nitrosodiphenylamine	86-30-6	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00562
n-Nitrosodiphenylamine	86-30-6	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0057
n-Nitrosodiphenylamine	86-30-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00582
n-Nitrosodiphenylamine	86-30-6	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00574
n-Nitrosodiphenylamine	86-30-6	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00566
n-Nitrosodiphenylamine	86-30-6	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00582
n-Nitrosodiphenylamine	86-30-6	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00586
n-Nitrosodiphenylamine	86-30-6	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00541
n-Nitrosodiphenylamine	86-30-6	0.206	mg/kg	0.412	UJ	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00582
n-Nitrosodiphenylamine	86-30-6	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.005255
Pentachlorophenol	87-86-5	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.044
Pentachlorophenol	87-86-5	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0435
Pentachlorophenol	87-86-5	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0411
Pentachlorophenol	87-86-5	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.213
Pentachlorophenol	87-86-5	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.1875
Pentachlorophenol	87-86-5	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0482
Pentachlorophenol	87-86-5	0.55	mg/kg	1.1	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	1.1
Pentachlorophenol	87-86-5	0.5	mg/kg	1	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Pentachlorophenol	87-86-5	0.65	mg/kg	1.3	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1.3
Pentachlorophenol	87-86-5	0.5	mg/kg	1	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	1
Pentachlorophenol	87-86-5	1	mg/kg	2	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	2
Pentachlorophenol	87-86-5	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0369
Pentachlorophenol	87-86-5	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0402
Pentachlorophenol	87-86-5	0.5	mg/kg	1	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	1
Pentachlorophenol	87-86-5	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0376
Pentachlorophenol	87-86-5	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0347
Pentachlorophenol	87-86-5	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.03615
Pentachlorophenol	87-86-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.036
Pentachlorophenol	87-86-5	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.042
Pentachlorophenol	87-86-5	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0362
Pentachlorophenol	87-86-5	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0357
Pentachlorophenol	87-86-5	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0363
Pentachlorophenol	87-86-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.037
Pentachlorophenol	87-86-5	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0365
Pentachlorophenol	87-86-5	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.036
Pentachlorophenol	87-86-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.037
Pentachlorophenol	87-86-5	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0373
Pentachlorophenol	87-86-5	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0344
Pentachlorophenol	87-86-5	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.037
Pentachlorophenol	87-86-5	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.03345
Phenanthrene	85-01-8	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0119
Phenanthrene	85-01-8	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0118
Phenanthrene	85-01-8	0.055	mg/kg	0.458	J	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0111
Phenanthrene	85-01-8	0.275	mg/kg	2.37	J	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	J	0.0577
Phenanthrene	85-01-8	0.831	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.0508
Phenanthrene	85-01-8	0.156	mg/kg	0.536	J	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	J	0.013
Phenanthrene	85-01-8	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Phenanthrene	85-01-8	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenanthrene	85-01-8	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Phenanthrene	85-01-8	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenanthrene	85-01-8	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Phenanthrene	85-01-8	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00998
Phenanthrene	85-01-8	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0109
Phenanthrene	85-01-8	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Phenanthrene	85-01-8	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0102
Phenanthrene	85-01-8	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0094
Phenanthrene	85-01-8	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00979
Phenanthrene	85-01-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00975
Phenanthrene	85-01-8	0.075	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0114
Phenanthrene	85-01-8	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00981
Phenanthrene	85-01-8	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00968
Phenanthrene	85-01-8	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00983
Phenanthrene	85-01-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.01
Phenanthrene	85-01-8	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0099
Phenanthrene	85-01-8	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00975
Phenanthrene	85-01-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.01

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Phenanthrene	85-01-8	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0101
Phenanthrene	85-01-8	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00933
Phenanthrene	85-01-8	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.01
Phenanthrene	85-01-8	0.0833	mg/kg	0.3725	JJ	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	JJ	0.00906
Phenol	108-95-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00588
Phenol	108-95-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.00582
Phenol	108-95-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0055
Phenol	108-95-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0285
Phenol	108-95-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.02505
Phenol	108-95-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.00644
Phenol	108-95-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Phenol	108-95-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenol	108-95-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Phenol	108-95-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Phenol	108-95-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Phenol	108-95-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.00493
Phenol	108-95-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.00538
Phenol	108-95-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Phenol	108-95-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.00503
Phenol	108-95-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00464
Phenol	108-95-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.004835
Phenol	108-95-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00481
Phenol	108-95-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00562
Phenol	108-95-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00485
Phenol	108-95-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.00478
Phenol	108-95-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00485
Phenol	108-95-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00495
Phenol	108-95-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00489
Phenol	108-95-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00481
Phenol	108-95-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Phenol	108-95-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.00498
Phenol	108-95-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00461
Phenol	108-95-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00495
Phenol	108-95-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.004475
Potassium	7440-09-7	1190	mg/kg	28.8	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		14.4
Potassium	7440-09-7	1260	mg/kg	26.1		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		13.1
Potassium	7440-09-7	1280	mg/kg	25.6		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		12.8
Potassium	7440-09-7	1160	mg/kg	25.8		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		12.9
Potassium	7440-09-7	654	mg/kg	23.8		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		11.9
Potassium	7440-09-7	1040	mg/kg	30.2	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		15.1
Potassium	7440-09-7	873.5	mg/kg	707		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		707
Potassium	7440-09-7	1090	mg/kg	654		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		654
Potassium	7440-09-7	417.5	mg/kg	835	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	835
Potassium	7440-09-7	781	mg/kg	648		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		648
Potassium	7440-09-7	610	mg/kg	1220	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1220
Potassium	7440-09-7	577	mg/kg	24.8	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		12.4
Potassium	7440-09-7	643	mg/kg	28.4	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		14.2
Potassium	7440-09-7	1720	mg/kg	632		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		632
Potassium	7440-09-7	1110	mg/kg	21.5	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		10.8
Potassium	7440-09-7	299	mg/kg	24.5		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		12.3
Potassium	7440-09-7	289.5	mg/kg	23.55		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		11.8
Potassium	7440-09-7	164	mg/kg	24.4		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		12.2
Potassium	7440-09-7	559	mg/kg	24.2		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		12.1
Potassium	7440-09-7	1010	mg/kg	20.9	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		10.5
Potassium	7440-09-7	1130	mg/kg	20.7	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		10.3
Potassium	7440-09-7	1580	mg/kg	22.6	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		11.3
Potassium	7440-09-7	1270	mg/kg	23.8	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		11.9
Potassium	7440-09-7	1080	mg/kg	22.8	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		11.4
Potassium	7440-09-7	1070	mg/kg	22.3		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		11.2
Potassium	7440-09-7	948	mg/kg	23.7		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		11.9
Potassium	7440-09-7	1110	mg/kg	23.5		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		11.7
Potassium	7440-09-7	1260	mg/kg	23.6	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		11.8
Potassium	7440-09-7	1370	mg/kg	24.1		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		12.1
Potassium	7440-09-7	1225	mg/kg	22.65	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		11.3
Pyrene	129-00-0	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0196
Pyrene	129-00-0	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0194
Pyrene	129-00-0	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0183

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Pyrene	129-00-0	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0947
Pyrene	129-00-0	1.32	mg/kg	2.085	JJ	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	JJ	0.08335
Pyrene	129-00-0	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0214
Pyrene	129-00-0	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Pyrene	129-00-0	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Pyrene	129-00-0	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Pyrene	129-00-0	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Pyrene	129-00-0	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Pyrene	129-00-0	0.0378	mg/kg	0.41	QJ	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	J	0.0164
Pyrene	129-00-0	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0179
Pyrene	129-00-0	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Pyrene	129-00-0	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0167
Pyrene	129-00-0	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0154
Pyrene	129-00-0	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0161
Pyrene	129-00-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.016
Pyrene	129-00-0	0.102	mg/kg	0.468	J	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	J	0.0187
Pyrene	129-00-0	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0161
Pyrene	129-00-0	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0159
Pyrene	129-00-0	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0161
Pyrene	129-00-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0165
Pyrene	129-00-0	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0163
Pyrene	129-00-0	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.016
Pyrene	129-00-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0165
Pyrene	129-00-0	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0166
Pyrene	129-00-0	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0153
Pyrene	129-00-0	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0165
Pyrene	129-00-0	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0149
RDX	121-82-4	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
RDX	121-82-4	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
RDX	121-82-4	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
RDX	121-82-4	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
RDX	121-82-4	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
RDX	121-82-4	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
RDX	121-82-4	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
RDX	121-82-4	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
RDX	121-82-4	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
RDX	121-82-4	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
RDX	121-82-4	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
RDX	121-82-4	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
RDX	121-82-4	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
RDX	121-82-4	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
RDX	121-82-4	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
RDX	121-82-4	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
RDX	121-82-4	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
RDX	121-82-4	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
RDX	121-82-4	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
RDX	121-82-4	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
RDX	121-82-4	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
RDX	121-82-4	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
RDX	121-82-4	0.1398	mg/kg	0.2795	UJU	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Selenium	7782-49-2	0.618	mg/kg	1.19	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	J	0.595
Selenium	7782-49-2	0.567	mg/kg	1.05	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	J	0.526
Selenium	7782-49-2	0.6	mg/kg	1.06	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.531
Selenium	7782-49-2	0.592	mg/kg	1.1	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.551
Selenium	7782-49-2	0.4973	mg/kg	0.9515	JU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JU	0.476
Selenium	7782-49-2	0.61	mg/kg	1.22	UJ	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.61
Selenium	7782-49-2	0.665	mg/kg	0.71	/U	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	U	0.71
Selenium	7782-49-2	0.65	mg/kg	1.3	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	1.3
Selenium	7782-49-2	1.2	mg/kg	0.84		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		0.84
Selenium	7782-49-2	2.7	mg/kg	0.65		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		0.65
Selenium	7782-49-2	2.6	mg/kg	1.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		1.2
Selenium	7782-49-2	0.4595	mg/kg	0.919	UJ	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.46
Selenium	7782-49-2	0.575	mg/kg	1.15	UJ	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.577
Selenium	7782-49-2	0.97	mg/kg	0.63		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		0.63
Selenium	7782-49-2	0.4785	mg/kg	0.957	UJ	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	U	0.479
Selenium	7782-49-2	0.449	mg/kg	0.898	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.449
Selenium	7782-49-2	0.4228	mg/kg	0.8455	UU	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4	UU	0.423

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Selenium	7782-49-2	0.481	mg/kg	0.962	U	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	U	0.481
Selenium	7782-49-2	0.559	mg/kg	1.06	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	J	0.531
Selenium	7782-49-2	0.4665	mg/kg	0.933	UJ	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	U	0.467
Selenium	7782-49-2	0.515	mg/kg	1.03	UJ	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	U	0.514
Selenium	7782-49-2	0.4545	mg/kg	0.909	UJ	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	U	0.455
Selenium	7782-49-2	0.4155	mg/kg	0.831	UJ	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	U	0.415
Selenium	7782-49-2	0.4625	mg/kg	0.925	UJ	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	U	0.463
Selenium	7782-49-2	0.51	mg/kg	1.02	U	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	U	0.509
Selenium	7782-49-2	0.4415	mg/kg	0.883	U	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	U	0.441
Selenium	7782-49-2	0.492	mg/kg	0.984	U	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	U	0.492
Selenium	7782-49-2	0.761	mg/kg	0.968	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10	J	0.484
Selenium	7782-49-2	0.51	mg/kg	1.02	U	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	U	0.51
Selenium	7782-49-2	0.4613	mg/kg	0.9225	UJUJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	UU	0.4615
Silver	7440-22-4	0.288	mg/kg	0.576	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.288
Silver	7440-22-4	0.2615	mg/kg	0.523	U	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1	U	0.261
Silver	7440-22-4	0.2555	mg/kg	0.511	U	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	U	0.256
Silver	7440-22-4	0.258	mg/kg	0.516	U	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	U	0.258
Silver	7440-22-4	0.238	mg/kg	0.476	UU	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	UU	0.238
Silver	7440-22-4	0.3025	mg/kg	0.605	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.302
Silver	7440-22-4	0.355	mg/kg	0.71	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	0.71
Silver	7440-22-4	0.325	mg/kg	0.65	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	0.65
Silver	7440-22-4	0.42	mg/kg	0.84	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	0.84
Silver	7440-22-4	0.325	mg/kg	0.65	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	0.65
Silver	7440-22-4	0.6	mg/kg	1.2	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1.2
Silver	7440-22-4	0.248	mg/kg	0.496	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.248
Silver	7440-22-4	0.2835	mg/kg	0.567	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.284
Silver	7440-22-4	0.315	mg/kg	0.63	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	0.63
Silver	7440-22-4	0.2155	mg/kg	0.431	U	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	U	0.215
Silver	7440-22-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.245
Silver	7440-22-4	0.2358	mg/kg	0.4715	UU	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4	UU	0.2355
Silver	7440-22-4	0.2445	mg/kg	0.489	U	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	U	0.244
Silver	7440-22-4	0.242	mg/kg	0.484	UJ	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	U	0.242
Silver	7440-22-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	U	0.209
Silver	7440-22-4	0.2065	mg/kg	0.413	U	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	U	0.207
Silver	7440-22-4	0.2255	mg/kg	0.451	U	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	U	0.226
Silver	7440-22-4	0.238	mg/kg	0.476	U	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	U	0.238
Silver	7440-22-4	0.228	mg/kg	0.456	U	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	U	0.228
Silver	7440-22-4	0.223	mg/kg	0.446	U	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	U	0.223
Silver	7440-22-4	0.237	mg/kg	0.474	U	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	U	0.237
Silver	7440-22-4	0.235	mg/kg	0.47	U	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	U	0.235
Silver	7440-22-4	0.236	mg/kg	0.472	U	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10	U	0.236
Silver	7440-22-4	0.241	mg/kg	0.482	U	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	U	0.241
Silver	7440-22-4	0.2263	mg/kg	0.4525	UU	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	UU	0.2265
Sodium	7440-23-5	114	mg/kg	11.5		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		5.76
Sodium	7440-23-5	96.8	mg/kg	10.5		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		5.23
Sodium	7440-23-5	119	mg/kg	10.2		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		5.11
Sodium	7440-23-5	165	mg/kg	10.3		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		5.16
Sodium	7440-23-5	89.15	mg/kg	9.535	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		4.76
Sodium	7440-23-5	161	mg/kg	12.1		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		6.05
Sodium	7440-23-5	353.5	mg/kg	707	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	707
Sodium	7440-23-5	327	mg/kg	654	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U	654
Sodium	7440-23-5	417.5	mg/kg	835	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	835
Sodium	7440-23-5	324	mg/kg	648	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	648
Sodium	7440-23-5	610	mg/kg	1220	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	1220
Sodium	7440-23-5	57.6	mg/kg	9.93		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		4.96
Sodium	7440-23-5	70.4	mg/kg	11.3		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		5.67
Sodium	7440-23-5	316	mg/kg	632	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	632
Sodium	7440-23-5	131	mg/kg	8.61		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		4.31
Sodium	7440-23-5	61.3	mg/kg	9.8		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		4.9
Sodium	7440-23-5	25	mg/kg	9.425		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		4.715
Sodium	7440-23-5	34.9	mg/kg	9.78		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		4.89
Sodium	7440-23-5	87.4	mg/kg	9.69		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		4.84
Sodium	7440-23-5	111	mg/kg	8.38		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		4.19
Sodium	7440-23-5	96	mg/kg	8.26		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		4.13
Sodium	7440-23-5	117	mg/kg	9.03		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		4.51
Sodium	7440-23-5	151	mg/kg	9.51		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		4.76
Sodium	7440-23-5	137	mg/kg	9.11		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		4.56

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Sodium	7440-23-5	132	mg/kg	8.93		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		4.46
Sodium	7440-23-5	45.9	mg/kg	9.48		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		4.74
Sodium	7440-23-5	107	mg/kg	9.4		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		4.7
Sodium	7440-23-5	118	mg/kg	9.44		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		4.72
Sodium	7440-23-5	98.5	mg/kg	9.65		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		4.82
Sodium	7440-23-5	152.5	mg/kg	9.05		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		4.525
Tetryl	479-45-8	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Tetryl	479-45-8	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Tetryl	479-45-8	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Tetryl	479-45-8	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Tetryl	479-45-8	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Tetryl	479-45-8	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Tetryl	479-45-8	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Tetryl	479-45-8	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Tetryl	479-45-8	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Tetryl	479-45-8	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Tetryl	479-45-8	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Tetryl	479-45-8	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Tetryl	479-45-8	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Tetryl	479-45-8	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Tetryl	479-45-8	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Tetryl	479-45-8	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Tetryl	479-45-8	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Tetryl	479-45-8	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Tetryl	479-45-8	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Tetryl	479-45-8	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Tetryl	479-45-8	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Tetryl	479-45-8	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Tetryl	479-45-8	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Tetryl	479-45-8	0.1395	mg/kg	0.279	UJ	ASH PIT 1-SB09	AP0058	EXPLOSIVES	AVGD	8-Dec-08	8	10	U	0.14
Thallium	7440-28-0	0.2975	mg/kg	0.595	U	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1	U	0.297
Thallium	7440-28-0	0.563	mg/kg	0.526		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.263
Thallium	7440-28-0	0.356	mg/kg	0.531	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1	J	0.266
Thallium	7440-28-0	0.303	mg/kg	0.551	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1	J	0.276
Thallium	7440-28-0	0.274	mg/kg	0.476	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1	JJ	0.2375
Thallium	7440-28-0	0.305	mg/kg	0.61	U	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1	U	0.305
Thallium	7440-28-0	0.7	mg/kg	1.4	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	UU	1.4
Thallium	7440-28-0	1.3	mg/kg	2.6	U,G	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	U,G	2.6
Thallium	7440-28-0	0.85	mg/kg	1.7	U	PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	U	1.7
Thallium	7440-28-0	0.65	mg/kg	1.3	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	U	1.3
Thallium	7440-28-0	1.2	mg/kg	2.4	U	PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	U	2.4
Thallium	7440-28-0	0.23	mg/kg	0.46	U	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5	U	0.23
Thallium	7440-28-0	0.2885	mg/kg	0.577	U	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8	U	0.288
Thallium	7440-28-0	0.65	mg/kg	1.3	U	PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	U	1.3
Thallium	7440-28-0	0.343	mg/kg	0.479	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8	J	0.239
Thallium	7440-28-0	0.2245	mg/kg	0.449	U	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5	U	0.224
Thallium	7440-28-0	0.2115	mg/kg	0.423	UU	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4	UU	0.2115
Thallium	7440-28-0	0.2405	mg/kg	0.481	U	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7	U	0.241
Thallium	7440-28-0	0.275	mg/kg	0.531	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5	J	0.265
Thallium	7440-28-0	0.2335	mg/kg	0.467	U	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4	U	0.233
Thallium	7440-28-0	0.366	mg/kg	0.514	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5	J	0.257
Thallium	7440-28-0	0.239	mg/kg	0.455	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8	J	0.227
Thallium	7440-28-0	0.271	mg/kg	0.415	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10	J	0.208
Thallium	7440-28-0	0.2315	mg/kg	0.463	U	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10	U	0.231
Thallium	7440-28-0	0.301	mg/kg	0.509	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10	J	0.255
Thallium	7440-28-0	0.354	mg/kg	0.441	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10	J	0.221
Thallium	7440-28-0	0.405	mg/kg	0.492	J	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9	J	0.246
Thallium	7440-28-0	0.663	mg/kg	0.484		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.242
Thallium	7440-28-0	0.333	mg/kg	0.51	J	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10	J	0.255
Thallium	7440-28-0	0.3975	mg/kg	0.4615	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10	JJ	0.2305
Total organic carbon	10-35-5	65	mg/kg	130	U	PBOW99-SBA102A	PBOW99SBA102A	TOC	REG	10-Jun-99	0	1	U	130
Total organic carbon	10-35-5	55.3	mg/kg	24.8	J	ASH PIT 1-SB01	AP0001	TOC-W	REG	8-Dec-08	0.5	1.5	B	0.62
Total organic carbon	10-35-5	1900	mg/kg	130		PBOW99-SBA103B	PBOW99SBA103B	TOC	REG	10-Jun-99	1	4		130
Trichlorobenzene, 1,2,4-	120-82-1	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0121
Trichlorobenzene, 1,2,4-	120-82-1	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0119
Trichlorobenzene, 1,2,4-	120-82-1	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0113
Trichlorobenzene, 1,2,4-	120-82-1	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0584

