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October 20, 2010

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PROJECT: Contract No.: EP-S3-07-06
Work Assignment No.: 025-RICO-C368

DOCUMENT NO.: 3330-025-EO-CORR-01344
SUBJECT: Final Remedial Investigation Report,
Ravenswood PCE Superfund Site, Ravenswood West Virginia
(DCN: 3330-025-RT-RIRT-01345)

Dear Ms. Johnson:

CDM Federal Programs Corporation (CDM) is pleased to submit two (2) copies of the Final Remedial Investigation Report (RI) for the Ravenswood PCE Superfund Site, in accordance with the reporting requirements for this Work Assignment. This report supersedes the Final RI submitted on August 18, 2010.

Note that one (1) copy of the Final RI has been sent to Mark Slusarski of the West Virginia Department of Environmental Protection, under separate cover.

We appreciate the opportunity to support the EPA on this project. If you have any questions or comments, please contact me at [redacted].

Sincerely,

[redacted]

[redacted]
Project Manager
CDM Federal Programs Corporation

cc: Tralie, RAC III Project Officer (3HS42) (letter only)
M. Slusarski, Division of Land Restoration, WVDEP
[redacted], CDM Program Manager (letter only)
Document Control File

CDM

U.S. Environmental Protection Agency Region III

Ravenswood PCE Superfund Site
Ravenswood, West Virginia

October 20, 2010

Final Remedial Investigation Report

Response Action Contract
for Remedial Planning and Oversight Activities at Sites
in EPA Region III

U.S. EPA Contract No. EP-S3-07-06

Final Remedial Investigation Report
For
Ravenswood PCE Superfund Site
Ravenswood, West Virginia

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OCTOBER 20, 2010

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Abbreviations and Acronyms

AS	air sparge
ASQAB	Analytical Services & Quality Assurance Branch
ATSDR	Agency for Toxic Substances and Disease Registry
BCF	bioconcentration factor
bgs	below ground surface
CDM	CDM Federal Programs Corporation
CLP	U.S. EPA Contract Laboratory Program
COD	chemical oxygen demand
COPC	contaminant of potential concern
CRQL	contract required quantitation limits
CSM	conceptual site model
DCE	dichloroethene
DNAPL	dense non-aqueous phase liquid
DPT	direct push technology
DQO	data quality objective
EDDs	electronic data deliverables
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assessment Team
°F	degrees Fahrenheit
FS	Feasibility Study
ft	feet
ft/day	feet/day
GAI	GAI Consultants, Inc.
GC	gas chromatograph
gpd	gallons per day
GPS	Global Positioning System
HHRA	Human Health Risk Assessment
kg	kilograms
K_{oc}	log of the organic carbon partition coefficient
lbs	pounds
Lockheed Martin	Lockheed Martin Technology Services Group
MCL	Maximum Contaminant Level
MEK	methyl ethyl ketone
mg/L	milligrams per liter
ml	milliliter
msl	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
MW	monitoring well
µg/Kg	micrograms per kilogram
µg/L	micrograms per liter
µm	micrometer
NTU	Nephelometric Turbidity Units
NPL	National Priorities List
PCE	tetrachloroethene
PDB	passive diffusion bag
PCBs	polychlorinated biphenyls

Abbreviations and Acronyms (Continued)

PID	photo ionization detector
ppbv	parts per billion by volume
ppmv	parts per million by volume
PVC	poly vinyl chloride
PW	production well
QA	quality assurance
QC	quality control
RAC	Response Action Contract
RBCs	Risk-Based Concentrations
REAC	Response Engineering and Analytical Contract
RI	Remedial Investigation
ROI	radius of influence
RPD	relative percent difference
RSL	Regional Screening Level
scf	standard cubic feet
SECC	Southeast Regional Climate Center
SLERA	Screening Level Ecological Risk Assessment
SMP	Site Management Plan
START	Superfund Technical Assistance and Response Team
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCE	trichloroethene
TCL	Target Compound List
TOC	total organic carbon
TS	Treatability Study
TSOP	Technical Standard Operating Procedure
USGS	United States Geological Survey
VI	vapor intrusion
VOA	volatile organic analysis
VOC	volatile organic compound
Weston	Roy F. Weston, Inc.
WTP	Water Treatment Plant
WVDEP	West Virginia Department of Environmental Protection

Section 1
Introduction

1.1 Introduction

CDM Federal Programs Corporation (CDM) has been tasked by the U.S. Environmental Protection Agency (EPA) Region III to conduct a Remedial Investigation (RI) for the Ravenswood PCE Superfund Site, located in Ravenswood, West Virginia (**Figure 1-1**). This work is being performed under the Response Action Contract (RAC) Work Assignment Number 025-RICO-C368 under contract number EP-S3-07-06. This report supersedes all previously issued versions of the RI Report.

The residents and businesses in Ravenswood receive their water from the Ravenswood municipal water supply. Currently, the municipal supply is a blended system that combines the flow from seven production wells (PWs). The groundwater RI was performed between 2005 and 2010 in order to determine the nature and extent of groundwater contamination affecting production wells and to help identify appropriate and effective remediation strategies. The RI consisted of the evaluation of data collected during prior investigations, the development of a hydrogeologic groundwater flow model, collection of groundwater samples, the performance of an air sparge (AS) and soil vapor extraction (SVE) Treatability Study (TS), a direct push technology (DPT) survey, and the collection of periodic groundwater samples from groundwater monitoring and municipal production wells. **Figure 1-2** depicts the locations of production wells, monitoring wells (MWs), AS wells, SVE wells and a vapor monitoring point at the Site. A Human Health Risk Assessment (HHRA) (CDM, 2010a), Feasibility Study (FS) (CDM, 2010b), and Screening Level Ecological Risk Assessment (SLERA) (CDM, 2010f) were also performed.

1.2 Objective

The objective of the Ravenswood PCE Superfund Site RI is to collect and evaluate sufficient data regarding the nature and extent of groundwater contamination at the Site to allow a human health risk assessment and a screening level ecological risk assessment and a FS for the remediation of contamination to be conducted. The data generated regarding the nature and extent of groundwater contamination at the Site are used in the HHRA and SLERA to identify potential risks to human health and the environment, respectively. These data are used in the FS to identify remedies to eliminate, reduce, or control those risks.

1.3 Purpose of the RI Report

The purposes of this report are to:

- Document the groundwater data collected during the various field investigations;
- Present an evaluation of the data that summarizes the nature and extent of groundwater contamination; and

- Present a conceptual site model (CSM) describing the fate and transport mechanisms of contaminated groundwater.

The HHRA, SLERA, and FS are separate documents and reference this RI Report for specifics regarding investigation activities.

1.4 Organization of the RI Report

Section 1 of the RI Report states the objectives of the RI and presents the organization of this report. The remainder of the report is organized as follows:

- Section 2 - Site Description and History. The history of the Site, a Site description, and summary of previous Site investigations are presented in this section.

- Section 3 Field Investigation Activities. This section provides a summary of the installation of groundwater monitoring wells and treatability study wells, the sampling and analysis of groundwater monitoring wells and municipal wells, and the collection of screening level groundwater samples at the Site.

- Section 4 -Site Physical Characteristics. This section provides a description of Site physiography, regional and Site geology and hydrogeology, and climate and meteorology. The results of the hydrogeological model developed during the RI are presented in this section.

- Section 5 - Results. The analytical and other data collected during the RI at the Site are presented and the distribution of contamination is described.

- Section 6 - Contaminant Fate and Transport. The physical and chemical mechanisms which determine fate and transport of contaminants at the Site are described. The fate of the groundwater contaminants is discussed, and a CSM is presented.

- Section 7 - Conclusions and Recommendations. The conclusions of the investigations and recommendations for future activities are presented.

- Section 8 - References. Full references noted in this report are listed.

- Tables and Figures follow the text.

- Appendices follow the Figures.

Section 2
Site Description and History

2.1 Site Location and Description

The Site is located in the City of Ravenswood in Jackson County, West Virginia. The City is located on the eastern bank of the Ohio River, which flows southward in the vicinity of Ravenswood. The municipality covers an area approximately three miles long by one mile wide. The downtown business area of Ravenswood is located primarily along Washington Street (West Virginia State Route 68) with residential properties located in close proximity to the downtown area (**Figure 1-1**).

In general, the Site is comprised of the portion of the downtown area that is underlain by groundwater contaminated by tetrachloroethene (PCE), also known as perchloroethylene. The plume extends from the intersection of Broadway Street and Walnut Street, approximately 1,400 feet northeast to the City of Ravenswood water supply well field on Virginia Street.

The City of Ravenswood water supply well field includes seven production wells that supply water to approximately 6,000 people (Agency for Toxic Substances and Disease Registry (ATSDR), 2007). The production wells are located within a three-acre to four-acre area northeast of downtown. Wells PW-1 through PW-4 were constructed between 1939 and 1964, and well PW-5 was installed in 1977 (GAI Consultants (GAI), 2001). Wells PW-6 and PW-7 were constructed by the EPA Region III Removal Program and placed in service in 2004 (ATSDR, 2007). The City production wells are screened in the deep groundwater from approximately 82 to 92 feet (ft) below ground surface (bgs).

2.2 Site History

In September 1989, during routine Health Department analyses, PCE contamination was detected in PW-2, PW-3 and PW-5 at levels exceeding the EPA's Maximum Contaminant Level (MCL) for PCE in drinking water of 5 micrograms per liter (µg/L). PCE concentrations in the production wells and/or the finished water blend were monitored 22 times from 1989 to 1998. Volatile organic compound (VOC) analytical results from this time period are included in **Tables A-1** and **A-2** in **Appendix A**. During that time period, PCE concentrations in the finished water distributed to the public exceeded the MCL on five occasions (GAI, 2001).

Following the identification of PCE in the City of Ravenswood drinking water supply, various Site investigation activities were conducted between 1998 and 2004, when the Site was added to the National Priorities List (NPL). In 1998, Roy F. Weston, Inc. (Weston), under contract to the EPA, conducted two soil gas surveys. In 1999, EPA contractor, Lockheed Martin Technology Services Group (Lockheed Martin) installed four groundwater monitoring wells. In 2001, seven additional groundwater monitoring wells were installed by GAI under contract to the West Virginia Department of Environmental Protection (WVDEP), and groundwater samples were collected from the wells and from 55 additional soil borings. Due to the effect that the

PCE-contaminated groundwater has on the public drinking water supply, the Site was proposed for the NPL on March 8, 2004, with the Final Rule published on September 23, 2004.

Following the listing of the Ravenswood PCE Site on the NPL, EPA collected groundwater samples from the monitoring wells and from the City's drinking water system during seven monitoring events between December 2004 and March 2007. Details of previous investigations are provided in Section 2.3.

In 2000 the City added a Venturi air stripper to the water treatment system to remove PCE from the drinking water and to eliminate the health threat from using contaminated groundwater for the water supply. The air stripper was installed in May and June 2000 to treat water from production wells PW-3 and PW-5 before blending the treated water with water from the non-contaminated wells. From 1999 to late 2009, PCE was only detected in wells PW-3 and PW-5; however, in early 2010 (following shut down of PW-3), low levels of PCE were detected in PW-2. While the system proved to be effective at removing PCE to below regulatory limits in the blended drinking water, the Operator of the Ravenswood Water Treatment Plant reports that the air stripper requires frequent maintenance, and parts are difficult to obtain (Cambarare, 2010).

2.3 Previous Site Investigations

The following subsections summarize the results of investigations performed prior to the initiation of RI activities in 2007. All available analytical results from previous investigations are provided in **Appendix A**.

2.3.1 Soil Vapor Investigation, 1998

In 1998, the West Virginia Rural Water Authority requested EPA's assistance to address the contamination in the Ravenswood public water supply. Under the direction of EPA, Weston conducted two soil gas surveys covering an area of 75 acres. Included in the survey area were three defunct dry cleaning operations thought to be potential source areas. No significant source of contamination was found. PCE in soil gas was detected at moderate concentrations at three locations: one beneath the City Maintenance Building and two beneath an asphalt parking lot on the south side of the Maintenance Building. Results from the survey suggested that the source of the PCE may be located in the vicinity of the Maintenance Building (Weston, 1999).

2.3.2 Soil and Groundwater Investigation, 1999

Based on the results of the soil gas study, EPA contracted with Lockheed Martin under the EPA Response Engineering and Analytical Contract (REAC) to locate the source of the groundwater contamination. Lockheed Martin installed and collected samples from four monitoring wells (EPA-01 through EPA-04) screened in the deep groundwater at depths ranging from 72 to 92 ft bgs to 77 to 92 ft bgs (Lockheed Martin, 1999).

As part of the REAC investigation, soil samples were collected during well installation at 5-foot intervals in soil borings advanced to the top of bedrock, which is found between 92 and 97 ft bgs. The soil samples were analyzed for PCE and trichloroethene (TCE) using a field-portable gas chromatograph (GC), with ten percent of the samples sent to a fixed-based laboratory for confirmation. PCE was not detected in any of the soil samples.

The REAC study included the collection of groundwater samples from the four installed "EPA" monitoring wells (EPA-01 to EPA-04) and five City production wells closest to the Maintenance Building (PW-1 to PW-5) shown on **Figure 2-1**, all of which are screened in the deep groundwater. PCE was not detected in the groundwater samples analyzed by the field laboratory. Concentrations of 2-butanone and toluene were detected in the groundwater sample collected from monitoring well EPA-01 at concentrations of 1,870 μg/L and 18.7 μg/L, respectively. Groundwater analytical results from the REAC sampling for production wells are presented in **Table A-2 in Appendix A.** Results ranged from non-detect to 10.8 μg/L in the blend, non-detect to 0.2 μg/L in PW-1, non-detect to 8.3 μg/L in PW-2, 12.8 to 29.8 μg/L in PW-3 and non-detect to 21.7 μg/L in PW-5. PCE was not detected in PW-4.

2.3.3 Site Inspection, 2000

In 2000, Weston prepared a Site Inspection Narrative Report to assess the possible threat to human health and to determine if additional investigations were warranted. Available Site data were used to prepare the report; no additional field investigations were conducted. Weston found that elevated concentrations of PCE were present in municipal well samples at levels significantly greater than background concentrations. Weston concluded that the contaminant plume posed a significant threat to both human health and the environment (Weston, 2000).

2.3.4 Interim Investigation, 2000 - 2001

In 2000, the WVDEP obtained an EPA Site Assessment Program grant and contracted with GAI to perform additional studies to further delineate the plume. Thirty-seven direct push points were advanced near suspected source areas (**Figures 2-2 and 2-3**). Groundwater samples were obtained from the production wells and the four monitoring wells. The monitoring well data are summarized in **Table A-3** in **Appendix A**. Groundwater samples from the direct push points were collected at approximately 60 ft bgs and at the bedrock interface, approximately 90 ft bgs. These data are summarized in **Table A-4** in **Appendix A**. These results were presented in an Interim Investigation Report (GAI, 2001).

In 2001, 18 additional Geoprobe® points were advanced, and seven additional monitoring wells were installed, with the results reported in the 2001 Investigation Summary Addendum #1 (GAI, 2002). One well, DEP-05S, was installed in the shallow groundwater. The remainder of the wells (DEP-05D through DEP-10), were installed in the deeper groundwater. DEP monitoring wells (DEP-05D through DEP-10) have 10-foot to 20-foot screens and are screened at varying depths. DEP-05D has a 10-foot screen from 80.5 to 90.5 ft bgs. DEP-06 has a 10-foot screen from 76.5 to 86.5 ft bgs. DEP-07 has a 20-foot screen from 68 to 88 ft bgs. DEP-08 and DEP-10 have 20-foot screens from 59 to 79 ft bgs. DEP-09 has a 20-foot screen from 34 to 54 ft bgs. The locations of the "DEP" monitoring wells installed in 2001 are shown on **Figure 2-1**. Soil samples were collected from selected Geoprobe® points as well as from four monitoring well locations. PCE was detected in one soil sample (DEP-07).

The Interim Investigation data indicated that the plume of PCE contamination extended approximately 1,400 feet from near the intersection of Broadway Street and Walnut Street, northeastward, to the municipal well field on Virginia Street. The plume width was approximately 400 feet in the shallow portion of the water bearing zone (approximately 60 ft bgs) and 200 feet in the deeper zone (approximately 90 ft bgs).

Site data indicated that concentrations of VOCs are higher in the shallow groundwater than in deeper groundwater. The highest concentrations detected in the shallow zone were clustered around an area bounded by Washington, Race, Mulberry, and Walnut Streets to the south, and around an area bounded by Virginia, Washington, and Mulberry Streets, and DEP-05S/D to the north (**Figure 2-2**). The highest concentrations in the deep zone were at GP-55 and GP-33 (to the south), and in an area bounded by Sycamore, Washington, and Virginia Streets and DEP-05S/D to the north (**Figure 2-3**). The report identified a small finger of the PCE plume extending north of the main plume toward DEP-05S/D and PW-3. This was attributed to contaminated water that had been drawn into PW-3 due to the high pumping rate (290 gallons per minute) relative to the other wells (GAI, 2002).

2.3.5 Groundwater Sampling, 2002

WVDEP contracted with Triad Engineering, Inc. to sample the existing groundwater wells twice in 2002. WVDEP provided CDM with electronic files containing analytical results from sampling conducted in April and August of 2002. Formal reports discussing the methods and results of the sampling were not prepared for these events.

During a sampling event at the end of March and beginning of April 2002, Triad Engineering, Inc. sampled eleven monitoring wells (EPA-01 through EPA-04, DEP-05S, DEP-05D, and DEP-06 through DEP-10) and five production wells (PW-1, PW-2, PW-3, PW-4 and PW-5). Samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), and metals (total and dissolved), with analytical services provided by the EPA Contract Laboratory Program (CLP). Four monitoring wells contained arsenic above the MCL of 10 μg/L, with concentrations ranging from 10.2 to 18.3 μg/L. Well DEP-10 contained lead at a concentration of 15.1 μg/L, which exceeds the MCL of 15 μg/L. SVOCs were not detected above screening levels. PCE was detected in six samples at levels up to 410 μg/L in DEP-05D. The data from the spring 2002 sampling event are provided in **Tables A-5, A-6,** and **A-7** in **Appendix A.**

Triad Engineering, Inc. conducted a second round of monitoring in August 2002, with samples collected from six monitoring wells (EPA-04, DEP-05S, DEP-05D, DEP-06, DEP-07, and DEP-08) and three production wells (PW-2, PW-3, and PW-5). Samples collected in August 2002 were analyzed for VOCs only. PCE was detected in seven samples at levels up to 200 µg/L in DEP-05S. The data are provided in **Table A-8** in **Appendix A**.

2.3.6 Groundwater Sampling, 2003-2007

EPA's Superfund Technical Assistance and Response Team (START) contractor conducted quarterly groundwater monitoring at the Site between August 2003 and March 2007. Micro-purge sampling methods were used during the first sampling event, followed by the use of passive diffusion bag (PDB) sampling methods in the remaining events (Ecology and Environment, 2005). During each monitoring event, groundwater samples were collected from eleven monitoring wells (EPA-01 through EPA-04, DEP-05S, DEP-05D, DEP-06 through DEP-10), six production wells (PW-1, PW-2, PW-4, PW-5, PW-6, and PW-7), and the finished drinking water at the Ravenswood Water Treatment Plant (WTP). The finished drinking water is referred to as the "blend" as it is a blend of water from all production wells. Available analytical results are provided in **Tables A-9, A-10** and **A-11** in **Appendix A**.

During the quarterly monitoring, between one and three PDB samples were collected from each well screen, depending on the length of screen and historical contamination at each well. Three PDBs were placed in the two monitoring wells known to contain VOCs that have 20-foot long well screens (DEP-07 and DEP-08). The PDBs were spaced across the well screen, with locations at the top, middle, and bottom (T, M, B). Two PDBs were placed in the three wells known to contain VOCs that have 10-foot well screens (DEP-05S, DEP-05D, and DEP-06), with the samplers placed at the top and bottom of the screen. One PDB was placed in the middle of the screen in six wells with no previous detectable concentrations of VOCs (EPA-01, EPA-02, EPA-03, EPA-04, DEP-09, and DEP-10).

Each PDB was filled with de-ionized ultra-filtered water prior to deployment. Upon deployment, the PDB samplers were allowed to equilibrate with the groundwater for 20 days before retrieval. On Day 20, the PDB samplers and the production well samples were collected. The water samples were collected in pre-preserved 40 milliliter (ml) volatile organic analysis (VOA) vials that were immediately placed on ice in a cooler. START used an EPA-owned SRI 8610C field GC to analyze the samples for PCE, TCE, and cis-1,2 dichloroethene (DCE). A small number of samples were split and sent to an EPA CLP laboratory for analysis of VOCs.

CDM received electronic data deliverables (EDDs) for seven of the 17 total potential sampling events completed between August 2003 and March 2007. Additionally, data from six events (August, November, and December 2003 and March, June, and September 2004) were available as an electronic file generated for the December 2004 Trip Report (Ecology and Environment, 2004).

It appears that the EDDs only contain data generated by the CLP laboratory, and not the field GC. EDD analytical results from December 2006 and March 2007 are only identified by laboratory sampling identifiers, and not field locations. The Yearly Summary Trip Reports for 2007 (and associated tables) was provided by WVDEP in hardcopy. These reports provide a summary of PCE analytical data for all wells. These data are included in **Appendix A.**

2.4 Municipal Well Treatment System

The residents and businesses in Ravenswood receive their water from the Ravenswood municipal water supply, which consists of production wells that extract groundwater from the underlying aquifer. Currently, the municipal supply blends the flow from up to seven production wells that are located north of Sycamore Street and east of Virginia Street. Five of the seven wells are located within several hundred feet or less of the PCE plume. The locations of the production and monitoring wells are show on **Figure 2-1**.

According to the Operator of the Ravenswood Water Treatment Plant, the maximum well field capacity is approximately 1.1 million gallons per day (gpd) with an average daily withdrawal of 861,000 gpd (Cambarare, 2010).

PW-3 has historically exhibited significantly higher PCE levels than the other PWs, with levels varying from under 10 µg/L prior to March 1990, to a high of 91.4 µg/L in April 2000. In May and June 2000, the City installed a Venturi air stripper to reduce PCE levels in drinking water and eliminate the health threat from contaminated groundwater in the water supply. From 2000 until February 2010 the City used the air stripper to treat contaminated water from wells PW-3 and PW-5 before blending it with water from non-contaminated wells. In February 2010, the City temporarily took PW-3 off line due to elevated PCE levels (44.4 µg/L) caused by a higher concentration portion of the plume being drawn into the well. PW-3 was reactivated in May 2010. To help maintain hydraulic control and keep the plume from spreading to other production wells, in May 2010 the City began discharging the treated water from PW-3 to the Ohio River after it had been treated by the Venturi air stripper. .

The most recent result for PW-3 collected for the EPA and available for use in this RI Report was 29 µg/L, collected in January 2010. Prior to shutdown in late February 2010, PW-3 had historically been pumped at an average rate of 200,000 gpd to control and contain the PCE plume as much as possible. The other production wells were pumped at lower average rates prior to the shutdown of PW-3. Since PW-3 has been removed from the City water supply system, the pumping rates in most of the other wells have been increased. The previous and current pumping rates for the City wells are as follows:

- PW-1: 70,000 gpd, which increased in 2010 to 132,000 gpd;
- PW-2: 55,000 gpd, which increased in 2010 to 138,000 gpd;
- PW-3: 200,000 gpd, which decreased in 2010 to 100,000 gpd (all discharged to the Ohio River following treatment by the Venturi air stripper);
- PW-4: 100,000 gpd, which decreased in 2010 to 87,000 gpd;

- PW-5: 106,000 gpd, which increased in 2010 to 150,000 gpd;
- PW-6: 80,000 gpd, which increased in 2010 to 198,000 gpd; and
- PW-7: 55,000 gpd, which increased in 2010 to 156,000 gpd.

In addition to PW-3, PCE continues to exist at levels less than the MCL in PW-2, PW-5, and the finished water blend from the City production wells.

Section 3
Investigation Activities

The investigation activities conducted by CDM for EPA from 2005 to 2010 as part of the Ravenswood RI included:

- Resurveying (using a Global Positioning System (GPS)) the location of the Geoprobe® samples collected during the GAI study;
- Developing a groundwater flow model and preparing the *Hydrogeological Analysis Report* (CDM, 2006a);
- Collecting a comprehensive round of groundwater samples in May 2007;
- Conducting a DPT study to more completely define the extent of the groundwater plume in February and March 2010; and
- Surveying existing and new monitoring wells and collecting groundwater samples (three events) from these wells.

Additional field activities conducted by CDM as part of the AS/SVE Treatability Study at the Ravenswood Site included:

- Collecting screening-level groundwater samples from soil borings advanced using sonic drilling techniques;
- Installing four types of wells:
    - Three SVE wells
    - Nine AS wells
    - Two groundwater monitoring wells and
    - One vapor monitoring well.

The RI activities were conducted in accordance with EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA, 1988) as well as the *Final Site Management Plan* (SMP), (CDM, 2007), *Final Site Management Plan Addendum for the Ravenswood PCE Superfund Site* (SMP Addendum #1), (CDM, 2008), and *Final Site Management Plan Addendum #2 for the Ravenswood PCE Superfund Site* (SMP Addendum #2), (CDM, 2010c).

3.1 GPS Survey of Previous Geoprobe® Boring Locations

CDM conducted a review of historic data and discovered discrepancies in well and soil boring locations completed by GAI. On August 5, 2005, the locations were surveyed using a hand-held GPS unit. These points were re-plotted on Site maps used in the Hydrological Analysis Report and in subsequent reports and planning documents.

3.2 Hydrogeologic Flow Model

In 2005, EPA requested that CDM perform additional characterization activities to better understand the extent of PCE contamination, the migration pathways, and the location of sources. Based on an evaluation of the existing data, EPA requested that CDM develop a groundwater flow model for the Site. CDM developed a steady-state, three-dimensional, numerical, groundwater flow model, as reported in the *Draft Hydrogeological Analysis Report* (CDM, 2006).

The model helped illustrate the complex flow conditions that occur at different water elevations of the Ohio River and explained the mechanism by which PCE was transported to the Ravenswood production wells (CDM, 2006). These mechanisms are summarized in the discussion of Site-specific hydrogeology in Section 4.

3.3 May 2007 Groundwater Sampling Event

3.3.1 Rationale and Locations

In May 2007, CDM collected groundwater samples from eleven monitoring wells and five municipal wells. These wells include all of those shown on **Figure 2-1** except PW-6 and PW-7. These data were used to enhance the CSM and provide a current plume configuration and a comprehensive set of analytical data to proceed with the FS, HHRA, and SLERA. Samples were analyzed for Target Compound List (TCL) organics and Target Analyte List (TAL) metals in accordance with the approved Site Management Plan (CDM, 2007). Samples from two wells (DEP-06, and DEP-07) were also analyzed for natural attenuation parameters, including sulfate, nitrate, phosphate, dissolved oxygen, chemical oxygen demand (COD), total organic carbon (TOC) and ferrous iron. Analyses performed on samples collected during the May 2007 event (as well as other events) are summarized in **Table 3-1**.

3.3.2 Methods

3.3.2.1 Groundwater Purging and Sampling

Monitoring wells were sampled after purging in accordance with the procedures listed in the Final Site Management Plan. All wells were checked for damage and evidence of tampering and measured for organic vapors. Purging was conducted following EPA Region III low-flow sampling procedures. All groundwater purging was conducted using a decontaminated submersible pump attached to Teflon-lined polyethylene tubing dedicated for use in each well.

The EPA-approved, low-flow groundwater sampling technique involves purging the well at a rate of no greater than 500 milliliters per minute while measuring the pH, conductivity, oxidation-reduction potential, dissolved oxygen, turbidity, and temperature at three-minute intervals. Once all parameters (pH, conductivity, turbidity, conductivity, and temperature) stabilized within the acceptable percentage for three consecutive readings, the well water was considered representative of the groundwater in the aquifer, and a sample was collected. Pumps were placed two feet from the bottom of the well to ensure that they were in the screen during the 2007 event. In subsequent events, the pumps were placed at the mid-point of the screened interval.

Samples were collected immediately following purging using pre-cleaned and preserved bottleware. Samples were immediately placed on ice in coolers and packaged for shipping.

Purge water removed from the monitoring wells was put in containers and disposed through the City of Ravenswood Water Treatment System under the City of Ravenswood discharge permit modified in April 2007.

3.3.2.2 Water Level Measurement

A round of synoptic groundwater level measurements was collected on May 10, 2007, and the results are presented in **Table 3-2**. Water levels were also measured prior to groundwater sampling and monitored throughout purging at each well to assure that significant drawdown did not occur. Purging rates and sample times were recorded in field log books.

3.3.2.3 Field Analysis

Field analyses were performed for ferrous/ferric iron with a HACH field test kit. The HACH Colorimeter DR890 was used with ferrous iron power pillows to analyze for ferrous iron. A 25-ml sample was prepared with Phenanthroline Method 8146 - 1, 10 outlined in the DR890 Colorimeter Procedures Manual.

Procedures involved programming the instrument for ferrous iron, calibrating the instrument, preparing a 25-ml sample for analysis, determining the presence of ferrous iron, and reading the ferrous iron concentration directly from the colorimeter.

Monitoring wells DEP-07 and DEP-06 were selected for ferrous iron testing in the field, because they were known to contain PCE, and were therefore more likely to provide evidence of reductive dechlorination. Neither well had any detectable ferrous iron in the groundwater.

3.3.2.4 Deviations from the Work Plan

Two production wells were not sampled as originally planned in the Final SMP. PW-3 and PW-5 were not sampled due to mechanical failures of the City's well pumps and air stripper at the time of CDM's May 2007 sampling event. Because these wells were subsequently sampled in August 2007, this deviation did not create a data gap.

The quantitation limits of the natural attenuation parameters are higher than originally specified in the Final SMP due to limitations on laboratory analytical capability assigned through EPA Region III's Analytical Services and Quality Assurance Branch (ASQAB). Despite the higher than specified quantitation limits, the quantitiation limits are considered to be sufficient to detect the parameters at the levels required for this study. Sulfate and nitrate were detected at levels above the laboratory quantitiation limits.

Samples for methane, ethane, and ethene, which were originally scheduled to be collected as indicators of natural degradation of PCE, were not collected, because ASQAB was not able to procure a laboratory to perform the analyses during the time that the sampling was being conducted. A review of the impact of the missing data determined that the lack of data for methane, ethane, and ethene did not impact the findings of the RI, because no other indicators of natural degradation of PCE were observed.

3.4 Installation of Monitoring and Air Sparge/Soil Vapor Extraction Treatability Study Wells

In order to provide the engineering data for EPA's use in selecting a final remedy for the Ravenswood site, an air sparge / soil vapor extraction Treatability Study was initiated. Between November 3 and November 25, 2008, fifteen wells were installed in the portion of the groundwater plume immediately upgradient of the Ravenswood production wells. These wells included;

- Nine AS wells (AS-01 through AS-09);
- Three SVE wells (SVE-1 through SVE-3);
- Two groundwater monitoring wells (MW-6S and MW-11S); and
- One vapor monitoring well (VP-01).

Well construction details are listed in **Table 3-3** and well locations are presented on **Figure 3-1**.

In June 2009, the AS and SVE wells were connected to a skid-mounted treatment unit containing an air compressor, vacuum blower, vapor carbon vessels, and control system. Details regarding the installation, startup and operation of the AS/SVE TS system are provided in the *Final Treatability Study System Installation and Baseline Conditions Report* (CDM, 2010d).

3.4.1 Rationale and Locations

The purpose of the AS/SVE TS was to collect additional data to enhance the CSM of PCE distribution in the vadose and saturated zones and to collect engineering data to evaluate the AS/SVE treatment alternative for the FS. AS and SVE well locations were selected to maximize the influence of the AS and SVE TS systems within the groundwater plume. Vapor and groundwater monitoring well locations were selected to provide data on the contaminant distribution in groundwater as well as to provide performance data on the AS/SVE TS system (**Figure 3-1**).

Screening-level groundwater samples were collected from the first encountered groundwater in selected air sparging and monitoring well boreholes. The analysis of the screening-level samples was expedited to allow for the adjustment of later well installation locations based on the data gathered as the TS drilling program progressed. This sampling is described in greater detail below.

3.4.2 Methods

3.4.2.1 Subsurface Utility Location and Traffic Control

Prior to the commencement of drilling and trenching for TS piping installation, the locations of subsurface utilities were identified through the West Virginia statewide utility location system, Miss Utility of West Virginia. As a precaution during drilling activities, the first 6 feet of each boring were hand-augered to verify that no subsurface utilities were present at the drilling location. The City of Ravenswood Department of Public Works verified that planned drilling locations did not conflict with City-owned utilities. An 8-inch gas line that was not identified by the utility clearance one-call system was encountered at the corner of Virginia Street and Sycamore Street, but the line was not damaged.

Traffic control measures, including the use of traffic barricades, traffic cones, road signs, and caution tape placed along the roads in the vicinity of active work zones, were instituted during drilling and TS system installation activities. In certain circumstances, it was necessary to use personnel with flags or to close sections of roads to prevent traffic from entering the work zone.

3.4.2.2 Sonic Drilling Methods

Sonic drilling methods were used to advance borings for the installation of TS wells. Sonic drilling utilizes a core barrel that is advanced inside an outer steel casing. Boreholes were drilled with a nominal 4-inch core barrel riding in a 6-inch casing (for AS and monitoring wells) or an 8-inch casing (for SVE wells). The core barrel was retracted at 5-foot or 10-foot intervals to retrieve the soil core, allowing for nearly continuous lithologic logging of the boring. Boring logs and well construction diagrams are provided in **Appendix B.**

3.4.2.3 Lithologic Logging

Core samples, extruded from the core barrel into a plastic sleeve, were described and logged by a CDM geologist following CDM's Technical Standard Operating Procedure (TSOP) 3-5, Lithologic Logging. Core samples were continuously screened with a photoionization detector (PID) to identify areas with elevated concentrations of VOCs. If elevated concentrations of VOCs had been encountered, up to five soil samples would have been collected for laboratory analysis. PID results did not indicate the presence of elevated VOCs in any of the cores; therefore, no soil samples were submitted for laboratory analysis.

Lithologic logging and PID screening of soil cores occurred during the advancement of 14 of the 15 boreholes that were completed. Well AS-09 was drilled and installed at an angle of approximately 40 degrees from vertical using hydrostatic pressure to force cuttings out of the core barrel and into the formation. Because soil cores were not retrieved during the drilling of this boring, lithologic logging was not performed.

3.4.2.4 Screening Level Groundwater Sampling

In order to provide additional information on the extent of groundwater contamination and baseline conditions, screening level groundwater samples were collected from eight of the nine AS well borings and one monitoring well boring. Borings were advanced to the top of the saturated zone. After encountering groundwater, the drill casing was pulled back and a steel screen was pressed into the formation ahead of the casing. A Teflon®-lined bailer was lowered through the drill rod into the steel screen to collect the groundwater sample. These samples were submitted for VOC analysis with a 24-hour turnaround time. The locations and depths of the screening-level groundwater samples are summarized in **Table 3-4**.

3.4.2.5 Air Sparge Wells

Nine AS wells were installed in 6-inch diameter borings to allow air injection into the deep saturated zone just above bedrock. The borings for the AS wells were advanced approximately one foot into weathered sandstone bedrock, encountered at approximately 92 ft bgs. The bottoms of the AS well screens were placed approximately one foot above bedrock, between 89 and 91 ft bgs. Continuous soil coring was used to verify the depth to groundwater and bedrock, with the exception of AS-09.

Well AS-09 was drilled and installed at an angle of approximately 40 degrees from vertical using hydrostatic pressure to force cuttings out of the core barrel and into the formation. Because soil cores were not retrieved during the drilling of this boring, lithologic logging was not performed.

Due to the presence of flowing sands, it was necessary to add water to the drill casing once the boring advanced into the saturated zone. To create a hydrostatic head that prevented flowing sands from entering the casing during drilling, approximately 250 gallons of water were added during the drilling of each boring to create a column of water in the well. With the exception of AS-02, borings for the AS wells were advanced under hydrostatic head within the saturated zone.

Prior to the addition of water to create the hydrostatic head, one screening-level groundwater sample was collected from the first encountered groundwater in the boreholes of eight of the nine AS wells (AS-01 through AS-08).

The AS wells were constructed of 2-inch poly vinyl chloride (PVC) casing and screen. The wells were completed using 2-foot long screens with 0.01-inch slots. Clean silica sand was used from the bottom of the borehole to at least 2 feet above the top of the screen, followed by a 2-foot to 3-foot bentonite seal, with the remaining annular space backfilled using a cement-bentonite grout. Following the installation of the well, additional grout was added to the annular space, as necessary, to bring the grout to within two feet of the ground surface. After the grout was allowed to set up for a minimum of 48 hours, expandable/lockable well caps were placed on all wells and the AS wells were completed by filling the remaining annular space with sand. To facilitate the future connection of the AS lines to the well head, and to support vehicle traffic, temporary steel plates welded onto 12-inch lengths of 6-inch diameter steel pipe were placed into the sand, just below the level of the road surface. Permanent vault boxes were later installed as part of the installation of AS/SVE system piping.

3.4.2.6 Soil Vapor Extraction Wells

SVE wells were installed to allow air to be extracted from the unsaturated zone. Three SVE wells (SVE-1 through SVE-3) were installed through 8-inch borings. The wells were constructed with 10-foot screens (with 0.01-inch slots), with the bottom of the screen located approximately 5 feet above the water table. The wells were constructed following the procedures described in Section 3.4.2.5, except that the SVE wells were constructed using 4-inch Schedule 40 PVC casing and screen. Clean silica sand was used from the bottom of the borehole to at least 2 feet above the top of the screen, followed by a 2-foot to 3-foot bentonite seal, with the remaining annular space backfilled using a cement-bentonite grout. Following the installation of the well, additional grout was added to the annular space, as necessary, to bring the grout to within two feet of the ground surface. After the grout was allowed to set up for a minimum of 48 hours, expandable/lockable well caps were placed on all wells and the SVE wells were completed by filling the remaining annular space with sand. To facilitate the future connection of the SVE lines to the well head, and to support vehicle traffic, temporary steel plates, welded onto 12-inch lengths of 6-inch diameter steel pipe, were placed into the sand, just below the road surface. Permanent vault boxes were installed as part of the installation of AS/SVE system piping.

3.4.2.7 Groundwater Monitoring Wells

Groundwater monitoring wells (MW-11S and MW-6S) were installed through 6-inch borings. One screening-level groundwater sample was collected from well MW-11S. Because well MW-6S was installed toward the end of drilling operations and a groundwater monitoring event was scheduled to be conducted following the installation, a screening level groundwater sample was not collected from this location.

The two monitoring wells were installed with 20 feet of screen. Approximately 12 feet of the screen was installed in the saturated zone with the remaining 8 feet in the vadose zone. This construction allowed each well to serve as both a vapor monitoring point and as a groundwater monitoring well. A third deep monitoring well had been planned for installation with 10 feet of screen set approximately 1 foot above the bedrock. Based on the existing well network, CDM, in consultation with EPA, elected to install a vapor monitoring well instead of a third dual phase monitoring well, as discussed in Section 3.4.2.8.

Monitoring wells were constructed of 2-inch Schedule 40 PVC casing with 0.01-inch slots, and 10-foot segments of screen. As described above, clean silica sand was used from the bottom of the borehole to at least 2 feet above the top of the screen, followed by a 2-foot to 3- foot bentonite seal, with the remaining annular space backfilled to the ground surface using a cement-bentonite grout.

Groundwater monitoring wells were finished with a permanent 8-inch diameter, flush-mount, bolt-down roadway box with an 18-inch galvanized steel skirt. The box was centered over the well with concrete placed on the floor of the box. The wells were secured with expandable/lockable well caps and locks.

3.4.2.8 Vapor Monitoring Well

One vapor monitoring well (VP-01) was installed to conduct radius of influence monitoring and to monitor the effectiveness of the AS and SVE systems. The well was installed in a 6-inch boring and was installed with 5 feet of screen set at 45 ft bgs, approximately 5 feet above the water table. The boring for VP-01 did not extend to the water table, and as a result, a screening level groundwater sample could not be collected from this location.

The vapor monitoring well was finished with a permanent 8-inch diameter, flush-mount, bolt-down roadway box with an 18-inch galvanized steel skirt. The box was centered over the well with concrete placed on the floor of the box. An expandable/lockable well cap and a lock were placed on the well casing.

3.4.2.9 Monitoring and AS Well Development

Each of the newly installed AS wells and groundwater monitoring wells was developed in order to remove fines from the well pack and surrounding native material and to encourage groundwater flow from the aquifer into the well (for monitoring wells) or air flow from the well into the aquifer (for AS wells). Development commenced after the grout was allowed to set for a minimum of 48 hours. The wells were developed by alternately surging and pumping the well with a submersible pump tolerant of suspended solids. Well development followed CDM TSOP 4-3, "Well Development and Purging."

During well development, AS-02 was repeatedly pumped dry. It was suspected that silts may have built up around the screen or in the sand pack during installation. Approximately 60 gallons of potable water were added to this well in three slugs of 20 gallons each. Following each addition, the well was surged and pumped. After the third addition, the well no longer pumped dry and was successfully developed.

3.4.2.10 Surveying

AS, SVE, and monitoring well locations and elevations were surveyed by a West Virginia licensed surveyor, Terradon of Nitro, West Virginia. Horizontal locations were surveyed to the nearest 0.1 foot. Elevations of the top of the PVC well riser were surveyed to the nearest 0.01 foot. These survey data are reported on **Table 3-3** along with well construction data.

3.4.2.11 Deviations from the Work Plan

Three groundwater monitoring wells were planned for installation as part of the TS system. Based on the existing well network, CDM, in consultation with EPA, elected to install one vapor monitoring well instead of the third, deep groundwater monitoring well.

Access to the planned installation location of well AS-09 was limited due to overhead and underground utilities and buildings. CDM, in consultation with EPA, elected to install well AS-09 as an angled well. This deviation allowed for air sparging in approximately the same location as originally planned, while avoiding the need to drill near buildings and utility lines. Additionally, the need to install approximately 60 feet of trenching for the AS piping was avoided.

It was originally planned for screening level groundwater samples to be collected from each AS and groundwater monitoring well. The installation of a vapor monitoring well, which did not extend to groundwater, precluded the collection of a groundwater sample at VP-1. Because wells MW-6S and AS-09 were installed toward the end of the drilling program, it was determined that the collection of the screening level sample was not necessary, as the data would not be used to guide additional well installation locations. In the case of MW-6S, a groundwater sample of higher quality was collected from the well following the well installation. As described in Section 3.4.2.5, well AS-09 was drilled using hydrostatic pressure to force soil cuttings out of the drilling tools. The use of water during drilling would have affected the concentrations of VOCs in groundwater and would have compromised the samples; therefore, no groundwater samples were collected.