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Trichlorobenzene, 1,2,4-	120-82-1	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.0514
Trichlorobenzene, 1,2,4-	120-82-1	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0132
Trichlorobenzene, 1,2,4-	120-82-1	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorobenzene, 1,2,4-	120-82-1	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorobenzene, 1,2,4-	120-82-1	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorobenzene, 1,2,4-	120-82-1	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorobenzene, 1,2,4-	120-82-1	0.405	mg/kg	0.81	U	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Trichlorobenzene, 1,2,4-	120-82-1	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0101
Trichlorobenzene, 1,2,4-	120-82-1	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.011
Trichlorobenzene, 1,2,4-	120-82-1	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Trichlorobenzene, 1,2,4-	120-82-1	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0103
Trichlorobenzene, 1,2,4-	120-82-1	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.00952
Trichlorobenzene, 1,2,4-	120-82-1	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.00991
Trichlorobenzene, 1,2,4-	120-82-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.00987
Trichlorobenzene, 1,2,4-	120-82-1	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0115
Trichlorobenzene, 1,2,4-	120-82-1	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.00993
Trichlorobenzene, 1,2,4-	120-82-1	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0098
Trichlorobenzene, 1,2,4-	120-82-1	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.00995
Trichlorobenzene, 1,2,4-	120-82-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0102
Trichlorobenzene, 1,2,4-	120-82-1	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.01
Trichlorobenzene, 1,2,4-	120-82-1	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.00987
Trichlorobenzene, 1,2,4-	120-82-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0101
Trichlorobenzene, 1,2,4-	120-82-1	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0102
Trichlorobenzene, 1,2,4-	120-82-1	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.00944
Trichlorobenzene, 1,2,4-	120-82-1	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0101
Trichlorobenzene, 1,2,4-	120-82-1	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.009175
Trichlorophenol, 2,4,5-	95-95-4	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.042
Trichlorophenol, 2,4,5-	95-95-4	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0416
Trichlorophenol, 2,4,5-	95-95-4	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0394
Trichlorophenol, 2,4,5-	95-95-4	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.204
Trichlorophenol, 2,4,5-	95-95-4	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.179
Trichlorophenol, 2,4,5-	95-95-4	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0461
Trichlorophenol, 2,4,5-	95-95-4	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorophenol, 2,4,5-	95-95-4	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,5-	95-95-4	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorophenol, 2,4,5-	95-95-4	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,5-	95-95-4	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81
Trichlorophenol, 2,4,5-	95-95-4	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0352
Trichlorophenol, 2,4,5-	95-95-4	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0384
Trichlorophenol, 2,4,5-	95-95-4	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Trichlorophenol, 2,4,5-	95-95-4	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.036
Trichlorophenol, 2,4,5-	95-95-4	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0332
Trichlorophenol, 2,4,5-	95-95-4	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.03455
Trichlorophenol, 2,4,5-	95-95-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0344
Trichlorophenol, 2,4,5-	95-95-4	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0402
Trichlorophenol, 2,4,5-	95-95-4	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0346
Trichlorophenol, 2,4,5-	95-95-4	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0342
Trichlorophenol, 2,4,5-	95-95-4	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0347
Trichlorophenol, 2,4,5-	95-95-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0354
Trichlorophenol, 2,4,5-	95-95-4	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.035
Trichlorophenol, 2,4,5-	95-95-4	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0344
Trichlorophenol, 2,4,5-	95-95-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0354
Trichlorophenol, 2,4,5-	95-95-4	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.0356
Trichlorophenol, 2,4,5-	95-95-4	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0329
Trichlorophenol, 2,4,5-	95-95-4	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0354
Trichlorophenol, 2,4,5-	95-95-4	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.032
Trichlorophenol, 2,4,6-	88-06-2	0.245	mg/kg	0.49	U	ASH PIT 1-SB02	AP0004	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0331
Trichlorophenol, 2,4,6-	88-06-2	0.2425	mg/kg	0.485	U	ASH PIT 1-SB03	AP0007	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.0327
Trichlorophenol, 2,4,6-	88-06-2	0.229	mg/kg	0.458	U	ASH PIT 1-SB04	AP0010	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.031
Trichlorophenol, 2,4,6-	88-06-2	1.185	mg/kg	2.37	U	ASH PIT 1-SB05	AP0014	SEMIVOLATILES	REG	9-Dec-08	0	1	U	0.16
Trichlorophenol, 2,4,6-	88-06-2	1.0425	mg/kg	2.085	UU	ASH PIT 1-SB08	AP0023AP0063	SEMIVOLATILES	AVGD	9-Dec-08	0	1	UU	0.141
Trichlorophenol, 2,4,6-	88-06-2	0.268	mg/kg	0.536	U	ASH PIT 1-SB09	AP0026	SEMIVOLATILES	REG	8-Dec-08	0	1	U	0.0362
Trichlorophenol, 2,4,6-	88-06-2	0.2325	mg/kg	0.465	UU	PBOW99-SBA101A	PBOW99SBA101APBOV	SEMIVOLATILES	AVGD	11-Jun-99	0	0.5	UU	0.465
Trichlorophenol, 2,4,6-	88-06-2	0.215	mg/kg	0.43	U	PBOW99-SBA102A	PBOW99SBA102A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,6-	88-06-2	0.275	mg/kg	0.55	U	PBOW99-SBA103A	PBOW99SBA103A	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.55
Trichlorophenol, 2,4,6-	88-06-2	0.215	mg/kg	0.43	U	PBOW99-SBA104B	PBOW99SBA104B	SEMIVOLATILES	REG	10-Jun-99	0	1	U	0.43
Trichlorophenol, 2,4,6-	88-06-2	0.405	mg/kg	0.81	UJ	PBOW99-SSA101	PBOW99SSA101	SEMIVOLATILES	REG	10-Jun-99	0	0	U	0.81

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Trichlorophenol, 2,4,6-	88-06-2	0.205	mg/kg	0.41	U	ASH PIT 1-SB01	AP0001	SEMIVOLATILES	REG	8-Dec-08	0.5	1.5	U	0.0277
Trichlorophenol, 2,4,6-	88-06-2	0.224	mg/kg	0.448	U	ASH PIT 1-SB06	AP0017	SEMIVOLATILES	REG	8-Dec-08	0.8	1.8	U	0.0302
Trichlorophenol, 2,4,6-	88-06-2	0.21	mg/kg	0.42	U	PBOW99-SBA103B	PBOW99SBA103B	SEMIVOLATILES	REG	10-Jun-99	1	4	U	0.42
Trichlorophenol, 2,4,6-	88-06-2	0.2095	mg/kg	0.419	U	ASH PIT 1-SB02	AP0005	SEMIVOLATILES	REG	8-Dec-08	3	3.8	U	0.0283
Trichlorophenol, 2,4,6-	88-06-2	0.193	mg/kg	0.386	U	ASH PIT 1-SB03	AP0008	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0261
Trichlorophenol, 2,4,6-	88-06-2	0.2013	mg/kg	0.4025	UU	ASH PIT 1-SB04	AP0011AP0012	SEMIVOLATILES	AVGD	9-Dec-08	3	4	UU	0.0272
Trichlorophenol, 2,4,6-	88-06-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB05	AP0015	SEMIVOLATILES	REG	9-Dec-08	3	3.7	U	0.0271
Trichlorophenol, 2,4,6-	88-06-2	0.234	mg/kg	0.468	U	ASH PIT 1-SB08	AP0024	SEMIVOLATILES	REG	9-Dec-08	3	5	U	0.0316
Trichlorophenol, 2,4,6-	88-06-2	0.2015	mg/kg	0.403	U	ASH PIT 1-SB09	AP0027	SEMIVOLATILES	REG	8-Dec-08	3	4	U	0.0273
Trichlorophenol, 2,4,6-	88-06-2	0.199	mg/kg	0.398	U	ASH PIT 1-SB01	AP0002	SEMIVOLATILES	REG	8-Dec-08	3.5	5.5	U	0.0269
Trichlorophenol, 2,4,6-	88-06-2	0.202	mg/kg	0.404	U	ASH PIT 1-SB06	AP0018	SEMIVOLATILES	REG	8-Dec-08	5	5.8	U	0.0273
Trichlorophenol, 2,4,6-	88-06-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB01	AP0003	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0279
Trichlorophenol, 2,4,6-	88-06-2	0.2035	mg/kg	0.407	U	ASH PIT 1-SB02	AP0006	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0275
Trichlorophenol, 2,4,6-	88-06-2	0.2005	mg/kg	0.401	U	ASH PIT 1-SB03	AP0009	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0271
Trichlorophenol, 2,4,6-	88-06-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB04	AP0013	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0279
Trichlorophenol, 2,4,6-	88-06-2	0.2075	mg/kg	0.415	U	ASH PIT 1-SB05	AP0016	SEMIVOLATILES	REG	9-Dec-08	8	9	U	0.028
Trichlorophenol, 2,4,6-	88-06-2	0.192	mg/kg	0.384	U	ASH PIT 1-SB06	AP0019	SEMIVOLATILES	REG	8-Dec-08	8	10	U	0.0259
Trichlorophenol, 2,4,6-	88-06-2	0.206	mg/kg	0.412	U	ASH PIT 1-SB08	AP0025	SEMIVOLATILES	REG	9-Dec-08	8	10	U	0.0278
Trichlorophenol, 2,4,6-	88-06-2	0.1863	mg/kg	0.3725	UU	ASH PIT 1-SB09	AP0058AP0028	SEMIVOLATILES	AVGD	8-Dec-08	8	10	UU	0.0252
Trinitrobenzene, 1,3,5-	99-35-4	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Trinitrobenzene, 1,3,5-	99-35-4	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Trinitrobenzene, 1,3,5-	99-35-4	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Trinitrobenzene, 1,3,5-	99-35-4	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Trinitrobenzene, 1,3,5-	99-35-4	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Trinitrobenzene, 1,3,5-	99-35-4	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Trinitrobenzene, 1,3,5-	99-35-4	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Trinitrobenzene, 1,3,5-	99-35-4	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Trinitrobenzene, 1,3,5-	99-35-4	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Trinitrobenzene, 1,3,5-	99-35-4	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Trinitrobenzene, 1,3,5-	99-35-4	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Trinitrobenzene, 1,3,5-	99-35-4	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Trinitrobenzene, 1,3,5-	99-35-4	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Trinitrobenzene, 1,3,5-	99-35-4	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Trinitrobenzene, 1,3,5-	99-35-4	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Trinitrobenzene, 1,3,5-	99-35-4	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Trinitrobenzene, 1,3,5-	99-35-4	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Trinitrobenzene, 1,3,5-	99-35-4	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Trinitrobenzene, 1,3,5-	99-35-4	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Trinitrobenzene, 1,3,5-	99-35-4	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Trinitrobenzene, 1,3,5-	99-35-4	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Trinitrobenzene, 1,3,5-	99-35-4	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Trinitrobenzene, 1,3,5-	99-35-4	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Trinitrobenzene, 1,3,5-	99-35-4	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14
Trinitrotoluene, 2,4,6-	118-96-7	0.1495	mg/kg	0.299	UJ	ASH PIT 1-SB02	AP0004	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.149
Trinitrotoluene, 2,4,6-	118-96-7	0.1525	mg/kg	0.305	UJ	ASH PIT 1-SB03	AP0007	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.152
Trinitrotoluene, 2,4,6-	118-96-7	0.137	mg/kg	0.274	UJ	ASH PIT 1-SB04	AP0010	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.137
Trinitrotoluene, 2,4,6-	118-96-7	0.1595	mg/kg	0.319	UJ	ASH PIT 1-SB05	AP0014	EXPLOSIVES	REG	9-Dec-08	0	1	U	0.16
Trinitrotoluene, 2,4,6-	118-96-7	0.1453	mg/kg	0.2905	UJUJ	ASH PIT 1-SB08	AP0023AP0063	EXPLOSIVES	AVGD	9-Dec-08	0	1	UU	0.1455
Trinitrotoluene, 2,4,6-	118-96-7	0.151	mg/kg	0.302	UJ	ASH PIT 1-SB09	AP0026	EXPLOSIVES	REG	8-Dec-08	0	1	U	0.151
Trinitrotoluene, 2,4,6-	118-96-7	0.158	mg/kg	0.316	UJ	ASH PIT 1-SB01	AP0001	EXPLOSIVES	REG	8-Dec-08	0.5	1.5	U	0.158
Trinitrotoluene, 2,4,6-	118-96-7	0.142	mg/kg	0.284	UJ	ASH PIT 1-SB06	AP0017	EXPLOSIVES	REG	8-Dec-08	0.8	1.8	U	0.142
Trinitrotoluene, 2,4,6-	118-96-7	0.143	mg/kg	0.286	UJ	ASH PIT 1-SB02	AP0005	EXPLOSIVES	REG	8-Dec-08	3	3.8	U	0.143
Trinitrotoluene, 2,4,6-	118-96-7	0.148	mg/kg	0.296	U	ASH PIT 1-SB03	AP0008	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.148
Trinitrotoluene, 2,4,6-	118-96-7	0.1575	mg/kg	0.315	UU	ASH PIT 1-SB04	AP0011AP0012	EXPLOSIVES	AVGD	9-Dec-08	3	4	UU	0.1575
Trinitrotoluene, 2,4,6-	118-96-7	0.142	mg/kg	0.284	U	ASH PIT 1-SB05	AP0015	EXPLOSIVES	REG	9-Dec-08	3	3.7	U	0.142
Trinitrotoluene, 2,4,6-	118-96-7	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB08	AP0024	EXPLOSIVES	REG	9-Dec-08	3	5	U	0.161
Trinitrotoluene, 2,4,6-	118-96-7	0.1615	mg/kg	0.323	UJ	ASH PIT 1-SB09	AP0027	EXPLOSIVES	REG	8-Dec-08	3	4	U	0.161
Trinitrotoluene, 2,4,6-	118-96-7	0.145	mg/kg	0.29	U	ASH PIT 1-SB01	AP0002	EXPLOSIVES	REG	8-Dec-08	3.5	5.5	U	0.145
Trinitrotoluene, 2,4,6-	118-96-7	0.153	mg/kg	0.306	U	ASH PIT 1-SB06	AP0018	EXPLOSIVES	REG	8-Dec-08	5	5.8	U	0.153
Trinitrotoluene, 2,4,6-	118-96-7	0.157	mg/kg	0.314	UJ	ASH PIT 1-SB01	AP0003	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.157
Trinitrotoluene, 2,4,6-	118-96-7	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB02	AP0006	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.149
Trinitrotoluene, 2,4,6-	118-96-7	0.1485	mg/kg	0.297	UJ	ASH PIT 1-SB03	AP0009	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.149
Trinitrotoluene, 2,4,6-	118-96-7	0.158	mg/kg	0.316	U	ASH PIT 1-SB04	AP0013	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.158
Trinitrotoluene, 2,4,6-	118-96-7	0.1585	mg/kg	0.317	U	ASH PIT 1-SB05	AP0016	EXPLOSIVES	REG	9-Dec-08	8	9	U	0.159
Trinitrotoluene, 2,4,6-	118-96-7	0.138	mg/kg	0.276	UJ	ASH PIT 1-SB06	AP0019	EXPLOSIVES	REG	8-Dec-08	8	10	U	0.138
Trinitrotoluene, 2,4,6-	118-96-7	0.15	mg/kg	0.3	U	ASH PIT 1-SB08	AP0025	EXPLOSIVES	REG	9-Dec-08	8	10	U	0.15
Trinitrotoluene, 2,4,6-	118-96-7	0.1398	mg/kg	0.2795	UJUJ	ASH PIT 1-SB09	AP0058AP0028	EXPLOSIVES	AVGD	8-Dec-08	8	10	UU	0.14

Table E-2
Total Soil Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	USER_TEST_GROUP	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	LAB_QUAL	METH_DET_LIM
Vanadium	7440-62-2	26.3	mg/kg	0.23	J	ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		0.115
Vanadium	7440-62-2	29.9	mg/kg	0.209	J	ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		0.105
Vanadium	7440-62-2	32.4	mg/kg	0.205	J	ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		0.102
Vanadium	7440-62-2	27.9	mg/kg	0.206	J	ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		0.103
Vanadium	7440-62-2	21.85	mg/kg	0.19	JJ	ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		0.09535
Vanadium	7440-62-2	20.7	mg/kg	0.242	J	ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		0.121
Vanadium	7440-62-2	20.25	mg/kg	7.1		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5		7.1
Vanadium	7440-62-2	17.8	mg/kg	13.1		PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1		13.1
Vanadium	7440-62-2	39.2	mg/kg	8.4		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1		8.4
Vanadium	7440-62-2	14.4	mg/kg	6.5		PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1		6.5
Vanadium	7440-62-2	23	mg/kg	12.2		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0		12.2
Vanadium	7440-62-2	20.7	mg/kg	0.199	J	ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		0.0993
Vanadium	7440-62-2	28.2	mg/kg	0.227	J	ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		0.113
Vanadium	7440-62-2	26.8	mg/kg	6.3		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4		6.3
Vanadium	7440-62-2	20.6	mg/kg	0.172	J	ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		0.0861
Vanadium	7440-62-2	15.1	mg/kg	0.196	J	ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		0.098
Vanadium	7440-62-2	24.05	mg/kg	0.1885	JJ	ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		0.09425
Vanadium	7440-62-2	37.6	mg/kg	0.196	J	ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		0.0978
Vanadium	7440-62-2	18.9	mg/kg	0.194	J	ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		0.0969
Vanadium	7440-62-2	19.1	mg/kg	0.168	J	ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		0.0838
Vanadium	7440-62-2	19.3	mg/kg	0.165	J	ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		0.0826
Vanadium	7440-62-2	24.3	mg/kg	0.181	J	ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		0.0903
Vanadium	7440-62-2	20.9	mg/kg	0.19	J	ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		0.0951
Vanadium	7440-62-2	20.3	mg/kg	0.182	J	ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		0.0911
Vanadium	7440-62-2	20.5	mg/kg	0.179	J	ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		0.0893
Vanadium	7440-62-2	29.3	mg/kg	0.19	J	ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		0.0948
Vanadium	7440-62-2	24.2	mg/kg	0.188	J	ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		0.094
Vanadium	7440-62-2	17	mg/kg	0.189	J	ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		0.0944
Vanadium	7440-62-2	25.3	mg/kg	0.193	J	ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		0.0965
Vanadium	7440-62-2	16.5	mg/kg	0.181	JJ	ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		0.0905
Zinc	7440-66-6	55.2	mg/kg	2.88		ASH PIT 1-SB02	AP0004	METALS	REG	8-Dec-08	0	1		1.44
Zinc	7440-66-6	57.1	mg/kg	2.61		ASH PIT 1-SB03	AP0007	METALS	REG	9-Dec-08	0	1		1.31
Zinc	7440-66-6	55.3	mg/kg	2.56		ASH PIT 1-SB04	AP0010	METALS	REG	9-Dec-08	0	1		1.28
Zinc	7440-66-6	62.8	mg/kg	2.58		ASH PIT 1-SB05	AP0014	METALS	REG	9-Dec-08	0	1		1.29
Zinc	7440-66-6	63.4	mg/kg	2.38		ASH PIT 1-SB08	AP0023AP0063	METALS	AVGD	9-Dec-08	0	1		1.19
Zinc	7440-66-6	34.8	mg/kg	3.02		ASH PIT 1-SB09	AP0026	METALS	REG	8-Dec-08	0	1		1.51
Zinc	7440-66-6	63.15	mg/kg	2.8		PBOW99-SBA101A	PBOW99SBA101APBOV	METALS	AVGD	11-Jun-99	0	0.5	MBDMBD	2.8
Zinc	7440-66-6	2.6	mg/kg	5.2	U	PBOW99-SBA102A	PBOW99SBA102A	METALS	REG	10-Jun-99	0	1	MBD	5.2
Zinc	7440-66-6	43.5	mg/kg	3.3		PBOW99-SBA103A	PBOW99SBA103A	METALS	REG	10-Jun-99	0	1	MBD	3.3
Zinc	7440-66-6	1.3	mg/kg	2.6	U	PBOW99-SBA104B	PBOW99SBA104B	METALS	REG	10-Jun-99	0	1	MBD	2.6
Zinc	7440-66-6	95.8	mg/kg	4.9		PBOW99-SSA101	PBOW99SSA101	METALS	REG	10-Jun-99	0	0	MBD	4.9
Zinc	7440-66-6	44.4	mg/kg	2.48		ASH PIT 1-SB01	AP0001	METALS	REG	8-Dec-08	0.5	1.5		1.24
Zinc	7440-66-6	85.4	mg/kg	2.84		ASH PIT 1-SB06	AP0017	METALS	REG	8-Dec-08	0.8	1.8		1.42
Zinc	7440-66-6	74.5	mg/kg	2.5		PBOW99-SBA103B	PBOW99SBA103B	METALS	REG	10-Jun-99	1	4	MBD	2.5
Zinc	7440-66-6	72.7	mg/kg	2.15		ASH PIT 1-SB02	AP0005	METALS	REG	8-Dec-08	3	3.8		1.08
Zinc	7440-66-6	23.1	mg/kg	2.45		ASH PIT 1-SB03	AP0008	METALS	REG	9-Dec-08	3	5		1.23
Zinc	7440-66-6	69.25	mg/kg	2.355		ASH PIT 1-SB04	AP0011AP0012	METALS	AVGD	9-Dec-08	3	4		1.18
Zinc	7440-66-6	92.4	mg/kg	2.44		ASH PIT 1-SB05	AP0015	METALS	REG	9-Dec-08	3	3.7		1.22
Zinc	7440-66-6	38.1	mg/kg	2.42		ASH PIT 1-SB08	AP0024	METALS	REG	9-Dec-08	3	5		1.21
Zinc	7440-66-6	63.3	mg/kg	2.09		ASH PIT 1-SB09	AP0027	METALS	REG	8-Dec-08	3	4		1.05
Zinc	7440-66-6	57.1	mg/kg	2.07		ASH PIT 1-SB01	AP0002	METALS	REG	8-Dec-08	3.5	5.5		1.03
Zinc	7440-66-6	67.2	mg/kg	2.26		ASH PIT 1-SB06	AP0018	METALS	REG	8-Dec-08	5	5.8		1.13
Zinc	7440-66-6	58.7	mg/kg	2.38		ASH PIT 1-SB01	AP0003	METALS	REG	8-Dec-08	8	10		1.19
Zinc	7440-66-6	55.4	mg/kg	2.28		ASH PIT 1-SB02	AP0006	METALS	REG	8-Dec-08	8	10		1.14
Zinc	7440-66-6	54.1	mg/kg	2.23		ASH PIT 1-SB03	AP0009	METALS	REG	9-Dec-08	8	10		1.12
Zinc	7440-66-6	87	mg/kg	2.37		ASH PIT 1-SB04	AP0013	METALS	REG	9-Dec-08	8	10		1.19
Zinc	7440-66-6	65.4	mg/kg	2.35		ASH PIT 1-SB05	AP0016	METALS	REG	9-Dec-08	8	9		1.17
Zinc	7440-66-6	78	mg/kg	2.36		ASH PIT 1-SB06	AP0019	METALS	REG	8-Dec-08	8	10		1.18
Zinc	7440-66-6	63.6	mg/kg	2.41		ASH PIT 1-SB08	AP0025	METALS	REG	9-Dec-08	8	10		1.21
Zinc	7440-66-6	75.5	mg/kg	2.265		ASH PIT 1-SB09	AP0058AP0028	METALS	AVGD	8-Dec-08	8	10		1.13

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.049	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.096	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.048	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.05	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.075	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.15	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.074	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.076	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.098	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.049	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.05	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.064	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.13	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.062	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.064	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.2	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.18	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.089	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.092	N	U	EXPLOSIVES
HMX	2691-41-0	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.21	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.1	N	U	EXPLOSIVES
HMX	2691-41-0	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.11	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.049	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.096	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.048	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.05	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.063	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.12	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.062	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.063	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.095	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.19	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.093	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.096	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.075	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.15	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.1	ug/L	0.2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.075	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.073	N	U	EXPLOSIVES
RDX	121-82-4	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.074	N	U	EXPLOSIVES
RDX	121-82-4	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.14	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.072	N	U	EXPLOSIVES
RDX	121-82-4	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.074	N	U	EXPLOSIVES
Tetryl	479-45-8	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.076	N	U	EXPLOSIVES
Tetryl	479-45-8	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.15	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.075	N	U	EXPLOSIVES
Tetryl	479-45-8	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.077	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.049	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.096	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.048	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.05	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.1	ug/L	0.2	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.068	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.19	ug/L	0.38	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.13	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.066	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.1	ug/L	0.2	UJ	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.068	N	U	EXPLOSIVES
Chloride	16887-00-6	3E+06	ug/L	200000		AP1-BEDGW-001	AP3053	REG	9-May-09	100000	N		GEN CHEMISTRY
Chloride	16887-00-6	4E+06	ug/L	200000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	100000	N		GEN CHEMISTRY
Chloride	16887-00-6	705000	ug/L	100000		AP1-BEDGW-002	AP3054	REG	10-May-09	50000	N		GEN CHEMISTRY
Chloride	16887-00-6	2E+06	ug/L	100000	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	50000	N		GEN CHEMISTRY
Cyanide, total	57-12-5	37	ug/L	10	J	AP1-BEDGW-001	AP3053	REG	9-May-09	5	N		GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5	N	U	GEN CHEMISTRY

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Cyanide, total	57-12-5	120	ug/L	10	J	AP1-BEDGW-002	AP3054	REG	10-May-09	5	N		GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	5	N	U	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	46	ug/L	100	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	30	N	B	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	1000	ug/L	2000	U	AP1-BEDGW-001	AP3053	REG	9-May-09	740	N	U	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	190	ug/L	100	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	30	N		GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	1000	ug/L	2000	U	AP1-BEDGW-002	AP3054	REG	10-May-09	740	N	U	GEN CHEMISTRY
Sulfate	14808-79-8	13600	ug/L	2000		AP1-BEDGW-001	AP3053	REG	9-May-09	1000	N		GEN CHEMISTRY
Sulfate	14808-79-8	25000	ug/L	50000	UJ	AP1-BEDGW-001	AP3073	REG	6-Nov-09	25000	N	U	GEN CHEMISTRY
Sulfate	14808-79-8	93400	ug/L	2000		AP1-BEDGW-002	AP3054	REG	10-May-09	1000	N		GEN CHEMISTRY
Sulfate	14808-79-8	50000	ug/L	100000	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	50000	N	U	GEN CHEMISTRY
Aluminum - f	7429-90-5	23.2	ug/L	200	J	AP1-BEDGW-001	AP3053	REG	9-May-09	11	Y	B	METALS
Aluminum - f	7429-90-5	26.1	ug/L	200	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	11	Y	B	METALS
Aluminum - f	7429-90-5	409	ug/L	200		AP1-BEDGW-002	AP3054	REG	10-May-09	11	Y		METALS
Aluminum - f	7429-90-5	24.8	ug/L	200	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	11	Y	B	METALS
Aluminum - uf	7429-90-5	57.2	ug/L	200	J	AP1-BEDGW-001	AP3053	REG	9-May-09	11	N	B	METALS
Aluminum - uf	7429-90-5	45.3	ug/L	200	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	11	N	B	METALS
Aluminum - uf	7429-90-5	67.5	ug/L	200	J	AP1-BEDGW-002	AP3054	REG	10-May-09	11	N	B	METALS
Aluminum - uf	7429-90-5	46.7	ug/L	200	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	11	N	B	METALS
Antimony - f	7440-36-0	6	ug/L	12	U	AP1-BEDGW-001	AP3053	REG	9-May-09	9	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	5.4	ug/L	6	J	AP1-BEDGW-002	AP3054	REG	10-May-09	4.5	Y	B	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	4.5	Y	U	METALS
Antimony - uf	7440-36-0	6	ug/L	12	U	AP1-BEDGW-001	AP3053	REG	9-May-09	9	N	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.5	N	U	METALS
Antimony - uf	7440-36-0	5.8	ug/L	6	J	AP1-BEDGW-002	AP3054	REG	10-May-09	4.5	N	B	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	4.5	N	U	METALS
Arsenic - f	7440-38-2	65.6	ug/L	20		AP1-BEDGW-001	AP3053	REG	9-May-09	7.2	Y		METALS
Arsenic - f	7440-38-2	133	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.2	Y		METALS
Arsenic - f	7440-38-2	77.7	ug/L	10		AP1-BEDGW-002	AP3054	REG	10-May-09	3.6	Y		METALS
Arsenic - f	7440-38-2	36.7	ug/L	10		AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.6	Y		METALS
Arsenic - uf	7440-38-2	69.7	ug/L	20		AP1-BEDGW-001	AP3053	REG	9-May-09	7.2	N		METALS
Arsenic - uf	7440-38-2	110	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.2	N		METALS
Arsenic - uf	7440-38-2	101	ug/L	10		AP1-BEDGW-002	AP3054	REG	10-May-09	3.6	N		METALS
Arsenic - uf	7440-38-2	50.7	ug/L	10		AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.6	N		METALS
Barium - f	7440-39-3	813	ug/L	200		AP1-BEDGW-001	AP3053	REG	9-May-09	5	Y		METALS
Barium - f	7440-39-3	961	ug/L	200		AP1-BEDGW-001	AP3073	REG	6-Nov-09	5	Y		METALS
Barium - f	7440-39-3	307	ug/L	200		AP1-BEDGW-002	AP3054	REG	10-May-09	5	Y		METALS
Barium - f	7440-39-3	406	ug/L	200		AP1-BEDGW-002	AP3074	REG	10-Nov-09	5	Y		METALS
Barium - uf	7440-39-3	897	ug/L	200		AP1-BEDGW-001	AP3053	REG	9-May-09	5	N		METALS
Barium - uf	7440-39-3	989	ug/L	200		AP1-BEDGW-001	AP3073	REG	6-Nov-09	5	N		METALS
Barium - uf	7440-39-3	555	ug/L	200		AP1-BEDGW-002	AP3054	REG	10-May-09	5	N		METALS
Barium - uf	7440-39-3	434	ug/L	200		AP1-BEDGW-002	AP3074	REG	10-Nov-09	5	N		METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1	Y	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1	N	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1	Y	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1	N	U	METALS
Calcium - f	7440-70-2	521000	ug/L	2000		AP1-BEDGW-001	AP3053	REG	9-May-09	200	Y		METALS
Calcium - f	7440-70-2	596000	ug/L	2000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	200	Y		METALS
Calcium - f	7440-70-2	153000	ug/L	1000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	Y		METALS
Calcium - f	7440-70-2	200000	ug/L	1000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	100	Y		METALS

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Calcium - uf	7440-70-2	573000	ug/L	2000		AP1-BEDGW-001	AP3053	REG	9-May-09	200	N		METALS
Calcium - uf	7440-70-2	590000	ug/L	2000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	200	N		METALS
Calcium - uf	7440-70-2	246000	ug/L	1000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	N		METALS
Calcium - uf	7440-70-2	220000	ug/L	1000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	100	N		METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.6	Y	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.6	N	U	METALS
Cobalt - f	7440-48-4	25	ug/L	50	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.83	Y	U	METALS
Cobalt - f	7440-48-4	25	ug/L	50	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.83	Y	U	METALS
Cobalt - f	7440-48-4	25	ug/L	50	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.83	Y	U	METALS
Cobalt - f	7440-48-4	25	ug/L	50	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.83	Y	U	METALS
Cobalt - uf	7440-48-4	25	ug/L	50	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.83	N	U	METALS
Cobalt - uf	7440-48-4	25	ug/L	50	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.83	N	U	METALS
Cobalt - uf	7440-48-4	25	ug/L	50	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.83	N	U	METALS
Cobalt - uf	7440-48-4	25	ug/L	50	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.83	N	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	Y	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	2.1	Y	U	METALS
Copper - f	7440-50-8	43.1	ug/L	25		AP1-BEDGW-002	AP3054	REG	10-May-09	2.1	Y		METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.1	Y	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-002	AP3054	REG	10-May-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.1	N	U	METALS
Iron - f	7439-89-6	77.4	ug/L	300	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	23	Y	B	METALS
Iron - f	7439-89-6	150	ug/L	300	U	AP1-BEDGW-001	AP3053	REG	9-May-09	23	Y	U	METALS
Iron - f	7439-89-6	124	ug/L	300	J	AP1-BEDGW-002	AP3054	REG	10-May-09	23	Y	B	METALS
Iron - f	7439-89-6	150	ug/L	300	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	23	Y	U	METALS
Iron - uf	7439-89-6	4910	ug/L	300		AP1-BEDGW-001	AP3053	REG	9-May-09	23	N		METALS
Iron - uf	7439-89-6	1570	ug/L	300		AP1-BEDGW-001	AP3073	REG	6-Nov-09	23	N		METALS
Iron - uf	7439-89-6	322	ug/L	300		AP1-BEDGW-002	AP3054	REG	10-May-09	23	N		METALS
Iron - uf	7439-89-6	335	ug/L	300	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	23	N		METALS
Lead - f	7439-92-1	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	4	Y	U	METALS
Lead - f	7439-92-1	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	Y	U	METALS
Lead - f	7439-92-1	7.5	ug/L	10	J	AP1-BEDGW-002	AP3054	REG	10-May-09	2	Y	B	METALS
Lead - f	7439-92-1	2.5	ug/L	5	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2	Y	U	METALS
Lead - uf	7439-92-1	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	4	N	U	METALS
Lead - uf	7439-92-1	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	METALS
Lead - uf	7439-92-1	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	2	N	U	METALS
Lead - uf	7439-92-1	2.5	ug/L	5	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2	N	U	METALS
Magnesium - f	7439-95-4	427000	ug/L	5000		AP1-BEDGW-001	AP3053	REG	9-May-09	100	Y		METALS
Magnesium - f	7439-95-4	471000	ug/L	5000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	100	Y		METALS
Magnesium - f	7439-95-4	96800	ug/L	5000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	Y		METALS
Magnesium - f	7439-95-4	148000	ug/L	5000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	100	Y		METALS
Magnesium - uf	7439-95-4	418000	ug/L	5000		AP1-BEDGW-001	AP3053	REG	9-May-09	100	N		METALS
Magnesium - uf	7439-95-4	479000	ug/L	5000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	100	N		METALS
Magnesium - uf	7439-95-4	155000	ug/L	5000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	N		METALS
Magnesium - uf	7439-95-4	155000	ug/L	5000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	100	N		METALS
Manganese - f	7439-96-5	804	ug/L	15		AP1-BEDGW-001	AP3053	REG	9-May-09	0.5	Y		METALS
Manganese - f	7439-96-5	658	ug/L	15		AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.5	Y		METALS
Manganese - f	7439-96-5	379	ug/L	15		AP1-BEDGW-002	AP3054	REG	10-May-09	0.5	Y		METALS
Manganese - f	7439-96-5	10.5	ug/L	15	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.5	Y	B	METALS
Manganese - uf	7439-96-5	857	ug/L	15		AP1-BEDGW-001	AP3053	REG	9-May-09	0.5	N		METALS
Manganese - uf	7439-96-5	704	ug/L	15		AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.5	N		METALS
Manganese - uf	7439-96-5	548	ug/L	15		AP1-BEDGW-002	AP3054	REG	10-May-09	0.5	N		METALS
Manganese - uf	7439-96-5	38	ug/L	15		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.5	N		METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.14	Y	U	METALS

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.14	Y	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-001	AP3053	REG	9-May-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.14	N	U	METALS
Nickel - f	7440-02-0	3.8	ug/L	40	J	AP1-BEDGW-001	AP3053	REG	9-May-09	2.3	Y	B	METALS
Nickel - f	7440-02-0	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	2.3	Y	U	METALS
Nickel - f	7440-02-0	55.2	ug/L	40		AP1-BEDGW-002	AP3054	REG	10-May-09	2.3	Y		METALS
Nickel - f	7440-02-0	20	ug/L	40	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.3	Y	U	METALS
Nickel - uf	7440-02-0	5.8	ug/L	40	J	AP1-BEDGW-001	AP3053	REG	9-May-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	2.8	ug/L	40	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	20	ug/L	40	U	AP1-BEDGW-002	AP3054	REG	10-May-09	2.3	N	U	METALS
Nickel - uf	7440-02-0	20	ug/L	40	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.3	N	U	METALS
Potassium - f	7440-09-7	107000	ug/L	20000		AP1-BEDGW-001	AP3053	REG	9-May-09	200	Y		METALS
Potassium - f	7440-09-7	131000	ug/L	20000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	200	Y		METALS
Potassium - f	7440-09-7	45300	ug/L	10000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	Y		METALS
Potassium - f	7440-09-7	84800	ug/L	20000	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	200	Y		METALS
Potassium - uf	7440-09-7	110000	ug/L	20000		AP1-BEDGW-001	AP3053	REG	9-May-09	200	N		METALS
Potassium - uf	7440-09-7	129000	ug/L	20000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	200	N		METALS
Potassium - uf	7440-09-7	59600	ug/L	10000		AP1-BEDGW-002	AP3054	REG	10-May-09	100	N		METALS
Potassium - uf	7440-09-7	88800	ug/L	20000	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	200	N		METALS
Selenium - f	7782-49-2	16.7	ug/L	20	J	AP1-BEDGW-001	AP3053	REG	9-May-09	6.2	Y	B	METALS
Selenium - f	7782-49-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.2	Y	U	METALS
Selenium - f	7782-49-2	15	ug/L	20	J	AP1-BEDGW-002	AP3054	REG	10-May-09	3.1	Y	B	METALS
Selenium - f	7782-49-2	4	ug/L	10	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.1	Y	B	METALS
Selenium - uf	7782-49-2	11.9	ug/L	20	J	AP1-BEDGW-001	AP3053	REG	9-May-09	6.2	N	B	METALS
Selenium - uf	7782-49-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.2	N	U	METALS
Selenium - uf	7782-49-2	6.3	ug/L	20	J	AP1-BEDGW-002	AP3054	REG	10-May-09	3.1	N	B	METALS
Selenium - uf	7782-49-2	5.2	ug/L	10	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.1	N	B	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.2	Y	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.2	N	U	METALS
Sodium - f	7440-23-5	1E+06	ug/L	200000		AP1-BEDGW-001	AP3053	REG	9-May-09	10000	Y		METALS
Sodium - f	7440-23-5	1E+06	ug/L	500000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	25000	Y		METALS
Sodium - f	7440-23-5	644000	ug/L	100000		AP1-BEDGW-002	AP3054	REG	10-May-09	5000	Y		METALS
Sodium - f	7440-23-5	833000	ug/L	200000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	10000	Y		METALS
Sodium - uf	7440-23-5	1E+06	ug/L	200000		AP1-BEDGW-001	AP3053	REG	9-May-09	10000	N		METALS
Sodium - uf	7440-23-5	1E+06	ug/L	500000		AP1-BEDGW-001	AP3073	REG	6-Nov-09	25000	N		METALS
Sodium - uf	7440-23-5	573000	ug/L	100000		AP1-BEDGW-002	AP3054	REG	10-May-09	5000	N		METALS
Sodium - uf	7440-23-5	889000	ug/L	200000		AP1-BEDGW-002	AP3074	REG	10-Nov-09	10000	N		METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.4	Y	U	METALS
Thallium - uf	7440-28-0	5.3	ug/L	10	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.4	N	B	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.4	N	U	METALS
Vanadium - f	7440-62-2	2	ug/L	50	J	AP1-BEDGW-001	AP3053	REG	9-May-09	0.66	Y	B	METALS
Vanadium - f	7440-62-2	25	ug/L	50	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.66	Y	U	METALS
Vanadium - f	7440-62-2	3.1	ug/L	50	J	AP1-BEDGW-002	AP3054	REG	10-May-09	0.66	Y	B	METALS
Vanadium - f	7440-62-2	25	ug/L	50	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.66	Y	U	METALS
Vanadium - uf	7440-62-2	2.2	ug/L	50	J	AP1-BEDGW-001	AP3053	REG	9-May-09	0.66	N	B	METALS
Vanadium - uf	7440-62-2	25	ug/L	50	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	0.66	N	U	METALS
Vanadium - uf	7440-62-2	2.6	ug/L	50	J	AP1-BEDGW-002	AP3054	REG	10-May-09	0.66	N	B	METALS
Vanadium - uf	7440-62-2	1.3	ug/L	50	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.66	N	B	METALS

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Zinc - f	7440-66-6	8.3	ug/L	20	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	Y	B	METALS
Zinc - f	7440-66-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	3.8	Y	U	METALS
Zinc - f	7440-66-6	140	ug/L	20		AP1-BEDGW-002	AP3054	REG	10-May-09	3.8	Y		METALS
Zinc - f	7440-66-6	10	ug/L	20	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.8	Y	U	METALS
Zinc - uf	7440-66-6	11.5	ug/L	20	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	B	METALS
Zinc - uf	7440-66-6	16	ug/L	20	J	AP1-BEDGW-002	AP3054	REG	10-May-09	3.8	N	B	METALS
Zinc - uf	7440-66-6	7.7	ug/L	20	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.8	N	B	METALS
3-Methylphenol and 4-Methylphenol	65794-96-9	9	ug/L	19	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	J	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	8	ug/L	20	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	J	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	0.97	ug/L	4.9	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	J	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Anthracene	120-12-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Anthracene	120-12-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	48	ug/L	96	U	AP1-BEDGW-001	AP3053	REG	9-May-09	38	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	49.5	ug/L	99	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12	ug/L	24	U	AP1-BEDGW-002	AP3054	REG	10-May-09	9.5	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12	ug/L	24	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	9.7	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Bis(2-chloroisopropyl)ether	108-60-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Carbazole	86-74-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Carbazole	86-74-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	4.6	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.8	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.1	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.2	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Chrysene	218-01-9	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Chrysene	218-01-9	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	19	ug/L	38	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Dichlorobenzidine, 3,3'-	91-94-1	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	4.75	ug/L	9.5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	4.85	ug/L	9.7	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.1	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.3	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	24.7	ug/L	19		AP1-BEDGW-001	AP3053	REG	9-May-09	4.6	N		SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	20.7	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.8	N		SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2	ug/L	4.8	J	AP1-BEDGW-002	AP3054	REG	10-May-09	1.1	N	J	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.8	ug/L	4.9	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.2	N	J	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	19	ug/L	38	U	AP1-BEDGW-001	AP3053	REG	9-May-09	15	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	16	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	4.75	ug/L	9.5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	3.8	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	4.85	ug/L	9.7	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	3.9	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	48	ug/L	96	U	AP1-BEDGW-001	AP3053	REG	9-May-09	38	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	49.5	ug/L	99	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12	ug/L	24	U	AP1-BEDGW-002	AP3054	REG	10-May-09	9.5	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12	ug/L	24	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	9.7	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5.8	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.9	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.4	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.5	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Fluorene	86-73-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Fluorene	86-73-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	9.6	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	9.9	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	2.4	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.4	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.1	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	N	U	SEMIVOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Hexachlorocyclopentadiene	77-47-4	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.3	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	9.6	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	9.9	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	2.4	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.4	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	4.2	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.4	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.1	N	U	SEMIVOLATILES
Isophorone	78-59-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Isophorone	78-59-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	36.2	ug/L	19		AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N		SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	32.7	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N		SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	14.5	ug/L	4.8		AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N		SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	14.5	ug/L	4.9		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N		SEMIVOLATILES
Methylphenol, 2-	95-48-7	6.9	ug/L	19	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	J	SEMIVOLATILES
Methylphenol, 2-	95-48-7	6.2	ug/L	20	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	J	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Naphthalene	91-20-3	33	ug/L	19		AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N		SEMIVOLATILES
Naphthalene	91-20-3	33.2	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N		SEMIVOLATILES
Naphthalene	91-20-3	11.8	ug/L	4.8		AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N		SEMIVOLATILES
Naphthalene	91-20-3	15.3	ug/L	4.9		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N		SEMIVOLATILES
Nitroaniline, 2-	88-74-4	19	ug/L	38	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	4.75	ug/L	9.5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	4.85	ug/L	9.7	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	19	ug/L	38	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	4.75	ug/L	9.5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	4.85	ug/L	9.7	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	19	ug/L	38	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	4.75	ug/L	9.5	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	4.85	ug/L	9.7	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.1	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	48	ug/L	96	U	AP1-BEDGW-001	AP3053	REG	9-May-09	38	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	49.5	ug/L	99	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12	ug/L	24	U	AP1-BEDGW-002	AP3054	REG	10-May-09	9.5	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12	ug/L	24	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	9.7	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.7	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.9	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.9	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.9	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	48	ug/L	96	U	AP1-BEDGW-001	AP3053	REG	9-May-09	38	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	49.5	ug/L	99	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12	ug/L	24	U	AP1-BEDGW-002	AP3054	REG	10-May-09	9.5	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12	ug/L	24	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	9.7	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Phenanthrene	85-01-8	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Phenol	108-95-2	6.6	ug/L	19	J	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	J	SEMIVOLATILES
Phenol	108-95-2	6.6	ug/L	20	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	J	SEMIVOLATILES
Phenol	108-95-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Phenol	108-95-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Pyrene	129-00-0	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Pyrene	129-00-0	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.8	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.95	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.97	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.5	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	9.5	ug/L	19	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.5	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.4	ug/L	4.8	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.45	ug/L	4.9	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.4	N	U	SEMIVOLATILES
Acetone	67-64-1	140	ug/L	250	J	AP1-BEDGW-001	AP3053	REG	9-May-09	100	N	J	VOLATILES
Acetone	67-64-1	463	ug/L	500	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	200	N	J	VOLATILES
Benzene	71-43-2	613	ug/L	10		AP1-BEDGW-001	AP3053	REG	9-May-09	4	N		VOLATILES
Benzene	71-43-2	1300	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	8	N		VOLATILES
Benzene	71-43-2	67.1	ug/L	2		AP1-BEDGW-002	AP3054	REG	10-May-09	0.8	N		VOLATILES
Benzene	71-43-2	27.5	ug/L	2		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.8	N		VOLATILES
Bromodichloromethane	75-27-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2	N	U	VOLATILES
Bromodichloromethane	75-27-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	VOLATILES
Bromodichloromethane	75-27-4	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.4	N	U	VOLATILES
Bromodichloromethane	75-27-4	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.4	N	U	VOLATILES
Bromoform	75-25-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.6	N	U	VOLATILES
Bromoform	75-25-2	5	ug/L	10	UJ	AP1-BEDGW-001	AP3053	REG	9-May-09	3.3	N	U	VOLATILES
Bromoform	75-25-2	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.66	N	U	VOLATILES
Bromoform	75-25-2	1	ug/L	2	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.66	N	U	VOLATILES
Bromomethane	74-83-9	10	ug/L	20	U	AP1-BEDGW-001	AP3053	REG	9-May-09	7.8	N	U	VOLATILES
Bromomethane	74-83-9	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	16	N	U	VOLATILES
Bromomethane	74-83-9	2	ug/L	4	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.6	N	U	VOLATILES
Bromomethane	74-83-9	2	ug/L	4	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.6	N	U	VOLATILES
Butanone, 2-	78-93-3	71.5	ug/L	50		AP1-BEDGW-001	AP3053	REG	9-May-09	20	N		VOLATILES
Butanone, 2-	78-93-3	299	ug/L	100		AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N		VOLATILES
Butanone, 2-	78-93-3	10.9	ug/L	10		AP1-BEDGW-002	AP3054	REG	10-May-09	4	N		VOLATILES
Butanone, 2-	78-93-3	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	4	N	U	VOLATILES
Carbon disulfide	75-15-0	12.3	ug/L	20	J	AP1-BEDGW-001	AP3053	REG	9-May-09	4	N	JB	VOLATILES
Carbon disulfide	75-15-0	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	8	N	U	VOLATILES
Carbon disulfide	75-15-0	3	ug/L	4	J	AP1-BEDGW-002	AP3054	REG	10-May-09	0.8	N	JB	VOLATILES
Carbon disulfide	75-15-0	1.9	ug/L	4	J	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.8	N	J	VOLATILES
Carbon tetrachloride	56-23-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.2	N	U	VOLATILES
Carbon tetrachloride	56-23-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.4	N	U	VOLATILES
Carbon tetrachloride	56-23-5	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.44	N	U	VOLATILES
Carbon tetrachloride	56-23-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.44	N	U	VOLATILES
Chlorobenzene	108-90-7	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.2	N	U	VOLATILES
Chlorobenzene	108-90-7	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.4	N	U	VOLATILES
Chlorobenzene	108-90-7	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.44	N	U	VOLATILES
Chlorobenzene	108-90-7	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.44	N	U	VOLATILES
Chloroethane	75-00-3	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	9.6	N	U	VOLATILES
Chloroethane	75-00-3	10	ug/L	20	UJ	AP1-BEDGW-001	AP3053	REG	9-May-09	4.8	N	U	VOLATILES
Chloroethane	75-00-3	2	ug/L	4	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.96	N	U	VOLATILES
Chloroethane	75-00-3	2	ug/L	4	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.96	N	U	VOLATILES
Chloroform	67-66-3	18	ug/L	10		AP1-BEDGW-001	AP3053	REG	9-May-09	2.8	N		VOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Chloroform	67-66-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.6	N	U	VOLATILES
Chloroform	67-66-3	12	ug/L	2		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.56	N		VOLATILES
Chloroform	67-66-3	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.56	N	U	VOLATILES
Chloromethane	74-87-3	10	ug/L	20	U	AP1-BEDGW-001	AP3053	REG	9-May-09	6.1	N	U	VOLATILES
Chloromethane	74-87-3	20	ug/L	40	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	12	N	U	VOLATILES
Chloromethane	74-87-3	216	ug/L	40		AP1-BEDGW-002	AP3074	REG	10-Nov-09	12	N		VOLATILES
Chloromethane	74-87-3	2	ug/L	4	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.2	N	U	VOLATILES
Dibromochloromethane	124-48-1	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2	N	U	VOLATILES
Dibromochloromethane	124-48-1	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	VOLATILES
Dibromochloromethane	124-48-1	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.4	N	U	VOLATILES
Dibromochloromethane	124-48-1	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.4	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.4	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.8	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.48	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.48	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.4	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.8	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.68	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.68	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	5.4	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	11	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	1.1	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	1.1	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.4	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.4	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	4.5	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	9	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.9	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.9	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.2	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.42	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.42	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.2	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.42	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.42	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.2	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	5	ug/L	10	UJ	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.42	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.42	N	U	VOLATILES
Ethylbenzene	100-41-4	126	ug/L	10		AP1-BEDGW-001	AP3053	REG	9-May-09	4.3	N		VOLATILES
Ethylbenzene	100-41-4	176	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	8.6	N		VOLATILES
Ethylbenzene	100-41-4	45.6	ug/L	2		AP1-BEDGW-002	AP3054	REG	10-May-09	0.86	N		VOLATILES
Ethylbenzene	100-41-4	30.9	ug/L	2		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.86	N		VOLATILES
Hexanone, 2-	591-78-6	50	ug/L	100	U	AP1-BEDGW-001	AP3053	REG	9-May-09	50	N	U	VOLATILES
Hexanone, 2-	591-78-6	100	ug/L	200	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	100	N	U	VOLATILES
Hexanone, 2-	591-78-6	10	ug/L	20	U	AP1-BEDGW-002	AP3054	REG	10-May-09	10	N	U	VOLATILES
Hexanone, 2-	591-78-6	10	ug/L	20	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	10	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	25	ug/L	50	U	AP1-BEDGW-001	AP3053	REG	9-May-09	20	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	50	ug/L	100	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	40	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	5	ug/L	10	U	AP1-BEDGW-002	AP3054	REG	10-May-09	4	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	4	N	U	VOLATILES
Methylene chloride	75-09-2	28.8	ug/L	100	J	AP1-BEDGW-001	AP3073	REG	6-Nov-09	20	N	J	VOLATILES
Methylene chloride	75-09-2	5	ug/L	10	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	2	N	U	VOLATILES
Styrene	100-42-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	7.2	N	U	VOLATILES
Styrene	100-42-5	5	ug/L	10	UJ	AP1-BEDGW-001	AP3053	REG	9-May-09	3.6	N	U	VOLATILES
Styrene	100-42-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.72	N	U	VOLATILES
Styrene	100-42-5	1	ug/L	2	UJ	AP1-BEDGW-002	AP3054	REG	10-May-09	0.72	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.1	N	U	VOLATILES