3.5 DPT Groundwater Investigation

In support of a planned future vapor intrusion (VI) investigation to be conducted by EPA, a DPT groundwater investigation was conducted to more clearly delineate the PCE plume. The objective of the program, as identified in SMP Addendum #2 (CDM, 2010c), was to define the PCE plume sufficiently to delineate where the groundwater concentrations exceeded the MCL of 5 µg/L. Thirty-three screening-level groundwater samples were collected during this investigation. Twenty-six shallow samples were collected during an initial mobilization in February 2010, and an additional six shallow samples and one deep sample were collected during a second mobilization in March 2010.

3.5.1 Rationale and Locations

To identify initial sampling locations, data from existing monitoring wells, the ongoing Treatability Study, and historic data from the GAI/WVDEP investigations were used to prepare an initial CSM of PCE contamination in groundwater. Site data indicated that concentrations of VOCs were higher in the shallow groundwater than in deeper groundwater; therefore, the target zone for sample collection was the top 10 feet of the water-bearing zone.

The DPT groundwater investigation was conducted in two mobilizations. The first mobilization (February 2010) used iterative, Triad principles, in which systematic planning and rapid measurement techniques allow for dynamic implementation of the investigation. Because it was not possible to utilize real-time measurement techniques to quantify the concentrations of PCE in groundwater, the investigation sampling locations were divided into three groups, "MCL Delineation Point," "Source Identification Point," and "Step-Out Point," so the collection sequence would allow time for analysis of groundwater samples and consideration of analytical results. The second mobilization, in March 2010, addressed remaining areas of uncertainty. These sample types and their objectives are described below. All sampling locations are shown on **Figure 3-2.**

1) **MCL Delineation Point -** Ten samples were collected from locations on the perimeter of the suspected PCE plume in areas of higher uncertainty to delineate the extent of the plume where concentrations exceeded the MCL (5 µg/L). These areas are largely to the east, south, and west of the intersection of Virginia Street and Sycamore Street. MCL samples were collected first.

2) **Source Identification Point** - The Source Identification Point samples were collected from the interior of the plume. Five of these locations were selected in advance, and they were not dependent on the data from the MCL samples. As a result, these samples were collected during the time in which analytical results from the MCL samples were received and locations for Step-Out Point samples were selected. Data from these samples were used to more clearly identify potential source areas. An additional Source Identification Point sample (DPT-27) was collected during the March 2010 mobilization.

3) **Step-Out Point** -During the first mobilization, the results of the MCL delineation (first) round of samples were evaluated to determine if the complete perimeter of the PCE MCL distribution was adequately delineated. If the PCE MCL distribution was not delineated, additional boundary sample locations were selected (Step-out samples). Following analyses of the first 26 samples, EPA and CDM determined that an additional six Step-Out Point samples were required. One Step-Out location was immediately upgradient of production well PW-3. Because PW-3 is screened below 70 feet, both shallow and deep samples were collected from that location to determine if higher levels of contamination are being drawn downward by the pumping.

Groundwater samples were analyzed solely for VOCs, because they are the chemicals that can volatilize and enter buildings (i.e., the chemicals of interest in the VI sampling planned by EPA) and because the primary contaminant of concern for groundwater is PCE. A 48-hour turnaround time on the analyses was requested for samples collected during this effort. During the first mobilization, the unvalidated analytical results were used to select locations of subsequent contaminant-delineation sampling.

3.5.2 Methods

3.5.2.1 Subsurface Utility Location and Traffic Control

Most of the DPT sample points were located in roadways and other paved areas. All drilling locations were reported to the West Virginia statewide utility location system, Miss Utility of West Virginia. Utilities were cleared prior to any subsurface work.

3.5.2.2 Direct Push Technology Drilling Methods

Borings were advanced utilizing DPT drilling techniques. Because the primary purpose of the borings was to collect screening-level groundwater samples, the borings were drilled without the collection of soil cores. As a result, the DPT drilling was conducted with minimal disruption to the community while limiting the amount of purge water and soil cuttings produced, and still meeting the objectives of the sampling effort.

At each location, a sampling device attached to metal rods was hydraulically pushed to the target depth. A dual head DPT rig was used so that hollow stem augers could be used, if necessary, to complete drilling to the target depth. It was not necessary to use hollow stem augers during the course of the DPT investigation. Upon completion of sampling (see Section 3.5.2.3), the sampler was removed and the remaining borehole was grouted with bentonite/cement grout.

3.5.2.3 Screening Level Groundwater Sampling

Screening level groundwater samples were collected approximately 10 feet beneath the first-encountered groundwater. Sampling depths ranged from 40 ft bgs to 70 ft bgs. At DPT-29, one sample was collected near the top of the aquifer and a second sample was collected at a depth of 85 ft bgs.

After advancing the screen point sampler to the desired sampling depth, a screen on the sampler was exposed to the aquifer and groundwater entered the rods. A Teflon®-lined polyethylene tube with a check valve at the bottom was inserted to the depth of the screen. Groundwater was purged through the tubing by repeatedly lifting and lowering the tube. Periodic measurements of pH, specific conductivity, temperature and turbidity were collected to verify the presence of formation water in the boring, as determined by obtaining less than 10% variance between two successive well point volumes and turbidity of less than 10 Nephelometric Turbidity Units (NTU). Typically, the turbidity of the groundwater did not decline to 10 NTU, and in accordance with SMP Addendum #2, the purging was determined to be acceptable if turbidity values stabilized to within a 10% variance between three successive tubing casing volumes. **Table 3-4** provides sampling dates and sample collection depths.

Following the purging, groundwater samples were collected in bottleware using the same lifting method with check valve and tubing. DPT groundwater samples were collected following CDM TSOP 3-1, "Geoprobe® Sampling."

3.5.2.4 Surveying

The DPT locations were all determined by CDM using a Trimble hand-held GPS unit. All surveyed points were referenced to the West Virginia South NAD 83 coordinate system.

3.5.2.5 Deviations from the Work Plan

During the first and second mobilizations, two and six additional Step-Out sampling points, respectively, were added to the sampling program. In addition, one source identification point was added to the program during the second mobilization. These additions to the sampling program were made to enhance the delineation effort.

As mentioned above, the SMP stated that the turbidity of the samples should be below 10 NTU. However, during sampling, this criterion was determined to be unachievable in this aquifer using the DPT screening level technology. Because VOCs do not significantly adsorb to sands, the presence of excess turbidity would have minimal impact on data quality for these screening level samples.

3.6 Treatability Study Groundwater Sampling

3.6.1 Rationale and Locations

As part of the AS/SVE TS, CDM collected groundwater samples from various monitoring wells on five occasions between December 2008 and February 2010. The first sampling event provided baseline groundwater data for use in evaluating the effectiveness of the AS/SVE TS system. Subsequent sampling events in September 2009 and February 2010 were scheduled events for use in evaluating the AS/SVE TS system. **Table 3-1** summarizes the sample dates and analytes for each well. Samples from the City's municipal production wells as well as the City Venturi air stripper system were also collected during the five groundwater monitoring events and on four additional occasions.

3.6.2 Methods

Monitoring wells were sampled after purging in accordance with the procedures listed in the Final SMP. All wells were checked for damage and evidence of tampering and measured for organic vapors. Purging and sampling were conducted following EPA Region III low-flow sampling procedures, as described in Section 3.3.2.1. All groundwater purging was conducted using a decontaminated submersible pump attached to Teflon®-lined polyethylene tubing dedicated for use in each well.

3.6.2.1 Water Level Measurement

Synoptic groundwater level measurements were collected on May 10, 2007, December 2, 2008, September 30, 2009, and February 1, 2010. Monitoring well water levels were also measured prior to groundwater sampling and monitored throughout purging to assure that significant drawdown did not occur. Water levels were recorded in the logbook throughout purging. Groundwater levels and elevations for each round of groundwater sampling are presented in Section 4.

3.6.2.2 Deviations from the Work Plan

During the September 2009 and February 2010 sampling events, synoptic groundwater level measurements were not collected following sampling, as specified in the Final SMP. Instead, the water level data was collected from each well prior to sampling, as groundwater sampling progressed over the course of each two-day sampling event. The impact from this deviation is expected to be minimal as there were no precipitation events during these 2-day periods. In addition, Site-wide potentiometric data had been collected during the baseline sampling event in December 2008.

Section 4
Site Physical Characteristics

4.1 Physiography, Topography, and Drainage

4.1.1 Physiography

The City of Ravenswood is located in the Appalachian Plateau Physiographic Province on the eastern bank of the Ohio River. The Province is characterized by flat-lying sedimentary rocks that have been deeply carved by winding streams, resulting in steep slopes. The elevation of the City of Ravenswood is 607 feet above mean sea level (msl).

The Ohio River, which flows southward in the vicinity of the Site, formed a flood plain known as the Ravenswood Bottom. Two prominent terraces are visible on the Ravenswood Bottom. The lower terrace lies 30 to 40 feet above the normal pool elevation of the Ohio River, and the upper terrace lies 60 to 70 feet above the normal pool elevation (Weston, 2000). According to the United States Geological Survey (USGS) topographic quadrangle for Ravenswood, West Virginia, the normal pool elevation for the Ohio River in this area is 560 ft msl.

4.1.2 Site Topography and Drainage

The Site is bounded on the southwest by the Ohio River and on the southeast by Sandy Creek, which empties into the Ohio River. Together, the Ohio River and Sandy Creek form a V-shaped hydraulic boundary about 1,500 feet south of the Site. The region is characterized by a mature topography in which the plateau surface is dissected by a network of streams in a dendritic drainage pattern (Weston, 2000).

4.2 Regional Geology and Hydrology

4.2.1 Regional Stratigraphy

Jackson County lies near the southern end of the Dunkard sedimentary basin (Weston, 2000). Bedrock within the area consists of cyclic sequences of channel sandstones, lacustrine limestones, flat-lying shales and claystones (redbeds), and occasional coal beds (Cardwell, et al., 1968). The dominant lithology of the Dunkard Group is sandstone (Kozar and Mathes, 2001).

Overlying the bedrock are unconsolidated, glacial-outwash alluvial deposits of sand and gravel. Overlying the glacial outwash deposits are fluvially-deposited, fine-grained silts, clays, and sands deposited primarily by floods, (Kozar and McKoy, 2004). These sediments may be clay-rich near the surface, becoming coarser with depth (Weston, 2000).

4.2.2 Regional Hydrostratigraphy

Two hydrogeologic units that are significant to the movement of groundwater are present in this area: Pleistocene age (11,000 - 1.8 million years ago) alluvium overlying Pennsylvanian-age and Permian-age (245 - 325 million years ago) Dunkard Group bedrock. A third unit of fine-grained, fluvially-deposited sediments overlies the alluvium but is not present below the water table.

The median horizontal hydraulic conductivity for the Dunkard Group bedrock is 3.3 feet per day (ft/day) (Kozar and Mathes, 2001). This value is one to two orders of magnitude lower than the range of values listed for the sand and gravel alluvium, which is 77 to 500 ft/day. Therefore, the occurrence and movement of groundwater in the bedrock is assumed to be negligible compared to the occurrence and movement of groundwater in the alluvium. The range of horizontal conductivities in the fine-grained alluvium is 0.1 to 8 ft/day.

The hydraulic connectivity between the River and the adjoining alluvial strata is very high, and the water table elevation fluctuates with the level of the River (Weston, 2000).

4.3 Site Geology and Hydrogeology

4.3.1 Site Stratigraphy

The boring logs from existing wells EPA-01 through EPA-04 and wells installed as part of the TS were examined to define the site-specific stratigraphy. (Boring logs for DEP wells were not available.) Two cross sections were constructed through the Site, as shown in **Figure 4-1**. Cross section A-A′ (**Figure 4-2**) is generally northeast-southwest trending, and bisects the PCE contaminant plume (see Section 5.3), lengthwise. Cross section B-B′ presented as **Figure 4-3**, is roughly perpendicular to cross section A-A′, in the north-central part of the plume.

As seen in the cross sections, soil borings advanced at the Site have encountered the light grayish green sandstone bedrock between 65 and 90 feet below ground surface (an elevation of about 525 ft msl).

The bedrock is overlain by well-graded alluvial sand and gravel. The gravel ranges in size from fine to coarse-size, and is generally limited to a 5-foot to 7-foot thick layer above the bedrock. Above the sand and gravel layer, sediments are predominantly fine to medium sands with occasional silts interbedded within the sands. In the cross sections, the various sands have been grouped together. A more extensive layer of silt was identified in the recent investigations between 3 and 10 feet bgs. The total thickness of the sand and gravel alluvium ranges from 48 to 90 feet. Detailed descriptions of the lithology can be found on the boring logs in **Appendix B**.

4.3.2 Site Hydrostratigraphic Units

The two regional hydrostratigraphic units, the Dunkard Group sandstone and the alluvium, are present and of interest at the Site. Aquifer characteristics of these hydrostratigraphic units were compiled from several sources including groundwater modeling reports for the region (Kozar and McCoy, 2004), published USGS West Virginia aquifer characteristics data (Kozar and Mathes, 2001), and Ravenswood well pump test data (West Virginia Rural Water Association, 1999). Groundwater flow within the sandstone bedrock unit was not considered as part of this RI, because, as discussed above, the occurrence and movement of groundwater in the bedrock is assumed to be negligible compared to the occurrence and movement of groundwater in the alluvium. Additionally, the higher concentrations of PCE contamination have been predominantly measured in the shallow portion of the alluvial aquifer.

The effective porosities for the sand and gravel unit range from 0.30 to 0.34, which are typical for sand and gravel. The effective porosities posted for the fine-grained alluvium range from 0.20 to 0.35. Note that these effective porosities are not based on Site-specific data, but are from calibrated sub-regional groundwater flow models (Kozar and McCoy, 2004 and CDM, 2006).

The horizontal hydraulic conductivities of the units are estimated to be 0.3 ft/day for bedrock and 8 to 50 ft/day for the alluvial aquifer. The estimated vertical conductivities are assumed to be ten percent of the horizontal hydraulic conductivity, based on the anisotropic ratios for the respective material types [$K_z = 0.1K_{xy}$] (Domenico and Schwartz, 1990, as reported in CDM, 2006).

Other units lie beneath the Dunkard Group, but are assumed to be insignificant to the flow of groundwater in the study area due to the low permeability of this unit when compared to the overlying hydrostratigraphic units.

4.3.3 Site Groundwater Flow

Regionally, groundwater flow follows topography, moving from topographic highs to topographic lows, where it discharges to surface water bodies. Given the proximity of the Site to the Ohio River, the direction of river flow, and the Site topographic relief, normal groundwater flow in the absence of groundwater withdrawals would be expected to be southwest from the Site, towards the River. However, groundwater withdrawal from the municipal production wells influences the groundwater flow in the alluvium. The steady-state, three-dimensional, numerical, groundwater flow model for the Ravenswood PCE Superfund Site, as reported in the *Draft Hydrogeological Analysis Report* (CDM, 2006) was developed to evaluate the influences of this groundwater withdrawal on the groundwater flow as well as on contaminant transport. The water level data collected during sampling events in May 2007 and December 2008 were used to develop potentiometric surface maps shown in **Figures 4-4** and **4-5**.

4.3.3.1 Horizontal Groundwater Flow

During the most recent comprehensive synoptic groundwater monitoring event, conducted in September 2009, the depth to groundwater at the Site ranged from about 25 ft bgs in well DEP-09, located closest to the Ohio River, to 58 ft bgs in well EPA-04, located furthest upgradient and furthest from the River. The thickness of the saturated aquifer averages 40 feet. As seen in **Figures 4-4 and 4-5**, groundwater withdrawals from the municipal wells control the groundwater flow throughout the majority of the northern part of the Site. In the absence of this pumping, the expected groundwater flow direction would be southwesterly, toward the Ohio River. Municipal pumping, however, induces a partial or complete reversal in normal water table gradients depending on the amount of pumping, the Ohio River pool stage, and the infiltration rate in recharge areas.

The groundwater flow modeling indicates that the majority of the plume is within the capture zone of the City production wells, specifically PW-3, with a smaller, western, portion migrating towards the Ohio River. **Figures 4-6 and 4-7** illustrate the flow paths predicted under two different river stages and well production rates. In both scenarios, PW-3 captures the majority of the plume, thus protecting the remaining City production wells. The location of the transition zone, dividing water in the capture zone of the City wells from water that will migrate to the Ohio River, varies largely due to the Ohio River pool stage. The location of the transition zone in the two modeled scenarios varied from slightly west of Race Street at its intersection with Sycamore Street (low river pool) to between Race Street and Washington Street near the intersection of Sycamore Street (high river pool), but is in the vicinity of Race Street and Sycamore Street. During the period that PW-3 was temporarily shut down, the direction of groundwater flow in the area near the well field would be expected to shift toward the remaining production wells (PW-2 and PW-5).

The model illustrates the complex flow conditions that occur during different water elevations of the Ohio River and helps explain both the mechanism by which PCE was transported to the Ravenswood production wells (CDM, 2006) and why the existing contamination between Washington Street and Race Street has not expanded significantly in the 10 years between the DPT investigations. These mechanisms are summarized in the Fate and Transport discussion in Section 6.

4.3.3.2 Vertical Groundwater Flow

The rate of vertical groundwater flow at the Site is assumed to be low due to low vertical hydraulic conductivities and low vertical gradients. As discussed above, the vertical hydraulic conductivity is assumed to be ten percent of the horizontal conductivity (estimated between 8 and 50 ft/day). There are two pairs of wells screened at different depths at the same location and four nearby wells screened at different depths. These well pairs include the following:

- DEP-05S (screen interval from 63 to 73 ft bgs) and DEP-05D (deep, screen interval from 80.5 to 90.5 ft bgs)

- MW-06S (screen interval from 44 to 64 ft bgs) and DEP-06 (deep, screen interval from 76.5 to 86.5 ft bgs)

- MW-11S (screen interval from 44.5 to 64.5 ft bgs) and EPA-02 (deep, screen interval from 72 to 92 ft bgs)

During the 14 sampling events conducted prior to the RI, between October 2001 and March 2005, the average vertical gradient was only 0.01 foot downward (**Table 4-1**). In two of the 14 sampling events, the vertical gradient was measured to be slightly upward. With the exception of one event, during the four sampling events associated with the RI, the difference in the groundwater elevation (head) within these well pairs was very small, indicating no significant vertical gradient.

The exception was during the September 2009 monitoring event, when the vertical gradient in the DEP-05S and DEP-05D cluster had a downward gradient of 1.22. During the same monitoring event, however, the gradient between MW-06S and DEP-06 (deep) was 0.04 feet downward, suggesting that the larger difference observed at the DEP-05 cluster was likely an anomalous reading. During baseline measurements, water elevations at MW-11S and EPA-02 were essentially the same (559.27 ft msl and 559.31 ft msl, respectively). However, in September 2009, the water level at MW-11S was 561.83 ft msl, 3 feet higher than the measurement at EPA-02 (559.01 ft msl). In February 2010, the reverse was true, with the elevation measurement at EPA-02 (561.64 ft msl) more than 2.5 feet higher than the water level at MW-11S (559.40 ft msl). The cause of these anomalous readings during this single event is not known; however, it is likely due to measurement or recording error as this is a substantially greater elevation difference then would be caused by production well pumping or AS mounding.

4.4 Climate and Meteorology

The Ohio River Valley of West Virginia has a moderate continental climate. Minimum monthly mean temperatures range from 22.3 degrees Fahrenheit (°F) in January to 62.3 °F in July. Maximum monthly mean temperatures range from 43.3 °F in January to 87.2 °F in July. Precipitation averages 44.7 inches annually, usually falling 3 to 4 inches each month in the form of rain and snow. The average total snow fall is 19.1 inches (Southeast Regional Climate Center (SECC), 2010).

Section 5
Results

The nature and extent of contamination at the Ravenswood PCE Site are described in this section. Section 5.1 discusses soil investigation results. The distribution of groundwater contamination is discussed in Section 5.2. Chemicals detected in groundwater samples are summarized in tables in this section. Full analytical data are provided in **Tables A-12 through A-15** in **Appendix A**. A Quality Assurance/Quality Control (QA/QC) Report is provided in **Appendix C**.

5.1 Soil Results

As discussed in Section 2, neither PCE nor TCE was definitively detected in soil samples collected during any of the previous investigations. During installation of DEP-07, GAI collected a sample of saturated soil from near the water table surface. That sample contained 76 micrograms per kilogram (µg/Kg) of PCE, although the measured concentration was outside the calibration range of the instrument. WVDEP has noted that the analysis was based on wet weight basis and that the reported result would, therefore, be slightly higher than the actual concentration in the soil. WVDEP also noted that PCE may have been present in soil as a result of PCE in the groundwater at that location.

During the installation of the three SVE wells, nine AS wells , and two monitoring wells installed for the TS, soil core samples were continuously screened with a PID to identify areas with elevated concentrations of VOCs. No PID readings were observed in any of the cores.

5.2 Groundwater Results

The groundwater analytical data collected as part of the RI are presented in this section. The groundwater data for samples collected are summarized in **Tables 5-1 through 5-4**. These tables only show those analytes which were detected in at least one sample.

Analytical data from duplicate samples collected as part of the field Quality Control program are included in the analytical data in **Appendix A** and in the **QA/QC Report** in **Appendix C**. However, the data are generally not discussed in this section unless the concentrations are significantly higher than those reported in the field sample, or they are particularly noteworthy for some other reason (e.g., the only detection of a constituent identified as a contaminant of potential concern (COPC)).

Analytical data that are qualified "B" due to the presence of the contaminant in an associated blank are not considered to be a detection of the contaminant in the sample, and are therefore not shown on **Tables 5-1 through 5-4**.

5.2.1 Groundwater Screening Criteria

In this RI Report, the concentrations of contaminants are compared to Federal MCLs and Regional Screening Levels (RSLs). Previous reports refer to EPA Region III Risk-Based Concentrations (RBCs) for tap water which are identical values. MCLs represent the maximum permissible level that a contaminant can be detected in the drinking water supply. MCLs are developed based upon health risks, detection limits, performance of treatment technologies, and treatability costs associated with the best available treatment technology. The West Virginia standards for groundwater are the same as the Federal MCLs (5 µg/L for PCE).

RSLs are developed using protective default exposure scenarios suggested by EPA and the best available reference doses and carcinogenic potency slope factors. RSLs represent relatively protective environmental concentrations at which EPA would typically not take action.

To evaluate potential risks to ecological receptors, the concentrations of contaminants are also compared to ecological screening values as part of the SLERA.

5.2.2 2007 Groundwater Sampling

In May 2007, CDM collected groundwater samples from all of the monitoring wells existing at that time, as well as five production wells. In August 2007, well DEP-05S was re-sampled to verify an unusually high PCE result from the May 2007 sampling event. During the May 2007 event, well PW-3 was not operating and could not be sampled. As a result, well PW-3 was sampled in August 2007, at the same time that the verification sample from DEP-05S was collected. Analytical results for groundwater monitoring wells are presented in **Table 5-1a through 5-1e.** Analytical results for production wells are presented in **Table 5-2.** These tables display only those analytes that were detected. Full analytical results for all samples can be found in **Appendix A.**

5.2.2.1 Distribution of Organic Contamination

VOCs

Four VOCs were detected in at least one sample. They included PCE, 2-butanone, cis-1,2-DCE, and methylene chloride. One of these compounds, methylene chloride, is a common laboratory contaminant, and detected concentrations are similar to those found in laboratory blanks. VOC results are provided in **Table 5-1a.**

The concentrations of PCE in groundwater are shown on **Figure 5-1**. The plume has a northeast-southwest orientation, located in an area between Virginia Street and Race Street. No PCE was found in monitoring well DEP-09, located closest to the Ohio River, or in the northern-most production wells PW-1, PW-4, PW-6 and PW-7.

PCE was detected in five of the eleven monitoring wells, with concentrations ranging from 2.2 µg/L to 1,200 µg/L. The highest PCE concentration was found at monitoring well DEP-05S, consistently exceeding both the RSL (0.11 µg/L) and the MCL (5 µg/L).

DEP-05S is located on Virginia Street, about 235 feet from production well PW-3. The 1,200 µg/L PCE concentration measured in May 2007 in DEP-05S was more than four times the level measured in the previous sampling event in September 2006, (250 µg/L). Due to this significant increase, well DEP-05S was re-sampled in August 2007. The PCE concentrations for this confirmation sample and a duplicate were 570 µg/L and 580 µg/L, respectively.

Cis-1,2 DCE, a breakdown product of PCE, was detected in only two wells: DEP-05D (2.2 µg/L) and DEP-08 (0.73 µg/L). Both of these concentrations are well below the MCL (70 µg/L) and RSL (370 µg/L). The chemical 2-butanone (also known as methyl ethyl ketone, or MEK) was found in one well, DEP-05D (3.4 J µg/L), well below the RSL of 7,060 µg/L. The qualifier "J" indicates that the value is an estimate, below the instrument quantitation limit. Neither cis-1,2 DCE nor 2-butanone was detected in enough samples to map a plume.

SVOCs

Two SVOCs, di-n-butylphthalate, and di-n-octylphthalate, were detected in samples collected during the May 2007 sampling event. Di-n-octylphthalate was detected in one municipal well, PW-07, at a concentration of 0.2 J µg/L. It was also detected in similar concentrations in a quality control blank. Di-n-butylphthalate was detected in three wells with concentrations ranging from 0.23 J µg/L to 0.64 J µg/L. These concentrations are well below the RSL of 3,700 µg/L. There is no MCL for di-n-butylphthalate. SVOC results are summarized and presented in **Table 5-1b**.

Pesticides and PCBs

One pesticide, gamma-chlordane, was detected at a concentration of 0.0011 J µg/L in well DEP-05S in August 2007. Gamma-chlordane has no established RSL or MCL; however, the MCL for chlordane is 2 µg/L and the RSL for chlordane is 0.19 µg/L. The concentration of gamma-chlordane detected at the Site is well below these criteria. No polychlorinated biphenyls (PCBs) were detected in the groundwater samples collected in 2007. Pesticide analytical results are provided in **Table 5-1c**.

5.2.2.2 Distribution of Inorganic Contamination

During the 2007 sampling event, groundwater samples from all monitoring and municipal wells were analyzed for inorganic analytes. Samples were collected from each well and analyzed for total and dissolved metals. Samples collected for analyses of dissolved metals were field filtered using a 0.45 micrometer (µm) pore diameter membrane filter to remove solid particles (which may contain metals) suspended in the water. Extra sample volume was collected for cyanide testing. Analytical results are summarized and presented in **Table 5-1d**. These tables represent only those analytes that were detected. Full analytical results can be found in **Appendix A**. The distribution of all inorganic compounds in groundwater is shown on **Figure 5-2**.

Several metals were detected in the groundwater samples including: aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, silver, sodium, vanadium, and zinc. Of these, aluminum, arsenic, chromium, lead, silver, and vanadium were only found in samples analyzed for total metals (unfiltered). This may indicate that the presence of these metals is due to metals adhering to or existing as part of the particulate matter in the samples and not dissolved in the water.

Arsenic, manganese, and vanadium concentrations exceeded the RSL or MCL in at least one sample.

The concentrations of total arsenic exceed the RSL (0.05 µg/L) in five widely distributed wells (DEP-05S, DEP-09, DEP-10, EPA-02, and EPA-03), with concentrations ranging from 1.2 µg/L to 5.1 µg/L. However, no total or dissolved arsenic was detected in any other wells and no results exceeded the MCL (10 µg/L).

Manganese was the only dissolved metal that exceeded an RSL (880 µg/L), with a concentration of 1,070 µg/L in DEP-09. This was almost equal to the total metal result of 1,190 µg/L in the same well. In addition to well DEP-09, the total manganese concentration in DEP-07 (903 µg/L) exceeded the RSL. There is no apparent manganese plume, and the observed concentrations likely represent background conditions, as sand and gravel aquifers along the Ohio River can have levels of naturally-occurring manganese up to 5,000 µg/L (Ohio EPA, 2000).

Total vanadium concentrations exceeded the RSL (2.6 µg/L) in well DEP-05S with a concentration of 2.7 J µg/L.

Concentrations of total iron did not exceed the RSL (26,000 µg/L). Dissolved iron was detected in wells DEP-05S and DEP-09, but levels did not exceed the established RSL. There is no MCL for iron. Field analyses for ferrous iron (Fe^{+2}) were completed for wells DEP-06 and DEP-07; both wells showed no ferrous iron in the groundwater. Ferric iron (Fe^{+3}), which is calculated by subtracting the ferrous iron from the total iron results, was found in wells DEP-06 and DEP-07.

Although nickel was found in every well sampled, concentrations did not exceed the RSL (730 µg/L). There is no MCL for nickel. The majority of results for dissolved metals were approximately equal to or less than the total metals results.

5.2.2.3 Natural Attenuation Parameters

Samples from two wells, DEP-06, and DEP-07, were also analyzed for natural attenuation parameters, including sulfate, nitrate, phosphate, dissolved oxygen, COD, TOC, and ferrous iron. COD, phosphate, and TOC were not detected in the samples. Nitrate concentrations were 4.06 milligrams per liter (mg/L) and 6.11 mg/L, and sulfate concentrations were 49.5 mg/L and 56.9 mg/L in DEP-06 and DEP-07, respectively. Following purging of the monitoring wells, dissolved oxygen was measured with a field instrument. Dissolved oxygen concentrations in DEP-06 and DEP-07 were 0.0 mg/L and 4.44 mg/L, respectively. Results for natural attenuation parameters are presented in **Table 5-1e**.

5.2.3 Treatability Study Groundwater Sampling Results

As part of the Treatability Study, CDM collected screening level groundwater samples during well installation activities in November 2008. A comprehensive groundwater monitoring event in December 2008 provided baseline data for use in evaluating the effectiveness of the AS/SVE TS system. Subsequent sampling events in September 2009 and February 2010 provided interim data for evaluation of the effectiveness of the AS/SVE TS system.

Samples were also collected from the municipal production wells and the City's Venturi air stripper system during the groundwater monitoring events in November and December 2009, and January, February, and March 2010.

5.2.3.1 Screening Level Groundwater Sampling, 2008

Screening level groundwater samples were collected from borings advanced to install eight of the nine AS well borings and one monitoring well. These samples were collected from the first groundwater encountered in the newly installed boreholes. The samples were analyzed for VOCs, and the results are summarized in **Table 5-3.** As shown on this table, thirteen VOCs were detected in the screening level groundwater samples. Only two compounds, benzene and PCE, were detected at concentrations above the RSLs.

Concentrations of PCE exceeded the RSL (0.11 μg/L) in seven of the samples, with concentrations ranging from 0.48 J μg/L in AS-05 to 210 μg/L in AS-02. AS-02 is located in the parking area of the City Maintenance Building. Six of these results also exceeded the MCL for PCE (5 μg/L). These one-time sampling data assisted in determining the location of subsequent wells and in the definition of the groundwater plume.

Concentrations of benzene exceeded the RSL (0.41 μg/L) in four of the samples, with concentrations ranging from 0.59 μg/L to 0.72 μg/L. The highest concentration was found at AS-07, located at the corner of Sycamore and Virginia Streets. Benzene was not detected at concentrations exceeding the MCL of 5 μg/L.

Although not detected at concentrations above the RSL, 2-butanone was found at relatively high concentrations in two wells: AS-03 (760 L μg/L) and AS-05 (580 L μg/L).

5.2.3.2 Baseline Groundwater Sampling, December 2008

In December 2008, groundwater samples were collected from thirteen groundwater monitoring wells and seven City production wells to document baseline conditions prior to initiating the TS. VOCs detected in these samples include: chloromethane, cis-1,2 DCE, 2-butanone, methylcyclohexane, bromodichloromethane, toluene, and PCE. Of these, bromodichloromethane and PCE were detected at concentrations above RSLs or MCLs. Groundwater analytical data from the December 2008 sampling event are summarized in **Tables 5-1a** and **5-2,** and the contaminant plume defined by these data is depicted on **Figure 5-3.**

VOCs in Monitoring Wells

PCE concentrations in the monitoring well baseline samples exceeded the RSL in seven wells at concentrations ranging from 0.15 J µg/L in well DEP-05D to 370 µg/L in well DEP-05S. Reported concentrations in five of these wells (DEP-05S, DEP-07, DEP-08, MW-06S, and MW-11S) also exceeded the MCL.

VOCs in Public Wells

Two of the City production wells contained PCE at concentrations exceeding the RSL. PW-3 contained PCE at a concentration of 24 J µg/L, a concentration that also exceeded the MCL. PW-5 contained PCE at a concentration of 0.43 J µg/L.

Bromodichloromethane exceeded the RSL (0.12 µg/L) at concentrations of 0.15 µg/ L and 0.41 µg/L in wells PW-06 and PW-07.

5.2.3.3 September and November 2009 Sampling

To evaluate the effectiveness of the ongoing TS, eleven monitoring wells and City production well PW-3 were sampled on September 30, 2009 and October 1, 2009. Because the sampling effort was focused on the area where the TS was being conducted, wells DEP-09 and DEP-10, located well outside the identified PCE plume, were not sampled. City production wells PW-3 and PW-5 and the City air stripper system (influent and effluent) were also sampled in November 2009. Samples were only analyzed for VOCs, and PCE was the only compound detected in the samples collected in 2009 (**Table 5-1a**).

VOCs in Monitoring Wells

Concentrations exceeding the RSLs or MCLs were found in samples from six monitoring wells (DEP-05S, DEP-06, DEP-07, DEP-08, MW-06S, and MW-11S), at concentrations ranging from 3.9 µg/L in well DEP-06 to 230 µg/L in both well DEP-05S and MW-06S. Concentrations in all of these wells, except DEP-06, exceeded the MCL.

VOCs in Public Wells

Concentrations of PCE in PW-3 were 14 µg/L in October 2009 and 28 µg/L in November 2009. These concentrations exceed the MCL. Well PW-5 contained PCE at a concentration of 0.54 µg/L in November 2009. The City air stripper influent contained 11 µg/L of PCE (above the MCL), while the effluent contained 2.1 µg/L (below the MCL).

5.2.3.4 January, February, and March 2010 Sampling

Eleven groundwater monitoring wells were sampled in February 2010 to evaluate the effectiveness of the operating AS/SVE TS system. Because the sampling effort was focused on the area where the TS was being conducted, wells DEP-09 and DEP-10, located well outside the identified PCE plume, were not sampled. The City air stripper system was sampled five times between January and March 2010: January 6, February 2, February 17, March 4, and March 17. Three City production wells were also sampled in this period; PW-2 was sampled in February and March, PW-3 was sampled in January, and PW-5 was sampled in January and February. Samples from these wells and City treatment system were only analyzed for VOCs. Three VOCs, bromomethane, chloroform, and PCE, were detected in the 2010 samples with concentrations of chloroform and PCE exceeding RSLs or MCLs. Groundwater analytical data from the 2010 sampling events are summarized in **Tables 5-1a** and **5-2**.

VOCs in Monitoring Wells

PCE was detected in six monitoring wells (DEP-05S, DEP-06, DEP-07, DEP-08, MW-06S, and MW-11S), at concentrations exceeding both the RSL and the MCL, and ranging from 5.5 µg/L in DEP-06 to 170 µg/L in MW-06S.

VOCs in Public Wells

During the January 2010 sampling event, PCE was detected in PW-3 at 29 µg/L, exceeding the MCL. PCE was also detected in PW-5 at 0.55 µg/L and in the influent at 2.6 µg/L. The City air stripper effluent contained 11 µg/L of PCE in January. Although the sample contained PCE concentrations exceeding the RSL, the results are suspect, because the reported concentration is more than four times greater than the reported concentration of the influent (2.6 J µg/l) during that same sampling event. This anomaly is likely due to a labeling error (i.e., it is suspected that the influent and effluent sample labels were switched). The values observed in the January 2010 sampling event are consistent with historical values.

Following an increase in PCE levels in PW-3, the City stopped pumping from PW-3 in February 2010.

Concentrations of PCE exceeded the RSL in all four samples collected from PW-2 in February and March 2010, at concentrations ranging from 1.9 µg/L (February 12) to 5 µg/L (March 17). Concentrations of PCE exceeded the RSL in all four samples collected from PW-5 in February and March with concentrations ranging from 1.2 µg/L (February 2) to 1.8 L µg/L (March 17). The City's Venturi air stripper system was sampled twice in March, with PCE in the influent concentration ranging from 1.2 µg/L on March 4, to 1.8 L µg/L on March 17. Both of these results exceed the RSL. Note that the "L" qualifier indicates that the reported value may be biased low and that the actual concentration may be higher.

The concentrations of chloroform exceeded the RSL (0.19 µg/L) with concentrations of 0.22 J µg/L to 0.53 µg/L in PW-5 during the January 6 and February 2 sampling events, respectively. Concentrations of chloroform also exceeded the RSL in samples from the City air stripper influent collected on March 4 (0.29 J µg/L) and March 17 (0.27 J µg/L). Chloroform was not detected in either the air stripper effluent or blended water samples collected in this time period.

5.2.4 DPT Groundwater Investigation and Horizontal Extent of Contamination

In February and March 2010, CDM conducted a DPT investigation to identify the extent of the plume and further characterize the areas of PCE to support a planned future VI study to be implemented by EPA. Geoprobe® soil borings were advanced at 32 locations across the site. Thirty–two samples were collected from the shallow groundwater, and one sample was collected from the deep groundwater. Analytical results from the DPT investigation are summarized in **Table 5-4** and in the full data tables found in **Appendix A.**

Eleven VOCs were detected in the screening-level groundwater samples collected as part of the DPT groundwater investigation. Five compounds were reported at concentrations that exceeded the RSL, including:

- PCE: detected in 23 samples, with concentrations ranging from 0.11 J μg/L in DP-32 to 220 μg/L in DP-15, all of which exceed the RSL of 0.11 μg/L and 14 which exceed the MCL of 5 μg/L.
- 1,4-Dichlorobenzene: detected in DP-23 at 0.66 J μg/L, which exceeds the RSL (0.427 μg/L).
- Bromodichloromethane: detected in DP-05 at a concentration of 0.56 J μg/L, DP-27 at 0.18 J μg/L, and DP-30 at 0.27 J μg/L, all of which exceed the RSL of 0.117 μg/L.
- Chloroform: detected in DP-30 at 0.5 L μg/L and DP-10 at 0.58 J μg/L, which exceeds the RSL of 0.193 μg/L.
- TCE: detected in DP-28 at a concentration of 8.6 L μg/L, which exceeds both the RSL of 2 μg/L and the MCL of 5 μg/L.

The highest reported concentration of PCE detected in the DPT investigation (220 μg/L) was collected from a boring advanced at the intersection of Mulberry Street and Washington Street. The extent of PCE in groundwater based on the results of the DPT investigations, the February 2010 groundwater sampling, and March 2010 City production well sampling event, is shown in **Figure 5-4.** The PCE plume extends from approximately the intersection of Broadway Street and Walnut Streets north-northeast to the City Maintenance Building on Virginia Street. The distribution of PCE shown in this figure is consistent with that observed in previous sampling events and the 2000 GAI investigation (**Figure 5-5**).

The maximum observed concentration of PCE has decreased from the May 2007 value of 1,200 μg/L in DEP-05S to the February 2010 value of 170 μg/L in MW-06S. This decrease is largely due to the influence of the AS/SVE TS system. The screening-level groundwater samples collected during the DPT investigation resulted in a sufficient delineation of the contaminant plume to help EPA design the future VI sampling event. In addition, the interior of the PCE plume has been more completely defined.

5.2.5 Vertical Extent of Contamination

CDM and others have installed monitoring wells into both the shallow (with completion depths from approximately 34 to 73 ft bgs) and deep (with completion depths from approximately 86 to 97 ft bgs, typically the top of bedrock) portions of the alluvium aquifer. The data from these wells, in addition to the shallow and deep DPT samples collected at one location, can be used to characterize the vertical extent of contamination within the aquifer. The shallow groundwater data are from monitoring wells: DEP-05S, DEP-09, MW-06S, and MW-11S, as well as DPT point DP-29S. The deep groundwater data are from monitoring wells DEP-05D, DEP-06, DEP-07, DEP-08, DEP-10, EPA-01, EPA-02, EPA-03, and EPA-04, as well as DPT sample DP-29D.

The highest concentrations of PCE in the shallow groundwater were 1,200 µg/L found in the shallow groundwater sample DEP-05S in May 2007 and 220 µg/L in DP-15 in February 2010.

PCE concentrations in the deep groundwater ranged from "not detected" in DEP-10 to 32 µg/L in DEP-08 in February 2010. DEP-08 is located on Mulberry Street, at the furthest edge of the plume that is still likely within the capture zone of production well PW-3. The deep DPT point (DP-29D), located in the parking lot of the City Maintenance Yard immediately upgradient of production well PW-3, had a PCE concentration of 4.8 J µg/L, compared to a concentration of 48 L µg/L in the shallow groundwater at that same location. Note that the "L" qualifier indicates that the reported value may be biased low and that the actual concentration may be higher.

5.2.6 Contaminants of Potential Concern

The groundwater analytical data were screened against Federal MCLs and RSLs. Note that the West Virginia Water Quality standards are the same as the Federal MCLs. They were also screened in the Human Health Risk Assessment (CDM, 2010a) to determine which contaminants posed potential risks to human receptors as well as in the SLERA (CDM, 2010f) to determine which contaminants posed potential risks to ecological receptors. A list of contaminants of potential concern was developed as part of the human health and ecological risk assessment process and includes VOCs, SVOCs, and inorganic compounds.

VOCs identified in the HHRA as contaminants of potential concern (COPCs) were PCE, TCE, and bromodichloromethane. Inorganic compounds identified as COPCs were arsenic, chromium, cobalt, iron, manganese, and nickel.

VOCs identified in the SLERA as COPCs were chloroform, methylcyclohexane, toluene, and PCE. SVOCS identified as COPCs were caprolactam and bis(2-ethylhexyl)phthalate. Inorganic compounds identified as COPCs were aluminum (total), arsenic (total), barium (total and dissolved), cadmium, chromium, cobalt, copper, iron (total and dissolved), lead (total and dissolved), manganese (total and dissolved), mercury, nickel (total and dissolved), selenium, and silver.

5.3 Presence of Dense Non-Aqueous Phase Liquid

As a pure product, PCE, the most commonly detected groundwater contaminant at the Site, is a dense non-aqueous phase liquid (DNAPL). A DNAPL is a liquid that is denser than water and does not dissolve or mix easily in water (it is immiscible). In the presence of water, it forms a separate phase from the water. When released onto the ground surface in pure form, PCE can be expected to flow downward, driven by gravity, even through the saturated aquifer material (i.e., below the water table).

However, depending on soil properties, it is possible for residual PCE to adhere to vadose zone material (unconsolidated material above the water table) or aquifer material and remain a continuing source of aqueous-phase PCE contamination. For this reason, it is important to identify any source areas of residual or pure-phase PCE DNAPL to be addressed in a remedial action.

Although DNAPL is often difficult to identify in the field, there are several lines of evidence that indicate that no residual DNAPL or significant remaining source area is present at the Site. First, no physical evidence, such as discolored soil or elevated PID readings have been observed during soil coring and well installation activities. Secondly, the lower vadose zone and aquifer materials at the Site are made up of uniform medium sand, with little to no total organic carbon. This indicates that there would be little to no sorption or attenuation capacity in the soils, and any PCE DNAPL present would migrate downward to the water table. The upper vadose zone has finer siltier deposits, but contains little TOC. If there were any significant amount of PCE in the vadose zone, it would have diffused widely through the permeable sands of the vadose zone, and high PCE levels would have likely been detected in vapor surveys, soil borings, PID readings, or in the influent to the SVE wells. The highest vapor phase PCE levels in SVE-3, the closest SVE well to Washington Street, was only 1.656 parts per million by volume (ppmv), which is not indicative of nearby high level soil contamination. The radius of influence of SVE-3 is approximately 90 feet, which would draw vapors from near the Washington Street area.

In addition to the lack of physical evidence, various analytical data collected at the Site have not suggested the presence of DNAPL. Two direct push investigations to sample groundwater (2000/2001 and 2010) and a soil vapor investigation (1999/2000) were conducted near suspected sources and across the potential extent of the PCE plume. The 2010 investigation indicated only trace-level PCE concentrations surrounding the entire plume, except for the northern edge of the mid-plume, near the bank parking lot. The highest shallow groundwater PCE concentration found in 2000 was 158 µg/L, and in 2010, the highest PCE concentration was 220 µg/L, both along the center line of the plume between the intersection of Washington Street and Mulberry Street and the DEP-05 cluster. The highest subsurface vapor result from 1999 was 217 parts per billion by volume (ppbv). The plume maps of the two DPT shallow water investigations are remarkably similar in both maximum concentrations and plume extent, despite the 10 years that elapsed between the investigations. If there was a significant continuing source of PCE, the plume would have been expected to expand through diffusion and advection, particularly in the area that is not influenced by the City water production wells. This expansion is not evident in **Figure 5-5** where the two plumes are compared.

The City well field has pumped continuously for many years, reversing the natural groundwater gradient toward the Ohio River, and creating an easterly gradient toward the City wells, primarily toward PW-3, which has been pumped at the highest rate. If a significant PCE source still existed in the area of Washington Street, much higher PCE levels would be expected along the line from MW-06S and DEP-05S leading toward PW-3. The highest PCE level measured was in one transient 1,200 µg/L result in DEP-05S, with all other results in DEP-05S and surrounding wells being substantially less than half that amount.

There are 15 deep wells spaced around the Site (EPA-01 through EPA-04, DEP-05D through DEP-10, and PW-1 through PW-5 are all considered screened in the deep zone), with the highest concentration found at DEP-05D in 2002 (410 µg/L). If appreciable DNAPL was present at an historic source area, it would have been expected to migrate downward to the surface of the relatively impermeable bedrock layer. Diffusion would have caused elevated PCE levels in some of the nearby shallow and deep wells and sampling points. No elevated levels have been observed.

There are three areas where the PCE plume has not been completely defined.

- Although several DPT water and vapor samples have been collected along Washington Street and the alley to the west (with the highest reported PCE concentration at 220 µg/L) there are no permanent monitoring points to collect repeatable samples or develop a historic trend.
- The second area, near deep well DEP-07 (highest reported PCE concentration of 56 µg/L) does not have a shallow well, which may reveal higher levels of contamination. It is noted, however, that this shallow zone area is bounded to the south by several DPT samples that had no detectable PCE, and MW-06S (170 µg/L) is only 150 feet away to the north.
- The third area, DP-27, in the bank parking lot to the north of MW-06S, showed PCE at 130 µg/L, indicating that the northern boundary and extent of contamination have not been completely defined.

Because relatively low PCE levels were found in each of these areas, the potential for the existence of significant residual source contamination in these three areas is remote.

As the aquifer is aerobic, and no PCE daughter products have been detected (except in one DPT sample at the edge of the plume, closest to the River where conditions may be more reducing), there is likely little to no degradation of the PCE in the majority of the plume area. The concentrations of PCE in shallow groundwater are well below what would be expected if residual DNAPL or a significant continual source were still present at the Site. Additionally, soil samples were collected during the installation of EPA and DEP series wells during the 2000 DPT study and during the installation of Treatability Study wells. PCE was detected in only one soil sample from DEP-07 (76 µg/kg) that had been collected from the top of the water table.

In summary, groundwater across most of the plume area has been investigated using a relatively fine sampling grid during numerous investigations. Given the relatively low PCE concentrations detected in groundwater, the lack of sorption in Site soils, the high soil permeability, the lack of significant levels of PCE in SVE vapors on the east side of the plume, the general absence of PCE in soil samples, and the amount of time that has passed since contamination was discovered, it is unlikely that a significant residual DNAPL source remains at the Site. Instead, PCE contamination may have resulted from a small release or series of releases of PCE from potential source(s) somewhere along a line from the intersection of Mulberry and Washington Streets to just north of the intersection of Virginia and Sycamore Streets.

Section 6
Contaminant Fate and Transport

An evaluation of the potential environmental fate and transport of dissolved groundwater contaminants is important for determining the potential for exposure to contaminants. There are several mechanisms by which contaminants may migrate from the potential source area to the groundwater and, secondarily, to surface water and sediment of the Ohio River. The degree to which the compounds will migrate via a particular mechanism is determined by the physical and chemical properties of the compound as well as the physical characteristics of the Site and source areas.

Section 6.1 describes the chemical and physical processes that control the fate of COPCs in the environment. Section 6.2 discusses how these chemical and physical processes affect the environmental fate and transport of COPCs at the Ravenswood PCE Site. The potential for natural biodegradation of the COPCs at the Site is discussed in Section 6.3. The fate and transport of PCE in the Site environment is presented in the Conceptual Site Model, Section 6.4.

6.1 Chemical and Physical Processes Influencing Contaminant Fate and Transport

The chemical and physical properties that affect the fate and transport of contaminants in the environment include dissolution, sorption, volatilization, photolysis, oxidation/reduction, hydrolysis, biodegradation, advection, diffusion, and dispersion. These processes are briefly described below. Those chemical and physical properties that are most important in the fate and transport of the COPCs are summarized in **Tables 6-1** and **6-2**.

6.1.1 Dissolution

Dissolution is the partitioning of a chemical in the aqueous phase. Water solubility is the maximum concentration of a chemical that dissolves in a given amount of pure water at a specific temperature and pH. Highly soluble chemicals are more likely to leach from the soil and waste into the groundwater and from sediment into pore water and surface water. Many of the metals found at the Site may be found in various forms such as carbonates and sulfates, which may have a variety of solubilities.

6.1.2 Sorption

The tendency for contaminants to adsorb to materials in the environment is called sorption. The amount of sorption that will take place is a function of the chemical properties of the contaminant as well as the properties of the media through which the contaminant is moving. Many contaminants tend to adsorb to organic carbon, so the tendency of a particular contaminant to adsorb can be indicated by the log of the organic carbon partition coefficient (K_{oc}) of that chemical. K_{oc} is the ratio of the adsorbed chemical per unit weight of organic carbon, to the aqueous solute concentration.

A low K_{oc} (e.g., 10) suggests that there is potential for the chemical to leach into groundwater or surface water, while a high K_{oc} (e.g., 10,000) indicates that the chemical will strongly adsorb to the available organic carbon. Generally, the stronger a chemical is adsorbed, the lower the water solubility. Log K_{oc} ranges and the ability to adsorb to soil are presented below.

K_{oc}	**Sorption to soil**
<10	Very weakly sorbed
10-100	Weakly sorbed
100-1000	Moderately sorbed
1000-10,000	Moderately to strongly sorbed
10,000-100,000	Strongly sorbed
>100,000	Very strongly sorbed

The tendency of metals to adsorb to environmental media is controlled not only by the organic carbon in the media, but also by the pH, the cation exchange capacity of the soils, and other site-specific factors.

As a contaminant moves through an aquifer, it will be slowed by its tendency to sorb to organic material and the amount of organic material that is present. The degree to which it is slowed is expressed as a retardation factor which can be calculated if the K_{oc} and TOC are known.

6.1.3 Volatilization

Vapor pressure is a relative measure of the volatility of the compound in its pure state and is an important factor in the rate of volatilization from contaminated soils and surface water to the atmosphere. Volatilization rates are also affected by site-specific conditions such as temperature, wind speed, and soil conditions. Chemicals with a relatively low vapor pressure and a high affinity for soil or water are less likely to vaporize and become airborne than those with a high vapor pressure and low affinity for water.

A related parameter, Henry's Law constant, is sometimes referred to as the air-water partition coefficient. It is the ratio of the partial pressure of a compound in air to the concentration of the chemical in water at a given temperature under equilibrium. When vapor pressure is high relative to water solubility, the Henry's Law constant is high, and the chemical volatilizes to air. If the water solubility is high relative to the vapor pressure, the Henry's Law constant will be low, and the chemical will tend to remain in solution. Some ranges of Henry's Law constants and associated volatility are listed below.

Henry's Law Constant	Volatility
<3E-7	Non-volatile
3E-7 to 1E-5	Low
1E-5 to 1E-3	Moderate
>1E-3	High

6.1.4 Advection, Diffusion, and Dispersion

Contaminants that have reached the water table move through an aquifer via advection, diffusion, and dispersion, all of which can increase the size of a plume. Advection is the movement of the contaminants with the water as it moves downgradient, forming a contaminant plume. Diffusion is the movement of contaminants in response to concentration gradients. The primary mechanism for dispersion is the mechanical mixing of the contaminant as the water flow velocity changes due to variations in pore size and shape.

6.1.5 Biodegradation, Photolysis, and Hydrolysis

The processes of biodegradation, photolysis, and hydrolysis transform the contaminant to a different chemical. Biodegradation is the process by which indigenous soil or sediment organisms degrade contaminants to innocuous byproducts such as carbon dioxide and water. The four requirements for biodegradation to occur include the presence of nutrients, moisture, an electron donor, and a terminal electron acceptor. Nutrients and moisture are generally readily available in the subsurface. Therefore, the presence of electron donors or terminal electron acceptors is generally the limiting factor in biodegradation.

Photolysis is the process where chemicals degrade as a result of exposure to sunlight. This process would be insignificant in groundwater, but could be more significant if contaminants are discharged to the Ohio River or other surface water bodies, where they can be exposed to sunlight.

Hydrolysis is the reaction of a compound with water resulting in a new chemical species. Hydrolysis reactions are highly pH dependent. In groundwater, these reactions are typically too slow to be significant.

6.2 Chemical and Physical Properties of COPCs

The various chemical and physical processes described in Section 6.1 affect the environmental fate and transport of Ravenswood Site COPCs to different extents. The primary COPC for Ravenswood groundwater, PCE, is a VOC. VOCs are generally highly mobile in the environment. They do not adsorb readily to soils, and they have low retardation factors in groundwater. Consequently, the migration rate through the environment in groundwater approximately equals that of the groundwater flow rate. VOCs, when initially released to the soil, would be expected to evaporate rapidly due to their high vapor pressure. Then, because VOCs are moderately soluble in water and do not sorb to soils, the fraction remaining in the soil would readily infiltrate through the unsaturated zone, especially with the relatively porous sandy aquifer with little TOC that is found at the Ravenswood Site. Once in the unsaturated zone, PCE would partition between the vapor phase and the liquid phase (soil moisture), which would eventually leach into the groundwater. In groundwater, the dissolved phase would be expected to flow down gradient with little retardation. As discussed in Section 5, there are several lines of evidence that indicate that no residual DNAPL exists within the area of the TS or in the saturated aquifer. The presence of very small pockets of residual DNAPL in other areas of the vadose zone cannot be conclusively ruled out at this time.

The relatively high Henry's Law Constant and low solubility for PCE indicate that it will volatilize to air. These characteristics are applied in the AS/SVE TS where air is introduced into the aquifer causing PCE to preferentially partition into the vapor phase. PCE is removed from the groundwater, subsequently captured by the SVE system, and sorbed on the granular activated carbon.

If discharged to surface water, several of these VOCs may volatilize. Some, but not all, may undergo photolysis and biodegradation. Direct photolysis is not expected to be an important environmental fate process, because these compounds only absorb light weakly in the environmental UV spectrum. The chemical and physical properties of PCE are shown on **Table 6-1**.

The inorganic COPCs at the Ravenswood Site will not volatilize or biodegrade, but they typically have low mobility in groundwater. The low mobility of metals is due to their tendency to strongly adsorb to clays and organic matter. Where conditions are not strongly reducing, metals also form hydroxides and oxides with iron and manganese. The solubilities of the various oxides of metals are dependent on pH and the redox potential (Eh) of the groundwater.

The natural degradation of chlorinated solvents (such as PCE) occurs under reducing conditions. Reducing conditions in groundwater combined with reduced pH caused by the degradation of chlorinated compounds, can cause metal hydroxides to dissolve, resulting in the release of metals into the groundwater (Drever, 1998). As a result, reductive dechlorination of solvents under anaerobic conditions can result in naturally occurring metals being more mobile, and potentially more toxic, than the original materials (EPA, 1998). However, as discussed in Section 6.3, anaerobic conditions are likely limited to areas close to the Ohio River, where sufficient naturally occurring organic matter may be present in the subsurface sediments. The relatively low concentrations of PCE and the aerobic nature of the majority of the aquifer suggest that it is unlikely that anaerobic conditions will develop. Therefore, the potential for mobilization of metals under anaerobic conditions is low. The chemical and physical properties of all inorganic COPCs are presented in **Table 6-2**.

6.3 Potential for Natural Attenuation

As part of the groundwater monitoring event in May 2007, natural attenuation parameters (nitrate, phosphate, sulfate, COD, and TOC) were measured to determine if reductive dechlorination or natural biodegradation are occurring. These analyses were performed on samples from two wells generally located within the plume, DEP-06 and DEP-07. The absence of PCE daughter products (TCE, cis-1,2 DCE, and vinyl chloride) in almost all analytical results across the Site indicate that PCE is not being degraded. Additionally, the presence of nitrate and sulfate at DEP-06 and DEP-07 indicates that aerobic conditions are prevalent in the aquifer and that reductive dechlorination, an anaerobic process, is not occurring in that area.

During the 2010 DPT investigation, both TCE (8.6 µg/L) and cis-1,2 DCE (10 µg/L) were detected in the sample from DP-28, with PCE found only at 1.6 µg/L. DP-28 is located on the southwestern downgradient fringe of the plume, outside the area of the plume having greater than 5 µg/L PCE, and is the only sample where PCE daughter products were detected. The presence of these two daughter products indicates that anaerobic dechlorination of PCE is likely occurring in this area, with dechlorination proceeding to cis-1,2 DCE, where it is likely inhibited from proceeding further by the absence of specific bacteria species. This sampling point is located about 400 feet from the Ohio River, an environment where higher levels of organic material would be expected to be present in the subsurface sediments. The decay of this organic material could release gases, such as methane, that create the anaerobic conditions necessary for the dechlorination of PCE. This could produce a natural reductive dechlorination barrier that degrades the low levels of PCE flowing towards the Ohio River.

6.4 Conceptual Site Model

The Ravenswood Conceptual Site Model describes the environmental conditions at the Site developed from all existing information including the following:

- locations of contaminant/waste sources or locations where contamination exists,
- types and expected concentrations of contaminants,
- potentially contaminated media and migration pathways, and
- potential human and ecological targets or receptors.

At the Ravenswood PCE Site, a small release or series of releases of PCE historically occurred from potential source(s) somewhere along a line from the intersection of Mulberry and Washington Streets to just north of the intersection of Virginia and Sycamore Streets, where the highest concentrations of PCE have been detected. Data collected during the RI indicate that residual DNAPL or a significant source of PCE is not present in the vadose zone within the TS Area or within the saturated aquifer. As discussed in Section 5.3, there are several lines of evidence that indicate that no residual DNAPL exists within the area of the TS or in the saturated aquifer. The presence of very small pockets of residual DNAPL in other areas of the vadose zone cannot be conclusively ruled out at this time.

The released PCE migrated through the 50-foot to 60-foot thick vadose zone to groundwater, most likely through leaching by percolating precipitation. Once in the groundwater, migration of PCE would be governed by the direction of groundwater flow, predominantly the horizontal flow. Groundwater levels measured during the RI indicate very low vertical gradients, with concentrations of PCE that are significantly higher in the shallow aquifer than in the deep aquifer.

In the absence of pumping of the City municipal production wells, the PCE would likely migrate with groundwater flow toward discharge points at the Ohio River or Sandy Creek, located to the south and west of the sources. However, under the influence of high-volume pumping at City wells PW-2, PW-3 and PW-5, the PCE plume has been drawn northeastward toward those wells. This pumping has created a long, thin plume of relatively low concentration PCE extending from between Broadway Street and Walnut Street to the City wells, residing primarily in the shallow portion of the aquifer.

The boundaries of the plume defined by the recent DPT investigation include Broadway Street (DP-26) to the south, Sycamore and Washington Streets (DP-22) on the northwest, and Walnut and Washington Streets on the southeast. With PCE detected at 130 µg/L in DP-27, PCE appears to extend to the north and east beyond the area investigated at this location. The plume tends to narrow to the north in the direction of the City's production wells. The PCE plume is approximately 400 feet wide by 1,400 feet long. The current area of the groundwater plume, based on March 2010 data, is shown on **Figure 5-4**.

The water table is located at approximately 50 to 60 ft bgs, and the bedrock surface is present at 90 ft bgs. As a result, the maximum thickness of the saturated zone is 40 feet. Using an assumed 20-foot thickness of the shallow zone, the estimated volume of contaminated shallow groundwater is 25 million gallons, with approximately 50.8 million gallons of groundwater in the shallow and deep zones. Although the highest concentrations of PCE are within the capture zone of the City wells, a portion of the plume is found to the southwest of the capture zone, southwest of Race Street, in an area where groundwater flow is toward the River. The location of this transition zone fluctuates over about a city block depending on the pool stage of the Ohio River. There is relatively little movement of the PCE plume in this area.

Groundwater data collected during the course of the RI indicate that the plume is relatively stable. **Figure 5-5** compares the results of the 2001 GAI DPT investigation with the 2010 DPT data collected by CDM. This figure illustrates that the geographic footprint and range of concentrations reported in the two investigations are very similar.

Between 2000 and early 2010, PW-3 has been pumped at an average rate of 200,000 gpd, with an average PCE concentration of 30.7 µg/L and a highest reported concentration of 91.4 µg/L in April 2000. Concentrations of PCE in well PW-3 have been stable over the course of the RI (2007 through 2010), ranging from 14 µg/L to 30 µg/L, with the most recent sample from January 2010 containing 29 µg/L PCE. The water pumped from City wells PW-3 and PW-5 has historically been treated using a Venturi air stripper, which removed approximately 9.39 lbs of PCE per year. Well

PW-3 was temporarily taken out of service in February 2010; as a result, the pumping rates from the other City wells were increased to maintain the supply in the distribution system. The City reactivated pumping of PW-3 in May 2010; however, the treated water is now being discharged to the Ohio River rather than contributing to the City water supply.

Based on the results of the monthly vapor sampling conducted since startup of the SVE system in June 2009, the AS/SVE TS system has removed 3.3 pounds (lbs) of PCE from nearly 17,900,000 standard cubic feet (scf) of extracted soil vapor through March 2010. Although concentrations of PCE have not declined in well PW-3, the decreasing PCE values in monitoring wells in the vicinity of the AS wells indicate that PCE within the radius of influence (ROI) of the AS wells is being effectively sparged from the saturated zone. This is most evident from the PCE concentrations in DEP-05S (shown on **Figure 6-1**), which have decreased from baseline conditions of 370 μg/L in December 2008, before installation of the TS, to 69 μg/L in February 2010, about 6 months after start-up of the TS. Concentrations of PCE at newly installed well MW-11S (in the City Maintenance Yard parking lot) have also decreased by nearly 30 percent from a baseline value of 93 μg/L in December 2008, to 66 μg/L in February 2010. The PCE concentration in MW-06S increased slightly from 180 μg/L in December 2008, to 200 μg/L in September 2009, before decreasing to 170 μg/L in February 2010. PCE levels in the SVE system influent indicate that the TS treatment unit is capturing sparged PCE and retaining it on the granular activated carbon vessels. The relatively static PCE levels in wells outside the ROI of the AS wells is expected, as the AS system is not affecting that groundwater

As seen in **Figure 6-1**, there was a sharp decrease in concentration of PCE at monitoring well DEP-05S even prior to the startup of the TS. Concentrations in that well have declined from a peak of 1,200 μg/L in May 2007, to 690 μg/L in August 2007, and to 370 μg/L in December 2008, when the baseline sampling was conducted. This decrease may indicate that a "slug" of relatively higher-concentration contaminated groundwater moved through this location, being pulled by the pumping of the City wells. The movement of the "slug" of contamination may, in part, also explain the increase in concentrations in PW-3 found in the winter of 2009/2010.

PCE has been detected at levels above the MCL in production well PW-3 since 1989, creating a potential risk to human health. Since 2000, this risk has been controlled by the City treating water from wells PW-3 and PW-5 using a Venturi air stripper prior to entering the City's water distribution system. In 2009, EPA's AS/SVE treatability study was initiated to evaluate the effectiveness of this technology in the area of apparently increasing PCE concentrations near the City production wells.

Section 7
Conclusions and Recommendations

The overall objective of the Ravenswood PCE Site RI was to characterize the nature and extent of groundwater contamination at the Site and to gather enough information about the Site to support EPA's informed risk management decision. The RI included:

- The development of a Site-specific groundwater flow model,
- Collection of several rounds of groundwater samples,
- Conducting a Treatability Study (and associated groundwater and vapor sampling) to evaluate the potential of AS/SVE to remediate the groundwater; and
- Conducting a DPT groundwater investigation to more fully delineate the extent of PCE contamination in groundwater.

7.1 Conclusions

The following are the significant conclusions of the Ravenswood PCE Site RI:

- The groundwater flow model demonstrated that the pumping of the City production wells controls the flow in the majority of the contaminated aquifer. The pumping, principally of well PW-3, is drawing the contaminated groundwater toward the City well field.
- At this time, analytical data indicate that the PCE plume has not reached the nearby surface water bodies; however, groundwater modeling does indicate that a portion of the plume is likely to migrate toward the Ohio River. The DPT water sample collected closest to the River was the only sample to contain breakdown products of PCE, indicating that anaerobic dechlorination is occurring. Therefore, it is likely that natural attenuation of the plume will occur prior to discharge to the Ohio River.
- The comprehensive set of groundwater data collected in May 2007 was used to conduct a Human Health Risk Assessment. The primary COPC identified in the HHRA is PCE. Other COPCs are metals, including: arsenic, chromium, cobalt, iron, manganese, and total nickel. The HHRA evaluated current and future child and adult receptors. The only COPC that is a cancer risk driver is PCE.
- Based on the results of the SLERA, there is currently no risk to ecological receptors, as contaminants in groundwater have not reached a point where exposure to ecological receptors is expected. The assessment of future risk, as evaluated through the comparison of maximum site concentrations with screening

benchmarks and through food chain evaluations, indicates limited potential for ecological risk.

- The DPT investigation, as well as the multiple rounds of groundwater samples collected as part of the TS, further delineated the groundwater plume (shown on **Figure 5-4**) to support EPA's planning for a future VI study.
- The concentrations of PCE are much higher in the shallow part of the aquifer than in the deeper part of the aquifer.
- The RI did not find any indications of residual DNAPL in either the vadose zone or the saturated aquifer.
- The highest measured concentration of PCE (1,200 µg/L) was found at DEP-05S in May 2007, in that part of the plume within the capture zone of the City wells. Concentrations in DEP-05S decreased to 370 µg/L in December 2008, potentially indicating that a slug of relatively higher-concentration groundwater had moved through that location, toward the City well field.
- The interim results of the TS study indicate that AS/SVE is effective at removing PCE from the groundwater. Evidence of this conclusion includes a decrease in PCE concentrations at monitoring wells located within the radius of influence of the sparge wells, and the presence of PCE in the influent of SVE treatment system.
- The RI, including the results of the TS, provides a set of data sufficient for the development of a FS, which includes a range of remedial alternatives.

7.2 Recommendations

Based on the findings of the RI, CDM recommends the following:

- The AS/SVE TS system should continue to operate and remove PCE from the groundwater while the FS is finalized and the Proposed Plan and ROD for the Site are being prepared. This is particularly important as the concentrations of PCE in PW-3 appear to be increasing slightly.
- Prior to the Remedial Design, a supplemental investigation should be performed to further delineate the plume in the areas of DP-27 and DP-15, so that all areas with PCE in groundwater can be treated by the remedy EPA selects in the ROD.

Section 8
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Figures

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Notes:
Source of aerial photo: Google Earth Pro 3/31/2010.

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Ravenswood PCE Superfund Site
Ravenswood, West Virginia

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Figure 1-1
Site Location Map

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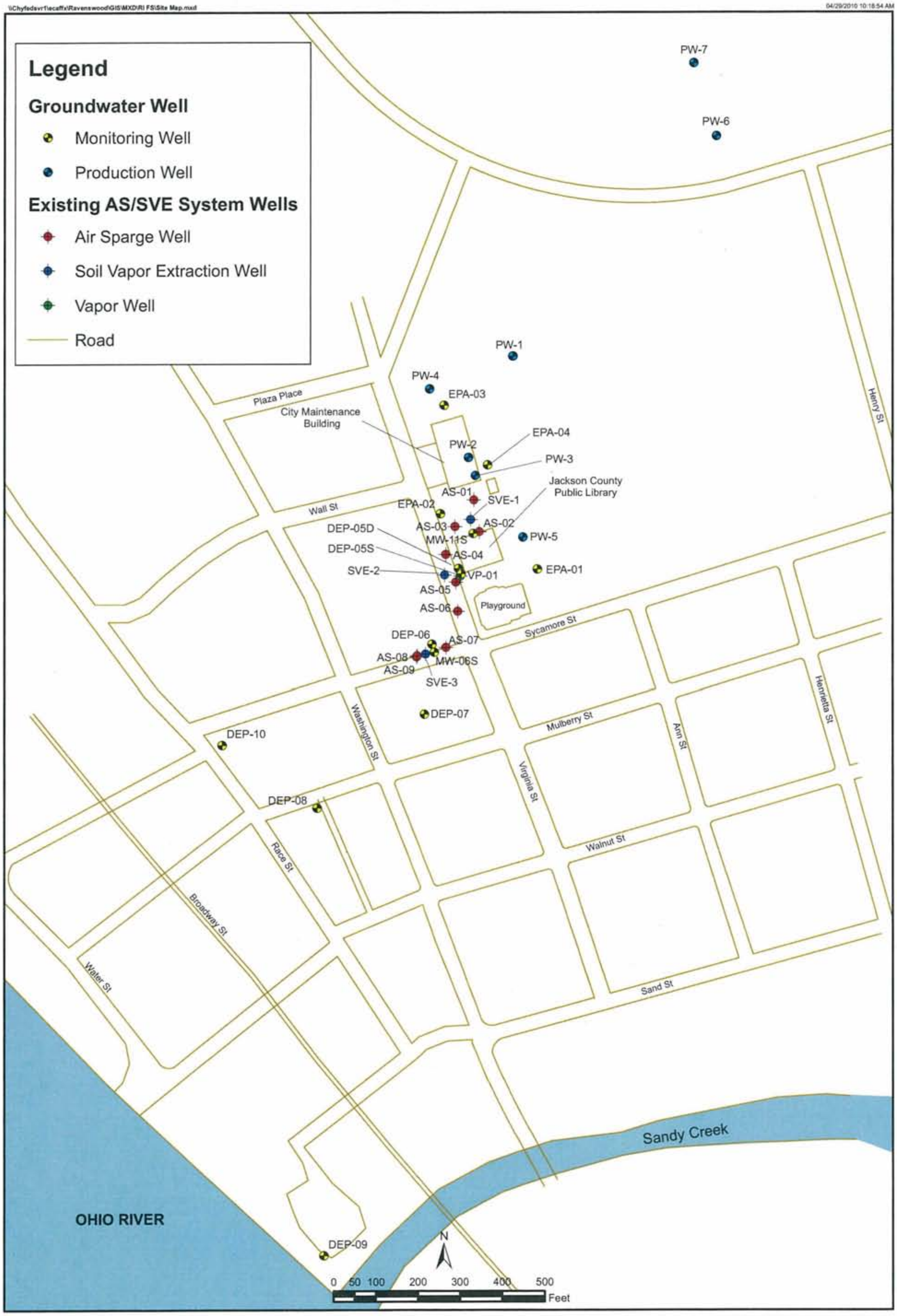

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Ravenswood PCE Site
Ravenswood, West Virginia

Figure 1-2
Site Map

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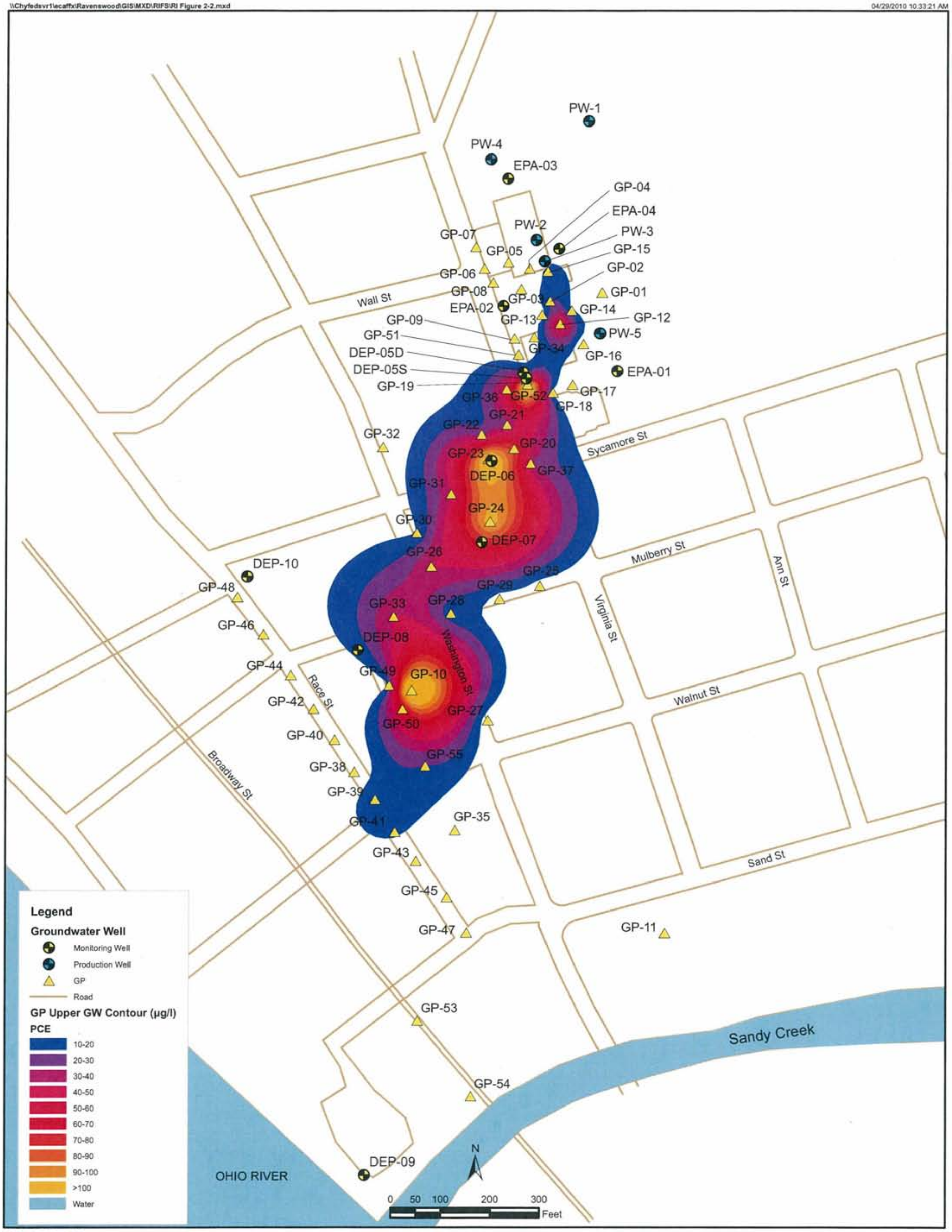
Ravenswood PCE Site
Ravenswood, West Virginia

Figure 2-1
Previous Well Installation Locations

Notes:
EPA Well = Monitoring wells installed by REAC, 1999
DEP Wells = Monitoring wells installed by WVDEP, 2001



Ravenswood PCE Site
Ravenswood, West Virginia

Figure 2-2
PCE in Shallow Groundwater
2000-2001 Geoprobe® Sampling

Notes:
Geoprobe® locations sampled May 2001 - August 2001.
Upper groundwater zone is 19 - 61 feet below land surface.
Horizontal coordinates taken from CDM GPS survey (August 5, 2005), existing WVDEP records (surveyed using traditional methods), or digitizing.
Analytical Data from GAI 2001 and GAI 2002.

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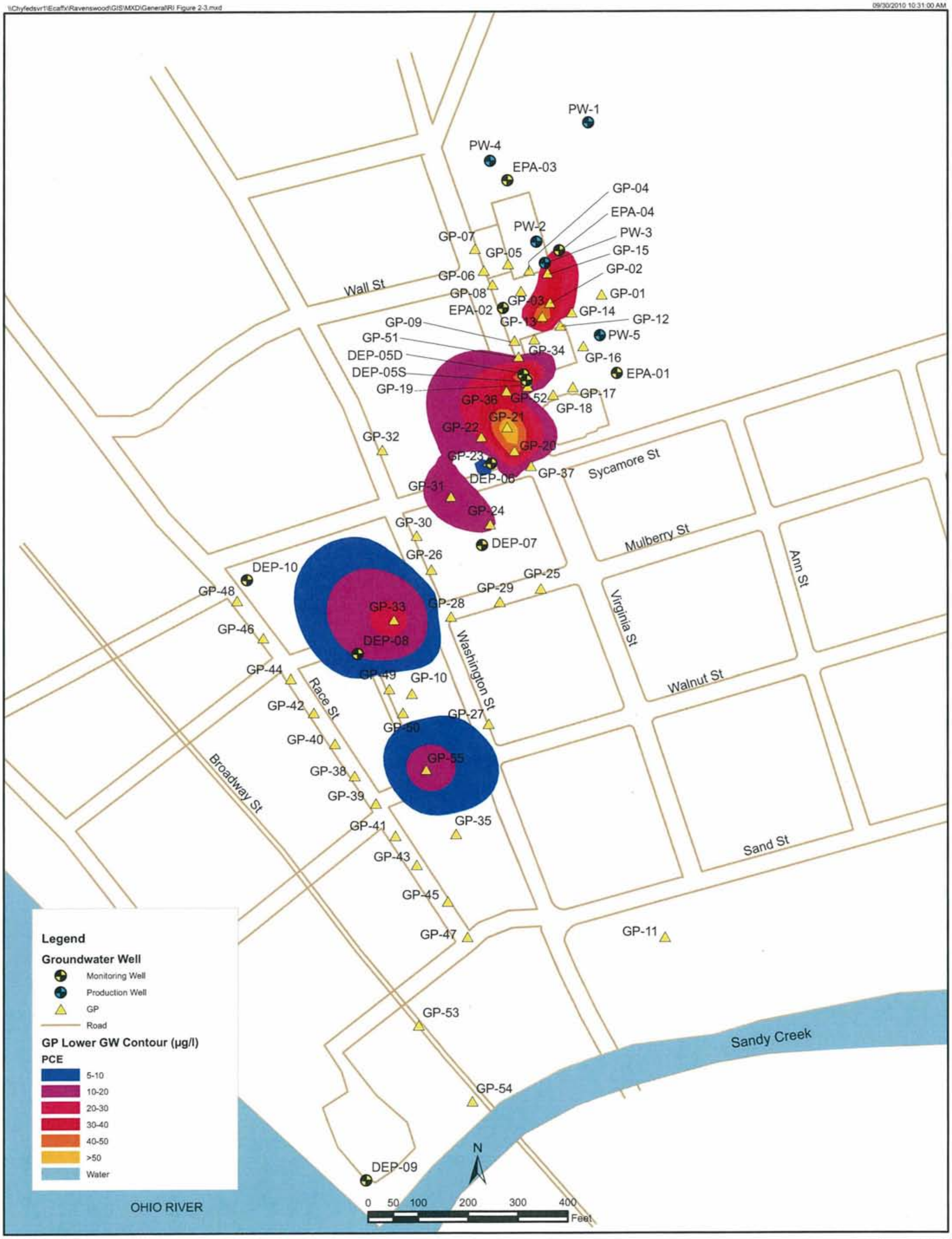

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Ravenswood PCE Site
Ravenswood, West Virginia

Figure 2-3
PCE in Deep Groundwater
2000-2001 Geoprobe® Sampling

Notes:
Geoprobe® locations sampled May 2001 - August 2001.
Lower groundwater zone is 64 - 92 feet below land surface.
Horizontal coordinates taken from CDM GPS survey (August 5, 2005), existing WVDEP records (surveyed using traditional methods), or digitizing.
Analytical Data from GAI 2001 and GAI 2002.