Table E-3
Bedrock Groundwater Analytical Data Used In Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Tetrachloroethane, 1,1,2,2-	79-34-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.2	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.53	ug/L	2	J	AP1-BEDGW-002	AP3054	REG	10-May-09	0.42	N	J	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.42	N	U	VOLATILES
Tetrachloroethene	127-18-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.2	N	U	VOLATILES
Tetrachloroethene	127-18-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	4.4	N	U	VOLATILES
Tetrachloroethene	127-18-4	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.44	N	U	VOLATILES
Tetrachloroethene	127-18-4	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.44	N	U	VOLATILES
Toluene	108-88-3	490	ug/L	10		AP1-BEDGW-001	AP3053	REG	9-May-09	3.5	N		VOLATILES
Toluene	108-88-3	730	ug/L	20		AP1-BEDGW-001	AP3073	REG	6-Nov-09	7	N		VOLATILES
Toluene	108-88-3	69.2	ug/L	2		AP1-BEDGW-002	AP3054	REG	10-May-09	0.7	N		VOLATILES
Toluene	108-88-3	43.6	ug/L	2		AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.7	N		VOLATILES
Trichloroethane, 1,1,1-	71-55-6	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.3	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.6	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.66	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.66	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	2.6	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	5.2	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.52	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.52	N	U	VOLATILES
Trichloroethene	79-01-6	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3.2	N	U	VOLATILES
Trichloroethene	79-01-6	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6.4	N	U	VOLATILES
Trichloroethene	79-01-6	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.64	N	U	VOLATILES
Trichloroethene	79-01-6	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.64	N	U	VOLATILES
Vinyl chloride	75-01-4	5	ug/L	10	U	AP1-BEDGW-001	AP3053	REG	9-May-09	3	N	U	VOLATILES
Vinyl chloride	75-01-4	10	ug/L	20	U	AP1-BEDGW-001	AP3073	REG	6-Nov-09	6	N	U	VOLATILES
Vinyl chloride	75-01-4	1	ug/L	2	U	AP1-BEDGW-002	AP3054	REG	10-May-09	0.6	N	U	VOLATILES
Vinyl chloride	75-01-4	1	ug/L	2	U	AP1-BEDGW-002	AP3074	REG	10-Nov-09	0.6	N	U	VOLATILES
Xylenes, total	1330-20-7	1060	ug/L	30		AP1-BEDGW-001	AP3053	REG	9-May-09	12	N		VOLATILES
Xylenes, total	1330-20-7	1340	ug/L	60		AP1-BEDGW-001	AP3073	REG	6-Nov-09	23	N		VOLATILES
Xylenes, total	1330-20-7	473	ug/L	6		AP1-BEDGW-002	AP3054	REG	10-May-09	2.3	N		VOLATILES
Xylenes, total	1330-20-7	370	ug/L	6		AP1-BEDGW-002	AP3074	REG	10-Nov-09	2.3	N		VOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
3-Methylphenol and 4-Methylphenol	65794-96-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Acetone	67-64-1	12.5	ug/L	25	U	AP1-MW01	AP3050	REG	7-May-09	10	N	U	VOLATILES
Acetone	67-64-1	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	10	N	U	VOLATILES
Acetone	67-64-1	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	10	N	U	VOLATILES
Aluminum - f	7429-90-5	100	ug/L	200	U	AP1-MW01	AP3050	REG	7-May-09	11	Y	U	METALS
Aluminum - f	7429-90-5	100	ug/L	200	U	AP1-MW01	AP3070	REG	4-Nov-09	11	Y	U	METALS
Aluminum - f	7429-90-5	15.5	ug/L	200	J	AP1-MW02	AP3051	REG	10-May-09	11	Y	B	METALS
Aluminum - f	7429-90-5	12.8	ug/L	200	J	AP1-MW02	AP3071	REG	6-Nov-09	11	Y	B	METALS
Aluminum - f	7429-90-5	19.1	ug/L	200	J	AP1-MW03	AP3052	REG	11-May-09	11	Y	B	METALS
Aluminum - f	7429-90-5	3320	ug/L	200		AP1-MW03	AP3072	REG	6-Nov-09	11	Y		METALS
Aluminum - uf	7429-90-5	26.1	ug/L	200	J	AP1-MW01	AP3050	REG	7-May-09	11	N	B	METALS
Aluminum - uf	7429-90-5	191	ug/L	200	J	AP1-MW01	AP3070	REG	4-Nov-09	11	N	B	METALS
Aluminum - uf	7429-90-5	76.8	ug/L	200	J	AP1-MW02	AP3051	REG	10-May-09	11	N	B	METALS
Aluminum - uf	7429-90-5	68.7	ug/L	200	J	AP1-MW02	AP3071	REG	6-Nov-09	11	N	B	METALS
Aluminum - uf	7429-90-5	1110	ug/L	200	J	AP1-MW03	AP3052	REG	11-May-09	11	N		METALS
Aluminum - uf	7429-90-5	17.2	ug/L	200	J	AP1-MW03	AP3072	REG	6-Nov-09	11	N	B	METALS
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.049	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.049	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.049	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.05	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.049	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.049	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.075	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.075	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.075	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.076	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.075	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.075	N	U	EXPLOSIVES
Anthracene	120-12-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW01	AP3050	REG	7-May-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW01	AP3070	REG	4-Nov-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW02	AP3051	REG	10-May-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW02	AP3071	REG	6-Nov-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW03	AP3052	REG	11-May-09	4.5	Y	U	METALS
Antimony - f	7440-36-0	3	ug/L	6	U	AP1-MW03	AP3072	REG	6-Nov-09	4.5	Y	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW01	AP3050	REG	7-May-09	4.5	N	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW01	AP3070	REG	4-Nov-09	4.5	N	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW02	AP3051	REG	10-May-09	4.5	N	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW02	AP3071	REG	6-Nov-09	4.5	N	U	METALS
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW03	AP3052	REG	11-May-09	4.5	N	U	METALS

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Antimony - uf	7440-36-0	3	ug/L	6	U	AP1-MW03	AP3072	REG	6-Nov-09	4.5	N	U	METALS
Arsenic - f	7440-38-2	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	3.6	Y	U	METALS
Arsenic - f	7440-38-2	6.2	ug/L	10	J	AP1-MW01	AP3070	REG	4-Nov-09	3.6	Y	B	METALS
Arsenic - f	7440-38-2	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	3.6	Y	U	METALS
Arsenic - f	7440-38-2	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	3.6	Y	U	METALS
Arsenic - f	7440-38-2	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	3.6	Y	U	METALS
Arsenic - f	7440-38-2	5.7	ug/L	10	J	AP1-MW03	AP3072	REG	6-Nov-09	3.6	Y	B	METALS
Arsenic - uf	7440-38-2	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	3.6	N	U	METALS
Arsenic - uf	7440-38-2	5.4	ug/L	10	J	AP1-MW01	AP3070	REG	4-Nov-09	3.6	N	B	METALS
Arsenic - uf	7440-38-2	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	3.6	N	U	METALS
Arsenic - uf	7440-38-2	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	3.6	N	U	METALS
Arsenic - uf	7440-38-2	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	3.6	N	U	METALS
Arsenic - uf	7440-38-2	6.3	ug/L	10	J	AP1-MW03	AP3072	REG	6-Nov-09	3.6	N	B	METALS
Barium - f	7440-39-3	28.4	ug/L	200	J	AP1-MW01	AP3050	REG	7-May-09	5	Y	B	METALS
Barium - f	7440-39-3	34.9	ug/L	200	J	AP1-MW01	AP3070	REG	4-Nov-09	5	Y	B	METALS
Barium - f	7440-39-3	61.7	ug/L	200	J	AP1-MW02	AP3051	REG	10-May-09	5	Y	B	METALS
Barium - f	7440-39-3	51.6	ug/L	200	J	AP1-MW02	AP3071	REG	6-Nov-09	5	Y	B	METALS
Barium - f	7440-39-3	255	ug/L	200		AP1-MW03	AP3052	REG	11-May-09	5	Y		METALS
Barium - f	7440-39-3	177	ug/L	200	J	AP1-MW03	AP3072	REG	6-Nov-09	5	Y	B	METALS
Barium - uf	7440-39-3	28.6	ug/L	200	J	AP1-MW01	AP3050	REG	7-May-09	5	N	B	METALS
Barium - uf	7440-39-3	37.8	ug/L	200	J	AP1-MW01	AP3070	REG	4-Nov-09	5	N	B	METALS
Barium - uf	7440-39-3	61	ug/L	200	J	AP1-MW02	AP3051	REG	10-May-09	5	N	B	METALS
Barium - uf	7440-39-3	53.1	ug/L	200	J	AP1-MW02	AP3071	REG	6-Nov-09	5	N	B	METALS
Barium - uf	7440-39-3	252	ug/L	200		AP1-MW03	AP3052	REG	11-May-09	5	N		METALS
Barium - uf	7440-39-3	154	ug/L	200	J	AP1-MW03	AP3072	REG	6-Nov-09	5	N	B	METALS
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.4	N	U	VOLATILES
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.4	N	U	VOLATILES
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.4	N	U	VOLATILES
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.4	N	U	VOLATILES
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.4	N	U	VOLATILES
Benzene	71-43-2	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.4	N	U	VOLATILES
Benzo(a)anthracene	56-55-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12	ug/L	24	U	AP1-MW01	AP3050	REG	7-May-09	9.6	N	U	SEMIVOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Benzoic acid	65-85-0	12	ug/L	24	U	AP1-MW01	AP3070	REG	4-Nov-09	9.5	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12	ug/L	24	U	AP1-MW02	AP3051	REG	10-May-09	9.6	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	10	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW01	AP3050	REG	7-May-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW01	AP3070	REG	4-Nov-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW02	AP3051	REG	10-May-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW02	AP3071	REG	6-Nov-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW03	AP3052	REG	11-May-09	1	Y	U	METALS
Beryllium - f	7440-41-7	2	ug/L	4	U	AP1-MW03	AP3072	REG	6-Nov-09	1	Y	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW01	AP3050	REG	7-May-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW01	AP3070	REG	4-Nov-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW02	AP3051	REG	10-May-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	METALS
Beryllium - uf	7440-41-7	2	ug/L	4	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	METALS
Bis(2-chloroethoxy)methane	111-91-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.2	N	U	VOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.2	N	U	VOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.2	N	U	VOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.2	N	U	VOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.2	N	U	VOLATILES
Bromodichloromethane	75-27-4	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.2	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.33	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.33	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.33	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.33	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.33	N	U	VOLATILES
Bromoform	75-25-2	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.33	N	U	VOLATILES
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW01	AP3050	REG	7-May-09	0.78	N	U	VOLATILES
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.78	N	U	VOLATILES
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW02	AP3051	REG	10-May-09	0.78	N	U	VOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.78	N	U	VOLATILES
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW03	AP3052	REG	11-May-09	0.78	N	U	VOLATILES
Bromomethane	74-83-9	1	ug/L	2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.78	N	U	VOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW01	AP3050	REG	7-May-09	2	N	U	VOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	2	N	U	VOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW02	AP3051	REG	10-May-09	2	N	U	VOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	VOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	VOLATILES
Butanone, 2-	78-93-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	VOLATILES
Butyl benzyl phthalate	85-68-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW01	AP3050	REG	7-May-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW02	AP3051	REG	10-May-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	Y	U	METALS
Cadmium - f	7440-43-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	Y	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW01	AP3050	REG	7-May-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW02	AP3051	REG	10-May-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	METALS
Cadmium - uf	7440-43-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	METALS
Calcium - f	7440-70-2	283000	ug/L	1000		AP1-MW01	AP3050	REG	7-May-09	100	Y		METALS
Calcium - f	7440-70-2	181000	ug/L	1000		AP1-MW01	AP3070	REG	4-Nov-09	100	Y		METALS
Calcium - f	7440-70-2	201000	ug/L	1000		AP1-MW02	AP3051	REG	10-May-09	100	Y		METALS
Calcium - f	7440-70-2	165000	ug/L	1000		AP1-MW02	AP3071	REG	6-Nov-09	100	Y		METALS
Calcium - f	7440-70-2	90500	ug/L	1000		AP1-MW03	AP3052	REG	11-May-09	100	Y		METALS
Calcium - f	7440-70-2	95500	ug/L	1000		AP1-MW03	AP3072	REG	6-Nov-09	100	Y		METALS
Calcium - uf	7440-70-2	282000	ug/L	1000		AP1-MW01	AP3050	REG	7-May-09	100	N		METALS
Calcium - uf	7440-70-2	194000	ug/L	1000		AP1-MW01	AP3070	REG	4-Nov-09	100	N		METALS
Calcium - uf	7440-70-2	207000	ug/L	1000		AP1-MW02	AP3051	REG	10-May-09	100	N		METALS
Calcium - uf	7440-70-2	169000	ug/L	1000		AP1-MW02	AP3071	REG	6-Nov-09	100	N		METALS
Calcium - uf	7440-70-2	93400	ug/L	1000		AP1-MW03	AP3052	REG	11-May-09	100	N		METALS
Calcium - uf	7440-70-2	94300	ug/L	1000		AP1-MW03	AP3072	REG	6-Nov-09	100	N		METALS
Carbazole	86-74-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW01	AP3050	REG	7-May-09	0.4	N	U	VOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.4	N	U	VOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW02	AP3051	REG	10-May-09	0.4	N	U	VOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.4	N	U	VOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW03	AP3052	REG	11-May-09	0.4	N	U	VOLATILES
Carbon disulfide	75-15-0	1	ug/L	2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.4	N	U	VOLATILES
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.22	N	U	VOLATILES
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.22	N	U	VOLATILES
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.22	N	U	VOLATILES
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.22	N	U	VOLATILES
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.22	N	U	VOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Carbon tetrachloride	56-23-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.22	N	U	VOLATILES
Chloride	16887-00-6	11500	ug/L	2000		AP1-MW01	AP3050	REG	7-May-09	1000	N		GEN CHEMISTRY
Chloride	16887-00-6	40000	ug/L	10000		AP1-MW01	AP3070	REG	4-Nov-09	5000	N		GEN CHEMISTRY
Chloride	16887-00-6	25600	ug/L	2000		AP1-MW02	AP3051	REG	10-May-09	1000	N		GEN CHEMISTRY
Chloride	16887-00-6	35400	ug/L	10000		AP1-MW02	AP3071	REG	6-Nov-09	5000	N		GEN CHEMISTRY
Chloride	16887-00-6	38700	ug/L	2000		AP1-MW03	AP3052	REG	11-May-09	1000	N		GEN CHEMISTRY
Chloride	16887-00-6	37000	ug/L	4000		AP1-MW03	AP3072	REG	6-Nov-09	2000	N		GEN CHEMISTRY
Chloro-3-methylphenol, 4-	59-50-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.22	N	U	VOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.22	N	U	VOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.22	N	U	VOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.22	N	U	VOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.22	N	U	VOLATILES
Chlorobenzene	108-90-7	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.22	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	U	AP1-MW01	AP3050	REG	7-May-09	0.48	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.48	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	UJ	AP1-MW02	AP3051	REG	10-May-09	0.48	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.48	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	U	AP1-MW03	AP3052	REG	11-May-09	0.48	N	U	VOLATILES
Chloroethane	75-00-3	1	ug/L	2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.48	N	U	VOLATILES
Chloroform	67-66-3	0.48	ug/L	1	J	AP1-MW01	AP3050	REG	7-May-09	0.28	N	J	VOLATILES
Chloroform	67-66-3	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.28	N	U	VOLATILES
Chloroform	67-66-3	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.28	N	U	VOLATILES
Chloroform	67-66-3	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.28	N	U	VOLATILES
Chloroform	67-66-3	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.28	N	U	VOLATILES
Chloroform	67-66-3	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.28	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW01	AP3050	REG	7-May-09	0.61	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.61	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW02	AP3051	REG	10-May-09	0.61	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.61	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW03	AP3052	REG	11-May-09	0.61	N	U	VOLATILES
Chloromethane	74-87-3	1	ug/L	2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.61	N	U	VOLATILES
Chloronaphthalene, 2-	91-58-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.1	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.2	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	1.6	Y	U	METALS

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	1.6	Y	U	METALS
Chromium - f	7440-47-3	5.5	ug/L	10	J	AP1-MW03	AP3072	REG	6-Nov-09	1.6	Y	B	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	1.6	N	U	METALS
Chromium - uf	7440-47-3	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	1.6	N	U	METALS
Chrysene	218-01-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Cobalt - f	7440-48-4	22.5	ug/L	50	J	AP1-MW01	AP3050	REG	7-May-09	0.83	Y	B	METALS
Cobalt - f	7440-48-4	5.1	ug/L	50	J	AP1-MW01	AP3070	REG	4-Nov-09	0.83	Y	B	METALS
Cobalt - f	7440-48-4	3.2	ug/L	50	J	AP1-MW02	AP3051	REG	10-May-09	0.83	Y	B	METALS
Cobalt - f	7440-48-4	3.6	ug/L	50	J	AP1-MW02	AP3071	REG	6-Nov-09	0.83	Y	B	METALS
Cobalt - f	7440-48-4	25	ug/L	50	U	AP1-MW03	AP3052	REG	11-May-09	0.83	Y	U	METALS
Cobalt - f	7440-48-4	5.1	ug/L	50	J	AP1-MW03	AP3072	REG	6-Nov-09	0.83	Y	B	METALS
Cobalt - uf	7440-48-4	22.2	ug/L	50	J	AP1-MW01	AP3050	REG	7-May-09	0.83	N	B	METALS
Cobalt - uf	7440-48-4	6.8	ug/L	50	J	AP1-MW01	AP3070	REG	4-Nov-09	0.83	N	B	METALS
Cobalt - uf	7440-48-4	3	ug/L	50	J	AP1-MW02	AP3051	REG	10-May-09	0.83	N	B	METALS
Cobalt - uf	7440-48-4	3.6	ug/L	50	J	AP1-MW02	AP3071	REG	6-Nov-09	0.83	N	B	METALS
Cobalt - uf	7440-48-4	1	ug/L	50	J	AP1-MW03	AP3052	REG	11-May-09	0.83	N	B	METALS
Cobalt - uf	7440-48-4	2.7	ug/L	50	J	AP1-MW03	AP3072	REG	6-Nov-09	0.83	N	B	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-MW01	AP3050	REG	7-May-09	2.1	Y	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-MW01	AP3070	REG	4-Nov-09	2.1	Y	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-MW02	AP3051	REG	10-May-09	2.1	Y	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	2.1	Y	U	METALS
Copper - f	7440-50-8	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	2.1	Y	U	METALS
Copper - f	7440-50-8	10.5	ug/L	25	J	AP1-MW03	AP3072	REG	6-Nov-09	2.1	Y	B	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW01	AP3050	REG	7-May-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW01	AP3070	REG	4-Nov-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW02	AP3051	REG	10-May-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	2.1	N	U	METALS
Copper - uf	7440-50-8	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	2.1	N	U	METALS
Cyanide, total	57-12-5	5	ug/L	10	UJ	AP1-MW01	AP3050	REG	7-May-09	5	N	U	GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	5	N	U	GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	UJ	AP1-MW02	AP3051	REG	10-May-09	5	N	U	GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	5	N	U	GEN CHEMISTRY
Cyanide, total	57-12-5	5	ug/L	10	UJ	AP1-MW03	AP3052	REG	11-May-09	5	N	U	GEN CHEMISTRY
Dibenz(a,h)anthracene	53-70-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.2	N	U	VOLATILES
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.2	N	U	VOLATILES
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.2	N	U	VOLATILES
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.2	N	U	VOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.2	N	U	VOLATILES
Dibromochloromethane	124-48-1	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.2	N	U	VOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	4.8	ug/L	9.6	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	4.75	ug/L	9.5	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	4.8	ug/L	9.6	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.24	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.24	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.24	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.24	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.24	N	U	VOLATILES
Dichloroethane, 1,1-	75-34-3	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.24	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.34	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.34	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.34	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.34	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.34	N	U	VOLATILES
Dichloroethane, 1,2-	107-06-2	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.34	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.54	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.54	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.54	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.54	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.54	N	U	VOLATILES
Dichloroethene, 1,1-	75-35-4	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.54	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.2	N	U	VOLATILES
Dichloroethene, cis-1,2-	156-59-2	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.2	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.45	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.45	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.45	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.45	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.45	N	U	VOLATILES
Dichloroethene, trans-1,2-	156-60-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.45	N	U	VOLATILES
Dichlorophenol, 2,4-	120-83-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.3	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.21	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.21	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.21	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.21	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.21	N	U	VOLATILES
Dichloropropane, 1,2-	78-87-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.21	N	U	VOLATILES
Dichloropropene, cis-1,3-	10061-01-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.21	N	U	VOLATILES
Dichloropropene, trans-1,3-	10061-02-6	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.21	N	U	VOLATILES
Diethyl phthalate	84-66-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.1	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.2	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	4.8	ug/L	9.6	U	AP1-MW01	AP3050	REG	7-May-09	3.8	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	4.75	ug/L	9.5	U	AP1-MW01	AP3070	REG	4-Nov-09	3.8	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	4.8	ug/L	9.6	U	AP1-MW02	AP3051	REG	10-May-09	3.8	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	4	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	4	N	U	SEMIVOLATILES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.05	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.05	N	U	EXPLOSIVES
Dinitrophenol, 2,4-	51-28-5	12	ug/L	24	U	AP1-MW01	AP3050	REG	7-May-09	9.6	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12	ug/L	24	U	AP1-MW01	AP3070	REG	4-Nov-09	9.5	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12	ug/L	24	U	AP1-MW02	AP3051	REG	10-May-09	9.6	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	10	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Dinitrotoluene, 2,4-	121-14-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4- exp	121-14-2	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.063	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.064	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.063	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.064	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.063	N	U	EXPLOSIVES
Dinitrotoluene, 2,4- exp	121-14-2	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.064	N	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6- exp	606-20-2	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.09	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.091	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.09	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.092	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.09	N	U	EXPLOSIVES
Dinitrotoluene, 2,6- exp	606-20-2	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.091	N	U	EXPLOSIVES
Di-n-octyl phthalate	117-84-0	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.4	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.4	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.4	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.5	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.5	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.5	N	U	SEMIVOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.43	N	U	VOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.43	N	U	VOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.43	N	U	VOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.43	N	U	VOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.43	N	U	VOLATILES
Ethylbenzene	100-41-4	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.43	N	U	VOLATILES
Fluoranthene	206-44-0	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	2.4	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	2.4	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	2.4	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2.5	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2.5	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2.5	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.3	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	2.4	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	2.4	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	2.4	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2.5	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2.5	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2.5	N	U	SEMIVOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	5	N	U	VOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	5	N	U	VOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	5	N	U	VOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	5	N	U	VOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	5	N	U	VOLATILES
Hexanone, 2-	591-78-6	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	5	N	U	VOLATILES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.11	N	U	EXPLOSIVES
HMX	2691-41-0	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.11	N	U	EXPLOSIVES
Indeno(1,2,3-cd)pyrene	193-39-5	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.1	N	U	SEMIVOLATILES
Iron - f	7439-89-6	4590	ug/L	300		AP1-MW01	AP3050	REG	7-May-09	23	Y		METALS
Iron - f	7439-89-6	4990	ug/L	300		AP1-MW01	AP3070	REG	4-Nov-09	23	Y		METALS
Iron - f	7439-89-6	300	ug/L	600	U	AP1-MW02	AP3051	REG	10-May-09	460	Y	U	METALS
Iron - f	7439-89-6	150	ug/L	300	U	AP1-MW02	AP3071	REG	6-Nov-09	23	Y	U	METALS
Iron - f	7439-89-6	150	ug/L	300	U	AP1-MW03	AP3052	REG	11-May-09	23	Y	U	METALS
Iron - f	7439-89-6	6070	ug/L	300		AP1-MW03	AP3072	REG	6-Nov-09	23	Y		METALS
Iron - uf	7439-89-6	4610	ug/L	300		AP1-MW01	AP3050	REG	7-May-09	23	N		METALS
Iron - uf	7439-89-6	4410	ug/L	300		AP1-MW01	AP3070	REG	4-Nov-09	23	N		METALS
Iron - uf	7439-89-6	150	ug/L	300	U	AP1-MW02	AP3051	REG	10-May-09	23	N	U	METALS
Iron - uf	7439-89-6	150	ug/L	300	U	AP1-MW02	AP3071	REG	6-Nov-09	23	N	U	METALS
Iron - uf	7439-89-6	1090	ug/L	300		AP1-MW03	AP3052	REG	11-May-09	23	N		METALS
Iron - uf	7439-89-6	150	ug/L	300	U	AP1-MW03	AP3072	REG	6-Nov-09	23	N	U	METALS
Isophorone	78-59-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Lead - f	7439-92-1	5.8	ug/L	5		AP1-MW01	AP3050	REG	7-May-09	2	Y		METALS
Lead - f	7439-92-1	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	2	Y	U	METALS
Lead - f	7439-92-1	2	ug/L	10	J	AP1-MW02	AP3051	REG	10-May-09	2	Y	B	METALS
Lead - f	7439-92-1	2.2	ug/L	5	J	AP1-MW02	AP3071	REG	6-Nov-09	2	Y	B	METALS
Lead - f	7439-92-1	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	2	Y	U	METALS
Lead - f	7439-92-1	4.9	ug/L	5	J	AP1-MW03	AP3072	REG	6-Nov-09	2	Y	B	METALS
Lead - uf	7439-92-1	4.3	ug/L	5	J	AP1-MW01	AP3050	REG	7-May-09	2	N	B	METALS
Lead - uf	7439-92-1	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	2	N	U	METALS
Lead - uf	7439-92-1	2.2	ug/L	10	J	AP1-MW03	AP3052	REG	11-May-09	2	N	B	METALS
Magnesium - f	7439-95-4	77600	ug/L	5000		AP1-MW01	AP3050	REG	7-May-09	100	Y		METALS
Magnesium - f	7439-95-4	61000	ug/L	5000		AP1-MW01	AP3070	REG	4-Nov-09	100	Y		METALS
Magnesium - f	7439-95-4	90800	ug/L	5000		AP1-MW02	AP3051	REG	10-May-09	100	Y		METALS
Magnesium - f	7439-95-4	75000	ug/L	5000		AP1-MW02	AP3071	REG	6-Nov-09	100	Y		METALS
Magnesium - f	7439-95-4	38400	ug/L	5000		AP1-MW03	AP3052	REG	11-May-09	100	Y		METALS
Magnesium - f	7439-95-4	39200	ug/L	5000		AP1-MW03	AP3072	REG	6-Nov-09	100	Y		METALS
Magnesium - uf	7439-95-4	77100	ug/L	5000		AP1-MW01	AP3050	REG	7-May-09	100	N		METALS
Magnesium - uf	7439-95-4	63200	ug/L	5000		AP1-MW01	AP3070	REG	4-Nov-09	100	N		METALS
Magnesium - uf	7439-95-4	92400	ug/L	5000		AP1-MW02	AP3051	REG	10-May-09	100	N		METALS

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Magnesium - uf	7439-95-4	74900	ug/L	5000		AP1-MW02	AP3071	REG	6-Nov-09	100	N		METALS
Magnesium - uf	7439-95-4	39100	ug/L	5000		AP1-MW03	AP3052	REG	11-May-09	100	N		METALS
Magnesium - uf	7439-95-4	38700	ug/L	5000		AP1-MW03	AP3072	REG	6-Nov-09	100	N		METALS
Manganese - f	7439-96-5	32100	ug/L	150		AP1-MW01	AP3050	REG	7-May-09	5	Y		METALS
Manganese - f	7439-96-5	6270	ug/L	60		AP1-MW01	AP3070	REG	4-Nov-09	2	Y		METALS
Manganese - f	7439-96-5	355	ug/L	15		AP1-MW02	AP3051	REG	10-May-09	0.5	Y		METALS
Manganese - f	7439-96-5	410	ug/L	15		AP1-MW02	AP3071	REG	6-Nov-09	0.5	Y		METALS
Manganese - f	7439-96-5	102	ug/L	15		AP1-MW03	AP3052	REG	11-May-09	0.5	Y		METALS
Manganese - f	7439-96-5	550	ug/L	15		AP1-MW03	AP3072	REG	6-Nov-09	0.5	Y		METALS
Manganese - uf	7439-96-5	32300	ug/L	150		AP1-MW01	AP3050	REG	7-May-09	5	N		METALS
Manganese - uf	7439-96-5	8290	ug/L	60		AP1-MW01	AP3070	REG	4-Nov-09	2	N		METALS
Manganese - uf	7439-96-5	351	ug/L	15		AP1-MW02	AP3051	REG	10-May-09	0.5	N		METALS
Manganese - uf	7439-96-5	436	ug/L	15		AP1-MW02	AP3071	REG	6-Nov-09	0.5	N		METALS
Manganese - uf	7439-96-5	136	ug/L	15		AP1-MW03	AP3052	REG	11-May-09	0.5	N		METALS
Manganese - uf	7439-96-5	463	ug/L	15		AP1-MW03	AP3072	REG	6-Nov-09	0.5	N		METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.14	Y	U	METALS
Mercury - f	7439-97-6	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.14	Y	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.14	N	U	METALS
Mercury - uf	7439-97-6	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.14	N	U	METALS
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW01	AP3050	REG	7-May-09	2	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	2	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW02	AP3051	REG	10-May-09	2	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	VOLATILES
Methyl-2-pentanone, 4-	108-10-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW01	AP3050	REG	7-May-09	1	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW01	AP3070	REG	4-Nov-09	1	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW02	AP3051	REG	10-May-09	1	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	VOLATILES
Methylene chloride	75-09-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	VOLATILES
Methylnaphthalene, 2-	91-57-6	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Nickel - f	7440-02-0	12.8	ug/L	40	J	AP1-MW01	AP3050	REG	7-May-09	2.3	Y	B	METALS
Nickel - f	7440-02-0	3.9	ug/L	40	J	AP1-MW01	AP3070	REG	4-Nov-09	2.3	Y	B	METALS
Nickel - f	7440-02-0	14.8	ug/L	40	J	AP1-MW02	AP3051	REG	10-May-09	2.3	Y	B	METALS
Nickel - f	7440-02-0	6.1	ug/L	40	J	AP1-MW02	AP3071	REG	6-Nov-09	2.3	Y	B	METALS
Nickel - f	7440-02-0	6.6	ug/L	40	J	AP1-MW03	AP3052	REG	11-May-09	2.3	Y	B	METALS

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Nickel - f	7440-02-0	13.4	ug/L	40	J	AP1-MW03	AP3072	REG	6-Nov-09	2.3	Y	B	METALS
Nickel - uf	7440-02-0	13.3	ug/L	40	J	AP1-MW01	AP3050	REG	7-May-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	4.1	ug/L	40		AP1-MW01	AP3070	REG	4-Nov-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	15.2	ug/L	40	J	AP1-MW02	AP3051	REG	10-May-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	5.8	ug/L	40	J	AP1-MW02	AP3071	REG	6-Nov-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	7.4	ug/L	40	J	AP1-MW03	AP3052	REG	11-May-09	2.3	N	B	METALS
Nickel - uf	7440-02-0	4.7	ug/L	40	J	AP1-MW03	AP3072	REG	6-Nov-09	2.3	N	B	METALS
Nitrate-Nitrite	10-28-6	50	ug/L	100	U	AP1-MW01	AP3050	REG	7-May-09	37	N	U	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	130	ug/L	100	J	AP1-MW01	AP3070	REG	4-Nov-09	30	N		GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	1000	ug/L	2000	U	AP1-MW02	AP3051	REG	10-May-09	740	N	U	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	41	ug/L	100	J	AP1-MW02	AP3071	REG	6-Nov-09	30	N	B	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	1000	ug/L	2000	U	AP1-MW03	AP3052	REG	11-May-09	740	N	U	GEN CHEMISTRY
Nitrate-Nitrite	10-28-6	55	ug/L	100	J	AP1-MW03	AP3072	REG	6-Nov-09	30	N	B	GEN CHEMISTRY
Nitroaniline, 2-	88-74-4	4.8	ug/L	9.6	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	4.75	ug/L	9.5	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	4.8	ug/L	9.6	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	4.8	ug/L	9.6	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	4.75	ug/L	9.5	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	4.8	ug/L	9.6	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	4.8	ug/L	9.6	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	4.75	ug/L	9.5	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	4.8	ug/L	9.6	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Nitrobenzene - exp	98-95-3	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.049	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.049	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.049	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.05	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.049	N	U	EXPLOSIVES
Nitrobenzene - exp	98-95-3	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.049	N	U	EXPLOSIVES
Nitrophenol, 2-	88-75-5	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12	ug/L	24	U	AP1-MW01	AP3050	REG	7-May-09	9.6	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12	ug/L	24	U	AP1-MW01	AP3070	REG	4-Nov-09	9.5	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12	ug/L	24	U	AP1-MW02	AP3051	REG	10-May-09	9.6	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	10	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.062	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.18	ug/L	0.2	J	AP1-MW01	AP3070	REG	4-Nov-09	0.063	N	J	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.062	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.063	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.062	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.063	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.094	N	U	EXPLOSIVES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Nitrotoluene, 3-	99-08-1	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.095	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.094	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.096	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.094	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.095	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.074	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.17	ug/L	0.2	J	AP1-MW01	AP3070	REG	4-Nov-09	0.075	N	J	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.074	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.075	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.074	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.075	N	U	EXPLOSIVES
n-Nitroso-di-n-propylamine	621-64-7	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.9	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.9	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.9	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	2	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	2	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	2	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12	ug/L	24	U	AP1-MW01	AP3050	REG	7-May-09	9.6	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12	ug/L	24	U	AP1-MW01	AP3070	REG	4-Nov-09	9.5	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12	ug/L	24	U	AP1-MW02	AP3051	REG	10-May-09	9.6	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-MW02	AP3071	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-MW03	AP3052	REG	11-May-09	10	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-MW03	AP3072	REG	6-Nov-09	10	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Phenol	108-95-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Phenol	108-95-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Potassium - f	7440-09-7	2760	ug/L	10000	J	AP1-MW01	AP3050	REG	7-May-09	100	Y	B	METALS
Potassium - f	7440-09-7	7000	ug/L	10000	J	AP1-MW01	AP3070	REG	4-Nov-09	100	Y	B	METALS
Potassium - f	7440-09-7	28500	ug/L	10000		AP1-MW02	AP3051	REG	10-May-09	100	Y		METALS
Potassium - f	7440-09-7	22000	ug/L	10000		AP1-MW02	AP3071	REG	6-Nov-09	100	Y		METALS
Potassium - f	7440-09-7	20400	ug/L	10000		AP1-MW03	AP3052	REG	11-May-09	100	Y		METALS
Potassium - f	7440-09-7	20500	ug/L	10000		AP1-MW03	AP3072	REG	6-Nov-09	100	Y		METALS
Potassium - uf	7440-09-7	2820	ug/L	10000	J	AP1-MW01	AP3050	REG	7-May-09	100	N	B	METALS
Potassium - uf	7440-09-7	6650	ug/L	10000	J	AP1-MW01	AP3070	REG	4-Nov-09	100	N	B	METALS
Potassium - uf	7440-09-7	28200	ug/L	10000		AP1-MW02	AP3051	REG	10-May-09	100	N		METALS
Potassium - uf	7440-09-7	21900	ug/L	10000		AP1-MW02	AP3071	REG	6-Nov-09	100	N		METALS
Potassium - uf	7440-09-7	20700	ug/L	10000		AP1-MW03	AP3052	REG	11-May-09	100	N		METALS
Potassium - uf	7440-09-7	19300	ug/L	10000		AP1-MW03	AP3072	REG	6-Nov-09	100	N		METALS
Pyrene	129-00-0	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.073	N	U	EXPLOSIVES
RDX	121-82-4	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.074	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.073	N	U	EXPLOSIVES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
RDX	121-82-4	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.074	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.073	N	U	EXPLOSIVES
RDX	121-82-4	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.074	N	U	EXPLOSIVES
Selenium - f	7782-49-2	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	3.1	Y	U	METALS
Selenium - f	7782-49-2	10	ug/L	20	U	AP1-MW01	AP3070	REG	4-Nov-09	3.1	Y	U	METALS
Selenium - f	7782-49-2	6.9	ug/L	20	J	AP1-MW02	AP3051	REG	10-May-09	3.1	Y	B	METALS
Selenium - f	7782-49-2	10	ug/L	20	U	AP1-MW02	AP3071	REG	6-Nov-09	3.1	Y	U	METALS
Selenium - f	7782-49-2	5.3	ug/L	20	J	AP1-MW03	AP3052	REG	11-May-09	3.1	Y	B	METALS
Selenium - f	7782-49-2	10	ug/L	20	U	AP1-MW03	AP3072	REG	6-Nov-09	3.1	Y	U	METALS
Selenium - uf	7782-49-2	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	3.1	N	U	METALS
Selenium - uf	7782-49-2	10	ug/L	20	U	AP1-MW01	AP3070	REG	4-Nov-09	3.1	N	U	METALS
Selenium - uf	7782-49-2	4.9	ug/L	20	J	AP1-MW02	AP3051	REG	10-May-09	3.1	N	B	METALS
Selenium - uf	7782-49-2	3.7	ug/L	20	J	AP1-MW02	AP3071	REG	6-Nov-09	3.1	N	B	METALS
Selenium - uf	7782-49-2	4.7	ug/L	20	J	AP1-MW03	AP3052	REG	11-May-09	3.1	N	B	METALS
Selenium - uf	7782-49-2	5.2	ug/L	20	J	AP1-MW03	AP3072	REG	6-Nov-09	3.1	N	B	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	1.2	Y	U	METALS
Silver - f	7440-22-4	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	1.2	Y	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	1.2	N	U	METALS
Silver - uf	7440-22-4	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	1.2	N	U	METALS
Sodium - f	7440-23-5	21000	ug/L	10000		AP1-MW01	AP3050	REG	7-May-09	500	Y		METALS
Sodium - f	7440-23-5	44300	ug/L	10000		AP1-MW01	AP3070	REG	4-Nov-09	500	Y		METALS
Sodium - f	7440-23-5	69900	ug/L	10000		AP1-MW02	AP3051	REG	10-May-09	500	Y		METALS
Sodium - f	7440-23-5	81700	ug/L	20000		AP1-MW02	AP3071	REG	6-Nov-09	1000	Y		METALS
Sodium - f	7440-23-5	53900	ug/L	10000		AP1-MW03	AP3052	REG	11-May-09	500	Y		METALS
Sodium - f	7440-23-5	60500	ug/L	10000		AP1-MW03	AP3072	REG	6-Nov-09	500	Y		METALS
Sodium - uf	7440-23-5	18900	ug/L	10000		AP1-MW01	AP3050	REG	7-May-09	500	N		METALS
Sodium - uf	7440-23-5	42900	ug/L	10000		AP1-MW01	AP3070	REG	4-Nov-09	500	N		METALS
Sodium - uf	7440-23-5	68400	ug/L	10000		AP1-MW02	AP3051	REG	10-May-09	500	N		METALS
Sodium - uf	7440-23-5	81300	ug/L	20000		AP1-MW02	AP3071	REG	6-Nov-09	1000	N		METALS
Sodium - uf	7440-23-5	52400	ug/L	10000		AP1-MW03	AP3052	REG	11-May-09	500	N		METALS
Sodium - uf	7440-23-5	59300	ug/L	10000		AP1-MW03	AP3072	REG	6-Nov-09	500	N		METALS
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.36	N	U	VOLATILES
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.36	N	U	VOLATILES
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.36	N	U	VOLATILES
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.36	N	U	VOLATILES
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.36	N	U	VOLATILES
Styrene	100-42-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.36	N	U	VOLATILES
Sulfate	14808-79-8	585000	ug/L	20000		AP1-MW01	AP3050	REG	7-May-09	10000	N		GEN CHEMISTRY
Sulfate	14808-79-8	311000	ug/L	10000	J	AP1-MW01	AP3070	REG	4-Nov-09	5000	N		GEN CHEMISTRY
Sulfate	14808-79-8	589000	ug/L	20000		AP1-MW02	AP3051	REG	10-May-09	10000	N		GEN CHEMISTRY
Sulfate	14808-79-8	358000	ug/L	200000	J	AP1-MW02	AP3071	REG	6-Nov-09	100000	N		GEN CHEMISTRY
Sulfate	14808-79-8	127000	ug/L	4000		AP1-MW03	AP3052	REG	11-May-09	2000	N		GEN CHEMISTRY
Sulfate	14808-79-8	109000	ug/L	4000		AP1-MW03	AP3072	REG	6-Nov-09	2000	N		GEN CHEMISTRY
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.21	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.21	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.21	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.21	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.21	N	U	VOLATILES
Tetrachloroethane, 1,1,2,2-	79-34-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.21	N	U	VOLATILES
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.22	N	U	VOLATILES
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.22	N	U	VOLATILES
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.22	N	U	VOLATILES
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.22	N	U	VOLATILES
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.22	N	U	VOLATILES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Tetrachloroethene	127-18-4	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.22	N	U	VOLATILES
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.076	N	U	EXPLOSIVES
Tetryl	479-45-8	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.076	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.076	N	U	EXPLOSIVES
Tetryl	479-45-8	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.077	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.076	N	U	EXPLOSIVES
Tetryl	479-45-8	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.076	N	U	EXPLOSIVES
Thallium - f	7440-28-0	37.8	ug/L	20		AP1-MW01	AP3050	REG	7-May-09	3.4	Y		METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	3.4	Y	U	METALS
Thallium - f	7440-28-0	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	3.4	Y	U	METALS
Thallium - uf	7440-28-0	34.6	ug/L	20		AP1-MW01	AP3050	REG	7-May-09	3.4	N		METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-MW01	AP3070	REG	4-Nov-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-MW02	AP3051	REG	10-May-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-MW02	AP3071	REG	6-Nov-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-MW03	AP3052	REG	11-May-09	3.4	N	U	METALS
Thallium - uf	7440-28-0	5	ug/L	10	U	AP1-MW03	AP3072	REG	6-Nov-09	3.4	N	U	METALS
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.35	N	U	VOLATILES
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.35	N	U	VOLATILES
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.35	N	U	VOLATILES
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.35	N	U	VOLATILES
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.35	N	U	VOLATILES
Toluene	108-88-3	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.35	N	U	VOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	0.96	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	0.95	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	0.96	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1	N	U	SEMIVOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,1-	71-55-6	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.33	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.26	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.26	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.26	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.26	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.26	N	U	VOLATILES
Trichloroethane, 1,1,2-	79-00-5	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.26	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.32	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.32	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.32	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.32	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.32	N	U	VOLATILES
Trichloroethene	79-01-6	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.32	N	U	VOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.4	ug/L	4.8	U	AP1-MW01	AP3050	REG	7-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.4	ug/L	4.8	U	AP1-MW01	AP3070	REG	4-Nov-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.4	ug/L	4.8	U	AP1-MW02	AP3051	REG	10-May-09	1.3	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-MW02	AP3071	REG	6-Nov-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-MW03	AP3052	REG	11-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-MW03	AP3072	REG	6-Nov-09	1.4	N	U	SEMIVOLATILES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.049	N	U	EXPLOSIVES