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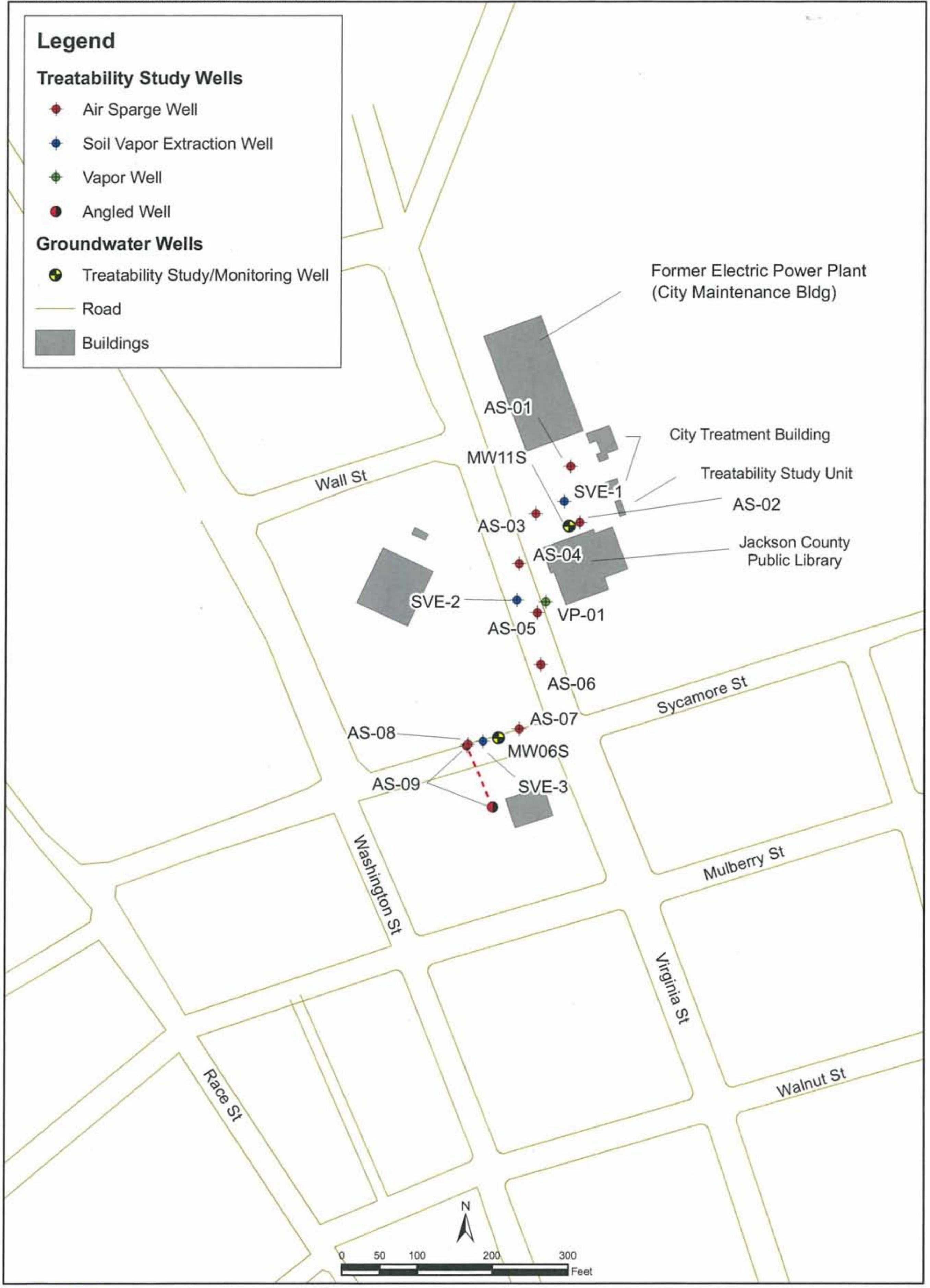

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Ravenswood PCE Site
Ravenswood, West Virginia

Figure 3-1
Location of Wells Installed During the
Treatability Study 2008 and 2009

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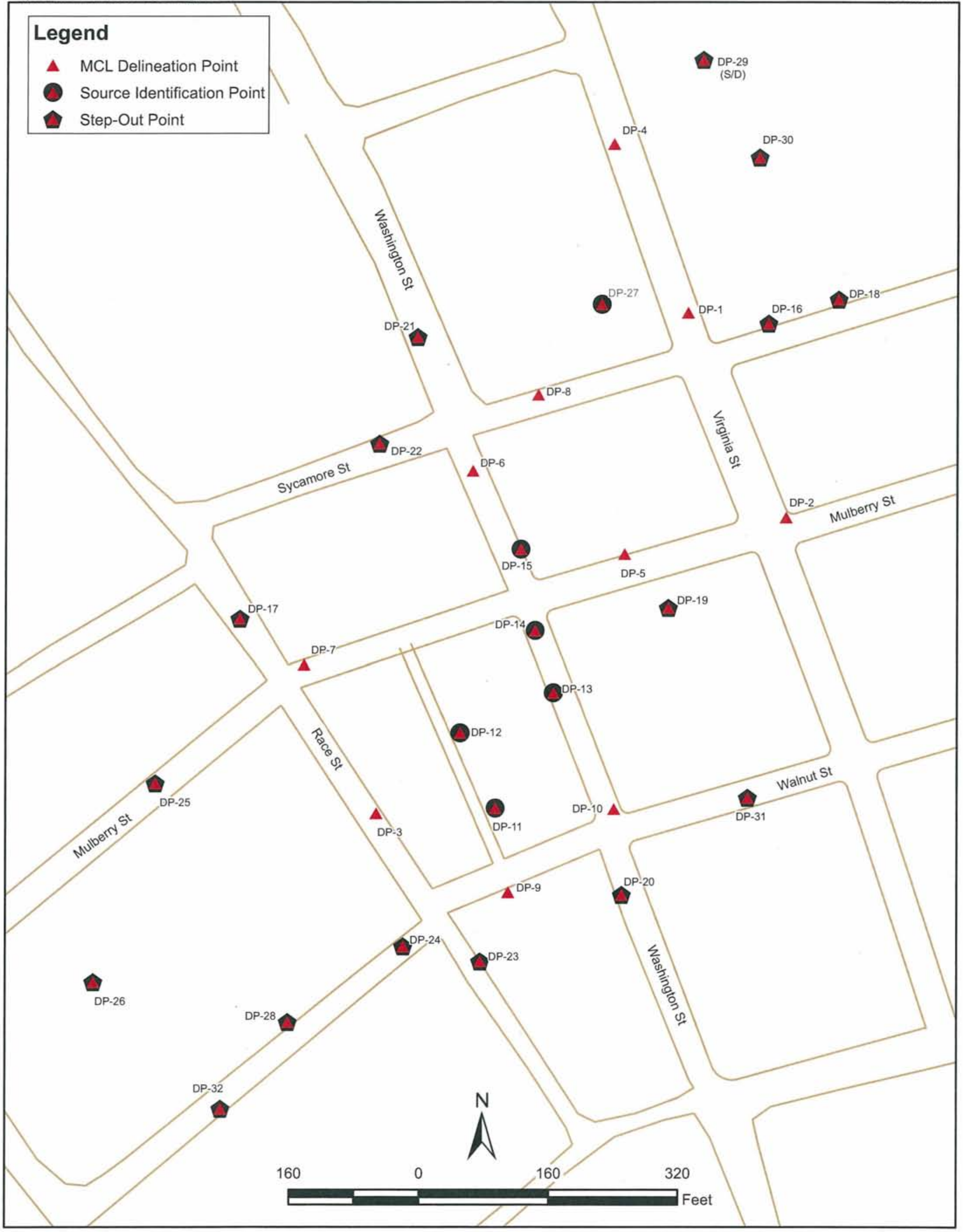

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 3-2
Location of DPT Samples

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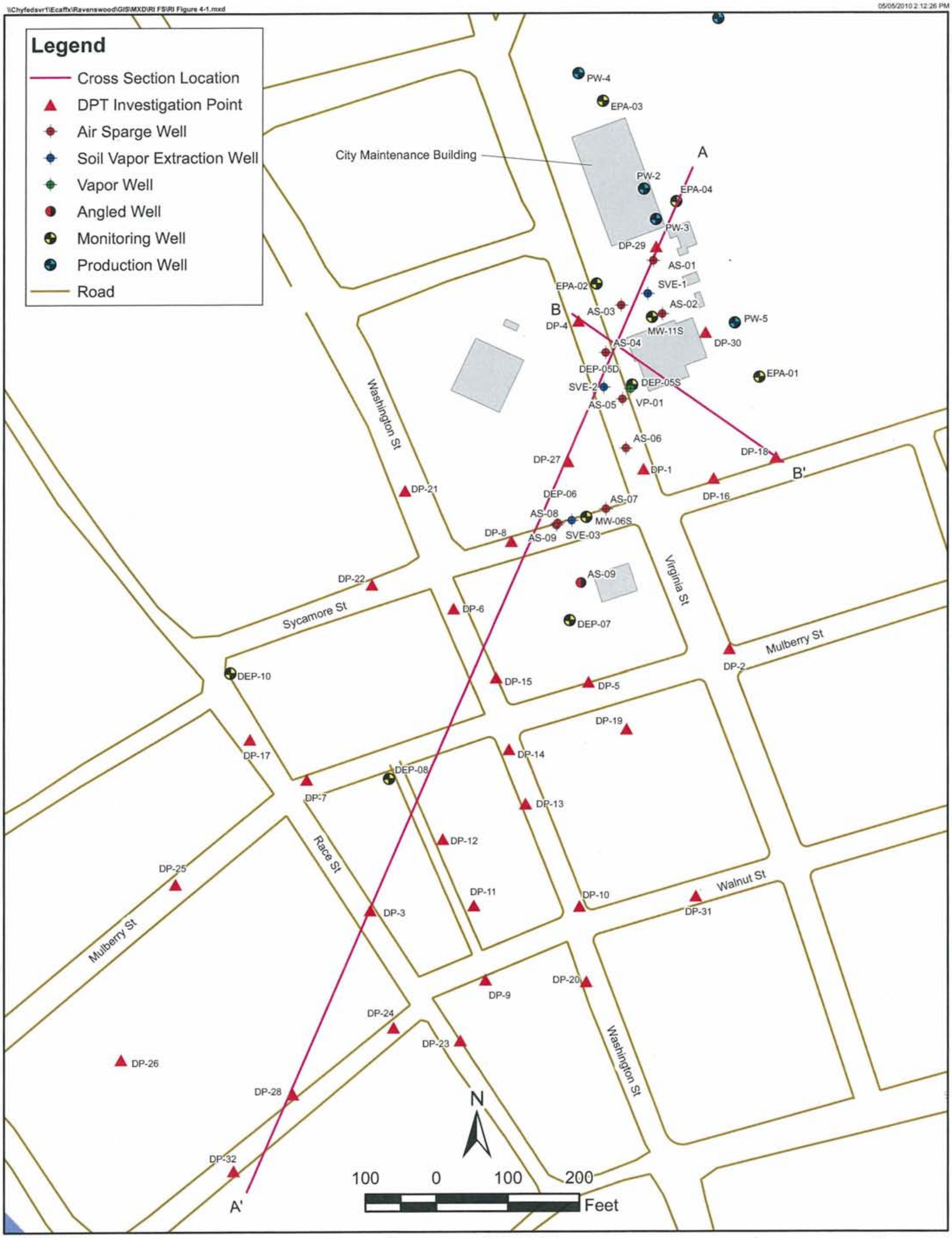

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Ravenswood PCE Site
Ravenswood, West Virginia

Figure 4-1
Location of Geologic Cross Sections

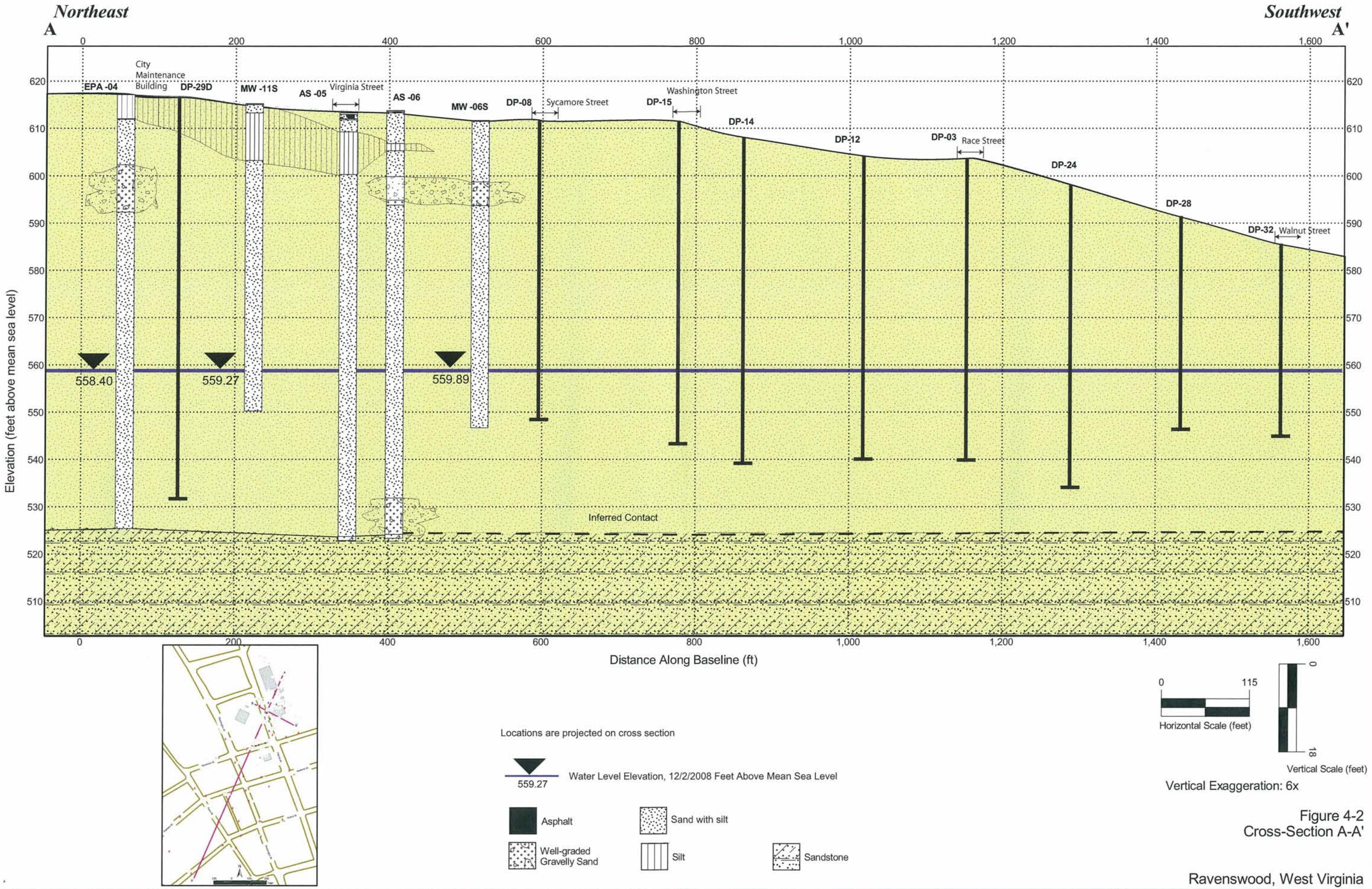

Figure 4-2
Cross-Section A-A'

Ravenswood, West Virginia

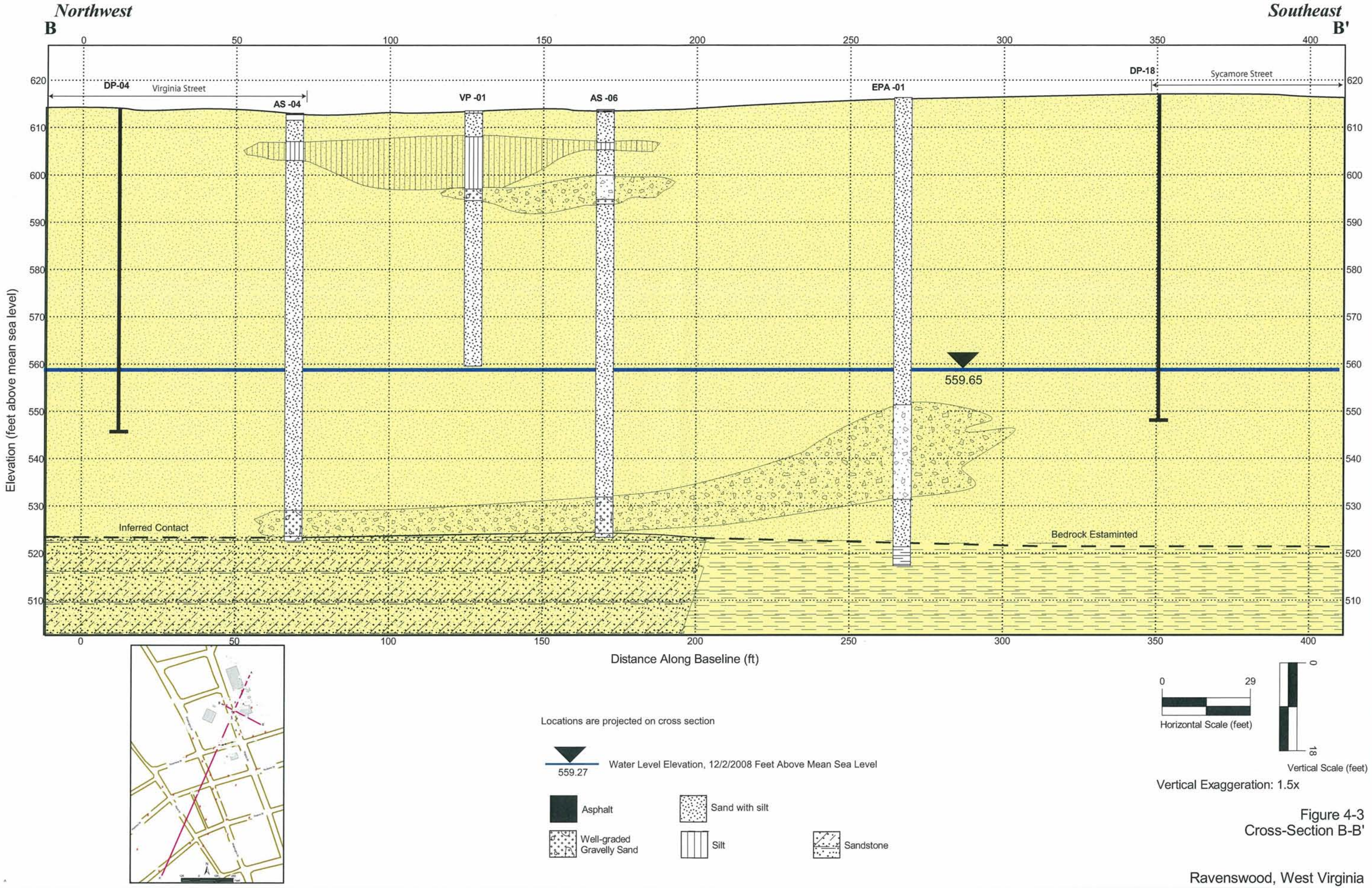

Figure 4-3
Cross-Section B-B'

Ravenswood, West Virginia

\\Chyfedsvr1\ecaffx\Ravenswood\GIS\MXD\RIFS\RI Figure 4-4.mxd

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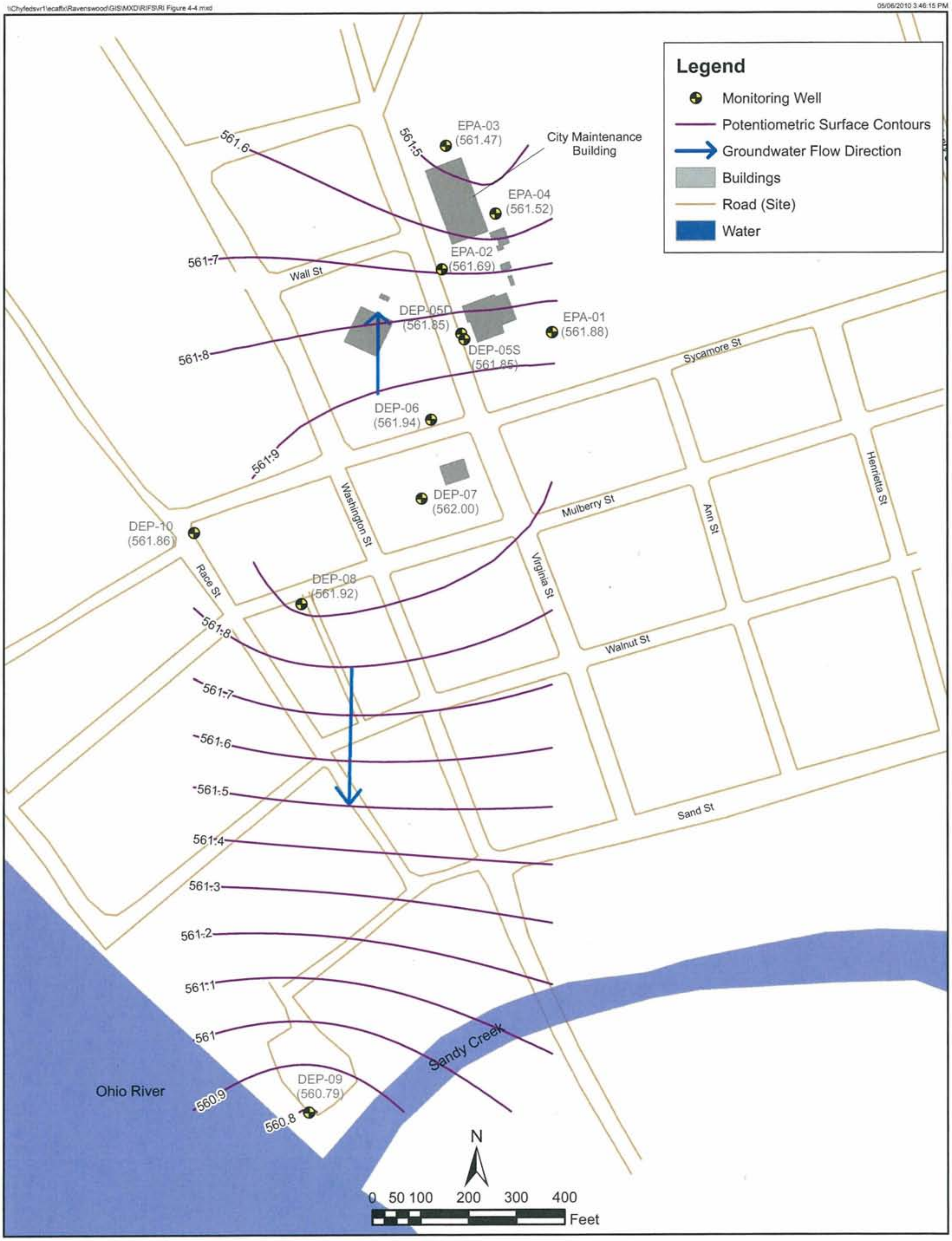

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 4-4
Potentiometric Surface Map
May 2007

Notes:
- Groundwater elevations in parentheses
- Elevations are measured in feet mean sea level (ft msl)
- Wells screened in the shallow and deep aquifer used in contouring.

\\Chyfedsvr1\ecaffx\Ravenswood\GIS\MXD\RIFS\RI Figure 4-5.mxd

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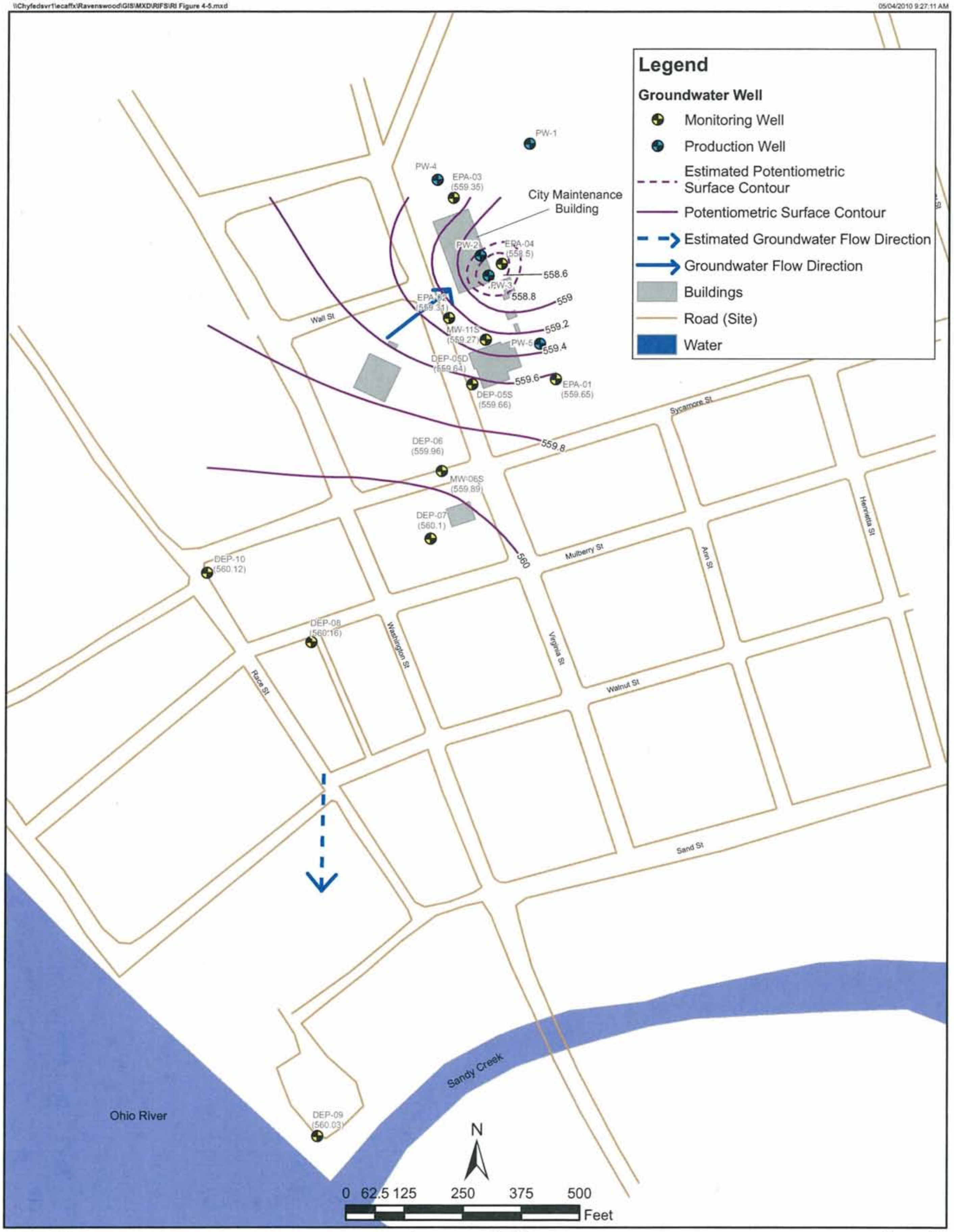

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 4-5
Potentiometric Surface Map
December 2008

Notes:
- Groundwater elevations in parentheses
- Elevations are measured in feet mean sea level (ft msl)
- Well PW-3 pumped 16 hrs/day at the time of the groundwater monitoring event. The groundwater gradient is assumed to be strongly influenced by this pumping.

\\Chyfedsvr1\Ecaffx\Ravenswood\GIS\MXD\RI FS\RI Figure 4-6.mxd

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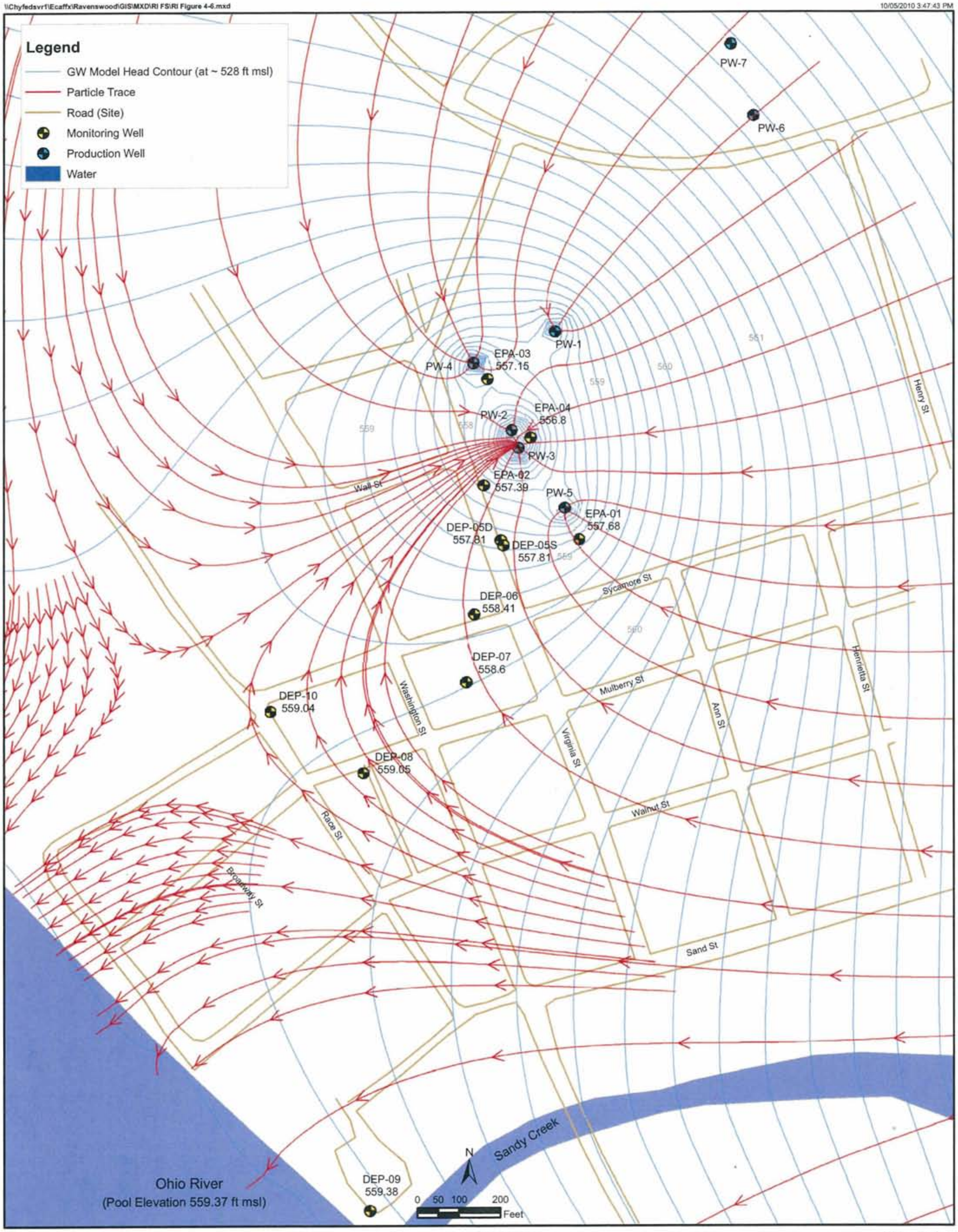

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 4-6
Estimated Head Contours - Alluvium (~ 530 ft msl)
Groundwater Flow Model Date = October 23, 2001

Notes:
- Head contour interval = 0.2 ft.
- Flowpath arrows placed at 1-yr intervals.
- Observed water levels listed beneath each monitoring well.
- Elevations are measured in feet mean sea level (ft msl)
- Ohio River pool Elevation = Low (559.37 ft msl)

\\Chyfedsvr1\Ecaffx\Ravenswood\GIS\MXD\RI FS\RI Figure 4-7.mxd

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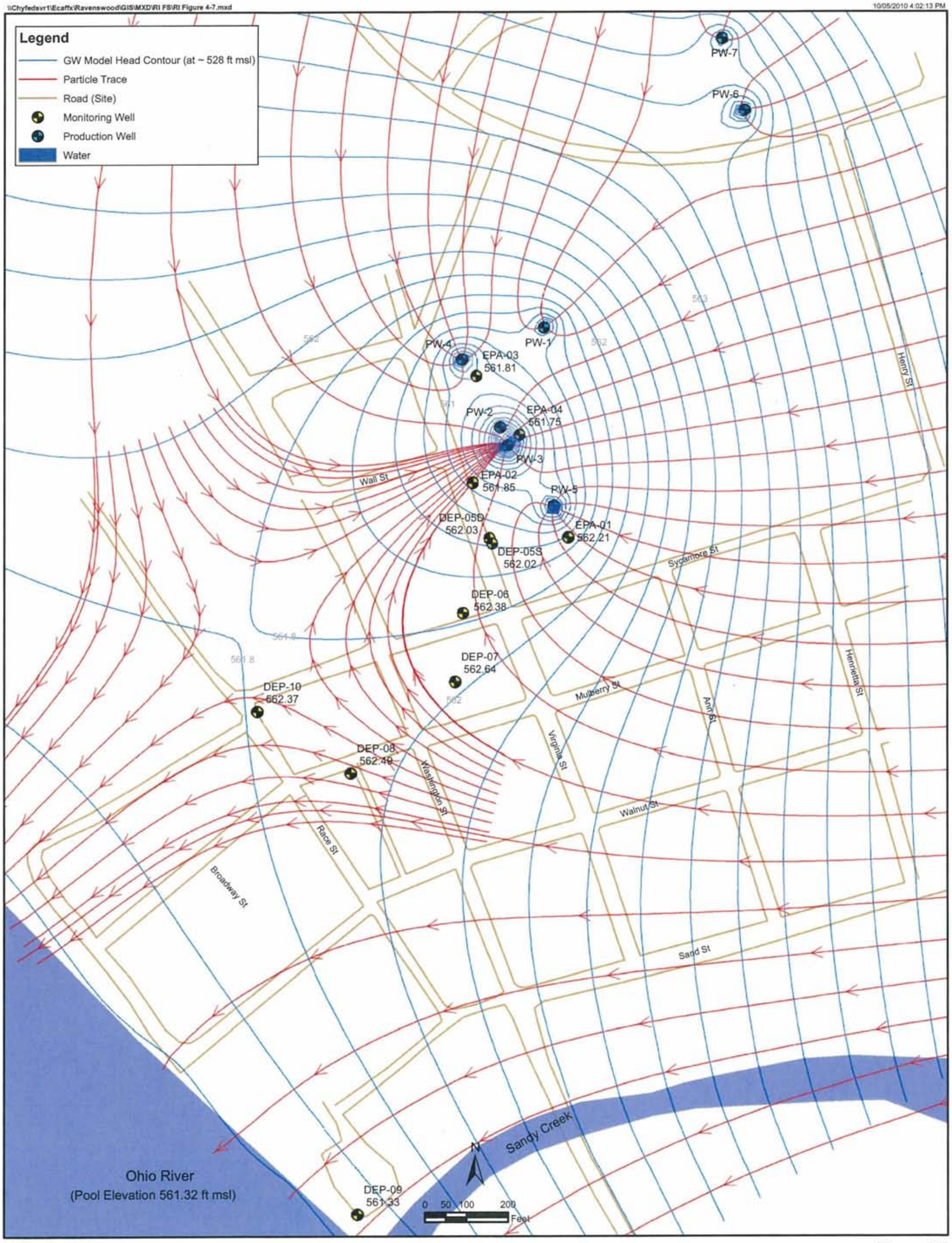

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 4-7
Estimated Head Contours - Alluvium (~530 ft msl)
Groundwater Flow Model Date = March 22, 2005

Notes:
- Head contour interval = 0.2 ft.
- Flowpath arrows placed at 1-yr intervals.
- Observed water levels listed beneath each monitoring well.
- Elevations are measured in feet mean sea level (ft msl)
- Ohio River Pool Elevation = High (561.32 ft msl)

\\Chyfedsvr1\Ecaffx\Ravenswood\GIS\MXD\RI FS\RI Figure 5-1.mxd

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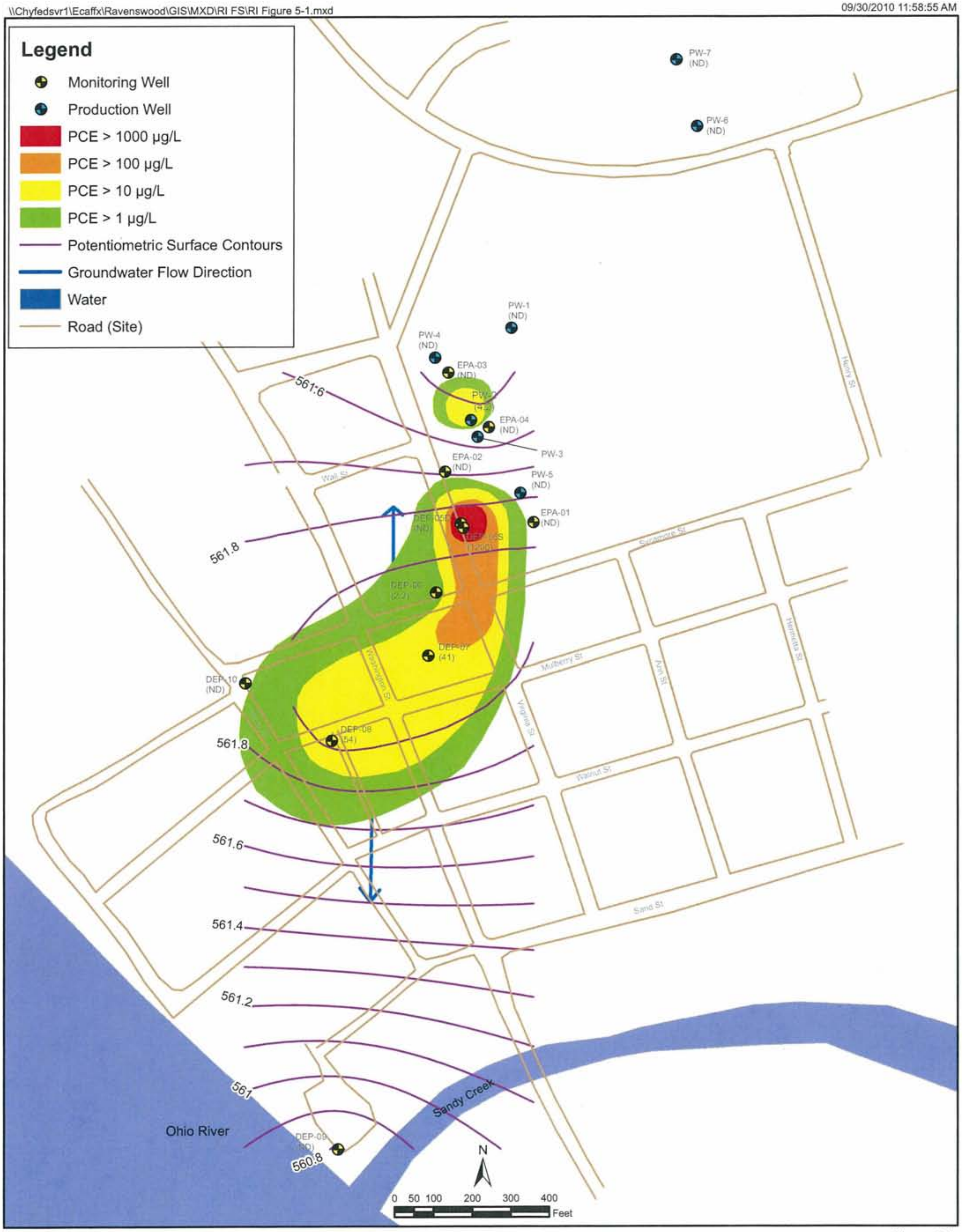
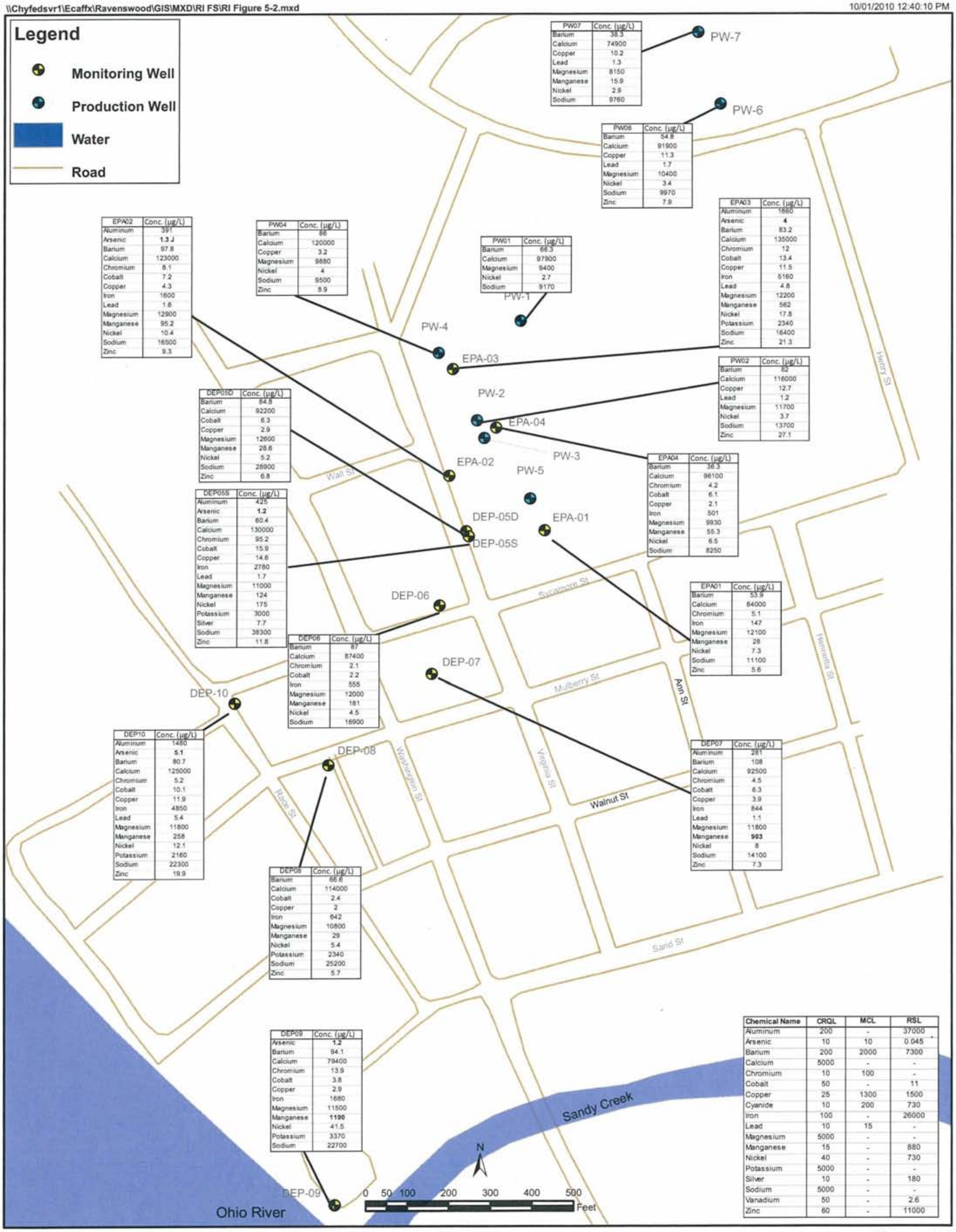


CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 5-1
PCE in Groundwater
May 2007

Notes:
- PCE concentrations in µg/L are shown in parentheses.
- Elevations are measured in feet mean sea level (ft msl).