Appendix E-4
Overburden Groundwater Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

4-	CASNUM	RES	UNIT	REP_LIMIT	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Trinitrobenzene, 1,3,5-	99-35-4	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.049	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.049	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.05	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.049	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.049	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-MW01	AP3050	REG	7-May-09	0.067	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.1	ug/L	0.2	U	AP1-MW01	AP3070	REG	4-Nov-09	0.068	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-MW02	AP3051	REG	10-May-09	0.067	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.1	ug/L	0.2	U	AP1-MW02	AP3071	REG	6-Nov-09	0.068	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-MW03	AP3052	REG	11-May-09	0.067	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.1	ug/L	0.2	U	AP1-MW03	AP3072	REG	6-Nov-09	0.068	N	U	EXPLOSIVES
Vanadium - f	7440-62-2	25	ug/L	50	U	AP1-MW01	AP3050	REG	7-May-09	0.66	Y	U	METALS
Vanadium - f	7440-62-2	25	ug/L	50	U	AP1-MW01	AP3070	REG	4-Nov-09	0.66	Y	U	METALS
Vanadium - f	7440-62-2	1.1	ug/L	50	J	AP1-MW02	AP3051	REG	10-May-09	0.66	Y	B	METALS
Vanadium - f	7440-62-2	25	ug/L	50	U	AP1-MW02	AP3071	REG	6-Nov-09	0.66	Y	U	METALS
Vanadium - f	7440-62-2	0.9	ug/L	50	J	AP1-MW03	AP3052	REG	11-May-09	0.66	Y	B	METALS
Vanadium - f	7440-62-2	5.9	ug/L	50	J	AP1-MW03	AP3072	REG	6-Nov-09	0.66	Y	B	METALS
Vanadium - uf	7440-62-2	25	ug/L	50	U	AP1-MW01	AP3050	REG	7-May-09	0.66	N	U	METALS
Vanadium - uf	7440-62-2	25	ug/L	50	U	AP1-MW01	AP3070	REG	4-Nov-09	0.66	N	U	METALS
Vanadium - uf	7440-62-2	1.2	ug/L	50	J	AP1-MW02	AP3051	REG	10-May-09	0.66	N	B	METALS
Vanadium - uf	7440-62-2	25	ug/L	50	U	AP1-MW02	AP3071	REG	6-Nov-09	0.66	N	U	METALS
Vanadium - uf	7440-62-2	2.9	ug/L	50	J	AP1-MW03	AP3052	REG	11-May-09	0.66	N	B	METALS
Vanadium - uf	7440-62-2	25	ug/L	50	U	AP1-MW03	AP3072	REG	6-Nov-09	0.66	N	U	METALS
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW01	AP3050	REG	7-May-09	0.3	N	U	VOLATILES
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW01	AP3070	REG	4-Nov-09	0.3	N	U	VOLATILES
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW02	AP3051	REG	10-May-09	0.3	N	U	VOLATILES
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW02	AP3071	REG	6-Nov-09	0.3	N	U	VOLATILES
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW03	AP3052	REG	11-May-09	0.3	N	U	VOLATILES
Vinyl chloride	75-01-4	0.5	ug/L	1	U	AP1-MW03	AP3072	REG	6-Nov-09	0.3	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW01	AP3050	REG	7-May-09	1.2	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW01	AP3070	REG	4-Nov-09	1.2	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW02	AP3051	REG	10-May-09	1.2	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW02	AP3071	REG	6-Nov-09	1.2	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW03	AP3052	REG	11-May-09	1.2	N	U	VOLATILES
Xylenes, total	1330-20-7	1.5	ug/L	3	U	AP1-MW03	AP3072	REG	6-Nov-09	1.2	N	U	VOLATILES
Zinc - f	7440-66-6	23.2	ug/L	20		AP1-MW01	AP3050	REG	7-May-09	3.8	Y		METALS
Zinc - f	7440-66-6	9.2	ug/L	20	J	AP1-MW01	AP3070	REG	4-Nov-09	3.8	Y	B	METALS
Zinc - f	7440-66-6	12.1	ug/L	20	J	AP1-MW02	AP3051	REG	10-May-09	3.8	Y	B	METALS
Zinc - f	7440-66-6	11.4	ug/L	20	J	AP1-MW02	AP3071	REG	6-Nov-09	3.8	Y	B	METALS
Zinc - f	7440-66-6	11.4	ug/L	20	J	AP1-MW03	AP3052	REG	11-May-09	3.8	Y	B	METALS
Zinc - f	7440-66-6	23.4	ug/L	20		AP1-MW03	AP3072	REG	6-Nov-09	3.8	Y		METALS
Zinc - uf	7440-66-6	23.2	ug/L	20		AP1-MW01	AP3050	REG	7-May-09	3.8	N		METALS
Zinc - uf	7440-66-6	13.4	ug/L	20	J	AP1-MW02	AP3051	REG	10-May-09	3.8	N	B	METALS
Zinc - uf	7440-66-6	10	ug/L	20	U	AP1-MW02	AP3071	REG	6-Nov-09	3.8	N	U	METALS
Zinc - uf	7440-66-6	14.3	ug/L	20	J	AP1-MW03	AP3052	REG	11-May-09	3.8	N	B	METALS

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
3-Methylphenol and 4-Methylphenol	65794-96-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
3-Methylphenol and 4-Methylphenol	65794-96-9	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Acenaphthene	83-32-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Acenaphthene	83-32-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Acenaphthene	83-32-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Acenaphthene	83-32-9	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Acenaphthylene	208-96-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Acenaphthylene	208-96-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Acenaphthylene	208-96-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Acenaphthylene	208-96-8	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Aluminum	7429-90-5	9880	mg/kg	15		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.84		METALS
Aluminum	7429-90-5	7130	mg/kg	13		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.7		METALS
Aluminum	7429-90-5	4490	mg/kg	15		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.82		METALS
Aluminum	7429-90-5	9860	mg/kg	24		AP1-SD04	AP1013	REG	20-May-09	0	0.5	1.3		METALS
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.044	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.047	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.048	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.09	mg/kg	0.18	U	5-	AP1013	REG	20-May-09	0	0.5	0.044	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.095	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.1	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.096	U	EXPLOSIVES
Anthracene	120-12-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Anthracene	120-12-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Anthracene	120-12-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Anthracene	120-12-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Antimony	7440-36-0	0.5	mg/kg	4.6	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.34	B	METALS
Antimony	7440-36-0	0.7	mg/kg	3.8	J	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.29	B	METALS
Antimony	7440-36-0	2.25	mg/kg	4.5	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.34	U	METALS
Antimony	7440-36-0	1.3	mg/kg	7.3	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.54	B	METALS
Aroclor 1016	12674-11-2	0.014	mg/kg	0.027	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1016	12674-11-2	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.011	U	PEST/PCB
Aroclor 1016	12674-11-2	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1016	12674-11-2	0.021	mg/kg	0.041	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1221	11104-28-2	0.014	mg/kg	0.027	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1221	11104-28-2	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.018	U	PEST/PCB
Aroclor 1221	11104-28-2	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1221	11104-28-2	0.021	mg/kg	0.041	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.033	U	PEST/PCB
Aroclor 1232	11141-16-5	0.014	mg/kg	0.027	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1232	11141-16-5	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.018	U	PEST/PCB
Aroclor 1232	11141-16-5	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1232	11141-16-5	0.021	mg/kg	0.041	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.033	U	PEST/PCB
Aroclor 1242	53469-21-9	0.014	mg/kg	0.027	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1242	53469-21-9	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.011	U	PEST/PCB
Aroclor 1242	53469-21-9	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1242	53469-21-9	0.021	mg/kg	0.041	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1248	12672-29-6	0.014	mg/kg	0.027	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1248	12672-29-6	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.011	U	PEST/PCB
Aroclor 1248	12672-29-6	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1248	12672-29-6	0.021	mg/kg	0.041	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.021	U	PEST/PCB
Aroclor 1254	11097-69-1	0.025	mg/kg	0.027	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.013	J	PEST/PCB
Aroclor 1254	11097-69-1	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.011	U	PEST/PCB
Aroclor 1254	11097-69-1	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1254	11097-69-1	0.035	mg/kg	0.041	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.021	J	PEST/PCB
Aroclor 1260	11096-82-5	0.021	mg/kg	0.027	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.013	J	PEST/PCB
Aroclor 1260	11096-82-5	0.011	mg/kg	0.022	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.011	U	PEST/PCB
Aroclor 1260	11096-82-5	0.013	mg/kg	0.026	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.013	U	PEST/PCB
Aroclor 1260	11096-82-5	0.113	mg/kg	0.041	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.021	J	PEST/PCB
Arsenic	7440-38-2	7.6	mg/kg	0.61		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.27		METALS
Arsenic	7440-38-2	9.3	mg/kg	0.51		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.23		METALS
Arsenic	7440-38-2	4	mg/kg	0.6		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.27		METALS
Arsenic	7440-38-2	15.9	mg/kg	0.97		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.44		METALS

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Barium	7440-39-3	57.5	mg/kg	15		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.38		METALS
Barium	7440-39-3	35.7	mg/kg	13		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.32		METALS
Barium	7440-39-3	31.3	mg/kg	15		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.37		METALS
Barium	7440-39-3	110	mg/kg	24		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.61		METALS
Benzo(a)anthracene	56-55-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	0.121	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	0.112	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	0.175	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Benzoic acid	65-85-0	2.7	mg/kg	5.4	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	2.2	U	SEMIVOLATILES
Benzoic acid	65-85-0	0.55	mg/kg	1.1	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Benzoic acid	65-85-0	0.65	mg/kg	1.3	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.52	U	SEMIVOLATILES
Benzoic acid	65-85-0	1.05	mg/kg	2.1	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.84	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Beryllium	7440-41-7	0.62	mg/kg	0.38		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.076		METALS
Beryllium	7440-41-7	0.5	mg/kg	0.32		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.064		METALS
Beryllium	7440-41-7	0.3	mg/kg	0.37	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.075	B	METALS
Beryllium	7440-41-7	1.6	mg/kg	0.61		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.12		METALS
Bis(2-chloroethoxy)methane	111-91-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	1.1	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.26	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.42	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Cadmium	7440-43-9	0.55	mg/kg	0.3		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.076		METALS
Cadmium	7440-43-9	0.32	mg/kg	0.25		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.064		METALS
Cadmium	7440-43-9	0.23	mg/kg	0.3	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.075	B	METALS
Cadmium	7440-43-9	0.59	mg/kg	0.48		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.12		METALS

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Calcium	7440-70-2	29900	mg/kg	380		AP1-SD01	AP1007	REG	19-May-09	0	0.5	7.6		METALS
Calcium	7440-70-2	10400	mg/kg	320		AP1-SD02	AP1008	REG	19-May-09	0	0.5	6.4		METALS
Calcium	7440-70-2	16800	mg/kg	370		AP1-SD03	AP1012	REG	19-May-09	0	0.5	7.5		METALS
Calcium	7440-70-2	13700	mg/kg	610		AP1-SD04	AP1013	REG	20-May-09	0	0.5	12		METALS
Carbazole	86-74-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Carbazole	86-74-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Carbazole	86-74-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Carbazole	86-74-8	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Chromium	7440-47-3	16.9	mg/kg	0.76		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.12		METALS
Chromium	7440-47-3	11.8	mg/kg	0.64		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.1		METALS
Chromium	7440-47-3	7.8	mg/kg	0.75		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.12		METALS
Chromium	7440-47-3	15.6	mg/kg	1.2		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.19		METALS
Chrysene	218-01-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Chrysene	218-01-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Chrysene	218-01-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Chrysene	218-01-9	0.149	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Cobalt	7440-48-4	9.9	mg/kg	3.8		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.063		METALS
Cobalt	7440-48-4	8.9	mg/kg	3.2		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.053		METALS
Cobalt	7440-48-4	4.4	mg/kg	3.7		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.062		METALS
Cobalt	7440-48-4	9.1	mg/kg	6.1		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.1		METALS
Copper	7440-50-8	38.5	mg/kg	1.9		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.16		METALS
Copper	7440-50-8	17.1	mg/kg	1.6		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.13		METALS
Copper	7440-50-8	10.5	mg/kg	1.9		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.16		METALS
Copper	7440-50-8	24.5	mg/kg	3		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.25		METALS
Dibenz(a,h)anthracene	53-70-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Dibenzofuran	132-64-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dibenzofuran	132-64-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dibenzofuran	132-64-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dibenzofuran	132-64-9	0.15	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.28	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.056	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.068	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.11	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.28	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.056	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.068	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.11	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.26	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.063	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.1	U	SEMIVOLATILES

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Dichlorobenzidine, 3,3'-	91-94-1	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	1.1	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.26	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.42	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	0.18	mg/kg	0.43	J	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	J	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.69	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.14	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.17	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.27	U	SEMIVOLATILES
Dinitrobenzene, 1,3-	99-65-0	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.046	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.05	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.051	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.047	U	EXPLOSIVES
Dinitrophenol, 2,4-	51-28-5	2.7	mg/kg	5.4	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	2.2	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	0.55	mg/kg	1.1	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	0.65	mg/kg	1.3	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.52	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	1.05	mg/kg	2.1	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.84	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.052	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.056	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.057	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.053	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.046	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.05	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.051	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.047	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Fluoranthene	206-44-0	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Fluoranthene	206-44-0	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Fluoranthene	206-44-0	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Fluoranthene	206-44-0	0.191	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Fluorene	86-73-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Fluorene	86-73-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Fluorene	86-73-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Fluorene	86-73-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Hexachlorobenzene	118-74-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Hexachloroethane	67-72-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.26	U	SEMIVOLATILES
Hexachloroethane	67-72-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Hexachloroethane	67-72-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.063	U	SEMIVOLATILES
Hexachloroethane	67-72-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.1	U	SEMIVOLATILES
HMX	2691-41-0	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.075	U	EXPLOSIVES
HMX	2691-41-0	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.08	U	EXPLOSIVES
HMX	2691-41-0	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.082	U	EXPLOSIVES
HMX	2691-41-0	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.076	U	EXPLOSIVES
Indeno(1,2,3-cd)pyrene	193-39-5	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Iron	7439-89-6	21700	mg/kg	7.6		AP1-SD01	AP1007	REG	19-May-09	0	0.5	1.7		METALS
Iron	7439-89-6	19300	mg/kg	6.4		AP1-SD02	AP1008	REG	19-May-09	0	0.5	1.5		METALS
Iron	7439-89-6	9270	mg/kg	7.5		AP1-SD03	AP1012	REG	19-May-09	0	0.5	1.7		METALS
Iron	7439-89-6	21400	mg/kg	12		AP1-SD04	AP1013	REG	20-May-09	0	0.5	2.8		METALS
Isophorone	78-59-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Isophorone	78-59-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Isophorone	78-59-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Isophorone	78-59-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Lead	7439-92-1	23.7	mg/kg	7.6		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.15		METALS
Lead	7439-92-1	13	mg/kg	6.4		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.13		METALS
Lead	7439-92-1	7	mg/kg	7.5	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.15	B	METALS
Lead	7439-92-1	22.9	mg/kg	12		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.24		METALS
Magnesium	7439-95-4	9370	mg/kg	380		AP1-SD01	AP1007	REG	19-May-09	0	0.5	7.6		METALS
Magnesium	7439-95-4	4360	mg/kg	320		AP1-SD02	AP1008	REG	19-May-09	0	0.5	6.4		METALS
Magnesium	7439-95-4	4970	mg/kg	370		AP1-SD03	AP1012	REG	19-May-09	0	0.5	7.5		METALS
Magnesium	7439-95-4	1810	mg/kg	610		AP1-SD04	AP1013	REG	20-May-09	0	0.5	12		METALS
Manganese	7439-96-5	446	mg/kg	2.3		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.076		METALS
Manganese	7439-96-5	337	mg/kg	1.9		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.064		METALS
Manganese	7439-96-5	165	mg/kg	1.1		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.037		METALS
Manganese	7439-96-5	1670	mg/kg	9.1		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.3		METALS
Mercury	7439-97-6	0.14	mg/kg	0.13		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.019		METALS
Mercury	7439-97-6	0.024	mg/kg	0.1	J	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.015	B	METALS
Mercury	7439-97-6	0.021	mg/kg	0.12	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.018	B	METALS
Mercury	7439-97-6	0.11	mg/kg	0.2	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.029	B	METALS
Methylnaphthalene, 2-	91-57-6	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	0.616	mg/kg	0.42		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084		SEMIVOLATILES
Methylphenol, 2-	95-48-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Naphthalene	91-20-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Naphthalene	91-20-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Naphthalene	91-20-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Naphthalene	91-20-3	0.337	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Nickel	7440-02-0	26.7	mg/kg	3		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.17		METALS
Nickel	7440-02-0	21.3	mg/kg	2.5		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.15		METALS
Nickel	7440-02-0	12	mg/kg	3		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.17		METALS
Nickel	7440-02-0	25.7	mg/kg	4.8		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.28		METALS

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Nitroaniline, 2-	88-74-4	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	1.1	mg/kg	2.2	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	0.215	mg/kg	0.43	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	0.26	mg/kg	0.52	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	0.42	mg/kg	0.84	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.058	U	EXPLOSIVES
Nitrobenzene	98-95-3	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.062	U	EXPLOSIVES
Nitrobenzene	98-95-3	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.063	U	EXPLOSIVES
Nitrobenzene	98-95-3	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.058	U	EXPLOSIVES
Nitrobenzene	98-95-3	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	2.7	mg/kg	5.4	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	2.2	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	0.55	mg/kg	1.1	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	0.65	mg/kg	1.3	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.52	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	1.05	mg/kg	2.1	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.84	U	SEMIVOLATILES
Nitrotoluene, 2-	88-72-2	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.044	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.047	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.048	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.044	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.073	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.079	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.08	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.074	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.054	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.058	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.059	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.055	U	EXPLOSIVES
n-Nitroso-di-n-propylamine	621-64-7	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.087	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.1	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.17	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	2.7	mg/kg	5.4	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	2.2	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	0.55	mg/kg	1.1	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.43	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	0.65	mg/kg	1.3	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.52	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	1.05	mg/kg	2.1	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.84	U	SEMIVOLATILES
Phenanthrene	85-01-8	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Phenanthrene	85-01-8	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Phenanthrene	85-01-8	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Phenanthrene	85-01-8	0.306	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
Phenol	108-95-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Phenol	108-95-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Phenol	108-95-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Phenol	108-95-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Potassium	7440-09-7	1740	mg/kg	760		AP1-SD01	AP1007	REG	19-May-09	0	0.5	7.6		METALS
Potassium	7440-09-7	1170	mg/kg	640		AP1-SD02	AP1008	REG	19-May-09	0	0.5	6.4		METALS
Potassium	7440-09-7	725	mg/kg	750	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	7.5	B	METALS
Potassium	7440-09-7	1340	mg/kg	1200		AP1-SD04	AP1013	REG	20-May-09	0	0.5	12		METALS