PW07	Conc. (µg/L)
Barium	38.3
Calcium	74900
Copper	10.2
Lead	1.3
Magnesium	8150
Manganese	15.9
Nickel	2.9
Sodium	9760

PW06	Conc. (µg/L)
Barium	54.8
Calcium	91900
Copper	11.3
Lead	1.7
Magnesium	10400
Nickel	3.4
Sodium	9970
Zinc	7.9

EPA02	Conc. (µg/L)
Aluminum	391
Arsenic	**1.3 J**
Barium	97.8
Calcium	123000
Chromium	8.1
Cobalt	7.2
Copper	4.3
Iron	1600
Lead	1.6
Magnesium	12900
Manganese	95.2
Nickel	10.4
Sodium	16500
Zinc	9.3

PW04	Conc. (µg/L)
Barium	86
Calcium	120000
Copper	3.2
Magnesium	9880
Nickel	4
Sodium	9500
Zinc	8.9

PW01	Conc. (µg/L)
Barium	66.3
Calcium	97900
Magnesium	9400
Nickel	2.7
Sodium	9170

EPA03	Conc. (µg/L)
Aluminum	1660
Arsenic	**4**
Barium	83.2
Calcium	135000
Chromium	12
Cobalt	13.4
Copper	11.5
Iron	5160
Lead	4.8
Magnesium	12200
Manganese	562
Nickel	17.8
Potassium	2340
Sodium	16400
Zinc	21.3

DEP05D	Conc. (µg/L)
Barium	84.8
Calcium	92200
Cobalt	6.3
Copper	2.9
Magnesium	12600
Manganese	28.6
Nickel	5.2
Sodium	28900
Zinc	6.8

PW02	Conc. (µg/L)
Barium	82
Calcium	116000
Copper	12.7
Lead	1.2
Magnesium	11700
Nickel	3.7
Sodium	13700
Zinc	27.1

EPA04	Conc. (µg/L)
Barium	36.3
Calcium	96100
Chromium	4.2
Cobalt	6.1
Copper	2.1
Iron	501
Magnesium	9930
Manganese	55.3
Nickel	6.5
Sodium	8250

DEP05S	Conc. (µg/L)
Aluminum	425
Arsenic	**1.2**
Barium	60.4
Calcium	130000
Chromium	95.2
Cobalt	15.9
Copper	14.6
Iron	2780
Lead	1.7
Magnesium	11000
Manganese	124
Nickel	175
Potassium	3000
Silver	7.7
Sodium	38300
Zinc	11.8

EPA01	Conc. (µg/L)
Barium	53.9
Calcium	84000
Chromium	5.1
Iron	147
Magnesium	12100
Manganese	28
Nickel	7.3
Sodium	11100
Zinc	5.6

DEP06	Conc. (µg/L)
Barium	87
Calcium	87400
Chromium	2.1
Cobalt	2.2
Iron	555
Magnesium	12000
Manganese	181
Nickel	4.5
Sodium	16900

DEP10	Conc. (µg/L)
Aluminum	1480
Arsenic	**5.1**
Barium	80.7
Calcium	125000
Chromium	5.2
Cobalt	10.1
Copper	11.9
Iron	4850
Lead	5.4
Magnesium	11800
Manganese	258
Nickel	12.1
Potassium	2160
Sodium	22300
Zinc	19.9

DEP07	Conc. (µg/L)
Aluminum	281
Barium	108
Calcium	92500
Chromium	4.5
Cobalt	6.3
Copper	3.9
Iron	844
Lead	1.1
Magnesium	11800
Manganese	**903**
Nickel	8
Sodium	14100
Zinc	7.3

DEP08	Conc. (µg/L)
Barium	66.6
Calcium	114000
Cobalt	2.4
Copper	2
Iron	642
Magnesium	10800
Manganese	29
Nickel	5.4
Potassium	2340
Sodium	25200
Zinc	5.7

DEP09	Conc. (µg/L)
Arsenic	**1.2**
Barium	94.1
Calcium	79400
Chromium	13.9
Cobalt	3.8
Copper	2.9
Iron	1680
Magnesium	11500
Manganese	**1190**
Nickel	41.5
Potassium	3370
Sodium	22700

Chemical Name	CRQL	MCL	RSL
Aluminum	200	-	37000
Arsenic	10	10	0.045
Barium	200	2000	7300
Calcium	5000	-	-
Chromium	10	100	-
Cobalt	50	-	11
Copper	25	1300	1500
Cyanide	10	200	730
Iron	100	-	26000
Lead	10	15	-
Magnesium	5000	-	-
Manganese	15	-	880
Nickel	40	-	730
Potassium	5000	-	-
Silver	10	-	180
Sodium	5000	-	-
Vanadium	50	-	2.6
Zinc	60	-	11000

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 5-2
Inorganics in Groundwater
May 2007 Event

RSL = Regional Screening Level (Updated May 2010)
MCL = Maximum Contaminant Level
CRQL = Contract Required Quantitation Limit
Bold values = MCL or RSL exceeded
J - Estimated value

\\Chyfedsvr1\Ecaffx\Ravenswood\GIS\MXD\RI FS\RI Figure 5-3.mxd

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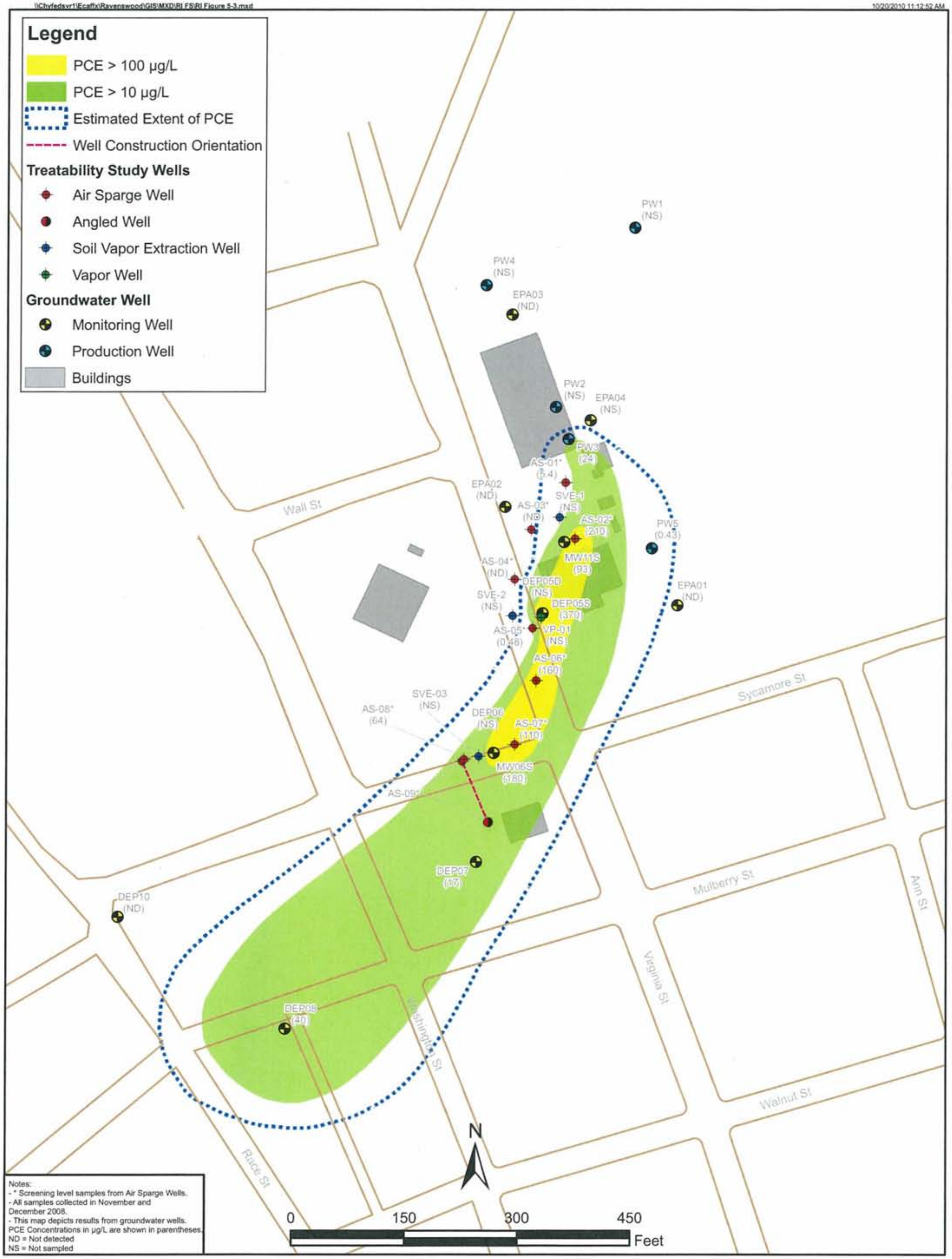

Notes:
- * Screening level samples from Air Sparge Wells.
- All samples collected in November and December 2008.
- This map depicts results from groundwater wells. PCE Concentrations in µg/L are shown in parentheses.
ND = Not detected
NS = Not sampled

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Ravenswood PCE Site
Ravenswood, West Virginia

Figure 5-3
PCE in Groundwater, 2008

\\Chyfedsvr1\Ecaffx\Ravenswood\GIS\MXD\RI FS\RI Figure 5-4.mxd

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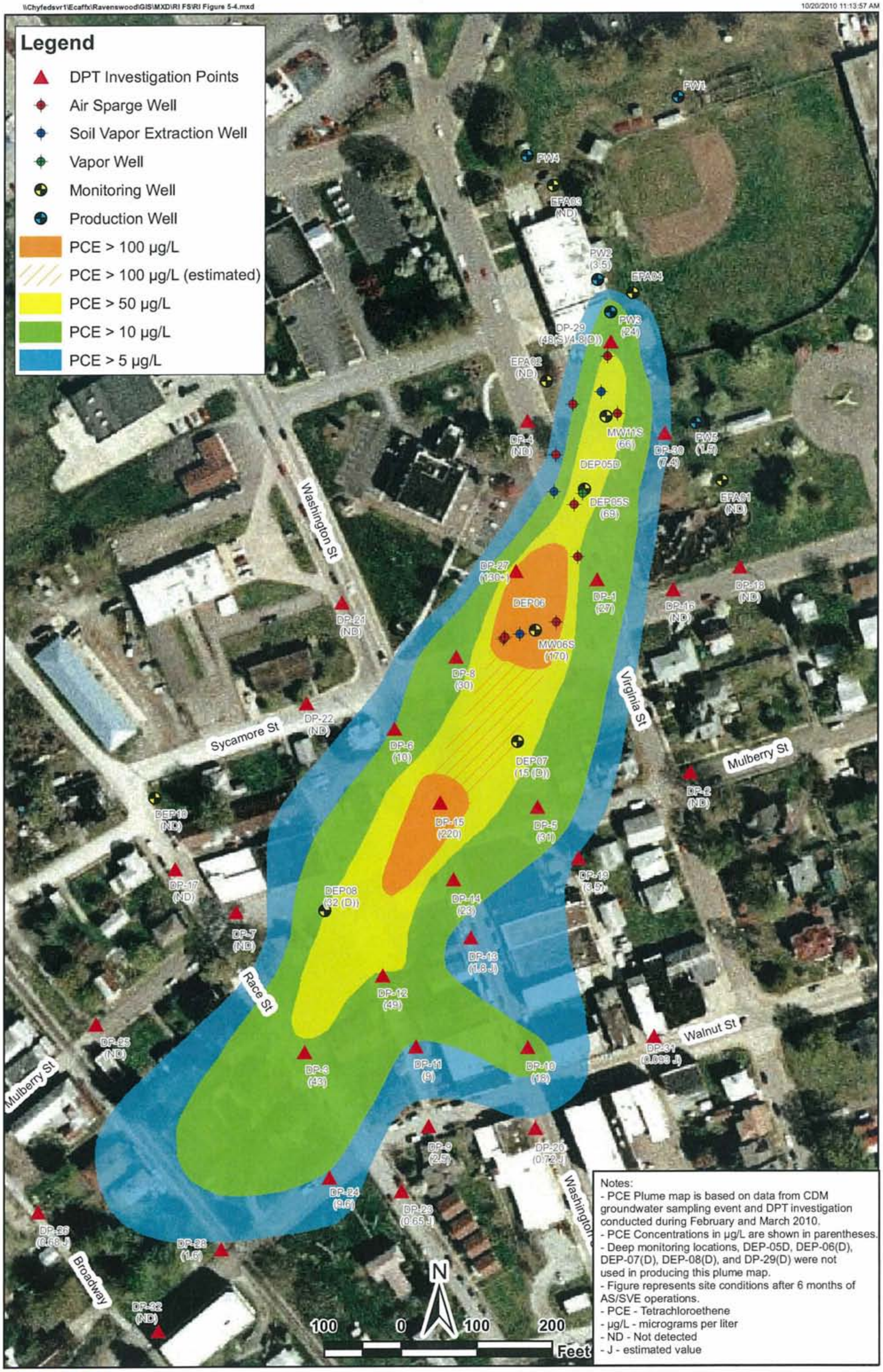
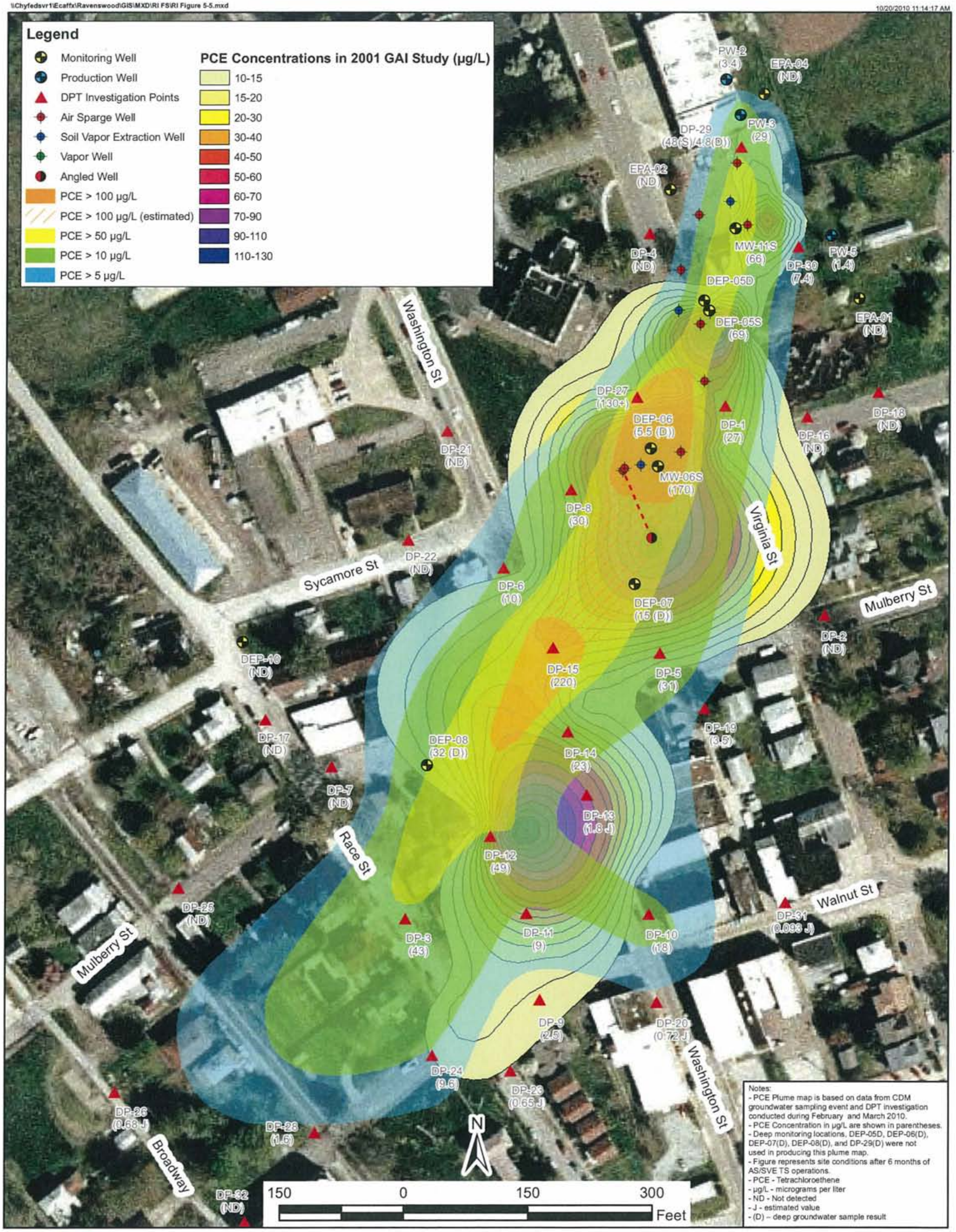


Notes:
- PCE Plume map is based on data from CDM groundwater sampling event and DPT investigation conducted during February and March 2010.
- PCE Concentrations in µg/L are shown in parentheses.
- Deep monitoring locations, DEP-05D, DEP-06(D), DEP-07(D), DEP-08(D), and DP-29(D) were not used in producing this plume map.
- Figure represents site conditions after 6 months of AS/SVE operations.
- PCE - Tetrachloroethene
- µg/L - micrograms per liter
- ND - Not detected
- J - estimated value

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 5-4
PCE in Groundwater, 2010



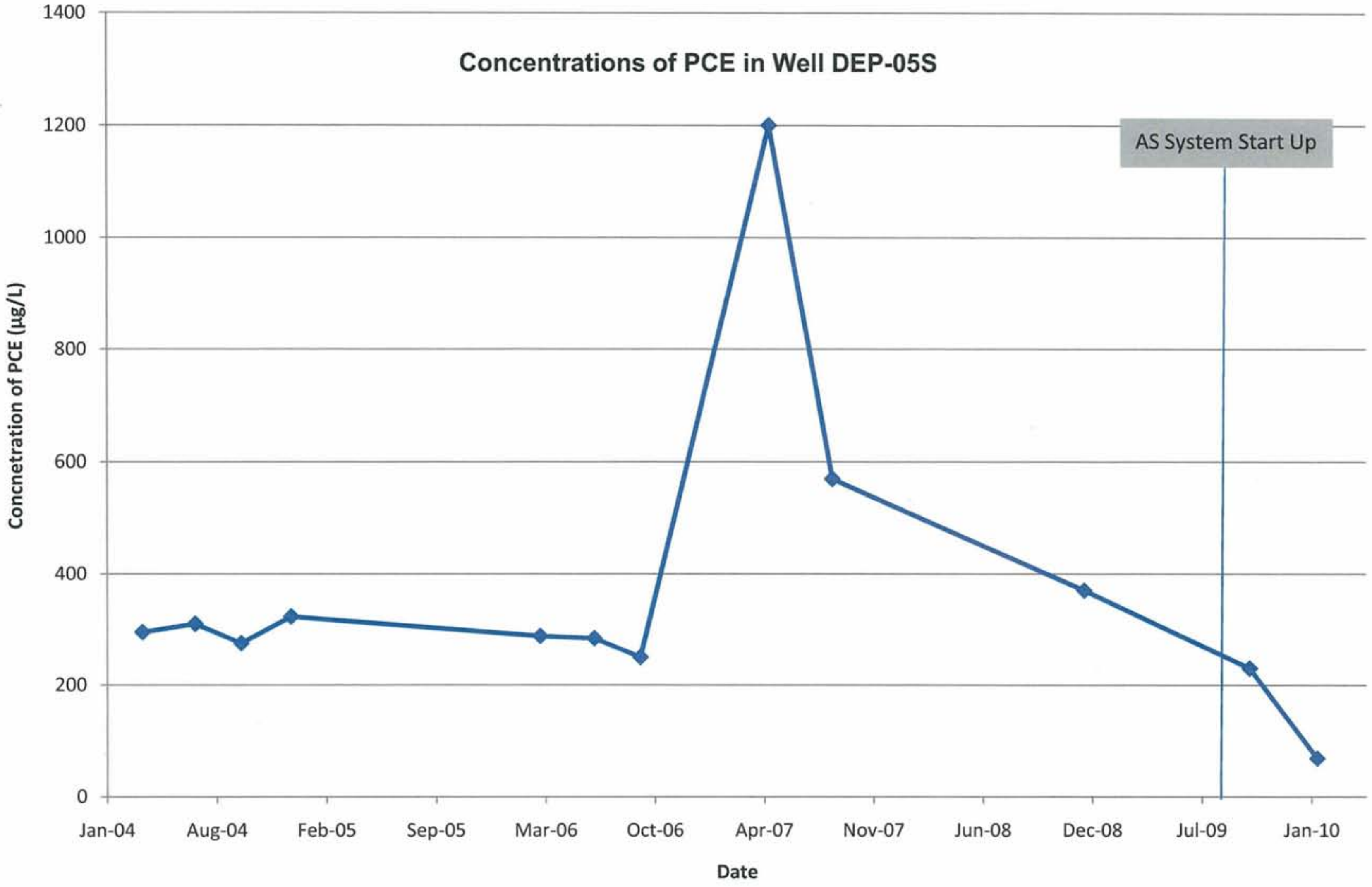
Notes:
- PCE Plume map is based on data from CDM groundwater sampling event and DPT investigation conducted during February and March 2010.
- PCE Concentration in µg/L are shown in parentheses.
- Deep monitoring locations, DEP-05D, DEP-06(D), DEP-07(D), DEP-08(D), and DP-29(D) were not used in producing this plume map.
- Figure represents site conditions after 6 months of AS/SVE TS operations.
- PCE - Tetrachloroethene
- µg/L - micrograms per liter
- ND - Not detected
- J - estimated value
- (D) -- deep groundwater sample result

CDM

Ravenswood PCE Site
Ravenswood, West Virginia

Figure 5-5
PCE in Shallow Groundwater,
2001 and 2010

Figure 6-1



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Tables

Table 3-1 Groundwater Monitoring Well Sampling Analysis

Monitoring Wells	May-07	Aug-07	Mar-08	Dec-08	Sep-09	Nov-09	Jan-10	Feb-10	Feb-10	Mar-10
DEP05D	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs		SVOCs, VOCs	SVOCs, VOCs	VOCs			VOCs		
DEP05S	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs	Aroclor, Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs		SVOCs, VOCs	VOCs			VOCs		
DEP06	Metals, Dissolved Metals, CN, PEST, SVOCs, VOCs, MNA			SVOCs, VOCs	VOCs			VOCs		
DEP07	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs, MNA			SVOCs, VOCs	VOCs			VOCs		
DEP08	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs	VOCs			VOCs		
DEP09	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs						
DEP10	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs						
EPA01	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs	VOCs			VOCs		
EPA02	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs	VOCs			VOCs		
EPA03	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs	VOCs			VOCs		
EPA04	Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs			SVOCs, VOCs	VOCs			VOCs		
MW06S				SVOCs, VOCs	VOCs			VOCs		
MW11S				SVOCs, VOCs	VOCs			VOCs		
Municpial Wells										
Municipal Drinking Water (BLEND)						VOCs	VOCs	VOCs	VOCs	VOCs
PW01	Metals, PEST, PCBs, CN, SVOCs, VOCs			SVOCs, VOCs						
PW02	Metals, PEST, PCBs, CN, SVOCs, VOCs			SVOCs, VOCs				VOCs	VOCs	VOCs
PW03		Aroclor, Metals, Dissolved Metals, CN, PEST, PCBs, SVOCs, VOCs	SVOCs, VOCs	SVOCs, VOCs	VOCs	VOCs	VOCs			
PW04	Metals, PEST, PCBs, CN, SVOCs, VOCs		SVOCs, VOCs	SVOCs, VOCs						
PW05			SVOCs, VOCs	SVOCs, VOCs		VOCs	VOCs	VOCs	VOCs	VOCs
PW06	Metals, PEST, PCBs, CN, SVOCs, VOCs		SVOCs, VOCs	SVOCs, VOCs						
PW07	Metals, PEST, PCBs, CN, SVOCs, VOCs		SVOCs, VOCs	SVOCs, VOCs						
Air Stripper Effluent (STRIPPEREFF)						VOCs	VOCs			VOCs
Air Stripper Influent (STRIPPERINF)						VOCs	VOCs			VOCs

Notes:
VOC = Volatile Organic Compounds
SVOC = Semivolatile Compounds
PEST = Pesticides
PCBs = Polychlorinated Biphenyls
Metals = Total Metals
CN = Cyanide
MNA =Monitored Natural Attenuation. Parameters include: Nitrate, Orthophosphate, Sulfate, Chemical Oxygen Demand, Total Organic Carbon
Stripper = PW03 Air stripper treatment
Blend = Drinking water composite from all municpal wells (PW3 post-treatment)

Table 3-2 Synoptic Water Level Measurements, 2007-2010

Well Number	Top of Casing Elevation (ft msl)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)	Depth to Water (ft BTOC)	Groundwater Elevation (ft msl)
Date		5/10/2007		12/2/2008		9/30/2009*		2/1/2010*	
DEP05D	613.71	51.86	561.85	54.07	559.64	54.75	558.96	54.02	559.69
DEP05S	614.06	52.21	561.85	54.40	559.66	53.88	560.18	54.46	559.60
DEP06	612.31	50.37	561.94	52.35	559.96	52.90	559.41	52.08	560.23
DEP07	611.90	49.90	562.00	51.80	560.10	52.16	559.74	51.37	560.53
DEP08	603.50	41.58	561.92	43.34	560.16	43.65	559.85	42.54	560.96
DEP09	585.98	25.19	560.79	25.95	560.03	NM	NM	NM	NM
DEP10	604.14	42.28	561.86	44.02	560.12	NM	NM	NM	NM
EPA01	615.98	54.10	561.88	56.33	559.65	56.86	559.12	56.65	559.33
EPA02	614.79	53.10	561.69	55.48	559.31	55.78	559.01	53.15	561.64
EPA03	615.80	54.33	561.47	56.45	559.35	57.16	558.64	56.55	559.25
EPA04	616.95	55.43	561.52	58.45	558.50	59.04	557.91	58.41	558.54
MW-06S	611.70	-	-	51.81	559.89	52.25	559.45	51.45	560.25
MW-11S	615.27	-	-	56.00	559.27	53.44	561.83	55.87	559.40

Notes
ft BTOC = feet below top of casing
MSL = Mean sea level
NM = Not monitored
ft msl = feet mean sea level
* = Depth to water measured throughout sampling event
\- = Data not collected

Table 3-3 Monitoring Well Construction Details

Well ID	Northing	Easting	Well Depth (ft bgs)	Well Diameter (in)	Screen Interval (ft bgs)
Air Sparge Wells					
AS-01	711249.23	1752113.69	91.3	2	89.25-91.25
AS-02	711173.88	1752126.23	90.5	2	88.5-90.5
AS-03	711186.12	1752068.16	89.3	2	87.13-89.13
AS-04	711119.24	1752046.15	88.40	2	86.4-88.4
AS-05	711053.50	1752070.08	88.75	2	87-89
AS-06	710984.00	1752074.96	89.0	2	87-89
AS-07	710897.99	1752046.67	87.17	2	85.17-87.17
AS-08	710878.02	1751978.76	86.5	2	84.5-86.5
AS-09 [1]	710875.35	1751976.76	115.0	2	110-115
Groundwater Monitoring Wells					
DEP05D	711082.03	1752074.45	90.5	4	80.5-90.5
DEP05S	711069.99	1752080.62	73	4	63-73
DEP06	710902.02	1752010.52	86.5	4	76.5-86.5
DEP07	710736.77	1751991.25	88.1	4	68.1-88.1
DEP08	710516.95	1751741.90	79	4	59-79
DEP09	709453.96	1751758.31	54	4	34-54
DEP10	710666.71	1751518.84	79	4	59-79
EPA01	711084.54	1752263.56	97.5	2	77.5-97.5
EPA02	711216.69	1752033.53	92	2	72-92
EPA03	711474.84	1752042.32	93	2	73-93
EPA04	711332.79	1752146.40	92	2	72-92
MW-06S	710886.65	1752018.96	64.0	2	44-64
MW-11S	711169.42	1752112.02	64.5	2	44.5-64.5
Vapor Monitoring Well					
VP-01	711067.89	1752081.57	50.0	2	45-50
Soil Vapor Extraction Wells					
SVE-01	711202.59	1752105.64	47.0	4	37-47
SVE-02	711070.48	1752043.53	49.0	4	39-49
SVE-03	710882.12	1751998.40	46.75	4	36.75-46.75
Municipal Wells					
PW1	711591.35	1752205.52	93*	13	83-93
PW2	711350.57	1752100.38	92*	13	82-92
PW3	711307.53	1752117.45	93*	13	83-93
PW4	711514.02	1752007.85	92*	10	82-92
PW5	711161.00	1752229.00	93*	12	83-93

Notes:

[1] Well AS-09 installed at an angle of 39.9° from vertical

in - inches

ft bgs - feet below ground surface

*Approximate value

Table 3-4 Screening-Level Groundwater Sampling Analysis

Boring	Date	Analyses	Sample Depth (ft bgs)
AS-01	11/11/08	VOCs	61
AS-02	11/04/08	VOCs	58.8
AS-03	11/10/08	VOCs	56.8
AS-04	11/08/08	VOCs	62
AS-05	11/07/08	VOCs	56.3
AS-06	11/06/08	VOCs	52.23
AS-07	11/20/08	VOCs	55
AS-08	11/19/08	VOCs	53
DP-01	2/2/2010	VOCs	56 - 61
DP-02	2/5/2010	VOCs	59 - 64
DP-03	2/8/2010	VOCs	59 - 64
DP-04	2/9/2010	VOCs	64 - 69
DP-05	2/3/2010	VOCs	59 - 64
DP-06	2/7/2010	VOCs	59 - 64
DP-07	2/8/2010	VOCs	59 - 64
DP-08	2/4/2010	VOCs	59 - 64
DP-09	2/4/2010	VOCs	54 - 59
DP-10	2/7/2010	VOCs	59 - 64
DP-11	2/15/2010	VOCs	59 - 64
DP-12	2/16/2010	VOCs	59 - 64
DP-13	2/21/2010	VOCs	64 - 69
DP-14	2/21/2010	VOCs	64 - 69
DP-15	2/21/2010	VOCs	64 - 69
DP-16	2/15/2010	VOCs	64 - 69
DP-17	2/19/2010	VOCs	64 - 69
DP-18	2/21/2010	VOCs	64 - 69
DP-19	2/9/2010	VOCs	59 - 64
DP-20	2/21/2010	VOCs	64 - 69
DP-21	2/19/2010	VOCs	64 - 69
DP-22	2/16/2010	VOCs	59 - 64
DP-23	2/18/2010	VOCs	59 - 64
DP-24	2/18/2010	VOCs	59 - 64
DP-25	2/21/2010	VOCs	54 - 59
DP-26	2/23/2010	VOCs	49 - 54
DP-27	3/16/2010	VOCs	56 - 61
DP-28	3/16/2010	VOCs	40 - 45
DP-29S	3/17/2010	VOCs	80 - 85
DP-29D	3/17/2010	VOCs	60 - 65
DP-30	3/17/2010	VOCs	60 - 65
DP-31	3/17/2010	VOCs	65 - 70
DP-32	3/18/2010	VOCs	35 - 40
MW-11S	11/17/08	VOCs	50.6

Notes:

ft bgs = feet below ground surface

Table 4-1 Vertical Groundwater Gradients, 2007-2010

	Groundwater Elevation (ft msl)		Vertical Gradient*	Groundwater Elevation (ft msl)		Vertical Gradient
Date	DEP05D	DEP05S		MW-06S	DEP06 (deep)	
03/22/05	562.03	562.02	0.01	NM	562.38	NA
03/08/05	562.33	562.35	-0.02	NM	562.68	NA
12/14/04	561.05	561.09	-0.04	NM	561.66	NA
11/30/04	561.15	561.15	0.00	NM	561.47	NA
09/14/04	560.53	560.57	-0.04	NM	561.27	NA
08/31/04	560.2	560.2	0.00	NM	560.55	NA
06/22/04	560.89	560.91	-0.02	NM	561.50	NA
06/09/04	561.23	561.23	0.00	NM	561.68	NA
03/18/04	561.04	561.08	-0.04	NM	561.66	NA
03/04/04	560.58	560.58	0.00	NM	561.09	NA
11/21/03	NM	560.18	NA	NM	560.58	NA
11/17/03	559.96	559.97	-0.01	NM	560.50	NA
08/04/03	559.84	559.87	-0.03	NM	560.44	NA
03/27/02	558.26	558.21	0.05	NM	553.93	NA
10/23/01	557.81	557.81	0.00	NM	558.41	NA
05/10/07	561.85	561.85	0.00	NM	561.94	NA
12/02/08	559.64	559.66	-0.02	559.89	559.96	-0.07
09/30/09*	558.96	560.18	-1.22	559.45	559.41	0.04
02/01/10*	559.69	559.6	0.09	560.25	560.23	0.02

NA = Not Applicable

NM = Not monitoried

* = A negative value indicates a downward vertical gradient

ft msl - feet mean sea level

Table 5-1a
Volatile Organic Compounds Detected in Monitoring Wells

Sample Location:				DEP05D	DEP05D	DEP05D	DEP05D	DEP05S	DEP05S	DEP05S	DEP05S	DEP05S	DEP06	DEP06
Sample Date:				5/8/07	12/3/08	9/30/09	2/1/10	5/8/07	8/31/07	12/3/08	10/1/09	2/1/10	5/9/07	12/3/08
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)											
Acetone	5	22000		R	R	R		R	R	R			R	R
Methylene chloride	0.5	4.8	5	1.1										
cis-1,2-Dichloroethene	0.5	370	70	2.2										
2-Butanone	0.5	7100		3.4 J					R					R
1,1,1-Trichloroethane	0.5	9100	200							0.11 J				
Tetrachloroethene	0.5	0.11	5		**0.15 J**			**1200**	**570**	**370**	**230**	**69**	**2.2**	**2.2 J**

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

R - Rejected result. Analyte may or may not be present in sample.

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1a
Volatile Organic Compounds Detected in Monitoring Wells

Sample Location:				DEP06	DEP06	DEP07	DEP07	DEP07	DEP07	DEP08	DEP08	DEP08	DEP08	DEP09	DEP09	DEP10
Sample Date:				10/1/09	2/2/10	5/9/07	12/2/08	9/30/09	2/2/10	5/9/07	12/2/08	9/30/09	2/1/10	5/8/07	12/2/08	5/9/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)													
Acetone	5	22000		R		R	R	R		R	R			R	R	R
Methylene chloride	0.5	4.8	5											1.5		
cis-1,2-Dichloroethene	0.5	370	70							0.73					0.35 J	
2-Butanone	0.5	7100					R									
1,1,1-Trichloroethane	0.5	9100	200													
Tetrachloroethene	0.5	0.11	5	**3.9**	**5.5**	**41**	**17 J**	**11**	**15**	**54**	**40 J**	**44**	**32**			

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

R - Rejected result. Analyte may or may not be present in sample.

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1a
Volatile Organic Compounds Detected in Monitoring Wells

Sample Location:				DEP10	EPA01	EPA01	EPA01	EPA01	EPA02	EPA02	EPA02	EPA02	EPA03	EPA03	EPA03	EPA03
Sample Date:				12/2/08	5/8/07	12/3/08	9/30/09	2/1/10	5/7/07	12/3/08	9/30/09	2/1/10	5/7/07	12/2/08	9/30/09	2/1/10
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)													
Acetone	5	22000		R	R	R	R			R	R		R	R	R	
Methylene chloride	0.5	4.8	5													
cis-1,2-Dichloroethene	0.5	370	70													
2-Butanone	0.5	7100														
1,1,1-Trichloroethane	0.5	9100	200													
Tetrachloroethene	0.5	0.11	5													

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

R - Rejected result. Analyte may or may not be present in sample.

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1a
Volatile Organic Compounds Detected in Monitoring Wells

Sample Location:				EPA04	EPA04	EPA04	EPA04	MW06S	MW06S	MW06S	MW11S	MW11S	MW11S
Sample Date:				5/7/07	12/2/08	9/30/09	2/1/10	12/3/08	10/1/09	2/2/10	12/3/08	10/1/09	2/2/10
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)										
Acetone	5	22000		R	R	R		R			R		
Methylene chloride	0.5	4.8	5										
cis-1,2-Dichloroethene	0.5	370	70										
2-Butanone	0.5	7100			R								
1,1,1-Trichloroethane	0.5	9100	200										
Tetrachloroethene	0.5	0.11	5					**180 J**	**230**	**170**	**93 J**	**56**	**66**

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

R - Rejected result. Analyte may or may not be present in sample.

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1b
Semivolatile Organic Compounds Detected in Monitoring Wells

Sample Location:				DEP05D	DEP05D	DEP05S	DEP05S	DEP05S	DEP06	DEP06	DEP07	DEP07	DEP08	DEP08	DEP09	DEP09	DEP10
Sample Date:				5/8/07	12/3/08	5/8/07	8/31/07	12/3/08	5/9/07	12/3/08	5/9/07	12/2/08	5/9/07	12/2/08	12/2/08	5/8/07	5/9/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)														
Di-n-butylphthalate	5	3700							0.23 J								
Pyrene	5	1100															
Bis(2-ethylhexyl)phthalate	5	4.8	6														
Di-n-octylphthalate	5																

Sample Location:				EPA01	EPA01	EPA02	EPA02	EPA03	EPA03	EPA04	EPA04	PW01	PW01	PW02	PW02	PW03	PW04
Sample Date:				5/8/07	12/3/08	5/7/07	12/3/08	5/7/07	12/2/08	5/7/07	12/2/08	5/8/07	12/3/08	5/8/07	12/3/08	8/31/07	5/8/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)														
Di-n-butylphthalate	5	3700		0.49 J													0.64 J
Pyrene	5	1100															
Bis(2-ethylhexyl)phthalate	5	4.8	6								**8.3**						
Di-n-octylphthalate	5																

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1b
Semivolatile Organic Compounds Detected in Monitoring Wells

Sample Location:				DEP10	MW06	MW06	MW11S
Sample Date:				12/2/08	12/3/08	12/3/08	12/3/08
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)				
Di-n-butylphthalate	5	3700					
Pyrene	5	1100					
Bis(2-ethylhexyl)phthalate	5	4.8	6		**330**		4.3 J
Di-n-octylphthalate	5						

Sample Location:				PW03	PW04	PW05	PW06	PW06	PW07	PW07
Sample Date:				12/3/08	12/3/08	12/3/08	5/8/07	12/3/08	5/8/07	12/3/08
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)							
Di-n-butylphthalate	5	3700				1.5 J				
Pyrene	5	1100								
Bis(2-ethylhexyl)phthalate	5	4.8	6			3 J				
Di-n-octylphthalate	5								0.2 J	

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1c
Pesticides Detected in Monitoring Wells

Sample Location:				DEP05D	DEP05S	DEP06	DEP06	DEP07	DEP08	DEP09	DEP10
Sample Date:				5/8/07	5/8/07	5/9/07	5/10/07	5/9/07	5/9/07	5/8/07	5/9/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)								
Chlordane,gamma	0.05										

Sample Location:				EPA01	EPA02	EPA03	EPA04	PW01	PW02	PW04	PW06
Sample Date:				5/8/07	5/7/07	5/7/07	5/7/07	5/8/07	5/8/07	5/8/07	5/8/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)								
Chlordane,gamma	0.05										

Sample Location:				PW07	DEP05S	DEP05S	PW03
Sample Date:				5/8/07	8/31/07	8/31/07	8/31/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)				
Chlordane,gamma	0.05					0.0011 J	

Notes:

All results are in microgram per liter (µg/L)

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1d
Total and Dissolved Metals Detected in Monitoring Wells

Sample Location:				DEP05D	DEP05D	DEP05S	DEP05S	DEP05S	DEP05S	DEP06	DEP06	DEP07	DEP07	DEP08
Sample Date:				5/8/07	5/8/07	5/8/07	5/8/07	8/31/07	8/31/07	5/9/07	5/9/07	5/9/07	5/9/07	5/9/07
Analyte	CRQL	RSL (μg/L)	MCL (μg/L)	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Aluminum	200	37000				425		1010				281		
Arsenic	10	0.045	10			**1.2**								
Barium	200	7300	2000	84.8	87.8	60.4	58	51.5 J	42.5 J	87	81.6	108	50.1	66.6
Calcium	5000			92200	96800	130000	130000	97900	99300	87400	84800	92500	91300	114000
Chromium	10		100			95.2		4.6 J		2.1		4.5		
Cobalt	50	11		6.3	5.2	15.9	3.8	3.2 J		2.2		6.3	3.6	2.4
Copper	25	1500	1300	2.9	2.1	14.6						3.9		2
CYANIDE	10	730	200											
Iron	100	26000				2780	112	2140		555		844		642
Lead	10		15			1.7						1.1		
Magnesium	5000			12600	13100	11000	9940	7240	6810	12000	11700	11800	11600	10800
Manganese	15	880		28.6	3.2	124	22.9	118	2.5 J	181	4.1	**903**	4.6	29
Nickel	40	730		5.2	4.7	175	62.1	6 J	2.3 J	4.5	3.5	8	4.9	5.4
Potassium	5000					3000	2940	2760 J	2360 J					2340
Silver	10	180				7.7								
Sodium	5000			28900	29300	38300	37700	27700 J	26700 J	16900	16600	14100	13800	25200
Vanadium	50	2.6						**2.7 J**						
Zinc	60	11000		6.8	5.4	11.8	12					7.3		5.7

Notes:

All results are in microgram per liter (μg/L)

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Bold values = MCL or RSL exceeded

- = Not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1d
Total and Dissolved Metals Detected in Monitoring Wells

Sample Location:				DEP08	DEP09	DEP09	DEP10	DEP10	EPA01	EPA01	EPA02	EPA02	EPA03	EPA03
Sample Date:				5/9/07	5/8/07	5/8/07	5/9/07	5/9/07	5/8/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Aluminum	200	37000					1480				391		1660	
Arsenic	10	0.045	10		**1.2**		**5.1**				**1.3 J**		**4**	
Barium	200	7300	2000	66.2	94.1	83.9	80.7	60.7	53.9	55.9	97.8	93.3	83.2	54.6
Calcium	5000			114000	79400	76100	125000	120000	84000	84000	123000	123000	135000	128000
Chromium	10		100		13.9		5.2		5.1		8.1		12	
Cobalt	50	11		1.4	3.8	1.8	10.1	1.5			7.2	4.6	13.4	5
Copper	25	1500	1300		2.9		11.9				4.3		11.5	
CYANIDE	10	730	200											
Iron	100	26000			1680	591	4850		147		1600		5160	
Lead	10		15				5.4				1.6		4.8	
Magnesium	5000			10500	11500	11500	11800	10200	12100	12100	12900	12700	12200	11300
Manganese	15	880		4.1	**1190**	**1070**	258	17.9	28		95.2	14	562	2.5
Nickel	40	730		4.7	41.5	8.1	12.1	4.7	7.3	4.6	10.4	5.3	17.8	6.3
Potassium	5000			2280	3370	3260	2160						2340	
Silver	10	180												
Sodium	5000			24900	22700	20500	22300	22000	11100	10800	16500	16000	16400	16000
Vanadium	50	2.6												
Zinc	60	11000					19.9		5.6		9.3		21.3	

Notes:

All results are in microgram per liter (µg/L)

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Bold values = MCL or RSL exceeded

- = Not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1d
Total and Dissolved Metals Detected in Monitoring Wells

Sample Location:				EPA04	EPA04	PW01	PW01	PW02	PW02	PW03	PW03	PW04	PW04	PW06
Sample Date:				5/7/07	5/7/07	5/8/07	5/8/07	5/8/07	5/8/07	8/31/07	8/31/07	5/8/07	5/8/07	5/8/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Aluminum	200	37000					-		-				-	
Arsenic	10	0.045	10				-		-				-	
Barium	200	7300	2000	36.3	33.9	66.3	-	82	-	73.1 J	73.6 J	86	-	54.8
Calcium	5000			96100	95500	97900	-	116000	-	98600	101000	120000	-	91900
Chromium	10		100	4.2			-		-	1.5 J			-	
Cobalt	50	11		6.1	4.5		-		-				-	
Copper	25	1500	1300	2.1			-	12.7	-			3.2	-	11.3
CYANIDE	10	730	200								4.3 J			
Iron	100	26000		501			-		-				-	
Lead	10		15				-	1.2	-				-	1.7
Magnesium	5000			9930	9750	9400	-	11700	-	10900	11100	9880	-	10400
Manganese	15	880		55.3			-		-	0.58 J			-	
Nickel	40	730		6.5	4.3	2.7	-	3.7	-	1.6 J		4	-	3.4
Potassium	5000						-		-	2060 J	2140 J		-	
Silver	10	180					-		-				-	
Sodium	5000			8250	8290	9170	-	13700	-	16900 J	26400 J	9500	-	9970
Vanadium	50	2.6					-		-				-	
Zinc	60	11000					-	27.1	-			8.9	-	7.9

Notes:

All results are in microgram per liter (µg/L)

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Bold values = MCL or RSL exceeded

- = Not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1d
Total and Dissolved Metals Detected in Monitoring Wells

Sample Location:				PW06	PW07	PW07
Sample Date:				5/8/07	5/8/07	5/8/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)	Dissolved	Total	Dissolved
Aluminum	200	37000		-		-
Arsenic	10	0.045	10	-		-
Barium	200	7300	2000	-	38.3	-
Calcium	5000			-	74900	-
Chromium	10		100	-		-
Cobalt	50	11		-		-
Copper	25	1500	1300	-	10.2	-
CYANIDE	10	730	200			
Iron	100	26000		-		-
Lead	10		15	-	1.3	-
Magnesium	5000			-	8150	-
Manganese	15	880		-	15.9	-
Nickel	40	730		-	2.9	-
Potassium	5000			-		-
Silver	10	180		-		-
Sodium	5000			-	9760	-
Vanadium	50	2.6		-		-
Zinc	60	11000		-		-

Notes:

All results are in microgram per liter (µg/L)

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Bold values = MCL or RSL exceeded

- = Not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table 5-1e
Natural Attenuation Parameters in Groundwater Wells

Chemical Name	CRQL	MCL (mg/L)	RSL (mg/L)	DEP06	DEP07
Chemical Oxygen Demand	0.01				
Dissolved Oxygen	NA			0	4.44
Nitrate	0.25	10	58	4.06	6.11
Phosphate	0.25				
Sulfate	0.25			49.5	56.9
Total Organic Carbon	3				

Notes

mg/L - miligrams per liter

All results are for samples collected 5/08/07

Blank cells indicate analyte not detected or detected in associated blank sample.

CRQL = Contract Required Quantitation Limit

MCL - maximum contaminant level, December 2009.

NA = Not applicable

RSL - Regional Screening Level - May 2010

Table 5-2
Volatile Organic Compounds Detected in Public Supply Wells

Sample Location:				BLEND	BLEND	BLEND	BLEND	BLEND	BLEND	PW1	PW1	PW2	PW2
Sample Date:				11/23/09	1/6/10	2/3/10	2/17/10	3/4/10	3/17/10	5/8/07	12/3/08	5/8/07	12/3/08
Analyte	CRQL	RSL (μg/L)	MCL (μg/L)										
Bromomethane	0.5	8.7				R							
Acetone	5	22000		R		R		R	R	R		3.7 J	R
Carbon Disulfide	0.5	1000				0.1 J							
Methylacetate	0.5	37000		R				R	R				
Methylene chloride	0.5	4.8	5									0.61	
cis-1,2-Dichloroethene	0.5	370	70										
2-Butanone	5	7100		R	R	R		R	R		R		R
Chloroform	0.5	0.019		**0.37 J**									
Cyclohexane	0.5	13000											
Carbon tetrachloride	0.5	0.2	5										
Methylcyclohexane	0.5												
Bromodichloromethane	0.5	0.12		**0.39 J**		**0.14 J**	**0.41 J**	**0.21 J**					
Tetrachloroethene	0.5	0.11	5	**0.82**	**0.62**		**0.59**	**0.74**	**0.78 L**			**4.2**	
2-Hexanone	5	47						R					
Dibromochloromethane	0.5	0.15		**0.45 J**		**0.17 J**	**0.38 J**	**0.38 J**	**0.16 J**				
Bromoform	0.5	8.5				0.086 J	0.26 J						

Notes:

All results are in microgram per liter (μg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Blend = Drinking water in distribution system

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

STRIPPEREFF = Air stripper effluent

STRIPPERINF = Air stripper influent

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-2
Volatile Organic Compounds Detected in Public Supply Wells

Sample Location:				PW2	PW2	PW2	PW2	PW3	PW3	PW3	PW3	PW3	PW4
Sample Date:				2/2/10	2/17/10	3/4/10	3/17/10	8/31/07	12/3/08	10/1/09	11/23/09	1/6/10	5/8/07
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)										
Bromomethane	0.5	8.7		R								0.96 J	
Acetone	5	22000		R			R	R	R	R		R	R
Carbon Disulfide	0.5	1000											
Methylacetate	0.5	37000					R						
Methylene chloride	0.5	4.8	5										
cis-1,2-Dichloroethene	0.5	370	70						0.16 J				
2-Butanone	5	7100		R		R	R	R					
Chloroform	0.5	0.019											
Cyclohexane	0.5	13000											
Carbon tetrachloride	0.5	0.2	5										
Methylcyclohexane	0.5												
Bromodichloromethane	0.5	0.12											
Tetrachloroethene	0.5	0.11	5	**1.9**	**3.5 J**	**3.4**	**5 L**	**30**	**24 J**	**14**	**28**	**29**	
2-Hexanone	5	47											
Dibromochloromethane	0.5	0.15											
Bromoform	0.5	8.5											

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Blend = Drinking water in distribution system

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

STRIPPEREFF = Air stripper effluent

STRIPPERINF = Air stripper influent

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-2
Volatile Organic Compounds Detected in Public Supply Wells

Sample Location:				PW4	PW5	PW5	PW5	PW5	PW5	PW5	PW5	PW6	PW6
Sample Date:				12/3/08	12/3/08	11/23/09	1/6/10	2/2/10	2/17/10	3/4/10	3/17/10	5/8/07	12/3/08
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)										
Bromomethane	0.5	8.7						R					
Acetone	5	22000				R		R			R	3.7 J	
Carbon Disulfide	0.5	1000											
Methylacetate	0.5	37000				R					R		
Methylene chloride	0.5	4.8	5										
cis-1,2-Dichloroethene	0.5	370	70										
2-Butanone	5	7100		R	R	R	R	R		R	R		R
Chloroform	0.5	0.019					**0.22 J**	**0.53**			**0.30 J**		
Cyclohexane	0.5	13000											
Carbon tetrachloride	0.5	0.2	5										
Methylcyclohexane	0.5												
Bromodichloromethane	0.5	0.12											**0.15 J**
Tetrachloroethene	0.5	0.11	5		**0.43 J**	**0.54**	**0.55**	**1.2**	**1.5 J**	**1.4**	**1.8 L**		
2-Hexanone	5	47											
Dibromochloromethane	0.5	0.15											
Bromoform	0.5	8.5											

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Blend = Drinking water in distribution system

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

STRIPPEREFF = Air stripper effluent

STRIPPERINF = Air stripper influent

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-2
Volatile Organic Compounds Detected in Public Supply Wells

Sample Location:				PW7	PW7	STRIPPEREFF	STRIPPEREFF	STRIPPEREFF	STRIPPEREFF	STRIPPERINF
Sample Date:				5/8/07	12/3/08	11/23/09	1/6/10	3/4/10	3/17/10	11/23/09
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)							
Bromomethane	0.5	8.7								
Acetone	5	22000		R		R	R		R	
Carbon Disulfide	0.5	1000								
Methylacetate	0.5	37000				R			R	
Methylene chloride	0.5	4.8	5							
cis-1,2-Dichloroethene	0.5	370	70					R		
2-Butanone	5	7100			R	R	R		R	
Chloroform	0.5	0.019								
Cyclohexane	0.5	13000								
Carbon tetrachloride	0.5	0.2	5							
Methylcyclohexane	0.5									
Bromodichloromethane	0.5	0.12			**0.41 J**					
Tetrachloroethene	0.5	0.11	5			**2.1**	**11**			**11**
2-Hexanone	5	47								
Dibromochloromethane	0.5	0.15			0.13 J					
Bromoform	0.5	8.5								

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Blend = Drinking water in distribution system

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

STRIPPEREFF = Air stripper effluent

STRIPPERINF = Air stripper influent

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-2
Volatile Organic Compounds Detected in Public Supply Wells

Sample Location: Sample Date:				STRIPPERINF 1/6/10	STRIPPERINF 3/4/10	STRIPPERINF 3/17/10
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)			
Bromomethane	0.5	8.7				
Acetone	5	22000		R		R
Carbon Disulfide	0.5	1000				
Methylacetate	0.5	37000				R
Methylene chloride	0.5	4.8	5			
cis-1,2-Dichloroethene	0.5	370	70			
2-Butanone	5	7100			R	R
Chloroform	0.5	0.019			**0.29 J**	**0.27 J**
Cyclohexane	0.5	13000				
Carbon tetrachloride	0.5	0.2	5			
Methylcyclohexane	0.5					
Bromodichloromethane	0.5	0.12				
Tetrachloroethene	0.5	0.11	5	**2.6 J**	**1.2**	**1.8 L**
2-Hexanone	5	47				
Dibromochloromethane	0.5	0.15				
Bromoform	0.5	8.5				

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Blend = Drinking water in distribution system

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

STRIPPEREFF = Air stripper effluent

STRIPPERINF = Air stripper influent

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-3
Volatile Organic Compounds Detected in Screening-Level Groundwater Sampling, 2008

Sample Location:				AS01	AS02	AS03	AS04	AS05	AS06	AS07	AS08	MW11S
Sample Date:				11/11/08	11/4/08	11/10/08	11/8/08	11/7/08	11/6/08	11/20/08	11/19/08	11/17/08
Analyte	CRQL	RSL (µg/L)	MCL (µg/L)									
Chloromethane	0.5	190				0.2 J		0.1 J			0.19 J	0.13 J
Carbon Disulfide	0.5	1000				0.12 J		0.15 J				
Methylacetate	0.5	37000		2.3				0.99				
2-Butanone	5	7100			R	760 L		580 L	R	3.6 J	5.7 J	2.5 J
Cyclohexane	0.5	13000				0.16 J	0.13 J	0.19 J		0.14 J		
Benzene	0.5	0.41	5	**0.59**		0.4 J	**0.67**			**0.72**	**0.66**	0.33 J
Trichloroethene	0.5	2	5							0.13 J	0.17 J	
Methylcyclohexane	0.5									0.13 J	0.33 J	0.17 J
Toluene	0.5	2300	1000	0.62		0.27 J	0.53	0.49 J		0.63	0.66	0.4 J
Tetrachloroethene	0.5	0.11	5	**5.4**	**210**			**0.48 J**	**140**	**110**	**64**	**16**
Ethylbenzene	0.5	1.5	700	0.11 J							0.11 J	
o-Xylene	0.5	1200		0.1 J								
m,p-Xylene	0.5			0.28 J			0.26 J	0.31 J		0.15 J	0.23 J	0.18 J

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R - Rejected result. Analyte may or may not be present in sample.

Table 5-4
Volatile Organic Compounds Detected in Screening-Level Groundwater Sampling, 2010

Sample Location: Sample Date:				DP-01 2/2/10	DP-02 2/5/10	DP-03 2/8/10	DP-04 2/9/10	DP-05 2/3/10	DP-06 2/7/10	DP-07 2/8/10	DP-08 2/4/10	DP-09 2/4/10
Analytes	CRQL	RSL (µg/L)	MCL (µg/L)									
1,4-Dichlorobenzene	5	0.43	75									
Acetone	10	22000		8.4 J	3.9 J		4 J					
Bromodichloromethane	5	0.12						**0.56 J**				
Carbon Disulfide	5	1000		0.59 J								
Chloroform	5	0.19										
cis-1,2-Dichloroethene	0.5	370	70									
Cyclohexane	5	13000		0.58 J							0.5 J	
Tetrachloroethene	5	0.11	5	**27**		**40**		**31**	**10**		**30**	**2.5 J**
Toluene	0.5	2300	1000									
trans-1,2-Dichloroethene	0.5	110	100									
Trichloroethene	0.5	2	5									

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank sample.

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table 5-4
Volatile Organic Compounds Detected in Screening-Level Groundwater Sampling, 2010

Sample Location:				DP-10	DP-11	DP-12	DP-13	DP-14	DP-15	DP-16	DP-17	DP-18	DP-19	DP-20	DP-21	DP-22
Sample Date:				2/7/10	2/15/10	2/16/10	2/21/10	2/21/10	2/20/10	2/15/10	2/19/10	2/22/10	2/9/10	2/20/10	2/19/10	2/16/10
Analytes	CRQL	RSL (µg/L)	MCL (µg/L)													
1,4-Dichlorobenzene	5	0.43	75													
Acetone	10	22000		6.1 J	3.6 J					3.9 J		4.8 J				
Bromodichloromethane	5	0.12														
Carbon Disulfide	5	1000		0.43 J		0.43 J										0.57 J
Chloroform	5	0.19		**0.58 J**												
cis-1,2-Dichloroethene	0.5	370	70													
Cyclohexane	5	13000														
Tetrachloroethene	5	0.11	5	**18**	**9**	**49**	**1.8 J**	**23**	**220**				**3.5 J**	**0.72 J**		
Toluene	0.5	2300	1000													
trans-1,2-Dichloroethene	0.5	110	100													
Trichloroethene	0.5	2	5													

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank samp

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table 5-4
Volatile Organic Compounds Detected in Screening-Level Groundwater Sampling, 2010

Sample Location:				DP-23	DP-24	DP-25	DP-26	DP-27	DP-28	DP-29D	DP-29S	DP-30	DP-31	DP-32
Sample Date:				2/18/10	2/18/10	2/22/10	2/23/10	3/16/10	3/16/10	3/17/10	3/17/10	3/17/10	3/17/10	3/18/10
Analytes	CRQL	RSL (µg/L)	MCL (µg/L)											
1,4-Dichlorobenzene	5	0.43	75	**0.66 J**										
Acetone	10	22000				5.9 J		R	R			R	R	R
Bromodichloromethane	5	0.12						**0.18 J**				**0.27 J**		
Carbon Disulfide	5	1000		0.44 J				R	R			R	R	R
Chloroform	5	0.19										**0.5 L**		
cis-1,2-Dichloroethene	0.5	370	70						10 L					
Cyclohexane	5	13000						R	R			R	R	R
Tetrachloroethene	5	0.11	5	**0.65 J**	**9.6**		**0.68 J**	**130 L**	**1.6 L**	**4.8 J**	**48 L**	**7.4 L**		**0.11 J**
Toluene	0.5	2300	1000										0.11 J	
trans-1,2-Dichloroethene	0.5	110	100						0.31 J					
Trichloroethene	0.5	2	5						**8.6 L**					

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected or detected in associated blank samp

Bold values = MCL or RSL exceeded

CRQL - contract required quantitation limit

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table 6-1
Chemical and Physical Properties of Ravenswood Organic Groundwater COPC

Compound	Solubility (mg/L at 25° C unless noted)	Bioconcentration Factor	log K_{oc}	Photolysis Potential	Biodegradation	Henry's Law Constant
Tetrachloroethene	150	39 - 49 in fish, not expected to bioconcentrate in aquatic organisms.	2.32 - 3.22	Does not readily undergo photolysis, but is biodegraded by microorganisms.	Slow biodegradation of PCE occurs under anaerobic conditions when the microorganisms have been acclimated. Will not be expected to significantly biodegrade in water or adsorb to sediment.	0.0177

Notes:

mg/L - milligrams per liter

°C - Degrees Celsius

K_{oc} - log of the organic carbon coefficient

Table 6-2 Chemical and Physical Properties of Ravenswood Inorganic Groundwater COPCs

Compound	Common Oxidation State	Solubility	Oxidation Reduction	Hydrolysis	Sorption	Volatilization	Biological Processes
Arsenic	+5, +3, -3	Oxides are slightly soluble	Under oxidizing conditions, soluble As oxide form. As is insoluble under reducing conditions.	Hydrolyzes to soluble forms.	Strongly adsorbs to iron, manganese, aluminum and clays.	—	Bioconcentration occurs in aquatic organisms, primarily in algae and lower invertebrates. Both bottom-feeding and predatory fish can accumulate As. Bottom-feeders are readily exposed to the greater quantities of metals that accumulate in sediments. Predators may bioaccumulate metals from the surrounding water or from feeding on other fish, including bottom-feeders, which can result in the biomagnification of the metals in their tissues.
Chromium	+2, +3, +6	CrO_2 is very soluble	Important for the formation of Cr+3.	Forms insoluble hydroxides at neutral or alkaline pH.	Adsorption predominant at neutral to high pH. Cr+6 mobile at pH of 4 to 9.	—	Chromium does not bioconcentrate in fish. There is no indication of biomagnification of chromium along the aquatic food chain.
Cobalt	+2, +3	Soluble in dilute acids.	—	—	—	—	Only a few plant species bioaccumulate cobalt over 100 ppm.
Iron	+2, +3	Insoluble. Oxides and hydroxides are soluble.	Oxidation of Fe(II) leads to Fe(III) which forms $FeOH_3$, or rust.	Fe-bearing minerals hydrolyze to form iron oxides.	Does not sorb strongly to soil materials.	—	Marine organisms accumulate and excrete Fe in clean water. Accumulation of Fe by marine organisms appears not to pose a hazard to higher trophic levels.

Table 6-2 Chemical and Physical Properties of Ravenswood Inorganic Groundwater COPCs

Compound	Common Oxidation State	Solubility	Oxidation Reduction	Hydrolysis	Sorption	Volatilization	Biological Processes
Manganese	+2, +3, +4, +7	Soluble in dilute acids Mn(II) predominates in most waters (pH 4 – 7). Principal anion associated with Mn(II) water is usually carbonate, and concentration of Mn is limited by the relatively low solubility (65 mg/L) of $MnCO_3$.	In relatively oxidized water, Mn(II) may be converted to the Mn(II) or Mn(IV) oxidation states. In extremely reduced water, fate controlled by formation of poor soluble sulfide. May be oxidized at a pH >8 or 9.	—	At low concentrations, Mn may be "fixed" by clays and not released into solution. The higher the organic content of soils or sediments, the more Mn is sorbed.	—	Mn in water may be significantly bioconcentrated at lower trophic levels. The BCF was 2,500 – 6,300 for phytoplankton, 300 – 5,500 for marine algae, 800 – 830 for intertidal mussels, and 35 – 930 for coastal fish.
Total Nickel	2	Low solubility under natural conditions.	Oxidizes with sulfides in air, usually in oxide form (NiO).	—	Strong coprecipitation with metal oxides.	—	Some bioaccumulation occurs.

Note: "—" = No Data Available

ppm - parts per million

mg/L - milligram per liter

BCF - bioconcentration factor

Appendix A
Analytical Data

Table A-1
VOCs in Public Wells, 1989

Sample Location: Sample Date:				BLEND-198906 6/19/89	BLEND-198909 9/15/89	PW1-198910A 10/13/89	PW1-198910B 10/16/89	PW1-198911 11/28/89	PW1-198912 12/6/89
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)						
Tetrachloroethene	μg/L	0.11	5	U	7	U	U	U	U

Sample Location: Sample Date:				PW2-198910A 10/13/89	PW2-198910B 10/16/89	PW2-198911 11/28/89	PW2-198912 12/6/89	PW3-198910A 10/13/89	PW3-198910B 10/16/89
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)						
Tetrachloroethene	μg/L	0.11	5	5	U	U	U	6	6

Sample Location: Sample Date:				PW3-198911 11/28/89	PW3-198912 12/6/89	PW4-198910A 10/13/89	PW4-198910B 10/16/89	PW4-198911 11/28/89	PW4-198912 12/6/89
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)						
Tetrachloroethene	μg/L	0.11	5	4	4	U	U	U	U

Sample Location: Sample Date:				PW5-198910A 10/13/89	PW5-198910B 10/16/89	PW5-198911 11/28/89	PW5-198912 12/6/89
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)				
Tetrachloroethene	μg/L	0.11	5	U	U	U	U

Notes:

μg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI Consultants Inc., July 13, 2001.

Table A-2
VOCs in Public Wells, 1990-1999

Sample Location:				BLEND-199003	BLEND-199203	BLEND-199206	BLEND-199208	BLEND-199209	BLEND-199303A	BLEND-199303B
Sample Date:				3/19/90	3/29/92	6/3/92	8/31/92	9/2/92	3/22/93	3/24/93
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	0.6	U	U	U	U	0.5	0.5

Sample Location:				BLEND-199311A	BLEND-199311B	BLEND-199411A	BLEND-199411B	BLEND-199501	BLEND-199504	BLEND-199507
Sample Date:				11/16/93	11/9/93	11/14/94	11/20/94	1/9/95	4/3/95	7/11/95
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	2.5	2.5	4.9	4.9	8.2	U	0.7

Sample Location:				BLEND-199601	BLEND-199602	BLEND-199701	BLEND-199803	BLEND-199804	BLEND-199809	BLEND-199811A
Sample Date:				1/29/96	2/8/96	1/8/97	3/23/98	4/7/98	9/16/98	11/23/98
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	7.6	10.8	1.2	U	0.5

Sample Location:				BLEND-199811B	BLEND-199901	BLEND-199902	BLEND-199903	BLEND-199905	BLEND-199911	PW1-199003A
Sample Date:				11/30/98	1/6/99	2/3/99	3/2/99	5/10/99	11/1/99	3/19/90
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	0.5	3.3	3.3	1.4	1.5	5.6	U

Sample Location:				PW1-199003B	PW1-199006	PW1-199009	PW1-199112	PW1-199212	PW1-199808	PW1-199811
Sample Date:				3/13/90	6/14/90	9/13/90	12/11/91	12/14/92	8/12/98	11/30/98
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U

Sample Location:				PW1-199901	PW1-199903	PW1-199905	PW2-199003A	PW2-199003B	PW2-199006	PW2-199009
Sample Date:				1/6/99	3/2/99	5/10/99	3/13/90	3/19/90	6/14/90	9/13/90
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	0.2	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI Consultants Inc., July 13, 2001.

Table A-2
VOCs in Public Wells, 1990-1999

Sample Location:				PW2-199112	PW2-199212	PW2-199808	PW2-199811	PW2-199901	PW2-199903	PW2-199905
Sample Date:				12/11/91	12/14/92	8/12/98	11/30/98	1/6/99	3/2/99	5/10/99
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	8.3	U	U	U	U

Sample Location:				PW3-199003A	PW3-199003B	PW3-199006	PW3-199009	PW3-199112	PW3-199212	PW3-199808
Sample Date:				3/19/90	3/13/90	6/14/90	9/13/90	12/11/91	12/14/92	8/12/98
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	1.9	1.9	20.6	13.7	20	43	73.3

Sample Location:				PW3-199811	PW3-199901	PW3-199903	PW3-199905	PW3-199911	PW4-199003A	PW4-199003B
Sample Date:				11/30/98	1/6/99	3/2/99	5/10/99	11/1/99	3/19/90	3/13/90
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	12.8	22	29.8	24.8	23.7	U	U

Sample Location:				PW4-199006	PW4-199009	PW4-199112	PW4-199212	PW4-199808	PW4-199811	PW4-199901
Sample Date:				6/14/90	9/13/90	12/11/91	12/14/92	8/12/98	11/30/98	1/6/99
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U

Sample Location:				PW4-199903	PW4-199905	PW5-199003A	PW5-199003B	PW5-199006	PW5-199009	PW5-199112
Sample Date:				3/2/99	5/10/99	3/19/90	3/13/90	6/14/90	9/13/90	12/11/91
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	2.3	2.3	4.6	U	2.4

Sample Location:				PW5-199212	PW5-199808	PW5-199811	PW5-199901	PW5-199903	PW5-199905	PW5-199911
Sample Date:				12/14/92	8/12/98	11/30/98	1/6/99	3/2/99	5/10/99	11/1/99
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	0.9	3.1	10.7	5.9	7.8	21.7

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI (

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				BLEND-200001	BLEND-200002	BLEND-200003	BLEND-200009	BLEND-200101
Sample Date:				1/3/00	2/1/00	3/7/00	9/11/00	1/3/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				BLEND-200102	BLEND-200103	BLEND-200104	BLEND-200105	BLEND-200106
Sample Date:				2/7/01	3/8/01	4/2/01	5/2/01	6/5/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	1.1	1.2	1.77	1	1.15

Sample Location:				BLEND-200107	BLEND-200108	BLEND-200109	BLEND-200110	BLEND-200111
Sample Date:				7/9/01	8/8/01	9/4/01	10/3/01	11/1/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				BLEND-200112	BLEND-200201	BLEND-200202A	BLEND-200202B	BLEND-200203
Sample Date:				12/4/01	1/2/02	2/11/02	2/19/02	3/5/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				BLEND-200204	BLEND-200205	BLEND-200206	BLEND-200207	BLEND-200208
Sample Date:				4/2/02	5/6/02	6/4/02	7/8/02	8/5/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				BLEND-200209	BLEND-200210	BLEND-200211	BLEND-200212	DEP10T-200110
Sample Date:				9/4/02	10/1/02	11/6/02	12/2/02	10/8/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	1.23	1.31	1.59	1.2

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI Consultants Inc., July 13, 2001.

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				DEP10T-200204	DEP5DT-200110	DEP5DT-200204	DEP5ST-200110	DEP5ST-200204
Sample Date:				4/1/02	10/8/01	4/1/02	10/8/01	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	7.8	U	324	430 J

Sample Location:				DEP6T-200110	DEP6T-200204	DEP7T-200110	DEP7T-200204	DEP8T-200110
Sample Date:				10/8/01	4/1/02	10/8/01	4/1/02	10/8/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	21.3	3 J	19.5	130	2.6

Sample Location:				DEP8T-200204	DEP9T-200110	DEP9T-200204	EFF-200005A	EFF-200005B
Sample Date:				4/1/02	10/8/01	4/1/02	5/17/00	5/19/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	35	U	U	4.2	3.5

Sample Location:				EFF-200005C	EFF-200006A	EFF-200006B	EFF-200007	EFF-200008
Sample Date:				5/22/00	6/6/00	6/6/00	7/5/00	8/7/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	4.1	2.8	3.8	3.3	2.4

Sample Location:				EFF-200009	EFF-200010	EFF-200011	EFF-200101	EFF-200102
Sample Date:				9/11/00	10/3/00	11/1/00	1/3/01	2/7/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	2.3	3.6	2.9	3.6	2.59

Sample Location:				EFF-200103	EFF-200104	EFF-200105	EFF-200106	EFF-200107
Sample Date:				3/8/01	4/2/01	5/2/01	6/5/01	7/9/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	3.78	5.21	4	3.48	2.34

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				EFF-200108	EFF-200109	EFF-200110	EFF-200111	EFF-200112	EFF-200201
Sample Date:				8/8/01	9/4/01	10/3/01	11/1/01	12/4/01	1/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	1.76	1.32	U	2.43	U	2.23

Sample Location:				EFF-200202A	EFF-200202B	EFF-200203	EFF-200204	EFF-200205	EFF-200206
Sample Date:				2/19/02	2/11/02	3/5/02	4/2/02	5/6/02	6/4/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	3	1.72	3.1	1.37	3.23	2.57

Sample Location:				EFF-200207	EFF-200208	EFF-200209	EFF-200210	EFF-200211	EFF-200212
Sample Date:				7/8/02	8/5/02	9/4/02	10/1/02	11/6/02	12/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	2.17	2.58	2.88	3.11	4.34	4.39

Sample Location:				EPA1T-200005	EPA1T-200110	EPA1T-200204	EPA2B-200005	EPA2T-200110	EPA2T-200204
Sample Date:				5/16/00	10/25/01	4/1/02	5/16/00	10/25/01	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				EPA3T-200110	EPA3T-200204	EPA4T-200005	EPA4T-200110	EPA4T-200204	INF-200005A
Sample Date:				10/25/01	4/1/02	5/16/00	10/25/01	4/1/02	5/19/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	37.8

Sample Location:				INF-200005B	INF-200005C	INF-200006A	INF-200006B	INF-200007	INF-200008
Sample Date:				5/22/00	5/17/00	6/6/00	6/6/00	7/5/00	8/7/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	25.8	26.2	47.6	26.1	19	22.8

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				INF-200009	INF-200010	INF-200011	INF-200101	INF-200102	INF-200103	INF-200104
Sample Date:				9/11/00	10/3/00	11/1/00	1/3/01	2/7/01	3/8/01	4/2/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	21.1	20.8	22.2	24.4	18.3	24.1	41.9

Sample Location:				INF-200105	INF-200106	INF-200107	INF-200108	INF-200109	INF-200110	INF-200111
Sample Date:				5/2/01	6/5/01	7/9/01	8/8/01	9/4/01	10/3/01	11/1/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	24	23.3	17.3	14.1	12.6	U	17.4

Sample Location:				INF-200112	INF-200201	INF-200202A	INF-200202B	INF-200203	INF-200204	INF-200205
Sample Date:				12/4/01	1/2/02	2/11/02	2/19/02	3/5/02	4/2/02	5/6/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	15.3	15.2	18	20	18.6	20.1

Sample Location:				INF-200206	INF-200207	INF-200208	INF-200209	INF-200210	INF-200211	INF-200212
Sample Date:				6/4/02	7/8/02	8/5/02	9/4/02	10/1/02	11/6/02	12/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	15	18.9	21.2	16.2	17.9	22.6	21.4

Sample Location:				PW1-200001	PW1-200002	PW1-200003	PW1-200107	PW1-200201	PW1-200204A	PW1-200204B
Sample Date:				1/3/00	2/1/00	3/7/00	7/9/01	1/2/02	4/2/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U

Sample Location:				PW1-200207	PW1-200210	PW2-200001	PW2-200002	PW2-200003	PW2-200107	PW2-200201
Sample Date:				7/8/02	10/1/02	1/3/00	2/1/00	3/7/00	7/23/01	1/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				PW2-200204A	PW2-200204B	PW2-200207	PW2-200210	PW3-200001A	PW3-200001B
Sample Date:				4/2/02	4/1/02	7/8/02	10/1/02	1/3/00	1/31/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	32.7	39.9

Sample Location:				PW3-200002A	PW3-200002B	PW3-200003A	PW3-200003B	PW3-200004A	PW3-200004B
Sample Date:				2/23/00	2/1/00	3/21/00	3/7/00	4/18/00	4/4/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	43.8	53	47.7	57	50.3	91.4

Sample Location:				PW3-200005	PW3-200006	PW3-200101	PW3-200107A	PW3-200107B	PW3-200111
Sample Date:				5/18/00	6/8/00	1/3/01	7/9/01	7/23/01	11/1/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	73.9	50.9	33.1	24.6	22.9	28.9

Sample Location:				PW3-200112	PW3-200201	PW3-200202A	PW3-200202B	PW3-200203	PW3-200204A
Sample Date:				12/4/01	1/2/02	2/11/02	2/19/02	3/5/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	35.7	31.6	27	29.5	33 J

Sample Location:				PW3-200204B	PW3-200205	PW3-200207	PW3-200210	PW4-200001A	PW4-200001B
Sample Date:				4/2/02	5/6/02	7/8/02	10/1/02	1/3/00	1/31/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	24.5	26.8	30.4	27.6	U	1.6

Sample Location:				PW4-200002	PW4-200003	PW4-200107	PW4-200201	PW4-200204A	PW4-200204B
Sample Date:				2/1/00	3/7/00	7/9/01	1/2/02	4/1/02	4/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI

Table A-3
VOCs in Public Wells 2000-2002

Sample Location:				PW4-200207	PW4-200210	PW5-200001	PW5-200002A	PW5-200002B
Sample Date:				7/8/02	10/1/02	1/3/00	2/1/00	2/23/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	2.3	0.8	0.5

Sample Location:				PW5-200003A	PW5-200003B	PW5-200004A	PW5-200004B	PW5-200005
Sample Date:				3/21/00	3/7/00	4/4/00	4/18/00	5/18/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	0.5	0.1	0.5	U	2

Sample Location:				PW5-200103	PW5-200104	PW5-200105	PW5-200106	PW5-200107A
Sample Date:				3/8/01	4/2/01	5/2/01	6/5/01	7/23/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				PW5-200107B	PW5-200108	PW5-200109	PW5-200110	PW5-200201
Sample Date:				7/9/01	8/8/01	9/4/01	10/3/01	1/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				PW5-200202A	PW5-200202B	PW5-200203	PW5-200204A	PW5-200204B
Sample Date:				2/11/02	2/19/02	3/5/02	4/1/02	4/2/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	2.23	3	4.3	6 J	4.7

Sample Location:				PW5-200205	PW5-200207	PW5-200210
Sample Date:				5/6/02	7/8/02	10/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)			
Tetrachloroethene	µg/L	0.11	5	4.26	3.16	3.07

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Interim Investigation Report, Ravenswood PCE Site by GAI

Table A-4
VOCs in Groundwater, 2001

Sample Location:				DEP-05D	DEP-05S	DEP-06	DEP-07	DEP-08	DEP-09	DEP-10	EPA-1
Sample Date:				10/8/01	10/8/01	10/8/01	10/8/01	10/8/01	10/8/01	10/8/01	10/25/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	7.8	324	21.3	19.5	2.6	U	1.2	U

Sample Location:				EPA-2	EPA-3	EPA-4	GP-01L	GP-01U	GP-02L	GP-02U	GP-03L
Sample Date:				10/25/01	10/25/01	10/25/01	5/8/00	5/8/00	5/9/00	5/9/00	5/10/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	8	U	U	34.6	21.6	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Addendum NO. 1, 2001 Investigation Summary, Ravenswood PCE Site by GAI Consultants Inc., May 2002.

Table A-4
VOCs in Groundwater, 2001

Sample Location:				GP-04L	GP-04U	GP-05L	GP-05U	GP-06L	GP-06U	GP-07L	GP-07U	GP-08L
Sample Date:				5/11/00	5/11/00	5/12/00	5/12/00	5/16/00	5/16/00	5/16/00	5/16/00	5/17/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U	U	U

Sample Location:				GP-08U	GP-09L	GP-09U	GP-10L	GP-10U	GP-11L	GP-11U	GP-12L	GP-12U
Sample Date:				5/17/00	5/18/00	5/18/00	5/22/00	5/22/00	5/23/00	5/23/00	5/24/00	5/24/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	152	U	U	11.4	65.1

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Addendum NO. 1, 2001 Investigation Summary, Ravenswood PCE Site by

Table A-4
VOCs in Groundwater, 2001

Sample Location:				GP-13L	GP-13U	GP-14L	GP-14U	GP-15L	GP-15U	GP-16L	GP-16U	GP-17L
Sample Date:				5/24/00	5/24/00	5/25/00	5/25/00	5/25/00	5/25/00	6/1/00	6/9/00	6/9/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	59.8	2.5	20.8	6.3	36.4	13	1	U	U

Sample Location:				GP-17U	GP-18L	GP-18U	GP-19L	GP-19U	GP-20L	GP-20U	GP-21L	GP-21U
Sample Date:				6/9/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/28/00	6/28/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	2.2	71.5	26.7	51.7	80	61.7	23.1

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Addendum NO. 1, 2001 Investigation Summary, Ravenswood PCE Site by

Table A-4
VOCs in Groundwater, 2001

Sample Location:				GP-22L	GP-22U	GP-23L	GP-23U	GP-24L	GP-24U	GP-25L	GP-25U	GP-26L
Sample Date:				6/29/00	6/29/00	6/29/00	6/29/00	7/24/00	7/24/00	7/24/00	7/24/00	7/25/00
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)									
Vinyl Chloride	μg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	μg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	μg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	μg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	μg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	μg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	μg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	μg/L	0.11	5	21.6	22.9	U	125	11.4	109	U	4.8	1.4

Sample Location:				GP-26U	GP-27L	GP-27U	GP-28L	GP-28U	GP-29L	GP-29U	GP-30L	GP-30U
Sample Date:				7/25/00	7/25/00	7/25/00	7/26/00	7/26/00	7/26/00	7/26/00	8/7/00	8/7/00
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)									
Vinyl Chloride	μg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	μg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	μg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	μg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	μg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	μg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	μg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	μg/L	0.11	5	41.5	3.6	1.7	U	11.1	2.5	4.5	U	8.3

Notes:

μg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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U - nondetect

Data was obtained from Addendum N0. 1, 2001 Investigation Summary, Ravenswood PCE Site by

Table A-4
VOCs in Groundwater, 2001

Sample Location: Sample Date:				GP-31L 8/7/00	GP-31U 8/7/00	GP-32L 8/8/00	GP-32U 8/8/00	GP-33L 8/8/00	GP-33U 8/8/00	GP-34L 8/23/00	GP-34U 8/23/00	GP-35L 8/23/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	19.8	37.6	U	U	28.3	40.5	1.3	3.6	1.7

Sample Location: Sample Date:				GP-35U 8/23/00	GP-36L 8/29/00	GP-36U 8/29/00	GP-37L 8/29/00	GP-37U 8/29/00	GP-38L 7/10/01	GP-38U 7/10/01	GP-39L 7/12/01	GP-39U 7/12/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	3.4	31.1	49.1	5.2	29.1	U	U	U	18.2

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

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U - nondetect

Data was obtained from Addendum N0. 1, 2001 Investigation Summary, Ravenswood PCE Site by

Table A-4
VOCs in Groundwater, 2001

Sample Location:				GP-40L	GP-40U	GP-41L	GP-41U	GP-42L	GP-42U	GP-43L	GP-43U	GP-44L
Sample Date:				7/11/01	7/11/01	7/12/01	7/12/01	7/11/01	7/11/01	7/13/01	7/13/01	7/16/01
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)									
Vinyl Chloride	μg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	μg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	μg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	μg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	μg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	μg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	μg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	μg/L	0.11	5	U	U	U	12	U	U	U	U	U

Sample Location:				GP-44U	GP-45L	GP-45U	GP-46L	GP-46U	GP-47L	GP-47U	GP-48L	GP-48U
Sample Date:				7/16/01	7/13/01	7/13/01	7/16/01	7/16/01	7/17/01	7/17/01	7/18/01	7/18/01
Analyte	Result Unit	RSL (μg/L)	MCL (μg/L)									
Vinyl Chloride	μg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	μg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	μg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	μg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	μg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	μg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	μg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	μg/L	0.11	5	U	U	U	U	U	U	U	U	U

Notes:

μg/L - microgram per liter

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U - nondetect

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Table A-4
VOCs in Groundwater, 2001

Sample Location:				GP-49L	GP-49U	GP-50L	GP-50U	GP-51L	GP-51U	GP-52L	GP-52U	GP-53L
Sample Date:				8/13/01	8/13/01	8/14/01	8/13/01	8/15/01	8/15/01	8/14/01	8/14/01	8/15/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	6.2	3.5	61	7.4	3.2	1.1	158	U

Sample Location:				GP-53U	GP-54L	GP-54U	GP-55L	GP-55U	MW-1	MW-10	MW-2	MW-3
Sample Date:				8/15/01	8/16/01	8/16/01	8/16/01	8/16/01	10/25/01	10/8/01	10/25/01	10/25/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	1.4	1.9	15.5	19.1	U	1.2	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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Table A-4
VOCs in Groundwater, 2001

Sample Location:				MW-4	MW-5D	MW-5S	MW-6	MW-7	MW-8	MW-9	PW-2	PW-3
Sample Date:				10/25/01	10/8/01	10/8/01	10/8/01	10/8/01	10/8/01	10/8/01	7/23/01	7/23/01
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	-	-	-	-	-
Trichloroethane	µg/L	2	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	8	7.8	324	21.3	19.5	2.6	U	U	22.9

Sample Location:				PW-3	PW-5	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	SB-07
Sample Date:				6/8/00	7/23/01	5/8/00	5/9/00	5/10/00	5/11/00	5/12/00	5/16/00	5/16/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	U	-	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	µg/L	110	100	U	-	U	U	U	U	U	U	U
1,1-Dichloroethane	µg/L	2.4		U	-	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	µg/L	370	70	U	-	U	U	U	U	U	U	U
1,1,1-Trichloroethane	µg/L	9100	200	U	-	U	U	U	U	U	U	U
Trichloroethane	µg/L	2	5	U	-	U	U	U	U	U	U	U
1,1,2-Trichloroethane	µg/L	0.24	5	U	-	U	U	U	U	U	U	U
Tetrachloroethene	µg/L	0.11	5	50.9	U	U	34.6	U	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

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U - nondetect

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Table A-4
VOCs in Groundwater, 2001

Sample Location:				SB-08	SB-09	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16
Sample Date:				5/17/00	5/18/00	5/22/00	5/23/00	5/24/00	5/24/00	5/25/00	5/25/00	6/9/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	U	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	µg/L	110	100	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	µg/L	2.4		U	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	µg/L	370	70	U	6.4	U	U	2.5	12.6	1	U	U
1,1,1-Trichloroethane	µg/L	9100	200	U	U	U	U	U	U	U	U	U
Trichloroethane	µg/L	2	5	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	µg/L	0.24	5	U	U	U	U	U	U	U	U	U
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	11.4	59.8	20.8	36.4	1

Sample Location:				SB-17	SB-18	SB-19	SB-20	SB-21	SB-22	SB-23	SB-24	SB-25
Sample Date:				6/9/00	6/12/00	6/12/00	6/12/00	6/28/00	6/29/00	6/29/00	7/24/00	7/24/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	U	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	µg/L	110	100	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	µg/L	2.4		U	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	µg/L	370	70	U	U	U	U	U	18.2	U	U	U
1,1,1-Trichloroethane	µg/L	9100	200	U	U	U	U	U	U	U	U	U
Trichloroethane	µg/L	2	5	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	µg/L	0.24	5	U	U	U	U	U	U	U	U	U
Tetrachloroethene	µg/L	0.11	5	U	U	71.5	51.7	61.7	21.6	U	11.4	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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U - nondetect

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Table A-4
VOCs in Groundwater, 2001

Sample Location:				SB-26	SB-27	SB-28	SB-29	SB-30	SB-31	SB-32	SB-33	SB-34
Sample Date:				7/25/00	7/25/00	7/26/00	7/26/00	8/7/00	8/7/00	8/8/00	8/8/00	8/23/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Vinyl Chloride	µg/L	0.016	2	U	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	µg/L	110	100	U	U	U	U	U	U	U	U	U
1,1-Dichloroethane	µg/L	2.4		U	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	µg/L	370	70	U	U	U	U	23.5	8.4	U	7.9	43.9
1,1,1-Trichloroethane	µg/L	9100	200	U	U	U	U	U	U	U	U	U
Trichloroethane	µg/L	2	5	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	µg/L	0.24	5	U	U	U	U	U	U	U	U	U
Tetrachloroethene	µg/L	0.11	5	1.4	3.6	U	2.5	U	19.8	U	28.3	1.3

Sample Location:				SB-35	SB-36	SB-37
Sample Date:				8/23/00	8/29/00	8/29/00
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)			
Vinyl Chloride	µg/L	0.016	2	U	U	U
trans-1,2-Dichloroethene	µg/L	110	100	U	U	U
1,1-Dichloroethane	µg/L	2.4		U	U	U
cis-1,2-Dichloroethene	µg/L	370	70	U	11.7	U
1,1,1-Trichloroethane	µg/L	9100	200	U	U	U
Trichloroethane	µg/L	2	5	U	U	U
1,1,2-Trichloroethane	µg/L	0.24	5	U	U	U
Tetrachloroethene	µg/L	0.11	5	1.7	31.1	5.2

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Addendum NO. 1, 2001 Investigation Summary, Ravenswood PCE Site by

Table A-5
VOCs in Groundwater, Spring 2002

Sample Location:				DEP10-200204	DEP5D-200203	DEP5S-200203	DEP6-200203	DEP7-200204	DEP8-200204	DEP9-200204	EPA1-200203	EPA2-200203	EPA3-200204	EPA4-200203	PW1-200203	PW1A-200203	PW2-200203
Sample Date:				4/1/02	3/27/02	3/27/02	3/28/02	4/1/02	4/1/02	4/1/02	3/29/02	3/29/02	4/1/02	3/29/02	3/28/02	3/28/02	3/27/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)														
Xylenes(total)	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	µg/L	400		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	µg/L	190		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U
Vinyl chloride	µg/L	0.016	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	8.7		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	21000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	1300		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	µg/L	340	7	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	22000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	µg/L	1000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylacetate	µg/L	37000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	µg/L	4.8	5	10 U	18 B	16 B	20 B	2 J	2 JB	2 JB	10 U	10 U	10 U	10 U	20 B	20 B	4 JB
trans-1,2-Dichloroethene	µg/L	110	100	10 U	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyltert-butylether	µg/L	13		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	µg/L	2.4		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	µg/L	370	70	10 U	10 U	54	3 J	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	µg/L	7100		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	µg/L	0.19		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	9100	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	µg/L	13000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	µg/L	0.2	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	0.41	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	µg/L	0.15	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	µg/L	2	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	µg/L	0.39	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	µg/L	0.12		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	µg/L	2000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	µg/L	2300	1000	10 U	10 U	10 U	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	µg/L	0.24	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	0.11	5	10 U	410 E	10 U	3 J	130	35	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	47		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	µg/L	0.15		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	µg/L	0.0065	0.05	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	µg/L	91	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	µg/L	1.5	700	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	µg/L	1600	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	µg/L	8.5		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	µg/L	680		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	µg/L	0.43	75	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	µg/L	370	600	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, CLP Case No. 30311. April 19, 2002.

Table A-5
VOCs in Groundwater, Spring 2002

Sample Location:				PW3-200203	PW4-200203	PW5-200203	VT1-200203	VT2-200203	VT3-200203	VT4-200203	VT5-200204
Sample Date:				3/27/02	3/27/02	3/27/02	3/27/02	3/28/02	3/29/02	3/28/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Xylenes(total)	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane	µg/L	400		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	µg/L	190		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	µg/L	0.016	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	µg/L	8.7		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	µg/L	21000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	µg/L	1300		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	µg/L	340	7	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	22000		10 U	10 U	10 U	10 U	8 J	11	8 J	6 J
Carbon Disulfide	µg/L	1000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylacetate	µg/L	37000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	µg/L	4.8	5	19 B	18 B	9 JB	19 B	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	µg/L	110	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyltert-butylether	µg/L	13		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	µg/L	2.4		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	µg/L	370	70	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	µg/L	7100		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	µg/L	0.19		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	µg/L	9100	200	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	µg/L	13000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	µg/L	0.2	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	0.41	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	µg/L	0.15	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	µg/L	2	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	µg/L	0.39	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	µg/L	0.12		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	µg/L	2000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	µg/L	2300	1000	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	µg/L	0.24	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	µg/L	0.11	5	33	10 U	6 J	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	47		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	µg/L	0.15		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	µg/L	0.0065	0.05	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	µg/L	91	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	µg/L	1.5	700	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	µg/L	1600	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	µg/L	8.5		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isopropylbenzene	µg/L	680		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	µg/L	0.43	75	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	µg/L	370	600	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, CLP C

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				DEP10-200204	DEP5D-200203	DEP5S-200203	DEP6-200203	DEP7-200204	DEP8-200204
Sample Date:				4/1/02	3/27/02	3/27/02	3/28/02	4/1/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Benzaldehyde	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Phenol	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl)ether	µg/L	0.012		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-Oxybis(1-Chloropropane)	µg/L	0.32		10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-Propylamine	µg/L	0.0096		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	4.8		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	0.12		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	µg/L	71		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	730		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)Methane	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	µg/L	0.14		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	0.34		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	0.86		10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	µg/L	18000		10 U	2 J	10 U	10 U	10 U	10 U
4-chloro-3-Methylphenol	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	150		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	220	50	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	6.1		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	3700		25 U	25 U	25 U	25 U	25 U	25 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, CLP Case No. 30311. April 19, 2002.