Table E-5
Sediment Analytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	START_DEPTH	END_DEPTH	METH_DET_LIM	LAB_QUAL	USER_TEST_GROUP
Pyrene	129-00-0	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Pyrene	129-00-0	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Pyrene	129-00-0	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Pyrene	129-00-0	0.195	mg/kg	0.42	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	J	SEMIVOLATILES
RDX	121-82-4	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.074	U	EXPLOSIVES
RDX	121-82-4	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.079	U	EXPLOSIVES
RDX	121-82-4	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.081	U	EXPLOSIVES
RDX	121-82-4	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.075	U	EXPLOSIVES
Selenium	7782-49-2	0.32	mg/kg	7.6	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.24	B	METALS
Selenium	7782-49-2	0.38	mg/kg	6.4	J	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.2	B	METALS
Selenium	7782-49-2	3.75	mg/kg	7.5	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.23	U	METALS
Selenium	7782-49-2	1.3	mg/kg	12	J	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.38	B	METALS
Silver	7440-22-4	0.099	mg/kg	0.76	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.091	B	METALS
Silver	7440-22-4	0.32	mg/kg	0.64	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.076	U	METALS
Silver	7440-22-4	0.375	mg/kg	0.75	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.09	U	METALS
Silver	7440-22-4	0.6	mg/kg	1.2	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.15	U	METALS
Sodium	7440-23-5	112	mg/kg	760	J	AP1-SD01	AP1007	REG	19-May-09	0	0.5	38	B	METALS
Sodium	7440-23-5	320	mg/kg	640	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	32	U	METALS
Sodium	7440-23-5	83.1	mg/kg	750	J	AP1-SD03	AP1012	REG	19-May-09	0	0.5	37	B	METALS
Sodium	7440-23-5	600	mg/kg	1200	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	61	U	METALS
Tetryl	479-45-8	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.045	U	EXPLOSIVES
Tetryl	479-45-8	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.048	U	EXPLOSIVES
Tetryl	479-45-8	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.049	U	EXPLOSIVES
Tetryl	479-45-8	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.045	U	EXPLOSIVES
Thallium	7440-28-0	1.9	mg/kg	3.8	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	2.6	U	METALS
Thallium	7440-28-0	3.2	mg/kg	6.4	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	2.2	U	METALS
Thallium	7440-28-0	3.75	mg/kg	7.5	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	2.5	U	METALS
Thallium	7440-28-0	6	mg/kg	12	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	8.2	U	METALS
Total organic carbon	10-35-5	21000	mg/kg	0.22		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22		GEN CHEMISTRY
Total organic carbon	10-35-5	43000	mg/kg	0.8		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.8		GEN CHEMISTRY
Trichlorobenzene, 1,2,4-	120-82-1	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	0.55	mg/kg	1.1	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.22	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	0.11	mg/kg	0.22	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.043	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	0.13	mg/kg	0.26	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.052	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	0.21	mg/kg	0.42	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.084	U	SEMIVOLATILES
Trinitrobenzene, 1,3,5-	99-35-4	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.044	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.047	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.048	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.044	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.085	mg/kg	0.17	U	AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.044	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	mg/kg	0.19	U	AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.047	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	mg/kg	0.19	U	AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.048	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.09	mg/kg	0.18	U	AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.044	U	EXPLOSIVES
Vanadium	7440-62-2	21.9	mg/kg	3.8		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.05		METALS
Vanadium	7440-62-2	19.2	mg/kg	3.2		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.042		METALS
Vanadium	7440-62-2	12.4	mg/kg	3.7		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.049		METALS
Vanadium	7440-62-2	25.5	mg/kg	6.1		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.08		METALS
Zinc	7440-66-6	98.9	mg/kg	1.5		AP1-SD01	AP1007	REG	19-May-09	0	0.5	0.29		METALS
Zinc	7440-66-6	45.3	mg/kg	1.3		AP1-SD02	AP1008	REG	19-May-09	0	0.5	0.24		METALS
Zinc	7440-66-6	33.3	mg/kg	1.5		AP1-SD03	AP1012	REG	19-May-09	0	0.5	0.28		METALS
Zinc	7440-66-6	137	mg/kg	2.4		AP1-SD04	AP1013	REG	20-May-09	0	0.5	0.46		METALS

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
3-Methylphenol and 4-Methylpheno	65794-96-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylpheno	65794-96-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylpheno	65794-96-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
3-Methylphenol and 4-Methylpheno	65794-96-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthene	83-32-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Acenaphthylene	208-96-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Aluminum	7429-90-5	83.8	ug/L	200	J	AP1-SW01	AP2007	REG	19-May-09	11	N	B	METALS
Aluminum	7429-90-5	31.8	ug/L	200	J	AP1-SW02	AP2008	REG	19-May-09	11	N	B	METALS
Aluminum	7429-90-5	31.9	ug/L	200	J	AP1-SW03	AP2012	REG	19-May-09	11	N	B	METALS
Aluminum	7429-90-5	8770	ug/L	200		AP1-SW04	AP2013	REG	20-May-09	11	N		METALS
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.048	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.048	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.048	N	U	EXPLOSIVES
Amino-2,6-dinitrotoluene, 4-	19406-51-0	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.048	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.074	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.073	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.073	N	U	EXPLOSIVES
Amino-4,6-dinitrotoluene, 2-	35572-78-2	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.073	N	U	EXPLOSIVES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Anthracene	120-12-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Antimony	7440-36-0	3	ug/L	6	U	AP1-SW01	AP2007	REG	19-May-09	4.5	N	U	METALS
Antimony	7440-36-0	3	ug/L	6	U	AP1-SW02	AP2008	REG	19-May-09	4.5	N	U	METALS
Antimony	7440-36-0	3	ug/L	6	U	AP1-SW03	AP2012	REG	19-May-09	4.5	N	U	METALS
Antimony	7440-36-0	3	ug/L	6	U	AP1-SW04	AP2013	REG	20-May-09	4.5	N	U	METALS
Aroclor 1016	12674-11-2	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1016	12674-11-2	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1016	12674-11-2	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1016	12674-11-2	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.24	N	U	PEST/PCB
Aroclor 1221	11104-28-2	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1221	11104-28-2	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1221	11104-28-2	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1221	11104-28-2	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.38	N	U	PEST/PCB
Aroclor 1232	11141-16-5	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1232	11141-16-5	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1232	11141-16-5	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.38	N	U	PEST/PCB
Aroclor 1232	11141-16-5	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.38	N	U	PEST/PCB
Aroclor 1242	53469-21-9	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1242	53469-21-9	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1242	53469-21-9	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1242	53469-21-9	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.24	N	U	PEST/PCB
Aroclor 1248	12672-29-6	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1248	12672-29-6	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1248	12672-29-6	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1248	12672-29-6	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.24	N	U	PEST/PCB
Aroclor 1254	11097-69-1	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1254	11097-69-1	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1254	11097-69-1	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1254	11097-69-1	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.24	N	U	PEST/PCB

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Aroclor 1260	11096-82-5	0.24	ug/L	0.48	U	AP1-SW01	AP2007	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1260	11096-82-5	0.24	ug/L	0.48	U	AP1-SW02	AP2008	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1260	11096-82-5	0.24	ug/L	0.48	U	AP1-SW03	AP2012	REG	19-May-09	0.24	N	U	PEST/PCB
Aroclor 1260	11096-82-5	0.24	ug/L	0.48	U	AP1-SW04	AP2013	REG	20-May-09	0.24	N	U	PEST/PCB
Arsenic	7440-38-2	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	3.6	N	U	METALS
Arsenic	7440-38-2	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	3.6	N	U	METALS
Arsenic	7440-38-2	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	3.6	N	U	METALS
Arsenic	7440-38-2	8.3	ug/L	10	J	AP1-SW04	AP2013	REG	20-May-09	3.6	N	B	METALS
Barium	7440-39-3	36.6	ug/L	200	J	AP1-SW01	AP2007	REG	19-May-09	5	N	B	METALS
Barium	7440-39-3	33.8	ug/L	200	J	AP1-SW02	AP2008	REG	19-May-09	5	N	B	METALS
Barium	7440-39-3	31.9	ug/L	200	J	AP1-SW03	AP2012	REG	19-May-09	5	N	B	METALS
Barium	7440-39-3	80	ug/L	200	J	AP1-SW04	AP2013	REG	20-May-09	5	N	B	METALS
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)anthracene	56-55-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(a)pyrene	50-32-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(b)fluoranthene	205-99-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(ghi)perylene	191-24-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzo(k)fluoranthene	207-08-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-SW01	AP2007	REG	19-May-09	10	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-SW02	AP2008	REG	19-May-09	10	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-SW03	AP2012	REG	19-May-09	10	N	U	SEMIVOLATILES
Benzoic acid	65-85-0	12.5	ug/L	25	U	AP1-SW04	AP2013	REG	20-May-09	10	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Benzyl alcohol	100-51-6	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Beryllium	7440-41-7	2	ug/L	4	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	METALS
Beryllium	7440-41-7	2	ug/L	4	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	METALS
Beryllium	7440-41-7	2	ug/L	4	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	METALS
Beryllium	7440-41-7	2	ug/L	4	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	METALS
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethoxy)methane	111-91-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroethyl)ether	111-44-4	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Bis(2-chloroisopropyl)ether	108-60-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Bis(2-ethylhexyl)phthalate	117-81-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Bromophenyl phenyl ether, 4-	101-55-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Butyl benzyl phthalate	85-68-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Cadmium	7440-43-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	METALS
Cadmium	7440-43-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	METALS
Cadmium	7440-43-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	METALS
Cadmium	7440-43-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	METALS
Calcium	7440-70-2	145000	ug/L	1000		AP1-SW01	AP2007	REG	19-May-09	100	N		METALS
Calcium	7440-70-2	143000	ug/L	1000		AP1-SW02	AP2008	REG	19-May-09	100	N		METALS
Calcium	7440-70-2	139000	ug/L	1000		AP1-SW03	AP2012	REG	19-May-09	100	N		METALS
Calcium	7440-70-2	222000	ug/L	1000		AP1-SW04	AP2013	REG	20-May-09	100	N		METALS
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Carbazole	86-74-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloro-3-methylphenol, 4-	59-50-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloroaniline, 4-	106-47-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Chloronaphthalene, 2-	91-58-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenol, 2-	95-57-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.2	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Chlorophenyl phenyl ether, 4-	7005-72-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Chromium	7440-47-3	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	1.6	N	U	METALS
Chromium	7440-47-3	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	1.6	N	U	METALS
Chromium	7440-47-3	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	1.6	N	U	METALS
Chromium	7440-47-3	13.9	ug/L	10		AP1-SW04	AP2013	REG	20-May-09	1.6	N		METALS
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Chrysene	218-01-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Cobalt	7440-48-4	25	ug/L	50	U	AP1-SW01	AP2007	REG	19-May-09	0.83	N	U	METALS
Cobalt	7440-48-4	25	ug/L	50	U	AP1-SW02	AP2008	REG	19-May-09	0.83	N	U	METALS
Cobalt	7440-48-4	25	ug/L	50	U	AP1-SW03	AP2012	REG	19-May-09	0.83	N	U	METALS
Cobalt	7440-48-4	6.9	ug/L	50	J	AP1-SW04	AP2013	REG	20-May-09	0.83	N	B	METALS

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Copper	7440-50-8	12.5	ug/L	25	U	AP1-SW01	AP2007	REG	19-May-09	2.1	N	U	METALS
Copper	7440-50-8	12.5	ug/L	25	U	AP1-SW02	AP2008	REG	19-May-09	2.1	N	U	METALS
Copper	7440-50-8	12.5	ug/L	25	U	AP1-SW03	AP2012	REG	19-May-09	2.1	N	U	METALS
Copper	7440-50-8	19.2	ug/L	25	J	AP1-SW04	AP2013	REG	20-May-09	2.1	N	B	METALS
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenz(a,h)anthracene	53-70-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dibenzofuran	132-64-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,2-	95-50-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,3-	541-73-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzene, 1,4-	106-46-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Dichlorobenzidine, 3,3'-	91-94-1	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Dichlorophenol, 2,4-	120-83-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.3	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Diethyl phthalate	84-66-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dimethyl phthalate	131-11-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.2	N	U	SEMIVOLATILES
Dimethylphenol, 2,4-	105-67-9	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.2	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Di-n-butyl phthalate	84-74-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	4	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	4	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	4	N	U	SEMIVOLATILES
Dinitro-2-methylphenol, 4,6-	534-52-1	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	4	N	U	SEMIVOLATILES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.049	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.049	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.049	N	U	EXPLOSIVES
Dinitrobenzene, 1,3-	99-65-0	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.049	N	U	EXPLOSIVES

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-SW01	AP2007	REG	19-May-09	10	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-SW02	AP2008	REG	19-May-09	10	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-SW03	AP2012	REG	19-May-09	10	N	U	SEMIVOLATILES
Dinitrophenol, 2,4-	51-28-5	12.5	ug/L	25	U	AP1-SW04	AP2013	REG	20-May-09	10	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.062	N	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.062	N	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.062	N	U	EXPLOSIVES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,4-	121-14-2	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.062	N	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.089	N	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.089	N	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.089	N	U	EXPLOSIVES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Dinitrotoluene, 2,6-	606-20-2	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.089	N	U	EXPLOSIVES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.5	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.5	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.5	N	U	SEMIVOLATILES
Di-n-octyl phthalate	117-84-0	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.5	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluoranthene	206-44-0	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Fluorene	86-73-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Hexachlorobenzene	118-74-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachlorobutadiene	87-68-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	2.5	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Hexachlorocyclopentadiene	77-47-4	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.3	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	2.5	N	U	SEMIVOLATILES
Hexachloroethane	67-72-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	2.5	N	U	SEMIVOLATILES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.1	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.1	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.1	N	U	EXPLOSIVES
HMX	2691-41-0	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.1	N	U	EXPLOSIVES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.1	N	U	SEMIVOLATILES
Indeno(1,2,3-cd)pyrene	193-39-5	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.1	N	U	SEMIVOLATILES

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Iron	7439-89-6	31.1	ug/L	300	J	AP1-SW01	AP2007	REG	19-May-09	23	N	B	METALS
Iron	7439-89-6	150	ug/L	300	U	AP1-SW02	AP2008	REG	19-May-09	23	N	U	METALS
Iron	7439-89-6	26.6	ug/L	300	J	AP1-SW03	AP2012	REG	19-May-09	23	N	B	METALS
Iron	7439-89-6	15100	ug/L	300		AP1-SW04	AP2013	REG	20-May-09	23	N		METALS
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Isophorone	78-59-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Lead	7439-92-1	2.1	ug/L	10	J	AP1-SW01	AP2007	REG	19-May-09	2	N	B	METALS
Lead	7439-92-1	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	METALS
Lead	7439-92-1	2	ug/L	10	J	AP1-SW03	AP2012	REG	19-May-09	2	N	B	METALS
Lead	7439-92-1	15	ug/L	10		AP1-SW04	AP2013	REG	20-May-09	2	N		METALS
Magnesium	7439-95-4	26200	ug/L	5000		AP1-SW01	AP2007	REG	19-May-09	100	N		METALS
Magnesium	7439-95-4	26600	ug/L	5000		AP1-SW02	AP2008	REG	19-May-09	100	N		METALS
Magnesium	7439-95-4	26300	ug/L	5000		AP1-SW03	AP2012	REG	19-May-09	100	N		METALS
Magnesium	7439-95-4	36900	ug/L	5000		AP1-SW04	AP2013	REG	20-May-09	100	N		METALS
Manganese	7439-96-5	488	ug/L	15		AP1-SW01	AP2007	REG	19-May-09	0.5	N		METALS
Manganese	7439-96-5	396	ug/L	15		AP1-SW02	AP2008	REG	19-May-09	0.5	N		METALS
Manganese	7439-96-5	247	ug/L	15		AP1-SW03	AP2012	REG	19-May-09	0.5	N		METALS
Manganese	7439-96-5	836	ug/L	15		AP1-SW04	AP2013	REG	20-May-09	0.5	N		METALS
Mercury	7439-97-6	0.5	ug/L	1	U	AP1-SW01	AP2007	REG	19-May-09	0.14	N	U	METALS
Mercury	7439-97-6	0.5	ug/L	1	U	AP1-SW02	AP2008	REG	19-May-09	0.14	N	U	METALS
Mercury	7439-97-6	0.5	ug/L	1	U	AP1-SW03	AP2012	REG	19-May-09	0.14	N	U	METALS
Mercury	7439-97-6	0.5	ug/L	1	U	AP1-SW04	AP2013	REG	20-May-09	0.14	N	U	METALS
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylnaphthalene, 2-	91-57-6	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Methylphenol, 2-	95-48-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Naphthalene	91-20-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Nickel	7440-02-0	20	ug/L	40	U	AP1-SW01	AP2007	REG	19-May-09	2.3	N	U	METALS
Nickel	7440-02-0	20	ug/L	40	U	AP1-SW02	AP2008	REG	19-May-09	2.3	N	U	METALS
Nickel	7440-02-0	20	ug/L	40	U	AP1-SW03	AP2012	REG	19-May-09	2.3	N	U	METALS
Nickel	7440-02-0	26.2	ug/L	40	J	AP1-SW04	AP2013	REG	20-May-09	2.3	N	B	METALS
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 2-	88-74-4	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 3-	99-09-2	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
Nitroaniline, 4-	100-01-6	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.048	N	U	EXPLOSIVES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.048	N	U	EXPLOSIVES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Nitrobenzene	98-95-3	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.048	N	U	EXPLOSIVES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Nitrobenzene	98-95-3	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.048	N	U	EXPLOSIVES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 2-	88-75-5	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.3	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-SW01	AP2007	REG	19-May-09	10	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-SW02	AP2008	REG	19-May-09	10	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-SW03	AP2012	REG	19-May-09	10	N	U	SEMIVOLATILES
Nitrophenol, 4-	100-02-7	12.5	ug/L	25	U	AP1-SW04	AP2013	REG	20-May-09	10	N	U	SEMIVOLATILES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.062	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.061	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.061	N	U	EXPLOSIVES
Nitrotoluene, 2-	88-72-2	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.061	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.093	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.092	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.092	N	U	EXPLOSIVES
Nitrotoluene, 3-	99-08-1	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.092	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.073	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.072	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.072	N	U	EXPLOSIVES
Nitrotoluene, 4-	99-99-0	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.072	N	U	EXPLOSIVES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
n-Nitroso-di-n-propylamine	621-64-7	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	2	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	2	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	2	N	U	SEMIVOLATILES
n-Nitrosodiphenylamine	86-30-6	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	2	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-SW01	AP2007	REG	19-May-09	10	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-SW02	AP2008	REG	19-May-09	10	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-SW03	AP2012	REG	19-May-09	10	N	U	SEMIVOLATILES
Pentachlorophenol	87-86-5	12.5	ug/L	25	U	AP1-SW04	AP2013	REG	20-May-09	10	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenanthrene	85-01-8	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Phenol	108-95-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Potassium	7440-09-7	2170	ug/L	10000	J	AP1-SW01	AP2007	REG	19-May-09	100	N	B	METALS
Potassium	7440-09-7	2040	ug/L	10000	J	AP1-SW02	AP2008	REG	19-May-09	100	N	B	METALS
Potassium	7440-09-7	2030	ug/L	10000	J	AP1-SW03	AP2012	REG	19-May-09	100	N	B	METALS
Potassium	7440-09-7	11800	ug/L	10000		AP1-SW04	AP2013	REG	20-May-09	100	N		METALS
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Pyrene	129-00-0	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.072	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.071	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.071	N	U	EXPLOSIVES
RDX	121-82-4	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.071	N	U	EXPLOSIVES

Table E-6
Surface Water Analaytical Data Used in Ash Pit 1 Baseline Human Health Risk Assessment

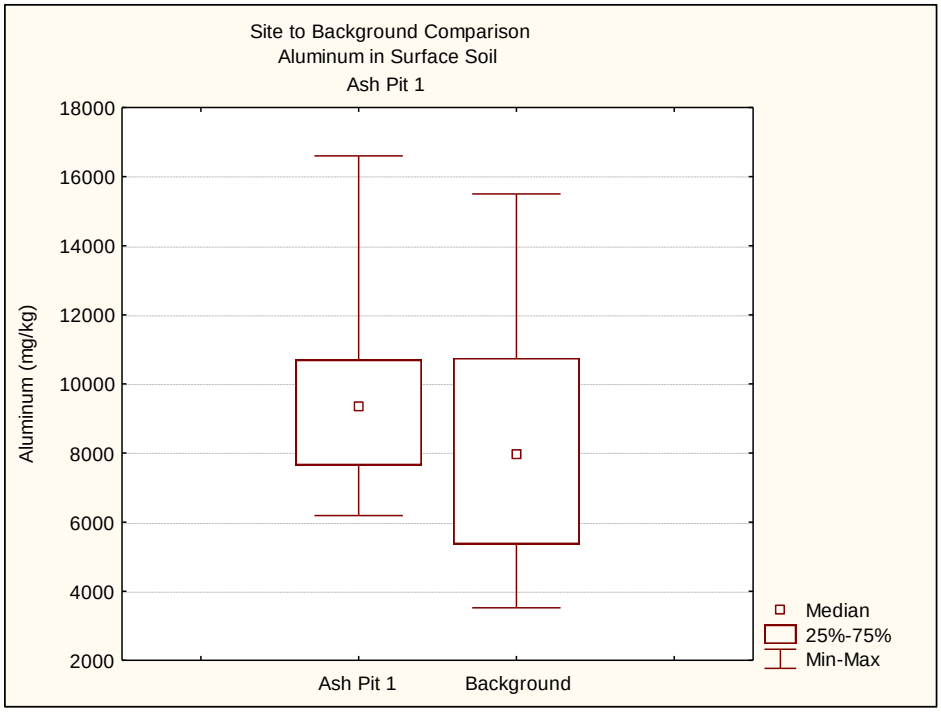
PARAMETER	CASNUM	RES	UNIT	REP_LIM	VQUAL	LOCATION_CODE	SAMPLE_NO	PURPOSE	SAMPLE_DATE	METH_DET_LIM	FILTERED	LAB_QUAL	USER_TEST_GROUP
Selenium	7782-49-2	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	3.1	N	U	METALS
Selenium	7782-49-2	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	3.1	N	U	METALS
Selenium	7782-49-2	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	3.1	N	U	METALS
Selenium	7782-49-2	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	3.1	N	U	METALS
Silver	7440-22-4	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	1.2	N	U	METALS
Silver	7440-22-4	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	1.2	N	U	METALS
Silver	7440-22-4	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	1.2	N	U	METALS
Silver	7440-22-4	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	1.2	N	U	METALS
Sodium	7440-23-5	6400	ug/L	10000	J	AP1-SW01	AP2007	REG	19-May-09	500	N	B	METALS
Sodium	7440-23-5	7050	ug/L	10000	J	AP1-SW02	AP2008	REG	19-May-09	500	N	B	METALS
Sodium	7440-23-5	6850	ug/L	10000	J	AP1-SW03	AP2012	REG	19-May-09	500	N	B	METALS
Sodium	7440-23-5	9140	ug/L	10000	J	AP1-SW04	AP2013	REG	20-May-09	500	N	B	METALS
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.075	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.074	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.074	N	U	EXPLOSIVES
Tetryl	479-45-8	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.074	N	U	EXPLOSIVES
Thallium	7440-28-0	5	ug/L	10	U	AP1-SW01	AP2007	REG	19-May-09	3.4	N	U	METALS
Thallium	7440-28-0	5	ug/L	10	U	AP1-SW02	AP2008	REG	19-May-09	3.4	N	U	METALS
Thallium	7440-28-0	5	ug/L	10	U	AP1-SW03	AP2012	REG	19-May-09	3.4	N	U	METALS
Thallium	7440-28-0	5	ug/L	10	U	AP1-SW04	AP2013	REG	20-May-09	3.4	N	U	METALS
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1	N	U	SEMIVOLATILES
Trichlorobenzene, 1,2,4-	120-82-1	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,5-	95-95-4	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-SW01	AP2007	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-SW02	AP2008	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-SW03	AP2012	REG	19-May-09	1.4	N	U	SEMIVOLATILES
Trichlorophenol, 2,4,6-	88-06-2	2.5	ug/L	5	U	AP1-SW04	AP2013	REG	20-May-09	1.4	N	U	SEMIVOLATILES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.048	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.048	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.048	N	U	EXPLOSIVES
Trinitrobenzene, 1,3,5-	99-35-4	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.048	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-SW01	AP2007	REG	19-May-09	0.066	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-SW02	AP2008	REG	19-May-09	0.066	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	U	AP1-SW03	AP2012	REG	19-May-09	0.066	N	U	EXPLOSIVES
Trinitrotoluene, 2,4,6-	118-96-7	0.095	ug/L	0.19	UJ	AP1-SW04	AP2013	REG	20-May-09	0.066	N	U	EXPLOSIVES
Vanadium	7440-62-2	25	ug/L	50	U	AP1-SW01	AP2007	REG	19-May-09	0.66	N	U	METALS
Vanadium	7440-62-2	25	ug/L	50	U	AP1-SW02	AP2008	REG	19-May-09	0.66	N	U	METALS
Vanadium	7440-62-2	25	ug/L	50	U	AP1-SW03	AP2012	REG	19-May-09	0.66	N	U	METALS
Vanadium	7440-62-2	20	ug/L	50	J	AP1-SW04	AP2013	REG	20-May-09	0.66	N	B	METALS
Zinc	7440-66-6	13.2	ug/L	20	J	AP1-SW01	AP2007	REG	19-May-09	3.8	N	B	METALS
Zinc	7440-66-6	9.6	ug/L	20	J	AP1-SW02	AP2008	REG	19-May-09	3.8	N	B	METALS
Zinc	7440-66-6	10.8	ug/L	20	J	AP1-SW03	AP2012	REG	19-May-09	3.8	N	B	METALS
Zinc	7440-66-6	93.2	ug/L	20		AP1-SW04	AP2013	REG	20-May-09	3.8	N		METALS