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				DEP10-200204	DEP5D-200203	DEP5S-200203	DEP6-200203	DEP7-200204	DEP8-200204
Sample Date:				4/1/02	3/27/02	3/27/02	3/28/02	4/1/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
1,1'-Biphenyl	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	2900		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	370		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	µg/L	2200		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	73		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	0.22		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	µg/L	29000		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
4-chlorophenyl-Phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	µg/L	3.4		25 U	25 U	25 U	25 U	25 U	25 U
4,6-dinitro-2-Methylphenol	µg/L	3.7		25 U	25 U	25 U	25 U	25 U	25 U
n-Nitrosodiphenylamine	µg/L	14		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	µg/L	0.042	1	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	µg/L	0.29	3	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	0.56	1	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, CLP Case No. 30311. April 19, 2002.

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				DEP10-200204	DEP5D-200203	DEP5S-200203	DEP6-200203	DEP7-200204	DEP8-200204
Sample Date:				4/1/02	3/27/02	3/27/02	3/28/02	4/1/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
di-n-Butylphthalate	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	µg/L	1100		10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	35		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	0.15		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	µg/L	3		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)Phthalate	µg/L	4.8	6	4 JB	3 JB	2 JB	1 J	3 JB	5 JB
di-n-Octylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	0.29		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	0.0029	0.2	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	0.0029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, CLP Case No. 30311. April 19, 2002.

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				DEP9-200204	EPA1-200203	EPA2-200203	EPA3-200204	EPA4-200203	PW1-200203
Sample Date:				4/1/02	3/29/02	3/29/02	4/1/02	3/29/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Benzaldehyde	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Phenol	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl)ether	µg/L	0.012		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-Oxybis(1-Chloropropane)	µg/L	0.32		10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-Propylamine	µg/L	0.0096		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	4.8		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	0.12		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	µg/L	71		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	730		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)Methane	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	µg/L	0.14		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	0.34		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	0.86		10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	µg/L	18000		10 U	10 U	10 U	10 U	10 U	10 U
4-chloro-3-Methylphenol	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	150		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	220	50	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	6.1		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	3700		25 U	25 U	25 U	25 U	25 U	25 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, Cl

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				DEP9-200204	EPA1-200203	EPA2-200203	EPA3-200204	EPA4-200203	PW1-200203
Sample Date:				4/1/02	3/29/02	3/29/02	4/1/02	3/29/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
1,1'-Biphenyl	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	2900		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	370		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	µg/L	2200		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	73		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	0.22		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	µg/L	29000		10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
4-chlorophenyl-Phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	µg/L	3.4		25 U	25 U	25 U	25 U	25 U	25 U
4,6-dinitro-2-Methylphenol	µg/L	3.7		25 U	25 U	25 U	25 U	25 U	25 U
n-Nitrosodiphenylamine	µg/L	14		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	µg/L	0.042	1	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	µg/L	0.29	3	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	0.56	1	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, Cl

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location: Sample Date:				DEP9-200204 4/1/02	EPA1-200203 3/29/02	EPA2-200203 3/29/02	EPA3-200204 4/1/02	EPA4-200203 3/29/02	PW1-200203 3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
di-n-Butylphthalate	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	µg/L	1100		10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	35		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	0.15		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	µg/L	3		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)Phthalate	µg/L	4.8	6	3 JB	3 J	1 J	3 JB	2 J	1 J
di-n-Octylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	0.29		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	0.0029	0.2	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	0.0029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
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Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, C

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				PW1A-200203	PW2-200203	PW3-200203	PW4-200203	PW5-200203	VT4-200203
Sample Date:				3/28/02	3/27/02	3/27/02	3/27/02	3/27/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Benzaldehyde	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Phenol	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl)ether	µg/L	0.012		10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2,2'-Oxybis(1-Chloropropane)	µg/L	0.32		10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	µg/L	3700		10 U	10 U	10 U	10 U	10 U	1 J
4-Methylphenol	µg/L	180		10 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-Propylamine	µg/L	0.0096		10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	4.8		10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	0.12		10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	µg/L	71		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	730		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)Methane	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	110		10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	µg/L	0.14		10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	0.34		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	0.86		10 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	µg/L	18000		10 U	10 U	10 U	10 U	10 U	10 U
4-chloro-3-Methylphenol	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	150		10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	220	50	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	µg/L	6.1		10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	3700		25 U	25 U	25 U	25 U	25 U	25 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, C

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				PW1A-200203	PW2-200203	PW3-200203	PW4-200203	PW5-200203	VT4-200203
Sample Date:				3/28/02	3/27/02	3/27/02	3/27/02	3/27/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
1,1'-Biphenyl	µg/L	1800		10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	2900		10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	370		25 U	25 U	25 U	25 U	25 U	25 U
Dimethylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Acenaphthene	µg/L	2200		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	73		25 U	25 U	25 U	25 U	25 U	25 U
4-Nitrophenol	µg/L			25 U	25 U	25 U	25 U	25 U	25 U
Dibenzofuran	µg/L	37		10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L	0.22		10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	µg/L	29000		10 U	10 U	10 U	10 U	10 U	2 J
Fluorene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
4-chlorophenyl-Phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	µg/L	3.4		25 U	25 U	25 U	25 U	25 U	25 U
4,6-dinitro-2-Methylphenol	µg/L	3.7		25 U	25 U	25 U	25 U	25 U	25 U
n-Nitrosodiphenylamine	µg/L	14		10 U	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	µg/L	0.042	1	10 U	10 U	10 U	10 U	10 U	10 U
Atrazine	µg/L	0.29	3	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	0.56	1	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	µg/L	11000		10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
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U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, C

Table A-6
SVOCs in Groundwater, Spring 2002

Sample Location:				PW1A-200203	PW2-200203	PW3-200203	PW4-200203	PW5-200203	VT4-200203
Sample Date:				3/28/02	3/27/02	3/27/02	3/27/02	3/27/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
di-n-Butylphthalate	µg/L	3700		10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	1500		10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	µg/L	1100		10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	µg/L	35		10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	0.15		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	µg/L	3		10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)Phthalate	µg/L	4.8	6	2 J	2 JB	2 JB	1 JB	2 JB	3 J
di-n-Octylphthalate	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	0.29		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	0.0029	0.2	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	µg/L	0.0029		10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L			10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Organic Data Validation Report, Ravenswood PCE, Cl

Table A-7
Metals in Groundwater, Spring 2002

Sample Location:				DEP10-200204	DEP5D-200203	DEP5S-200203
Sample Date:				4/1/02	3/27/02	3/27/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)			
Aluminum	µg/L	37000		3710	373	68.7 BJ
Antimony	µg/L	15	6	60 U	60 U	2.9 J
Arsenic	µg/L	0.045	10	18.3	2.6 J	1.9 J
Barium	µg/L	7300	2000	130 J	71.4 J	96.9 J
Beryllium	µg/L	73	4	0.45 BJ	5 U	0.53 BJ
Cadmium	µg/L	18	5	5 U	5 U	0.4 BJ
Calcium	µg/L			125000	149000	109000
Chromium	µg/L		100	4.9 J	10 U	10 U
Cobalt	µg/L	11		25.2 J	50 U	2.9 J
Copper	µg/L	1500	1300	33.8 L	25 UL	25 UL
Iron	µg/L	26000		14800	869	45.3 J
Lead	µg/L		15	15.1	3 U	3 U
Magnesium	µg/L			15400	12800	15000
Manganese	µg/L	880		919	63.2	12.8 J
Mercury	µg/L	0.57	2	0.12 KJ	0.2 U	0.2 U
Nickel	µg/L	730		24.6 J	1.4 J	2.7 J
Potassium	µg/L			2610 J	2940 J	1620 J
Selenium	µg/L	180	50	5 U	5 U	2 J
Silver	µg/L	180		10 U	10 U	0.66 J
Sodium	µg/L			21000	21400	19700
Thallium	µg/L		2	10 UL	10 UL	10 UL
Vanadium	µg/L	2.6		11.4 J	50 U	3.5 J
Zinc	µg/L	11000		37.6 L	20 UL	20 UL
Aluminum_dissolved	µg/L			200 U	-	-
Antimony_dissolved	µg/L			60 U	-	-
Arsenic_dissolved	µg/L			10 U	-	-
Barium_dissolved	µg/L			76.6 J	-	-
Beryllium_dissolved	µg/L			5 U	-	-
Cadmium_dissolved	µg/L			5 U	-	-
Calcium_dissolved	µg/L			129000	-	-
Chromium_dissolved	µg/L			10 UL	-	-
Cobalt_dissolved	µg/L			50 U	-	-
Copper_dissolved	µg/L			25 U	-	-
Iron_dissolved	µg/L			100 U	-	-
Lead_dissolved	µg/L			3 U	-	-
Magnesium_dissolved	µg/L			14100	-	-
Manganese_dissolved	µg/L			5.7 J	-	-
Mercury_dissolved	µg/L			0.2 U	-	-
Nickel_dissolved	µg/L			40 U	-	-
Potassium_dissolved	µg/L			2440 J	-	-
Selenium_dissolved	µg/L			5 U	-	-
Silver_dissolved	µg/L			10 U	-	-
Sodium_dissolved	µg/L			19100 J	-	-
Thallium_dissolved	µg/L			10 U	-	-
Vanadium_dissolved	µg/L			50 U	-	-
Zinc_dissolved	µg/L			3.4 BJ	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Inorganic Data Validation Report, Ravenswood PCE, CLP Case No. 30311. April 19, 2002.

Table A-7
Metals in Groundwater, Spring 2002

Sample Location:				DEP6-200203	DEP7-200204	DEP8-200204	DEP9-200204
Sample Date:				3/28/02	4/1/02	4/1/02	4/1/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Aluminum	µg/L	37000		2500	257 B	4290	1230
Antimony	µg/L	15	6	60 U	60 U	60 U	60 U
Arsenic	µg/L	0.045	10	10.2	10 U	20.4	17.5
Barium	µg/L	7300	2000	240	58.3 J	117 J	242
Beryllium	µg/L	73	4	0.48 BJ	5 U	0.57 BJ	5 U
Cadmium	µg/L	18	5	5 U	5 U	5 U	5 U
Calcium	µg/L			135000	107000	165000	42200
Chromium	µg/L		100	3.1 J	10 U	7.4 J	1.4 J
Cobalt	µg/L	11		18 J	50 U	30.8 J	3 J
Copper	µg/L	1500	1300	25.5 L	25 UL	40.3 L	9 LJ
Iron	µg/L	26000		9470	606	18600	29400
Lead	µg/L		15	10.9	3 U	19.6	4.2
Magnesium	µg/L			18900	12900	17700	12200
Manganese	µg/L	880		2410	89	1000	3580
Mercury	µg/L	0.57	2	0.13 KJ	0.2 U	0.14 KJ	0.2 U
Nickel	µg/L	730		18.7 J	40 U	30.4 J	7 J
Potassium	µg/L			2670 J	2600 J	3290 J	1400 J
Selenium	µg/L	180	50	3 J	5 U	5 U	2 J
Silver	µg/L	180		10 U	10 U	10 U	10 U
Sodium	µg/L			29500	19600	17400	15100
Thallium	µg/L		2	10 UL	10 UL	10 UL	10 UL
Vanadium	µg/L	2.6		7 J	50 U	12.4 J	3 J
Zinc	µg/L	11000		23.7 L	20 UL	55.3	11.4 LJ
Aluminum_dissolved	µg/L			200 U	-	200 U	-
Antimony_dissolved	µg/L			60 U	-	60 U	-
Arsenic_dissolved	µg/L			10 U	-	10 U	-
Barium_dissolved	µg/L			121 J	-	59.2 J	-
Beryllium_dissolved	µg/L			5 U	-	5 U	-
Cadmium_dissolved	µg/L			5 U	-	5 U	-
Calcium_dissolved	µg/L			143000	-	144000	-
Chromium_dissolved	µg/L			10 UL	-	10 UL	-
Cobalt_dissolved	µg/L			50 U	-	50 U	-
Copper_dissolved	µg/L			25 U	-	25 U	-
Iron_dissolved	µg/L			100 U	-	100 U	-
Lead_dissolved	µg/L			3 U	-	3 U	-
Magnesium_dissolved	µg/L			18800	-	12900	-
Manganese_dissolved	µg/L			2.1 J	-	1.2 J	-
Mercury_dissolved	µg/L			0.2 U	-	0.2 U	-
Nickel_dissolved	µg/L			40 U	-	40 U	-
Potassium_dissolved	µg/L			2970 J	-	3270 J	-
Selenium_dissolved	µg/L			5 U	-	5 U	-
Silver_dissolved	µg/L			10 U	-	10 U	-
Sodium_dissolved	µg/L			28800 J	-	14700 J	-
Thallium_dissolved	µg/L			10 U	-	10 U	-
Vanadium_dissolved	µg/L			50 U	-	50 U	-
Zinc_dissolved	µg/L			6.6 BJ	-	3.5 BJ	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Inorganic Data Validation Report, Ravenswood PCE

Table A-7
Metals in Groundwater, Spring 2002

Sample Location:				EPA1-200203	EPA2-200203	EPA3-200204	EPA4-200203
Sample Date:				3/29/02	3/29/02	4/1/02	3/29/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Aluminum	µg/L	37000		1990	2680	622	161 BJ
Antimony	µg/L	15	6	60 U	60 U	60 U	60 U
Arsenic	µg/L	0.045	10	4.7 J	9.2 J	2.2 J	10 U
Barium	µg/L	7300	2000	97.6 J	124 J	56.9 J	49.2 J
Beryllium	µg/L	73	4	0.38 BJ	5 U	5 U	5 U
Cadmium	µg/L	18	5	5 U	5 U	5 U	5 U
Calcium	µg/L			90400	114000	103000	108000
Chromium	µg/L		100	6.4 J	7.1 J	1 J	10 U
Cobalt	µg/L	11		7.6 J	8.6 J	2.1 J	50 U
Copper	µg/L	1500	1300	9.9 LJ	15.2 LJ	1.9 LJ	25 UL
Iron	µg/L	26000		6100	9100	1640	288
Lead	µg/L		15	6.3	8	3 U	3 U
Magnesium	µg/L			13000	11600	11600	12300
Manganese	µg/L	880		634	534	195	67
Mercury	µg/L	0.57	2	0.11 KJ	0.2 U	0.2 U	0.2 U
Nickel	µg/L	730		9.6 J	11.6 J	2.7 J	40 U
Potassium	µg/L			1870 J	2050 J	2390 J	1210 J
Selenium	µg/L	180	50	5 U	5 U	5 U	2.2 J
Silver	µg/L	180		10 U	10 U	10 U	10 U
Sodium	µg/L			11000	11000	18800	7340
Thallium	µg/L		2	10 UL	10 UL	10 UL	10 UL
Vanadium	µg/L	2.6		6.2 J	7.7 J	50 U	50 U
Zinc	µg/L	11000		13.7 LJ	25.2 L	20 UL	20 UL
Aluminum_dissolved	µg/L			200 U	200 U	200 U	-
Antimony_dissolved	µg/L			60 U	60 U	60 U	-
Arsenic_dissolved	µg/L			10 U	10 U	10 U	-
Barium_dissolved	µg/L			58.6 J	90.7 J	49.7 J	-
Beryllium_dissolved	µg/L			5 U	5 U	5 U	-
Cadmium_dissolved	µg/L			5 U	5 U	5 U	-
Calcium_dissolved	µg/L			98300	129000	115000	-
Chromium_dissolved	µg/L			10 UL	10 UL	10 UL	-
Cobalt_dissolved	µg/L			50 U	50 U	50 U	-
Copper_dissolved	µg/L			25 U	25 U	25 U	-
Iron_dissolved	µg/L			100 U	100 U	100 U	-
Lead_dissolved	µg/L			2.2 KJ	3 U	3 U	-
Magnesium_dissolved	µg/L			13500	12400	12200	-
Manganese_dissolved	µg/L			1.2 J	10.5 J	3.2 J	-
Mercury_dissolved	µg/L			0.2 U	0.2 U	0.2 U	-
Nickel_dissolved	µg/L			40 U	2.4 J	40 U	-
Potassium_dissolved	µg/L			2400 J	2230 J	3150 J	-
Selenium_dissolved	µg/L			5 U	5 U	5 U	-
Silver_dissolved	µg/L			10 U	10 U	10 U	-
Sodium_dissolved	µg/L			10100 J	10400 J	17000 J	-
Thallium_dissolved	µg/L			10 U	10 U	10 U	-
Vanadium_dissolved	µg/L			50 U	50 U	50 U	-
Zinc_dissolved	µg/L			47.6	4.6 BJ	5.4 BJ	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Inorganic Data Validation Report, Ravenswood PCE

Table A-7
Metals in Groundwater, Spring 2002

Sample Location:				PW1-200203	PW1A-200203	PW2-200203	PW3-200203
Sample Date:				3/28/02	3/28/02	3/27/02	3/27/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Aluminum	µg/L	37000		54.4 BJ	200 U	127 BJ	65.7 BJ
Antimony	µg/L	15	6	60 U	60 U	60 U	60 U
Arsenic	µg/L	0.045	10	10 U	10 U	10 U	10 U
Barium	µg/L	7300	2000	56.7 J	60.6 J	76.4 J	80.1 J
Beryllium	µg/L	73	4	0.36 BJ	5 U	0.53 BJ	5 U
Cadmium	µg/L	18	5	5 U	1.3 BJ	5 U	5 U
Calcium	µg/L			84100	90400	113000	116000
Chromium	µg/L		100	10 U	10 U	10 U	10 U
Cobalt	µg/L	11		50 U	50 U	50 U	50 U
Copper	µg/L	1500	1300	25 UL	6.3 LJ	25 UL	25 UL
Iron	µg/L	26000		100 U	100 U	100 U	100 U
Lead	µg/L		15	3 U	2.4 J	3 U	3 U
Magnesium	µg/L			8040	8630	11700	13400
Manganese	µg/L	880		0.32 J	15 U	15 U	15 U
Mercury	µg/L	0.57	2	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	µg/L	730		40 U	40 U	40 U	40 U
Potassium	µg/L			1300 J	1390 J	1710 J	2090 J
Selenium	µg/L	180	50	5 U	5 U	5 U	5 U
Silver	µg/L	180		10 U	10 U	10 U	10 U
Sodium	µg/L			8570	9330	11800	16000
Thallium	µg/L		2	10 UL	10 UL	10 UL	10 UL
Vanadium	µg/L	2.6		50 U	50 U	50 U	50 U
Zinc	µg/L	11000		20 UL	20 UL	20 UL	20 UL
Aluminum_dissolved	µg/L			-	-	-	-
Antimony_dissolved	µg/L			-	-	-	-
Arsenic_dissolved	µg/L			-	-	-	-
Barium_dissolved	µg/L			-	-	-	-
Beryllium_dissolved	µg/L			-	-	-	-
Cadmium_dissolved	µg/L			-	-	-	-
Calcium_dissolved	µg/L			-	-	-	-
Chromium_dissolved	µg/L			-	-	-	-
Cobalt_dissolved	µg/L			-	-	-	-
Copper_dissolved	µg/L			-	-	-	-
Iron_dissolved	µg/L			-	-	-	-
Lead_dissolved	µg/L			-	-	-	-
Magnesium_dissolved	µg/L			-	-	-	-
Manganese_dissolved	µg/L			-	-	-	-
Mercury_dissolved	µg/L			-	-	-	-
Nickel_dissolved	µg/L			-	-	-	-
Potassium_dissolved	µg/L			-	-	-	-
Selenium_dissolved	µg/L			-	-	-	-
Silver_dissolved	µg/L			-	-	-	-
Sodium_dissolved	µg/L			-	-	-	-
Thallium_dissolved	µg/L			-	-	-	-
Vanadium_dissolved	µg/L			-	-	-	-
Zinc_dissolved	µg/L			-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Inorganic Data Validation Report, Ravenswood PCE

Table A-7
Metals in Groundwater, Spring 2002

Sample Location:				PW4-200203	PW5-200203	VT4-200203
Sample Date:				3/27/02	3/27/02	3/28/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)			
Aluminum	µg/L	37000		70.6 BJ	77.5 BJ	200 U
Antimony	µg/L	15	6	60 U	60 U	60 U
Arsenic	µg/L	0.045	10	10 U	10 U	10 U
Barium	µg/L	7300	2000	81.9 J	68 J	200 U
Beryllium	µg/L	73	4	0.36 BJ	5 U	5 U
Cadmium	µg/L	18	5	5 U	5 U	5 U
Calcium	µg/L			118000	94200	5000 UL
Chromium	µg/L		100	10 U	10 U	10 U
Cobalt	µg/L	11		50 U	50 U	50 U
Copper	µg/L	1500	1300	25 UL	25 UL	25 UL
Iron	µg/L	26000		100 U	100 U	100 U
Lead	µg/L		15	3 U	3 U	3 U
Magnesium	µg/L			9620	12300	5000 U
Manganese	µg/L	880		0.96 J	15 U	15 U
Mercury	µg/L	0.57	2	0.2 U	0.2 U	0.2 U
Nickel	µg/L	730		40 U	40 U	40 U
Potassium	µg/L			1610 J	2540 J	5000 U
Selenium	µg/L	180	50	5 U	2.2 J	5 U
Silver	µg/L	180		10 U	10 U	10 U
Sodium	µg/L			10400	14600	5000 U
Thallium	µg/L		2	10 UL	10 UL	10 UL
Vanadium	µg/L	2.6		50 U	50 U	50 U
Zinc	µg/L	11000		20 UL	20 UL	20 UL
Aluminum_dissolved	µg/L			-	-	-
Antimony_dissolved	µg/L			-	-	-
Arsenic_dissolved	µg/L			-	-	-
Barium_dissolved	µg/L			-	-	-
Beryllium_dissolved	µg/L			-	-	-
Cadmium_dissolved	µg/L			-	-	-
Calcium_dissolved	µg/L			-	-	-
Chromium_dissolved	µg/L			-	-	-
Cobalt_dissolved	µg/L			-	-	-
Copper_dissolved	µg/L			-	-	-
Iron_dissolved	µg/L			-	-	-
Lead_dissolved	µg/L			-	-	-
Magnesium_dissolved	µg/L			-	-	-
Manganese_dissolved	µg/L			-	-	-
Mercury_dissolved	µg/L			-	-	-
Nickel_dissolved	µg/L			-	-	-
Potassium_dissolved	µg/L			-	-	-
Selenium_dissolved	µg/L			-	-	-
Silver_dissolved	µg/L			-	-	-
Sodium_dissolved	µg/L			-	-	-
Thallium_dissolved	µg/L			-	-	-
Vanadium_dissolved	µg/L			-	-	-
Zinc_dissolved	µg/L			-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the USEPA Region III Inorganic Data Validation Report, Ravenswood PCE

Table A-8
VOCs in Groundwater, August 2002

Sample Location:				DEP5D-200209	DEP5S-200209	DEP6-200209	DEP7-200209	DEP8-200209	EPA4-200209	PW2-200209	PW3-200209	PW5-200209
Sample Date:				9/26/02	9/26/02	9/26/02	9/27/02	9/27/02	9/25/02	9/25/02	9/25/02	9/25/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
1,1,1,2-Tetrachloroethane	µg/L	0.52		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	µg/L	0.00072		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene	µg/L	330		45	0.5 U	2	0.5 U	11	0.5 U	0.5 U	0.66	0.5 U
1,3,5-Trimethylbenzene	µg/L	370		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichloropropane	µg/L	730		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Difluorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,2-Dichloropropane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chloro-1,3-butadiene	µg/L	14		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chloroethylvinylether	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	µg/L	730		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Nitropropane	µg/L	0.0018		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
3-Chloropropene	µg/L	0.65		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Chlorotoluene	µg/L	2600		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetonitrile	µg/L	130		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acrolein	µg/L	0.042		20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acrylonitrile	µg/L	0.045		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	µg/L	88		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	µg/L	8.2		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethanol	µg/L			20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Ethylether	µg/L	7300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylmethacrylate	µg/L	3300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexane	µg/L	880		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iodomethane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isobutanol	µg/L	11000		20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
m,p-Xylene	µg/L			1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methacrylonitrile	µg/L	1		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylmethacrylate	µg/L	1400		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Butanol	µg/L	3700		20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
n-Butylbenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Propylbenzene	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the West Virginia Department of Environmental Protection.

Table A-8
VOCs in Groundwater, August 2002

Sample Location:				DEP5D-200209	DEP5S-200209	DEP6-200209	DEP7-200209	DEP8-200209	EPA4-200209	PW2-200209	PW3-200209	PW5-200209
Sample Date:				9/26/02	9/26/02	9/26/02	9/27/02	9/27/02	9/25/02	9/25/02	9/25/02	9/25/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
Pentachloroethane	µg/L	0.75		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
p-Isopropyltoluene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Propionitrile	µg/L			1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
tert-Butanol	µg/L			40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U
tert-Butylbenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,4-Dichloro-2-butene	µg/L	0.0012		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinylacetate	µg/L	410		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes(total)	µg/L			1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	µg/L	400		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		5 U	5 U	6.3	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.5 U	0.5 U	0.63	0.5 U	0.51	0.51	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	1.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	13		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	38	0.5 U	1.7	0.5 U	9.5	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	µg/L	0.14		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromochloromethane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.86		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the West Virginia Department of Environmental Protection.

Table A-8
VOCs in Groundwater, August 2002

Sample Location:				DEP5D-200209	DEP5S-200209	DEP6-200209	DEP7-200209	DEP8-200209	EPA4-200209	PW2-200209	PW3-200209	PW5-200209
Sample Date:				9/26/02	9/26/02	9/26/02	9/27/02	9/27/02	9/25/02	9/25/02	9/25/02	9/25/02
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)									
1,4-Dioxane	µg/L	6.1		20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-methyl-2-Pentanone	µg/L	2000		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.93	200	2.7	40	4	0.5 U	0.5 U	17	1.9
2-Hexanone	µg/L	47		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from the West Virginia Department of Environmental Protection.

Table A-9
VOCs in Public Wells 2003-2004

Sample Location:				BLEND-200301	BLEND-200302	BLEND-200303	BLEND-200304	BLEND-200305
Sample Date:				1/7/03	2/3/03	3/3/03	4/1/03	5/5/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	1.47	U	1.59	U	1.21

Sample Location:				BLEND-200306	BLEND-200307	BLEND-200308	BLEND-200308A	BLEND-200308B
Sample Date:				6/2/03	7/1/03	8/4/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	1.13	1.03	U	1.4 B	U

Sample Location:				BLEND-200309	BLEND-200310	BLEND-200311	BLEND-200311A	BLEND-200311B
Sample Date:				9/2/03	10/1/03	11/3/03	11/17/03	11/17/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	1.8	1.09	1.1	0.6 J

Sample Location:				BLEND-200312	DEP10M-200308A	DEP10M-200308B	DEP10M-200311	DEP5DB-200312
Sample Date:				12/1/03	8/6/03	8/6/03	11/17/03	12/8/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				DEP5DM-200308A	DEP5DM-200308B	DEP5DM-200311A	DEP5DM-200311B	DEP5DM-200312A
Sample Date:				8/6/03	8/6/03	11/17/03	11/17/03	12/8/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U

Sample Location:				DEP5DM-200312B	DEP5DT-200312	DEP5SB-200312	DEP5SM-200308A	DEP5SM-200308B
Sample Date:				12/8/03	12/8/03	12/8/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	U	U	248	15	205.2

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood PCE Site by Region III Superfund Technical Assessment and Resonse Team-West (START-West).

Table A-9
VOCs in Public Wells 2003-2004

Sample Location:				DEP5SM-200311A	DEP5SM-200311B	DEP5SM-200312A	DEP5SM-200312B	DEP5ST-200312
Sample Date:				11/17/03	11/17/03	12/8/03	12/8/03	12/8/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	180	181	470	293	303

Sample Location:				DEP6B-200312	DEP6M-200308A	DEP6M-200308B	DEP6M-200311	DEP6M-200312A
Sample Date:				12/8/03	8/6/03	8/6/03	11/17/03	12/8/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	2.2	0.46 B	4.7	6.5	2

Sample Location:				DEP6M-200312B	DEP6T-200312	DEP7B-200312	DEP7M-200308A	DEP7M-200308B
Sample Date:				12/8/03	12/8/03	12/8/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	1.8	25	67	44	74.8

Sample Location:				DEP7M-200311A	DEP7M-200311B	DEP7M-200312A	DEP7M-200312B	DEP7T-200312
Sample Date:				11/17/03	11/17/03	12/8/03	12/8/03	12/8/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	43	40.5	62	96	76

Sample Location:				DEP8B-200312	DEP8M-200308A	DEP8M-200308B	DEP8M-200311A	DEP8M-200311B
Sample Date:				12/8/03	8/6/03	8/6/03	11/17/03	11/17/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	24	3	23.1	19	24.2

Sample Location:				DEP8M-200312A	DEP8M-200312B	DEP8T-200312	DEP9M-200308A	DEP9M-200308B
Sample Date:				12/8/03	12/8/03	12/8/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	34	37	25	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswooc

Table A-9
VOCs in Public Wells 2003-2004

Sample Location:				DEP9M-200311	EFF-200301	EFF-200302	EFF-200303	EFF-200304	EFF-200305	EFF-200306
Sample Date:				11/17/03	1/7/03	2/3/03	3/3/03	4/1/03	5/5/03	6/2/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	3.44	4.67	4.48	3.44	3.7	2.92

Sample Location:				EFF-200307	EFF-200308	EFF-200309	EFF-200310	EFF-200311	EFF-200312	EPA1M-200308A
Sample Date:				7/1/03	8/4/03	9/2/03	10/1/03	11/3/03	12/1/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	2.99	2.84	2.66	3.83	3.28	3.22	U

Sample Location:				EPA1M-200308B	EPA1M-200311	EPA2M-200308A	EPA2M-200308B	EPA2M-200311	EPA3M-200308A	EPA3M-200308B
Sample Date:				8/6/03	11/17/03	8/6/03	8/6/03	11/17/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U	U

Sample Location:				EPA3M-200311	EPA4M-200308A	EPA4M-200308B	EPA4M-200311	INF-200301	INF-200302	INF-200303
Sample Date:				11/17/03	8/6/03	8/6/03	11/17/03	1/7/03	2/3/03	3/3/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	19.8	26.3	21.3

Sample Location:				INF-200304	INF-200305	INF-200306	INF-200307	INF-200308	INF-200309	INF-200310
Sample Date:				4/1/03	5/5/03	6/2/03	7/1/03	8/4/03	9/2/03	10/1/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	19.3	19.1	14.4	16.3	16	14.5	15.3

Sample Location:				INF-200311	INF-200312	PW1-200301	PW1-200304	PW1-200307	PW1-200308A	PW1-200308B
Sample Date:				11/3/03	12/1/03	1/7/03	4/1/03	7/1/03	8/6/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Tetrachloroethene	µg/L	0.11	5	16.5	17.5	U	U	U	0.17 B	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswooc

Table A-9
VOCs in Public Wells 2003-2004

Sample Location:				PW1-200310	PW1-200311	PW2-200301	PW2-200304	PW2-200307	PW2-200308A
Sample Date:				10/1/03	11/17/03	1/7/03	4/1/03	7/1/03	8/6/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	0.16 B

Sample Location:				PW2-200308B	PW2-200310	PW2-200311	PW3-200301	PW3-200304	PW3-200307
Sample Date:				8/6/03	10/1/03	11/17/03	1/7/03	4/1/03	7/1/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	32.5	35	23.3

Sample Location:				PW3-200308A	PW3-200308B	PW3-200310	PW3-200311A	PW3-200311B	PW4-200301
Sample Date:				8/6/03	8/6/03	10/1/03	11/17/03	11/17/03	1/7/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	5.6	30.5	27.9	24	23.7	U

Sample Location:				PW4-200304	PW4-200307	PW4-200308A	PW4-200308B	PW4-200310	PW4-200311
Sample Date:				4/1/03	7/1/03	8/6/03	8/6/03	10/1/03	11/17/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				PW5-200301	PW5-200304	PW5-200307	PW5-200308A	PW5-200308B	PW5-200310
Sample Date:				1/7/03	4/1/03	7/1/03	8/6/03	8/6/03	10/1/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	2.65	2.49	2.27	2.8	1	2.51

Sample Location:				PW5-200311A	PW5-200311B
Sample Date:				11/17/03	11/17/03
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)		
Tetrachloroethene	µg/L	0.11	5	1.9	2 J

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswoo

Table A-10
VOCs in Groundwater, 2004

Sample Location:				BLEND-200401A	BLEND-200401B	BLEND-200402	BLEND-200403A	BLEND-200403B	BLEND-200404
Sample Date:				1/5/04	1/5/04	2/2/04	3/2/04	3/18/04	4/1/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	1.3	U	1.3	1 J	1.96

Sample Location:				BLEND-200405	BLEND-200406	BLEND-200406A	BLEND-200406B	BLEND-200407	BLEND-200408
Sample Date:				5/3/04	6/1/04	6/22/04	6/22/04	7/1/04	8/3/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	0.84	0.5 J	U	U

Sample Location:				BLEND-200409	BLEND-200409A	BLEND-200409B	BLEND-200410	BLEND-200411	DEP10B-200409
Sample Date:				9/1/04	9/14/04	9/14/04	10/5/04	11/16/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	1.2 L	0.04 J	U	U	U

Sample Location:				DEP10M-200403	DEP10M-200406	DEP10M-200409	DEP10T-200403	DEP10T-200406	DEP10T-200409
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				DEP5DB-200403	DEP5DB-200406	DEP5DB-200409	DEP5DM-200403	DEP5DM-200406	DEP5DM-200409
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				DEP5DT-200403A	DEP5DT-200403B	DEP5DT-200406	DEP5DT-200409	DEP5SB-200403	DEP5SB-200406
Sample Date:				3/18/04	3/18/04	6/22/04	9/14/04	3/18/04	6/22/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	300	270

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

J - Analyte Present. Reported value may not be accurate or precise.

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood PCE Site by Region III Superfund Technical Assessment and Resonse Team-West (START-West).

Table A-10
VOCs in Groundwater, 2004

Sample Location:				DEP5SB-200409	DEP5SM-200403A	DEP5SM-200403B	DEP5SM-200406A	DEP5SM-200406B
Sample Date:				9/14/04	3/18/04	3/18/04	6/22/04	6/22/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	239	240	310	310	340

Sample Location:				DEP5SM-200409	DEP5ST-200403	DEP5ST-200406	DEP5ST-200409	DEP6B-200403
Sample Date:				9/14/04	3/18/04	6/22/04	9/14/04	3/18/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	295	330	320	292	2.2 J

Sample Location:				DEP6B-200406	DEP6B-200409	DEP6M-200403	DEP6M-200406	DEP6M-200409
Sample Date:				6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	3.1	0.3 J	4.8	4.5	0.7 J

Sample Location:				DEP6T-200403A	DEP6T-200403B	DEP6T-200406	DEP6T-200409A	DEP6T-200409B
Sample Date:				3/18/04	3/18/04	6/22/04	9/14/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	7.7	8.2	13.3	8.7	7.1

Sample Location:				DEP7B-200403	DEP7B-200406	DEP7B-200409	DEP7M-200403A	DEP7M-200403B
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	3/18/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	66	51	42	57	67

Sample Location:				DEP7M-200406	DEP7M-200409	DEP7T-200403	DEP7T-200406	DEP7T-200409A
Sample Date:				6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Tetrachloroethene	µg/L	0.11	5	68	57	97	72	88

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

J - Analyte Present. Reported value may not be accurate or precise.

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood

Table A-10
VOCs in Groundwater, 2004

Sample Location:				DEP7T-200409B	DEP8B-200403	DEP8B-200406	DEP8B-200409	DEP8M-200403A	DEP8M-200403B
Sample Date:				9/14/04	3/18/04	6/22/04	9/14/04	3/18/04	3/18/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	91	21	26	10.1	24	27

Sample Location:				DEP8M-200406	DEP8M-200409A	DEP8M-200409B	DEP8T-200403	DEP8T-200406	DEP8T-200409
Sample Date:				6/22/04	9/14/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	35	20	19.9	39	31	23

Sample Location:				DEP9M-200403	DEP9M-200406	DEP9T-200403	DEP9T-200406	EFF-200401	EFF-200402
Sample Date:				3/18/04	6/22/04	3/18/04	6/22/04	1/5/04	2/2/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	4.35	3.68

Sample Location:				EFF-200403	EFF-200404	EFF-200405	EFF-200406	EFF-200407	EFF-200408
Sample Date:				3/2/04	4/1/04	5/3/04	6/1/04	7/1/04	8/3/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	3.67	4.29	3.72	3.05	2.9	3.51

Sample Location:				EFF-200409	EFF-200410	EFF-200411	EPA1M-200403	EPA1M-200406	EPA1M-200409
Sample Date:				9/1/04	10/5/04	11/16/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				EPA1T-200403	EPA1T-200406	EPA1T-200409	EPA2M-200403	EPA2M-200406	EPA2M-200409
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

J - Analyte Present. Reported value may not be accurate or precise.

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood

Table A-10
VOCs in Groundwater, 2004

Sample Location:				EPA2T-200403	EPA2T-200406	EPA2T-200409	EPA3M-200403	EPA3M-200406	EPA3M-200409
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				EPA3T-200403	EPA3T-200406	EPA3T-200409	EPA4M-200403	EPA4M-200406	EPA4M-200409
Sample Date:				3/18/04	6/22/04	9/14/04	3/18/04	6/22/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Sample Location:				EPA4T-200403	EPA4T-200406	EPA4T-200409	INF-200401	INF-200402	INF-200403
Sample Date:				3/18/04	6/22/04	9/14/04	1/5/04	2/2/04	3/2/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	20.2	18.6	16.1

Sample Location:				INF-200404	INF-200405	INF-200406	INF-200407	INF-200408	INF-200409
Sample Date:				4/1/04	5/3/04	6/1/04	7/1/04	8/3/04	9/1/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	20.2	17.8	13.9	13.4	17.2	14.6

Sample Location:				INF-200410	INF-200411	PW1-200401	PW1-200403	PW1-200404	PW1-200406
Sample Date:				10/5/04	11/16/04	1/5/04	3/18/04	4/1/04	6/22/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	12	10.6	U	U	U	U

Sample Location:				PW1-200407	PW1-200409	PW1-200410	PW2-200401	PW2-200403	PW2-200404
Sample Date:				7/1/04	9/14/04	10/5/04	1/5/04	3/18/04	4/1/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	U	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

J - Analyte Present. Reported value may not be accurate or precise.

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood

Table A-10
VOCs in Groundwater, 2004

Sample Location:				PW2-200406	PW2-200407	PW2-200409	PW2-200410	PW3-200401	PW3-200403A
Sample Date:				6/22/04	7/1/04	9/14/04	10/5/04	1/5/04	3/18/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	U	30.2	43

Sample Location:				PW3-200403B	PW3-200404	PW3-200406A	PW3-200406B	PW3-200407	PW3-200409A
Sample Date:				3/18/04	4/1/04	6/22/04	6/22/04	7/1/04	9/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	31	30.3	26	27	22	21

Sample Location:				PW3-200409B	PW3-200410	PW4-200401	PW4-200403	PW4-200404	PW4-200406
Sample Date:				9/14/04	10/5/04	1/5/04	3/18/04	4/1/04	6/22/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	21	18.3	U	U	U	U

Sample Location:				PW4-200407	PW4-200409	PW4-200410	PW5-200401	PW5-200403	PW5-200404
Sample Date:				7/1/04	9/14/04	10/5/04	1/5/04	3/18/04	4/1/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	U	U	U	2.15	1.3 J	1.45

Sample Location:				PW5-200406A	PW5-200406B	PW5-200407	PW5-200409	PW5-200410	PW6-200410
Sample Date:				6/22/04	6/22/04	7/1/04	9/14/04	10/5/04	10/5/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Tetrachloroethene	µg/L	0.11	5	1.6	0.7 J	1.3	0.4 J	U	U

Sample Location:				PW7-200410
Sample Date:				10/5/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)	
Tetrachloroethene	µg/L	0.11	5	U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

U - nondetect

J - Analyte Present. Reported value may not be accurate or precise.

Data was obtained from Trip Report - December 2004 Sampling Event Ravenswood

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				BLEND-200412	BLEND-200412A	BLEND-200412B	BLEND-200501	C02C1	C02C2	C02C3	C02C4	C02C5	C02C6	C02C7
Sample Date:				12/1/04	12/14/04	12/14/04	1/4/05	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)											
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-	-	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-	-	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-	-	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
Bromoethane	µg/L	8.7		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	-	-	-	-	0.5 U	0.11 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		-	-	-	-	4.4 B	8.2 B	9.1 B	4.6 B	2.3 B	1.7 B	1.7 B
Carbon Disulfide	µg/L	1000		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	-	-	-	-	0.39 B	0.44 B	0.4 B	0.41 B	0.93 B	0.36 B	0.36 B
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	13		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		-	-	-	-	5 U	1.3 J	5 U	5 U	5 U	5 U	5 U
Naphthalene	µg/L	0.14		-	-	-	-							
Bromochloromethane	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Technical Assessment and Resonse Team-West (START-West).

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				BLEND-200412	BLEND-200412A	BLEND-200412B	BLEND-200501	C02C1	C02C2	C02C3	C02C4	C02C5	C02C6	C02C7
Sample Date:				12/1/04	12/14/04	12/14/04	1/4/05	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06	12/12/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)											
Chloroform	µg/L	0.19		-	-	-	-	0.5 U	0.5 U	0.21 J	0.5 U	0.54	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.86		-	-	-	-							
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		-	-	-	-	R	R	R	R	R	R	R
Trichloroethene	µg/L	2	5	-	-	-	-	0.1 J	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
Methylcyclohexane	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		-	-	-	-	0.5 U	0.5 U	0.2 J	0.5 U	0.16 J	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-methyl-2-Pentanone	µg/L	2000		-	-	-	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	6	0.51	1.1	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	U	1.4 L	1.2 J	U	430 L	37 L	68 L	0.5 U	1.3 L	23	21
2-Hexanone	µg/L	47		-	-	-	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.3 J	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
o-Xylene	µg/L	1200		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
m,p-Xylene	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
Styrene	µg/L	1600	100	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
Bromoform	µg/L	8.5		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	-	-	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U
1,3-Dichlorobenzene	µg/L			-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	-	-	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Technical Assessment and Resonse Team-West (START-West).