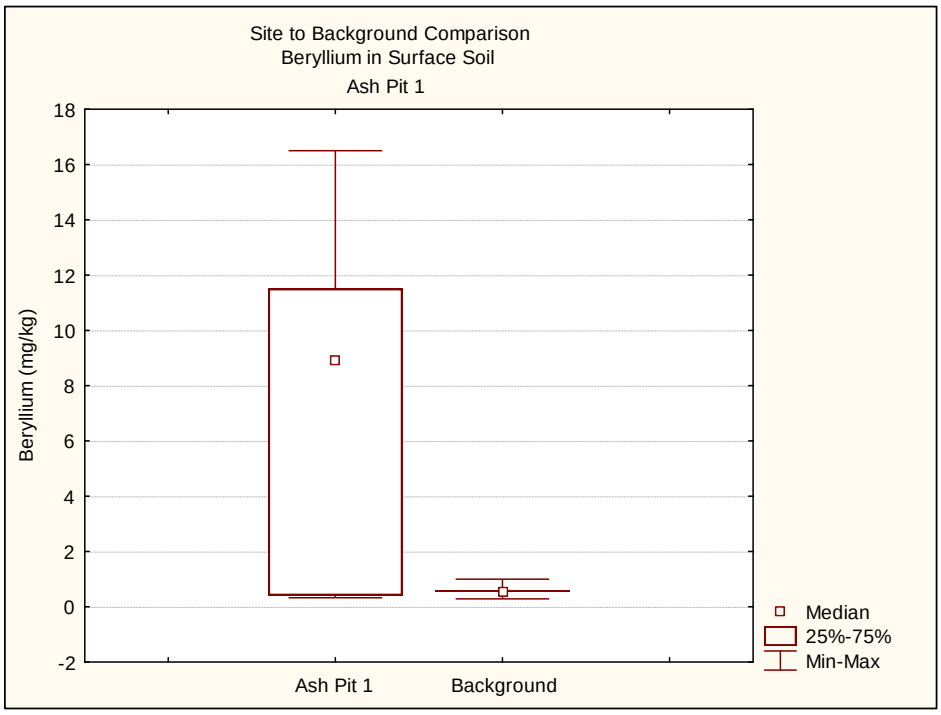
APPENDIX F

WILCOXON RANK SUM STATISTICAL TEST OUTPUT

Site to Background Evaluation for Metals in Surface Soil - AP 1

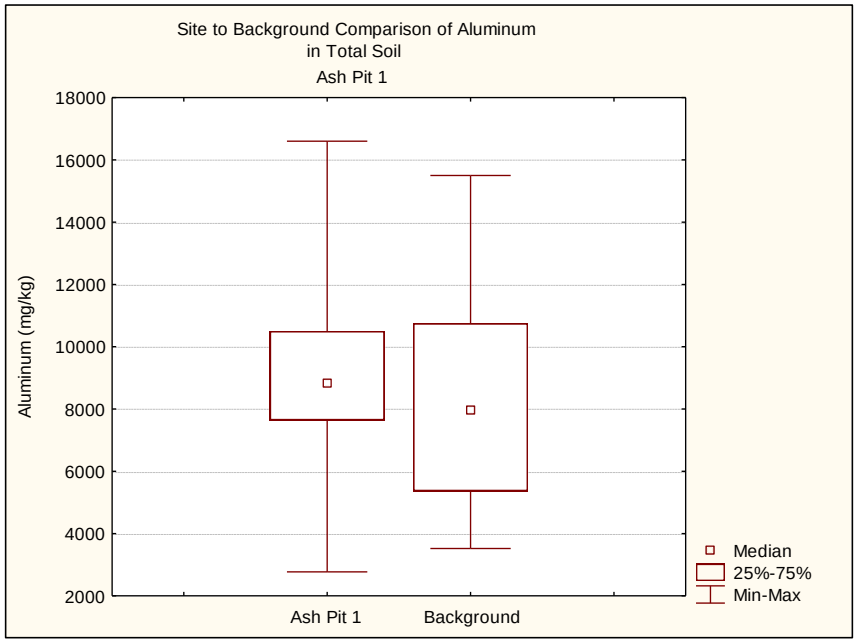
	Rank Sum	Rank Sum	U	Z	p-level	Z	p-level	Valid N	Valid N	2*1sided
Aluminum	190.0000	135.0000	57.00000	1.142249	0.253351	1.142469	0.253260	13	12	0.270124
Beryllium	336.0000	405.0000	80.00000	2.538462	0.011135	2.563549	0.010361	13	25	0.010261

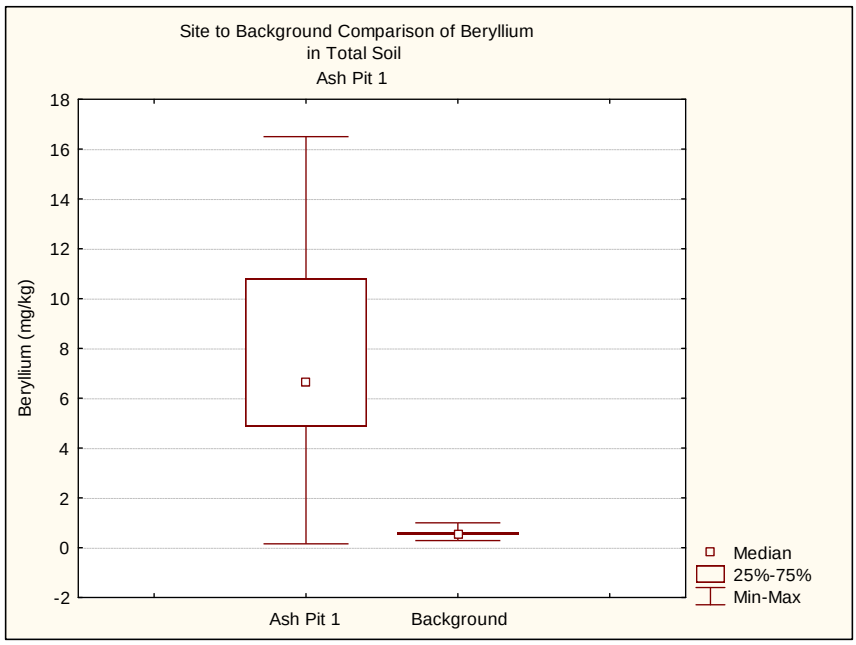


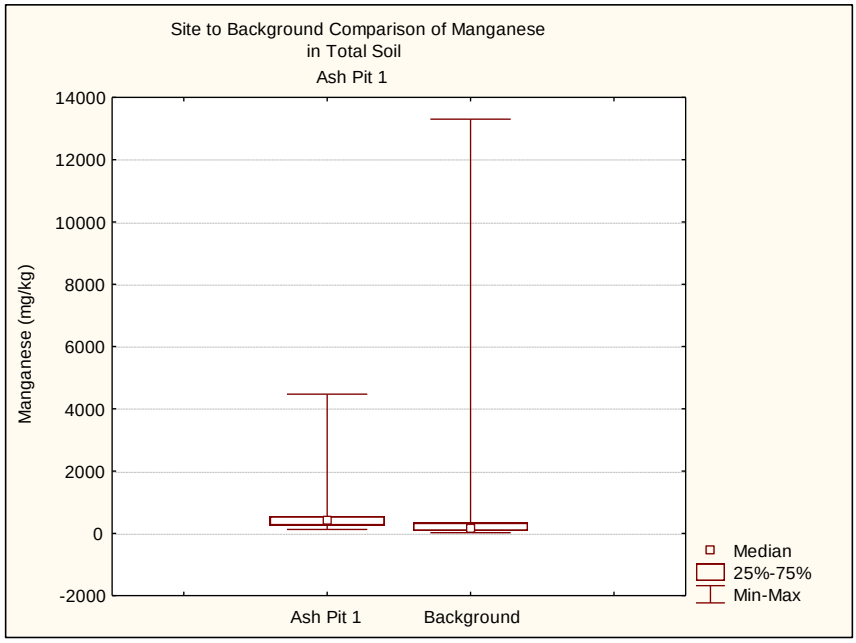


Site to Background Evaluation for Metals in Total Soil - AP 1

	Rank Sum	Rank Sum	U	Z	p-level	Z	p-level	Valid N	Valid N	2*1sided
Aluminum	674.500	228.5000	150.5000	0.821348	0.411449	0.821414	0.411411	30	12	0.416631
Beryllium	1110.000	430.0000	105.0000	4.563833	0.000005	4.578640	0.000005	30	25	0.000001
Manganese	1068.000	528.0000	177.0000	3.499335	0.000466	3.499395	0.000466	30	26	0.000329






Site to Background Comparison of Manganese
in Total Soil
Ash Pit 1
Manganese (mg/kg)
14000
12000
10000
8000
6000
4000
2000
0
-2000
Ash Pit 1
Background
Median
25%-75%
Min-Max

RESPONSE TO COMMENTS

Response to External Comments
Draft Baseline Human Health Risk Assessment and
Screening-Level Ecological Risk Assessment,
Ash Pit 1 and Ash Pit 3
Plum Brook Ordnance Works, Sandusky, Ohio,
Dated December 20, 2010
FUDS Project No. G05OH001821

Note that the following comments reference the Baseline Human Health Risk Assessment (BHHRA) for Ash Pit 1 (AP1) and Ash Pit 3 (AP3) and the Screening-Level Ecological Risk Assessment (SLERA) for AP1 and Ash Pit 3 AP3, each of which was issued as a combined AP1/AP3 report. Please note that the U.S. Army Corps of Engineers has decided to issue two separate BHHRA reports, one for AP1 and one for AP3, rather than the combined report issued previously. The AP1 and AP3 SLERAs are likewise being issued as two separate reports.

Comments by Janusz Byczkowski, Ph.D., Ohio Environmental Protection Agency (OEPA) Toxicologist, received February 17, 2011.

Comment 1: **BHHRA Executive Summary AP3 P. ES-5 L# 1 – 7 S. 7.3 P. 7-4 L# 24 and P. 7-5 L# 4. <u>This document states:</u> "… *ILCR = 1E-6 (excluding background-related arsenic)* […] *ILCR = 3E-6 (excluding background-related arsenic)*…"and then "…*apparent background-related* manganese […] *appropriately excluded* […] *background-related contribution of arsenic* […] *appropriately excluded*…" While in the Section 2.4.3.1 (P. 2-8) at least there is a sentence, that background "…*method* […] *differs from that shown in current OEPA (2004a) guidance*…" there is no such an explanation provided either in *Executive Summary,* in *Introduction*, or in *Recommendations*. To the contrary, in the *Introduction* (Sect. 1.5, P. 1-5; L# 17) this document states that "…*The BHHRA was performed consistent with* […] *Ohio Environmental Protection Agency (OEPA) guidance*…" and then (P. ES-6, L# 24) "…*background-related contributions of arsenic in AP3 soil are appropriately excluded*…" Since the *Executive Summary, Introduction* and *Recommendations,* are the parts of the document which probably will be the most read by the public, a detailed rationale for deviation from the current OEPA-DERR standard risk assessment guidance should be included as a part of the introduction of the BHHRA document. I suggest a revision of these Documents, which should follow the suggestions listed below:**

a. On *Distribution Lists* (BHHRA, SLERA) please correct the address of Janusz Z. Byczkowski.

b. Please emphasize in *Executive Summary* that background screening methodology differs from that, currently recommended by OEPA-DERR, and provide justification in the *Introduction*.

Response 1: a. The corrected address shall be used for future deliverables:

Janusz Z. Byczkowski, Ph.D., D.Sc., DABT.
Div. Emergency and Remedial Response
Lazarus Government Ctr.
P.O. Box 1049
50 W. Town Str., Suite 700
Columbus, OH 43216-1049

b. It is agreed that it is possible that certain stakeholders may only read the executive summary of this document. In the executive summary on page ES-3, 1st full paragraph, we will add text stating that the standard steps of risk assessment, data analysis, exposure assessment, toxicity assessment, risk characterization, uncertainty analysis were executed in the risk assessment. Data analysis for inorganic constituents differs from OEPA-DERR 2004, and is further described in Section 2.4.3.1 Background Screening of Inorganics.

Comment 2: **BHHRA S. 3.2.1 P. 3-19 L# 17 and P. 3-20 L# 3 Also, Tables 2-6 to 2-9; 2-11; 2-13; 2-14; and Appendix B. This document states: "…*One-half the reporting limit is used as the ProUCL input concentration for nondetects*…" The ProUCL ver 4.0.(05) should be used for modeling/calculating reasonable maximum exposure (RMEs) with 100% reporting limit (RL) as input concentration for nondetects (but not for screening, or calculations of background concentration). For screening- selecting COPCs, on the other hand, it is appropriate to use the MAXIMUM concentration in each medium or 1/2 of the Reporting Limit (RL) if the nondetect RL exceeds the toxicity-based screening concentration (=0.1 x RSL for non-carcinogenic or 1.0 x RSL for carcinogenic chemicals). Please revise the exposure concentrations data (EPCs) calculated with ProUCL software, by using 100% RL as an input for RME modeling at NDs mode.**

Response 2: Maximum detected concentrations (MDC) were used in the data analysis screening portion of the risk assessment. The exposure point concentration (EPC) protocol used in the BHHRA is consistent with that which has been performed for PBOW human health and ecological risk assessments for the past decade, consistent with other FUDS assessments across the country and consistent with RAGS Part A (EPA 1989). PBOW EPC protocol was based on RAGS Part A Chapter 5 Data Evaluation Section which say to use ½ the quantitation limit for non-detect results if there is reason to believe that the chemical present in a sample. Quantitation limit is further defined as the lowest level at which a chemical can be accurately reproducibly quantified. This guidance even recommends that individual samples with elevated RLs be excluded from the quantitative risk assessment.

The ProUCL Version 4.00.05 05 User's Guide (EPA, 2010a) states that the full detection limit should be used rather than ½ the detection limit. Section

1.12 of the ProUCL User's Guide cautions that ProUCL does not make distinctions between MDLs, adjusted MDLs, sample quantitation limits, or instrument detection limits, and that, "It is the user's responsibility to supply correct numerical values (should be entered as reported detection limit value) for ND observations in the data set…" With this responsibility in mind, it must be recognized that the RL is not a detection limit, but is a limit of quantitation, which is defined as the concentration at which an analyte can be reported with a specified degree of accuracy (generally 20 percent, depending on the method). The method detection limit (MDL), however, is a true sample-specific detection limit reported for each sample and analyte. It is defined as the lowest concentration of an analyte that can be distinguished from a blank with 99% certainty. Note that the RL is the MDL multiplied by a factor of 3 to 5; that is, the RL (a limit of quantitation) is 3 to 5 times higher than the MDL (detection limit). The detection limits (i.e., MDLs) are not available for some of the historical data collected prior to 2008, but the RLs are available. Use of ½ the RL is a conservative (i.e., high) estimate of the full detection limit, as ½ the RL is 1.5 to 2.5 times higher than the detection limit.

Further, the use of full RLs as "detection limits" in ProUCL is not desirable because goodness-of-fit tests used in the ProUCL upper confidence limit module are based on all values greater than the highest value identified by the ProUCL user as a "detection limit," as described in Section 4.1 of the ProUCL Version 4.00.05 Technical Guide (EPA, 2010b). For example, a hypothetical data set of n=30 may have 29 detections and a single nondetect characterized by an elevated RL value that is greater than all detected values except for 5 samples. In this case, ProUCL bases the distribution only on the 5 samples that are higher than the elevated RL. This may either limit the selection of UCL methods or may result in the selection of a distribution type that fits the 5 highest detections but is inappropriate for the rest of the sample set (i.e., the other 24 detections). As a result, a UCL value that is nonconservative may be selected because the wrong distribution type was selected by ProUCL based only on the five highest detections. Also, EPA (1989) risk assessment guidance directs that "J-" qualified data should be used to calculate the exposure point concentration based on the reported levels. Because many "J" qualified data are less than the RL (but greater than the MDL), the use of even a single RL for a nondetect result will likely eliminate the inclusion of these "J" values in the distribution fitting. Therefore, use of the RL as the "detection limit" value in ProUCL may lead to distribution testing input that eliminates the consideration of J- qualified data, which is inconsistent with the current EPA (1989) risk assessment guidance practice of assuming that J-qualified data are valid detected values.

References cited in this response:

U.S. Environmental Protection Agency (EPA), 2010a, ***ProUCL Version 4.00.04 User Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, April, EPA/600/R-07/038, April.

U.S. Environmental Protection Agency (EPA), 2010b, ***ProUCL Version 4.00.04 Technical Guide***, Draft, Office of Research and Development, Technology Support Center Characterization and Monitoring Branch, Las Vegas, Nevada, EPA/600/R-07/041, May.

U.S. Environmental Protection Agency (EPA), 1989, ***Risk Assessment Guidance for Superfund***, ***Volume I, Human Health Evaluation Manual (Part A)***, Interim Final, Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002, May.

Comment 1: **SLERA ES. P. 1 L# 31. This document states: "*…additional screening criteria (e.g., comparison with background data…*" For comments, see above: BHHRA comment # 1. Please emphasize that background screening methodology differs from that, currently recommended by OEPA-DERR, and provide justification.**

Response 1: See response to HHRA comment 1.b. Text will be added to ES-1 3rd full paragraph stating that background screening for inorganics differs from OEPA-DERR 2004. In section 2.2.3.3 Background Evaluation 2nd full paragraph, will be expanded with rationale for background inorganic screening, and that the background screening differs from OEPA-DERR 2004. In Section 2.2.3.3 a more detailed description of inorganic background screening will be included. The PBOW Project Delivery Team, including members from the U.S. Army Corps of Engineers (USACE), Nashville and Huntington Districts and their contractors, the National Aeronautics and Space Administration (NASA), and the OEPA have strived to cooperate together for more than a decade. Site-specific team agreements have been made over the years, including how background screening for inorganics. The methodology used for background screening and evaluation in the risk assessment for inorganics was previously requested by OEPA risk assessors for soil in 1999 and was again agreed to by the Project Delivery Team in 2002 for groundwater (Shaw, 2005). It has been used for all PBOW risk assessments conducted since 1999 for consistency from AOC to AOC.

Comment 2: **SLERA S. 2.2.2 P. 2-10 L#14 Also, Tables 2-9 to 2-14. This document states: "*…One-half the reporting limit is used as the ProUCL input concentration for nondetects…*" For comments, see above: BHHRA comment # 2. Please revise the exposure concentrations data (EPCs) calculated with ProUCL software, by using 100% RL as an input for RME modeling at NDs mode.**

Response 2: See HHRA response #2.

Comment 3: **SLERA S.5.1 P. 5-2 L# 3 and S. 6.0 P. 6-1 L.# 11. This document states:**

"*…Thallium was a COPEC in soil at AP 3 and was only detected in 3 out of 16 soil samples (Table 2-12)…*" and then: "*…Thallium was only detected in*

***2 out of 16 samples at concentrations exceeding toxicological and background concentrations…*"**

These two statements may appear contradictory, especially that the Table 2-12 is not detailed enough to relate individual detected concentrations to toxicity values or background levels.
Please harmonize the two statements with Table 2-12.

Response 3: The statements are correct as written, as one refers to the overall detection frequency, and the other refers to the number of detections that exceed screening criteria (in looking at Table 2-12, one can see that the minimum detected thallium concentration of 0.5 mg/kg is below both the BSC and ESV). To clear up any confusion, the statement in section 5.1 will be revised consistent with the following, "Thallium was a COPEC in soil at AP3 and was only detected in 3 out of 16 soil samples, *2 of which exceeded the BSC and ESV* (Table 2-12)."