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				C02C8	C02C9	C02D0	C02D1	C02D2	C02D3	C02D4	DEP10M-200412B	DEP10T-200412B	DEP18M	DEP5DB-200412B
Sample Date:				3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	12/14/04	12/14/04	9/13/06	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)											
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-	-	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-	-	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-	-	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	-	-	-	-	-	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	-	-	0.5 U	-
Bromoethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Acetone	µg/L	22000		R	R	R	R	R	R	R	-	-	6.6 B	-
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Methylene chloride	µg/L	4.8	5	0.5 B	0.5 B	0.13 B	0.092 B	0.53 B	0.24 B	0.46 B	-	-	0.5 U	-
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Methyltert-butylether	µg/L	13		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.022 B	-
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.39 J	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.35 J	-
2-Butanone	µg/L	7100		R	R	R	R	R	R	R	-	-	5 U	-
Naphthalene	µg/L	0.14									-	-		-
Bromochloromethane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

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U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				C02C8	C02C9	C02D0	C02D1	C02D2	C02D3	C02D4	DEP10M-200412B	DEP10T-200412B	DEP18M	DEP5DB-200412B
Sample Date:				3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	3/19/07	12/14/04	12/14/04	9/13/06	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)											
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.73 B	-
Hexachlorobutadiene	µg/L	0.86									-	-		-
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.73	-
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,4-Dioxane	µg/L	6.1		R	R	R	R	R	R	R	-	-	R	-
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.041 J	-
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.47 J	-
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
4-methyl-2-Pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	-	-	5 U	-
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Tetrachloroethene	µg/L	0.11	5	580	20	13	0.5 U	0.95	12	11	U	U	69	U
2-Hexanone	µg/L	47		R	R	R	R	R	R	R	-	-	5 U	-
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	-	0.5 U	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP5DM-200412B	DEP5DT-200412B	DEP5SB	DEP5SB-200412B	DEP5SM-200412B	DEP5ST-200412B	DEP5ST-200606	DEP5ST-200609
Sample Date:				12/14/04	12/14/04	3/14/06	12/14/04	12/14/04	12/14/04	6/21/06	9/13/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-	0.2 J	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-	0.5 U	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-	0.5 U	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-	0.5 U	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-	0.5 U	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-	0.5 U	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-	0.5 U	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-	0.5 U	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-	0.5 U	-
Bromobenzene	µg/L	88		-	-	-	-	-	-	0.5 U	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-	0.5 U	-
m,p-Xylene	µg/L			-	-	0.5 U	-	-	-	1 U	-
n-Butylbenzene	µg/L			-	-	-	-	-	-	0.5 U	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-	0.5 U	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-	0.5 U	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-	0.5 U	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-	0.5 U	-
Vinylacetate	µg/L	410		-	-	-	-	-	-	0.5 U	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Chloromethane	µg/L	190		-	-	0.5 U	-	-	-	0.5 U	0.28 B
Vinyl chloride	µg/L	0.016	2	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Bromoethane	µg/L	8.7		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Chloroethane	µg/L	21000		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Acetone	µg/L	22000		-	-	5 U	-	-	-	1 B	3.3 B
Carbon Disulfide	µg/L	1000		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Methylacetate	µg/L	37000		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Methyltert-butylether	µg/L	13		-	-	0.5 U	-	-	-	0.5 U	0.019 B
1,1-Dichloroethane	µg/L	2.4		-	-	0.5 U	-	-	-	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	-	-	0.5 U	-	-	-	0.5 U	0.5 U
2-Butanone	µg/L	7100		-	-	5 U	-	-	-	2 U	5 U
Naphthalene	µg/L	0.14		-	-		-	-	-	0.5 U	-
Bromochloromethane	µg/L			-	-	0.5 U	-	-	-	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP5DM-200412B	DEP5DT-200412B	DEP5SB	DEP5SB-200412B	DEP5SM-200412B	DEP5ST-200412B	DEP5ST-200606	DEP5ST-200609
Sample Date:				12/14/04	12/14/04	3/14/06	12/14/04	12/14/04	12/14/04	6/21/06	9/13/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Chloroform	µg/L	0.19		-	-	0.5 U	-	-	-	0.5 U	0.13 B
Hexachlorobutadiene	µg/L	0.86		-	-		-	-	-	0.5 U	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	0.5 U	-	-	-	0.1 J	0.5 U
Cyclohexane	µg/L	13000		-	-	0.5 U	-	-	-	0.09 J	0.78
Carbon tetrachloride	µg/L	0.2	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Benzene	µg/L	0.41	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		-	-	R	-	-	-	-	R
Trichloroethene	µg/L	2	5	-	-	0.5 U	-	-	-	0.06 J	0.071 J
Methylcyclohexane	µg/L			-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		-	-	0.5 U	-	-	-	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			-	-	0.5 U	-	-	-	0.5 U	0.5 U
4-methyl-2-Pentanone	µg/L	2000		-	-	5 U	-	-	-	2 U	5 U
Toluene	µg/L	2300	1000	-	-	0.5 U	-	-	-	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	U	U	270	274	363	333	289	250
2-Hexanone	µg/L	47		-	-	5 U	-	-	-	2 U	5 U
Dibromochloromethane	µg/L	0.15		-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	-	-	0.5 U	-	-	-	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	-	-	0.5 U	-	-	-	0.5 U	0.5 U
o-Xylene	µg/L	1200		-	-	0.5 U	-	-	-	1 U	0.5 U
m,p-Xylene	µg/L			-	-		-	-	-	-	0.5 U
Styrene	µg/L	1600	100	-	-	0.5 U	-	-	-	1 U	0.5 U
Bromoform	µg/L	8.5		-	-	0.5 U	-	-	-	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	0.5 U	-	-	-	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		-	-	0.5 U	-	-	-	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP6B-200412B	DEP6M-200412B	DEP6T-200412A	DEP6T-200412B	DEP7B	DEP7B-200412B	DEP7M-200412B	DEP7M-200603
Sample Date:				12/14/04	12/14/04	12/14/04	12/14/04	6/21/06	12/14/04	12/14/04	3/14/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	0.5 U	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	0.5 U	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	0.5 U	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	0.5 U	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	0.5 U	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	0.5 U	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	0.5 U	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	0.5 U	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	0.5 U	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	0.5 U	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	0.5 U	-	-	-
m,p-Xylene	µg/L			-	-	-	-	1 U	-	-	0.5 U
n-Butylbenzene	µg/L			-	-	-	-	0.5 U	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	0.5 U	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	0.5 U	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	0.5 U	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	0.5 U	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	0.5 U	-	-	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	-	-	0.5 U	-	-	0.5 U
Chloromethane	µg/L	190		-	-	-	-	0.5 U	-	-	0.5 U
Vinyl chloride	µg/L	0.016	2	-	-	-	-	0.5 U	-	-	0.5 U
Bromoethane	µg/L	8.7		-	-	-	-	0.5 U	-	-	0.5 U
Chloroethane	µg/L	21000		-	-	-	-	0.5 U	-	-	0.5 U
Trichlorofluoromethane	µg/L	1300		-	-	-	-	0.5 U	-	-	0.5 U
1,1-Dichloroethene	µg/L	340	7	-	-	-	-	0.5 U	-	-	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	-	-	0.5 U	-	-	0.5 U
Acetone	µg/L	22000		-	-	-	-	0.6 B	-	-	5 U
Carbon Disulfide	µg/L	1000		-	-	-	-	0.5 U	-	-	0.5 U
Methylacetate	µg/L	37000		-	-	-	-	0.5 U	-	-	0.5 U
Methylene chloride	µg/L	4.8	5	-	-	-	-	0.5 U	-	-	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	-	-	-	-	0.5 U	-	-	0.5 U
Methyltert-butylether	µg/L	13		-	-	-	-	0.5 U	-	-	0.5 U
1,1-Dichloroethane	µg/L	2.4		-	-	-	-	0.5 U	-	-	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	-	-	-	-	0.5 U	-	-	0.5 U
2-Butanone	µg/L	7100		-	-	-	-	2 U	-	-	5 U
Naphthalene	µg/L	0.14		-	-	-	-	0.5 U	-	-	-
Bromochloromethane	µg/L			-	-	-	-	0.5 U	-	-	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP6B-200412B	DEP6M-200412B	DEP6T-200412A	DEP6T-200412B	DEP7B	DEP7B-200412B	DEP7M-200412B	DEP7M-200603
Sample Date:				12/14/04	12/14/04	12/14/04	12/14/04	6/21/06	12/14/04	12/14/04	3/14/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Chloroform	µg/L	0.19		-	-	-	-	0.5 U	-	-	0.5 U
Hexachlorobutadiene	µg/L	0.86		-	-	-	-	0.5 U	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	-	-	0.06 J	-	-	0.5 U
Cyclohexane	µg/L	13000		-	-	-	-	0.08 J	-	-	0.5 U
Carbon tetrachloride	µg/L	0.2	5	-	-	-	-	0.5 U	-	-	0.5 U
Benzene	µg/L	0.41	5	-	-	-	-	0.5 U	-	-	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	-	-	-	-	0.5 U	-	-	0.5 U
1,4-Dioxane	µg/L	6.1		-	-	-	-	-	-	-	R
Trichloroethene	µg/L	2	5	-	-	-	-	0.5 U	-	-	0.5 U
Methylcyclohexane	µg/L			-	-	-	-	0.5 U	-	-	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	-	-	-	-	0.5 U	-	-	0.5 U
Bromodichloromethane	µg/L	0.12		-	-	-	-	0.5 U	-	-	0.5 U
cis-1,3-Dichloropropene	µg/L			-	-	-	-	0.5 U	-	-	0.5 U
4-methyl-2-Pentanone	µg/L	2000		-	-	-	-	2 U	-	-	5 U
Toluene	µg/L	2300	1000	-	-	-	-	0.5 U	-	-	0.5 U
trans-1,3-Dichloropropene	µg/L			-	-	-	-	0.5 U	-	-	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	-	-	0.5 U	-	-	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.6 J	0.3 J	11	13	47	54	56	42
2-Hexanone	µg/L	47		-	-	-	-	2 U	-	-	5 U
Dibromochloromethane	µg/L	0.15		-	-	-	-	0.5 U	-	-	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	-	-	0.5 U	-	-	0.5 U
Chlorobenzene	µg/L	91	100	-	-	-	-	0.5 U	-	-	0.5 U
Ethylbenzene	µg/L	1.5	700	-	-	-	-	0.5 U	-	-	0.5 U
o-Xylene	µg/L	1200		-	-	-	-	1 U	-	-	0.5 U
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-
Styrene	µg/L	1600	100	-	-	-	-	1 U	-	-	0.5 U
Bromoform	µg/L	8.5		-	-	-	-	0.5 U	-	-	0.5 U
Isopropylbenzene	µg/L	680		-	-	-	-	0.5 U	-	-	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	-	-	0.5 U	-	-	0.5 U
1,3-Dichlorobenzene	µg/L			-	-	-	-	0.5 U	-	-	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	-	-	0.5 U	-	-	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	-	-	-	-	0.5 U	-	-	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	-	-	0.5 U	-	-	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	-	-	0.5 U	-	-	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		-	-	-	-	0.5 U	-	-	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP7M-200609	DEP7T	DEP7T-200412A	DEP7T-200412B	DEP8B-200412B	DEP8M-200412A	DEP8M-200412B	DEP8M-200503
Sample Date:				9/13/06	9/13/06	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	3/22/05
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	-	-	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	10 U
Dichlorodifluoromethane	µg/L	400		0.5 U	0.5 U	-	-	-	-	-	10 U
Chloromethane	µg/L	190		0.29 B	0.43 B	-	-	-	-	-	10 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	-	-	-	-	-	10 U
Bromoethane	µg/L	8.7		0.5 U	0.5 U	-	-	-	-	-	10 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	-	-	-	-	-	10 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	-	-	-	-	-	10 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	-	-	-	-	-	10 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		0.5 U	0.5 U	-	-	-	-	-	10 U
Acetone	µg/L	22000		5.1 B	7.6 B	-	-	-	-	-	7.9 B
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	-	-	-	-	-	10 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	-	-	-	-	-	10 U
Methylene chloride	µg/L	4.8	5	0.5 U	0.5 U	-	-	-	-	-	0.16 B
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	-	-	-	-	-	10 U
Methyltert-butylether	µg/L	13		0.022 B	0.025 B	-	-	-	-	-	10 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	-	-	-	-	-	10 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	-	-	-	-	-	1.1
2-Butanone	µg/L	7100		5 U	5 U	-	-	-	-	-	10 U
Naphthalene	µg/L	0.14		-	-	-	-	-	-	-	-
Bromochloromethane	µg/L			0.5 U	0.5 U	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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U - nondetect

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP7M-200609	DEP7T	DEP7T-200412A	DEP7T-200412B	DEP8B-200412B	DEP8M-200412A	DEP8M-200412B	DEP8M-200503
Sample Date:				9/13/06	9/13/06	12/14/04	12/14/04	12/14/04	12/14/04	12/14/04	3/22/05
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Chloroform	µg/L	0.19		0.5 U	0.5 U	-	-	-	-	-	10 U
Hexachlorobutadiene	µg/L	0.86		-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.11 J	-	-	-	-	-	10 U
Cyclohexane	µg/L	13000		0.76	1	-	-	-	-	-	10 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	-	-	-	-	-	10 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	-	-	-	-	-	10 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	-	-	-	-	-	10 U
1,4-Dioxane	µg/L	6.1		R	R	-	-	-	-	-	-
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	-	-	-	-	-	0.28 B
Methylcyclohexane	µg/L			0.5 U	0.5 U	-	-	-	-	-	10 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	-	-	-	-	-	10 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	-	-	-	-	-	10 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	-	-	-	-	-	10 U
4-methyl-2-Pentanone	µg/L	2000		5 U	5 U	-	-	-	-	-	10 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	-	-	-	-	-	10 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	-	-	-	-	-	10 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	-	-	-	-	-	10 U
Tetrachloroethene	µg/L	0.11	5	48	52	77 J	90	15	33 J	32	45
2-Hexanone	µg/L	47		5 U	5 U	-	-	-	-	-	10 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	-	-	-	-	-	10 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	-	-	-	-	-	10 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	-	-	-	-	-	10 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	-	-	-	-	-	10 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	-	-	-	-	-	-
m,p-Xylene	µg/L			0.5 U	0.5 U	-	-	-	-	-	-
Styrene	µg/L	1600	100	0.5 U	0.5 U	-	-	-	-	-	10 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	-	-	-	-	-	10 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	-	-	-	-	-	10 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	-	-	-	-	-	10 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	-	-	-	-	-	10 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	-	-	-	-	-	10 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	-	-	-	-	-	10 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	-	-	-	-	-	R
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	-	-	-	-	-	10 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP8M-200603	DEP8M-200609	DEP8T-200412B	DEP9M-200412B	DEP9T-200412B	EFF-200412	EFF-200501	EPA1M-200412B
Sample Date:				3/14/06	9/13/06	12/14/04	12/14/04	12/14/04	12/1/04	1/4/05	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-	-	-
m,p-Xylene	µg/L			0.5 U	-	-	-	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	-	-	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		0.5 U	0.5 U	-	-	-	-	-	-
Chloromethane	µg/L	190		0.5 U	0.3 B	-	-	-	-	-	-
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	-	-	-	-	-	-
Bromoethane	µg/L	8.7		0.5 U	0.5 U	-	-	-	-	-	-
Chloroethane	µg/L	21000		0.5 U	0.5 U	-	-	-	-	-	-
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		0.5 U	0.5 U	-	-	-	-	-	-
Acetone	µg/L	22000		5 U	4.5 B	-	-	-	-	-	-
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	-	-	-	-	-	-
Methylacetate	µg/L	37000		0.5 U	0.5 U	-	-	-	-	-	-
Methylene chloride	µg/L	4.8	5	0.31 B	0.5 U	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	-	-	-	-	-	-
Methyltert-butylether	µg/L	13		0.5 U	0.5 U	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.33 J	-	-	-	-	-	-
2-Butanone	µg/L	7100		5 U	5 U	-	-	-	-	-	-
Naphthalene	µg/L	0.14		-	-	-	-	-	-	-	-
Bromochloromethane	µg/L			0.5 U	0.5 U	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				DEP8M-200603	DEP8M-200609	DEP8T-200412B	DEP9M-200412B	DEP9T-200412B	EFF-200412	EFF-200501	EPA1M-200412B
Sample Date:				3/14/06	9/13/06	12/14/04	12/14/04	12/14/04	12/1/04	1/4/05	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Chloroform	µg/L	0.19		0.5 U	0.75 B	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	0.86		-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	-	-	-	-	-	-
Cyclohexane	µg/L	13000		0.22 J	0.81	-	-	-	-	-	-
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	-	-	-	-	-	-
Benzene	µg/L	0.41	5	0.5 U	0.5 U	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	-	-	-	-	-	-
1,4-Dioxane	µg/L	6.1		R	R	-	-	-	-	-	-
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	-	-	-	-	-	-
Methylcyclohexane	µg/L			0.5 U	0.5 U	-	-	-	-	-	-
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	-	-	-	-	-	-
Bromodichloromethane	µg/L	0.12		0.31 J	0.49 J	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	-	-	-	-	-	-
4-methyl-2-Pentanone	µg/L	2000		5 U	5 U	-	-	-	-	-	-
Toluene	µg/L	2300	1000	0.5 U	0.5 U	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	-	-	-	-	-	-
Tetrachloroethene	µg/L	0.11	5	33	68	45	U	U	3.18	2.6	U
2-Hexanone	µg/L	47		5 U	5 U	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	-	-	-	-	-	-
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	-	-	-	-	-	-
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	-	-	-	-	-	-
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	-	-	-	-	-	-
o-Xylene	µg/L	1200		0.5 U	0.5 U	-	-	-	-	-	-
m,p-Xylene	µg/L			-	0.5 U	-	-	-	-	-	-
Styrene	µg/L	1600	100	0.5 U	0.5 U	-	-	-	-	-	-
Bromoform	µg/L	8.5		0.5 U	0.5 U	-	-	-	-	-	-
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	-	-	-	-	-	-
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				EPA1T-200412B	EPA2M-200412B	EPA2M-200503	EPA2T-200412B	EPA3M-200412B	EPA3T-200412B
Sample Date:				12/14/04	12/14/04	3/22/05	12/14/04	12/14/04	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	-
Xylenes (total)	µg/L			-	-	10 U	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	10 U	-	-	-
Chloromethane	µg/L	190		-	-	10 U	-	-	-
Vinyl chloride	µg/L	0.016	2	-	-	10 U	-	-	-
Bromoethane	µg/L	8.7		-	-	10 U	-	-	-
Chloroethane	µg/L	21000		-	-	10 U	-	-	-
Trichlorofluoromethane	µg/L	1300		-	-	10 U	-	-	-
1,1-Dichloroethene	µg/L	340	7	-	-	10 U	-	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	10 U	-	-	-
Acetone	µg/L	22000		-	-	3.6 B	-	-	-
Carbon Disulfide	µg/L	1000		-	-	10 U	-	-	-
Methylacetate	µg/L	37000		-	-	10 U	-	-	-
Methylene chloride	µg/L	4.8	5	-	-	0.19 B	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	10 U	-	-	-
Methyltert-butylether	µg/L	13		-	-	10 U	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	10 U	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	10 U	-	-	-
2-Butanone	µg/L	7100		-	-	10 U	-	-	-
Naphthalene	µg/L	0.14		-	-	-	-	-	-
Bromochloromethane	µg/L			-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				EPA1T-200412B	EPA2M-200412B	EPA2M-200503	EPA2T-200412B	EPA3M-200412B	EPA3T-200412B
Sample Date:				12/14/04	12/14/04	3/22/05	12/14/04	12/14/04	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Chloroform	µg/L	0.19		-	-	10 U	-	-	-
Hexachlorobutadiene	µg/L	0.86		-	-	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	10 U	-	-	-
Cyclohexane	µg/L	13000		-	-	10 U	-	-	-
Carbon tetrachloride	µg/L	0.2	5	-	-	10 U	-	-	-
Benzene	µg/L	0.41	5	-	-	10 U	-	-	-
1,2-Dichloroethane	µg/L	0.15	5	-	-	10 U	-	-	-
1,4-Dioxane	µg/L	6.1		-	-	-	-	-	-
Trichloroethene	µg/L	2	5	-	-	10 U	-	-	-
Methylcyclohexane	µg/L			-	-	10 U	-	-	-
1,2-Dichloropropane	µg/L	0.39	5	-	-	10 U	-	-	-
Bromodichloromethane	µg/L	0.12		-	-	10 U	-	-	-
cis-1,3-Dichloropropene	µg/L			-	-	10 UL	-	-	-
4-methyl-2-Pentanone	µg/L	2000		-	-	10 U	-	-	-
Toluene	µg/L	2300	1000	-	-	10 U	-	-	-
trans-1,3-Dichloropropene	µg/L			-	-	10 UL	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	10 UL	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	10 U	U	U	U
2-Hexanone	µg/L	47		-	-	10 U	-	-	-
Dibromochloromethane	µg/L	0.15		-	-	10 U	-	-	-
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	10 U	-	-	-
Chlorobenzene	µg/L	91	100	-	-	10 U	-	-	-
Ethylbenzene	µg/L	1.5	700	-	-	10 U	-	-	-
o-Xylene	µg/L	1200		-	-	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-
Styrene	µg/L	1600	100	-	-	10 U	-	-	-
Bromoform	µg/L	8.5		-	-	10 U	-	-	-
Isopropylbenzene	µg/L	680		-	-	10 U	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	10 U	-	-	-
1,3-Dichlorobenzene	µg/L			-	-	10 U	-	-	-
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	10 U	-	-	-
1,2-Dichlorobenzene	µg/L	370	600	-	-	10 U	-	-	-
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	R	-	-	-
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	10 U	-	-	-
1,2,3-Trichlorobenzene	µg/L	29		-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

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U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				EPA4M-200412B	EPA4T-200412B	FW11	FW1-200503	FW1-200603	FW1-200606	FW1P-200503	INF-200412	INF-200501	PW1-200412B
Sample Date:				12/14/04	12/14/04	3/14/06	3/22/05	3/14/06	6/21/06	3/22/05	12/1/04	1/4/05	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	-	-	-	0.5 U	-	-	-	-
1,1-dichloropropene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	-	-	-	0.5 U	-	-	-	-
1,2,4-Trimethylbenzene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	-	-	-	0.5 U	-	-	-	-
1,3-Dichloropropane	µg/L	730		-	-	-	-	-	0.5 U	-	-	-	-
2,2-Dichloropropane	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
2-Chlorotoluene	µg/L	730		-	-	-	-	-	0.5 U	-	-	-	-
4-Chlorotoluene	µg/L	2600		-	-	-	-	-	0.5 U	-	-	-	-
Bromobenzene	µg/L	88		-	-	-	-	-	0.5 U	-	-	-	-
Dibromomethane	µg/L	8.2		-	-	-	-	-	0.5 U	-	-	-	-
m,p-Xylene	µg/L			-	-	R	-	R	1 U	-	-	-	-
n-Butylbenzene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
N-Propylbenzene	µg/L	1300		-	-	-	-	-	0.5 U	-	-	-	-
P-Isopropyltoluene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
sec-Butylbenzene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
tret-Butylbenzene	µg/L			-	-	-	-	-	0.5 U	-	-	-	-
Vinylacetate	µg/L	410		-	-	-	-	-	0.5 U	-	-	-	-
Xylenes (total)	µg/L			-	-	-	10 UL	-	-	10 UL	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Chloromethane	µg/L	190		-	-	0.5 U	10 U	0.5 U	0.02 J	10 U	-	-	-
Vinyl chloride	µg/L	0.016	2	-	-	R	R	R	0.5 U	R	-	-	-
Bromoethane	µg/L	8.7		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Chloroethane	µg/L	21000		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Trichlorofluoromethane	µg/L	1300		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,1-Dichloroethene	µg/L	340	7	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Acetone	µg/L	22000		-	-	5 U	8.2 B	5 U	0.4 B	6.8 B	-	-	-
Carbon Disulfide	µg/L	1000		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Methylacetate	µg/L	37000		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Methylene chloride	µg/L	4.8	5	-	-	0.5 U	0.32 B	0.5 U	0.5 U	2.1 B	-	-	-
trans-1,2-Dichloroethene	µg/L	110	100	-	-	0.5 UL	10 U	0.5 UL	0.5 U	10 U	-	-	-
Methyltert-butylether	µg/L	13		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,1-Dichloroethane	µg/L	2.4		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
cis-1,2-Dichloroethene	µg/L	370	70	-	-	0.5 UL	10 U	0.5 UL	0.5 U	10 U	-	-	-
2-Butanone	µg/L	7100		-	-	5 U	10 U	5 U	2 U	10 U	-	-	-
Naphthalene	µg/L	0.14		-	-	-	-	-	0.5 U	-	-	-	-
Bromochloromethane	µg/L			-	-	0.5 U	-	0.5 U	0.5 U	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				EPA4M-200412B	EPA4T-200412B	FW11	FW1-200503	FW1-200603	FW1-200606	FW1P-200503	INF-200412	INF-200501	PW1-200412B
Sample Date:				12/14/04	12/14/04	3/14/06	3/22/05	3/14/06	6/21/06	3/22/05	12/1/04	1/4/05	12/14/04
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
Chloroform	µg/L	0.19		-	-	0.5 U	10 U	0.23 B	0.08 J	10 U	-	-	-
Hexachlorobutadiene	µg/L	0.86		-	-	-	-	-	0.5 U	-	-	-	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Cyclohexane	µg/L	13000		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Carbon tetrachloride	µg/L	0.2	5	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Benzene	µg/L	0.41	5	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,2-Dichloroethane	µg/L	0.15	5	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,4-Dioxane	µg/L	6.1		-	-	R	-	R	-	-	-	-	-
Trichloroethene	µg/L	2	5	-	-	R	10 UL	R	0.5 U	10 UL	-	-	-
Methylcyclohexane	µg/L			-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,2-Dichloropropane	µg/L	0.39	5	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Bromodichloromethane	µg/L	0.12		-	-	0.5 U	10 U	0.5 U	0.1 J	10 U	-	-	-
cis-1,3-Dichloropropene	µg/L			-	-	R	10 U	R	0.5 U	10 U	-	-	-
4-methyl-2-Pentanone	µg/L	2000		-	-	5 U	10 U	5 U	2 U	10 U	-	-	-
Toluene	µg/L	2300	1000	-	-	R	10 UL	R	0.5 U	10 UL	-	-	-
trans-1,3-Dichloropropene	µg/L			-	-	R	10 U	R	0.5 U	10 U	-	-	-
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	R	10 U	R	0.5 U	10 U	-	-	-
Tetrachloroethene	µg/L	0.11	5	U	U	0.92 L	1.1 L	R	1.3	0.89 L	15.5	10.4	U
2-Hexanone	µg/L	47		-	-	5 U	10 U	5 U	2 U	10 U	-	-	-
Dibromochloromethane	µg/L	0.15		-	-	0.2 J	10 U	0.22 J	0.2 J	0.29 J	-	-	-
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Chlorobenzene	µg/L	91	100	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Ethylbenzene	µg/L	1.5	700	-	-	R	10 UL	R	0.5 U	10 UL	-	-	-
o-Xylene	µg/L	1200		-	-	R	-	R	1 U	-	-	-	-
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	1600	100	-	-	R	10 UL	R	1 U	10 UL	-	-	-
Bromoform	µg/L	8.5		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
Isopropylbenzene	µg/L	680		-	-	R	10 UL	R	0.5 U	10 UL	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,3-Dichlorobenzene	µg/L			-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,2-Dichlorobenzene	µg/L	370	600	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	0.5 U	R	0.5 U	0.5 U	10 UR	-	-	-
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	0.5 U	10 U	0.5 U	0.5 U	10 U	-	-	-
1,2,3-Trichlorobenzene	µg/L	29		-	-	0.5 U	-	0.5 U	0.5 U	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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VOCs in Groundwater, 2004-2007

Sample Location:				PW1-200501	PW13	PW2-200412B	PW2-200501	PW3-200412A	PW3-200412B	PW3-200501	PW3-200503	PW3-200603	PW3-200606
Sample Date:				1/4/05	6/21/06	12/14/04	1/4/05	12/14/04	12/14/04	1/4/05	3/22/05	3/14/06	6/21/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,1-dichloropropene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,2,3-Trichloropropane	µg/L	0.00072		-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,2,4-Trimethylbenzene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,3,5-Trimethylbenzene	µg/L	370		-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,3-Dichloropropane	µg/L	730		-	0.5 U	-	-	-	-	-	-	-	0.5 U
2,2-Dichloropropane	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
2-Chlorotoluene	µg/L	730		-	0.5 U	-	-	-	-	-	-	-	0.5 U
4-Chlorotoluene	µg/L	2600		-	0.5 U	-	-	-	-	-	-	-	0.5 U
Bromobenzene	µg/L	88		-	0.5 U	-	-	-	-	-	-	-	0.5 U
Dibromomethane	µg/L	8.2		-	0.5 U	-	-	-	-	-	-	-	0.5 U
m,p-Xylene	µg/L			-	1 U	-	-	-	-	-	-	0.5 U	1 U
n-Butylbenzene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
N-Propylbenzene	µg/L	1300		-	0.5 U	-	-	-	-	-	-	-	0.5 U
P-Isopropyltoluene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
sec-Butylbenzene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
tret-Butylbenzene	µg/L			-	0.5 U	-	-	-	-	-	-	-	0.5 U
Vinylacetate	µg/L	410		-	0.5 U	-	-	-	-	-	-	-	0.5 U
Xylenes (total)	µg/L			-	-	-	-	-	-	-	10 U	-	-
Dichlorodifluoromethane	µg/L	400		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Chloromethane	µg/L	190		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Bromoethane	µg/L	8.7		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Acetone	µg/L	22000		-	2 U	-	-	-	-	-	3.3 B	5 U	2 U
Carbon Disulfide	µg/L	1000		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	-	0.5 U	-	-	-	-	-	0.16 B	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	13		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	-	0.2 J	-	-	-	-	-	0.27 J	0.5 U	0.2 J
2-Butanone	µg/L	7100		-	2 U	-	-	-	-	-	10 U	5 U	2 U
Naphthalene	µg/L	0.14		-	0.5 U	-	-	-	-	-	-	-	0.5 U
Bromochloromethane	µg/L			-	0.5 U	-	-	-	-	-	-	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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VOCs in Groundwater, 2004-2007

Sample Location:				PW1-200501	PW13	PW2-200412B	PW2-200501	PW3-200412A	PW3-200412B	PW3-200501	PW3-200503	PW3-200603	PW3-200606
Sample Date:				1/4/05	6/21/06	12/14/04	1/4/05	12/14/04	12/14/04	1/4/05	3/22/05	3/14/06	6/21/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
Chloroform	µg/L	0.19		-	0.05 J	-	-	-	-	-	10 U	0.37 B	0.05 J
Hexachlorobutadiene	µg/L	0.86		-	0.5 U	-	-	-	-	-	-	-	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		-	-	-	-	-	-	-	-	R	-
Trichloroethene	µg/L	2	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
4-methyl-2-Pentanone	µg/L	2000		-	2 U	-	-	-	-	-	10 U	5 U	2 U
Toluene	µg/L	2300	1000	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	U	23	U	U	21	22	18.7	22	24	22
2-Hexanone	µg/L	47		-	2 U	-	-	-	-	-	10 U	5 U	2 U
Dibromochloromethane	µg/L	0.15		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		-	1 U	-	-	-	-	-	-	0.5 U	1 U
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	1600	100	-	1 U	-	-	-	-	-	10 U	0.5 U	1 U
Bromoform	µg/L	8.5		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	0.5 U	-	-	-	-	-	R	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	0.5 U	-	-	-	-	-	10 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		-	0.5 U	-	-	-	-	-	-	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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Table A-11
VOCs in Groundwater, 2004-2007

Sample Location:				PW4-200412B	PW4-200501	PW5	PW5-200412B	PW5-200501	PW6-200501	PW7-200501	TB-200603	TB-200606	TB-200609
Sample Date:				12/14/04	1/4/05	6/21/06	12/14/04	1/4/05	1/4/05	1/4/05	3/14/06	6/21/06	9/13/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
1,1,1,2-Tetrachloroethane	µg/L	0.52		-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,1-dichloropropene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,2,3-Trichloropropane	µg/L	0.00072		-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,2,4-Trimethylbenzene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,3,5-Trimethylbenzene	µg/L	370		-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,3-Dichloropropane	µg/L	730		-	-	0.5 U	-	-	-	-	-	0.5 U	-
2,2-Dichloropropane	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
2-Chlorotoluene	µg/L	730		-	-	0.5 U	-	-	-	-	-	0.5 U	-
4-Chlorotoluene	µg/L	2600		-	-	0.5 U	-	-	-	-	-	0.5 U	-
Bromobenzene	µg/L	88		-	-	0.5 U	-	-	-	-	-	0.5 U	-
Dibromomethane	µg/L	8.2		-	-	0.5 U	-	-	-	-	-	0.5 U	-
m,p-Xylene	µg/L			-	-	1 U	-	-	-	-	0.5 U	1 U	-
n-Butylbenzene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
N-Propylbenzene	µg/L	1300		-	-	0.5 U	-	-	-	-	-	0.5 U	-
P-Isopropyltoluene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
sec-Butylbenzene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
tret-Butylbenzene	µg/L			-	-	0.5 U	-	-	-	-	-	0.5 U	-
Vinylacetate	µg/L	410		-	-	0.5 U	-	-	-	-	-	0.5 U	-
Xylenes (total)	µg/L			-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	µg/L	400		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.33 B
Vinyl chloride	µg/L	0.016	2	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Bromoethane	µg/L	8.7		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	59000		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		-	-	2 U	-	-	-	-	4.6 J	0.8 J	6 B
Carbon Disulfide	µg/L	1000		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	13		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		-	-	2 U	-	-	-	-	5 U	2 U	5 U
Naphthalene	µg/L	0.14		-	-	0.5 U	-	-	-	-	-	0.5 U	-
Bromochloromethane	µg/L			-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

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Sample Date:				12/14/04	1/4/05	6/21/06	12/14/04	1/4/05	1/4/05	1/4/05	3/14/06	6/21/06	9/13/06
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
Chloroform	µg/L	0.19		-	-	0.5 U	-	-	-	-	0.33 B	0.5 U	0.22 B
Hexachlorobutadiene	µg/L	0.86		-	-	0.5 U	-	-	-	-	-	0.5 U	-
1,1,1-Trichloroethane	µg/L	9100	200	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		-	-	-	-	-	-	-	R	-	R
Trichloroethene	µg/L	2	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
4-methyl-2-Pentanone	µg/L	2000		-	-	2 U	-	-	-	-	5 U	2 U	5 U
Toluene	µg/L	2300	1000	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.062 J
trans-1,3-Dichloropropene	µg/L			-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	U	U	2.2	1.3 J	1.1	U	U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		-	-	2 U	-	-	-	-	5 U	2 U	5 U
Dibromochloromethane	µg/L	0.15		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		-	-	1 U	-	-	-	-	0.5 U	1 U	0.5 U
m,p-Xylene	µg/L			-	-	-	-	-	-	-	-	-	0.5 U
Styrene	µg/L	1600	100	-	-	1 U	-	-	-	-	0.5 U	1 U	0.5 U
Bromoform	µg/L	8.5		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.00032	0.2	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		-	-	0.5 U	-	-	-	-	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Data was obtained from Trip Reports (December 2004 - March 2007) Sampling Event Ravenswood PCE Site by Region III Superfund Tech

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				BLEND-0911	BLEND-1001	BLEND-100203	BLEND-100217	BLEND-100217P	BLEND-1003	BLEND-100317	DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705	DEP09-0705	DEP10-0705	DP-01
Sample Date:				11/23/09	1/6/10	2/3/10	2/17/10	2/17/10	3/4/10	3/17/10	5/8/07	5/8/07	5/9/07	5/9/07	5/9/07	5/9/07	5/8/07	5/9/07	2/2/10
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.13 B	0.13 B	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.29 B	0.17 B	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Vinyl chloride	µg/L	0.016	2	0.5 UL	0.5 UL	0.5 U	0.5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	R	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Acetone	µg/L	22000		R	1.5 B	R	2.9 B	R	R	R	R	R	R	R	R	R	R	R	8.4 J
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.59 J
Methylacetate	µg/L	37000		R	0.5 U	0.5 U	0.5 U	0.5 U	R	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Methylene chloride	µg/L	4.8	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	1.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.5	0.5 U	5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	2.2	0.5 U	0.5 U	0.5 U	0.5 U	0.73	0.5 U	0.5 U	5 U
2-Butanone	µg/L	7100		R	R	R	1.8 B	R	R	R	3.4 J	5 U	5 U	5 U	5 U	5 U	5 UL	5 U	10 U
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Chloroform	µg/L	0.19		0.37 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.58 J
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.15 B	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,4-Dioxane	µg/L	6.1									R	R	R	R	R	R	R	R	R
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Bromodichloromethane	µg/L	0.12		0.39 J	0.5 U	0.14 J	0.41 J	0.5 U	0.21 J	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.54 B
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Tetrachloroethene	µg/L	0.11	5	0.82	0.62	0.5 U	0.59	0.78	0.74	0.78 L	0.5 U	1200	2.2	2.3	41	54	0.5 U	0.5 U	27
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	R	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U
Dibromochloromethane	µg/L	0.15		0.45 J	0.5 U	0.17 J	0.38 J	0.25 J	0.38 J	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.086 J	0.26 J	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	R	R	R	R	R	R	R	R	5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				DP-02	DP-03	DP-04	DP-05	DP-06	DP-06P	DP-07	DP-08	DP-09	DP-10	DP-11	DP-12	DP-13	DP-13P	DP-14	DP-15	DP-16	DP-17	DP-18	DP-19	DP-20	DP-21	DP-22	DP-23
Sample Date:				2/5/10	2/8/10	2/9/10	2/3/10	2/7/10	2/7/10	2/8/10	2/4/10	2/4/10	2/7/10	2/15/10	2/16/10	2/21/10	2/21/10	2/21/10	2/20/10	2/15/10	2/19/10	2/22/10	2/9/10	2/20/10	2/19/10	2/16/10	2/18/10
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																								
Dichlorodifluoromethane	µg/L	390		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	µg/L	190		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	µg/L	0.016	2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	µg/L	8.7		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	µg/L	21000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	µg/L	1300		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	340	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	µg/L	22000		3.9 J	10 U	4 J	5 B	10 U	10 U	10 U	6.1 B	10 U	6.1 J	3.6 J	10 U	10 U	10 U	10 U	10 U	3.9 J	10 U	4.8 J	10 U	10 U	4.3 B	10 U	10 U
Carbon Disulfide	µg/L	1000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.43 J	5 U	0.43 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.49 B	0.57 J	0.44 J
Methylacetate	µg/L	37000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	µg/L	4.8	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	µg/L	110	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyltert-butylether	µg/L	12		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	2.4		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	µg/L	370	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	µg/L	7100		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromochloromethane	µg/L	0.15		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	µg/L	0.19		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.58 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	µg/L	9100	200	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	µg/L	13000		5 U	1.4 B	1.5 B	5 U	1.4 B	1.5 B	1.7 B	0.5 J	5 U	1.5 B	1.7 B	5 U	5 U	5 U	5 U	5 U	1.7 B	5 U	5 U	1.4 B	5 U	5 U	5 U	5 U
Carbon tetrachloride	µg/L	0.2	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	µg/L	0.41	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	0.15	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dioxane	µg/L	6.1		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Trichloroethene	µg/L	2	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	0.39	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	µg/L	0.12		5 U	5 U	5 U	0.56 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	2000		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	µg/L	2300	1000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.37 B	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	0.24	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	µg/L	0.11	5	5 U	40	5 U	31	10	9.4	5 U	30	2.5 J	18	9	49	1.8 J	1.3 J	23	220	5 U	5 U	5 U	3.5 J	0.72 J	5 U	5 U	0.65 J
2-Hexanone	µg/L	47		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	µg/L	0.15		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	91	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	µg/L	1.5	700	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
o-Xylene	µg/L	1200		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
m,p-Xylene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	µg/L	1600	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	µg/L	8.5		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	µg/L	680		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	µg/L	0.43	75	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.66 J
1,2-Dichlorobenzene	µg/L	370	600	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	µg/L	29		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				DP-24	DP-25	DP-26	DP-27	DP-28	DP-29D	DP-29DP	DP-29S	DP-30	DP-31	DP-32	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507	FB-070831	FB-080312	FB-081106	FB-081107	FB-081108
Sample Date:				2/18/10	2/22/10	2/23/10	3/16/10	3/16/10	3/17/10	3/17/10	3/17/10	3/17/10	3/17/10	3/18/10	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07	8/31/07	12/3/08	11/6/08	11/7/08	11/8/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																					
Dichlorodifluoromethane	µg/L	390		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		10 U	5.9 J	10 U	R	R	10 UL	10 UL	10 UL	R	R	R	R	2.5 B	R	R	3.4 J	R	25 B	32 L	32 L	33 L
Carbon Disulfide	µg/L	1000		5 U	0.47 B	0.46 B	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.11 B	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		5 U	5 U	5 U	R	R	5 UL	5 UL	5 UL	R	R	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	1.5 B	1.9 B	0.5 U	0.5 U	0.55 B	210	0.23 B	0.63 B	0.63 B	0.57 B
trans-1,2-Dichloroethene	µg/L	110	100	5 U	5 U	5 U	0.5 UL	0.31 J	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	5 U	5 U	5 U	0.5 UL	10 L	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		10 U	10 U	10 U	R	R	10 UL	10 UL	10 UL	R	R	R	3.6 B	5 U	5 UL	5 UL	5 U	R	1 J	31 L	R	37 L
Bromochloromethane	µg/L	0.15		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		5 U	5 U	5 U	0.5 UL	0.5 UL	1.7 B	1.6 B	1.8 B	0.5 L	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.86	0.5 U	0.62	0.82	0.86	0.81
1,1,1-Trichloroethane	µg/L	9100	200	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		R	R	R			R	R	R				R	R	R	R	R					
Trichloroethene	µg/L	2	5	5 U	5 U	5 U	0.5 UL	8.6 L	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.11 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		5 U	5 U	5 U	0.18 J	0.5 UL	5 UL	5 UL	5 UL	0.27 J	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		10 U	10 U	10 U	5 UL	5 UL	10 UL	10 UL	10 UL	5 UL	5 UL	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.11 J	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	9.6	5 U	0.68 J	130 L	1.6 L	4.8 J	5.8 L	48 L	7.4 L	0.093 B	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		10 U	10 U	10 U	5 UL	5 UL	10 UL	10 UL	10 UL	5 UL	5 UL	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	R	R	R	R	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		5 U	5 U	5 U	0.5 UL	0.5 UL	5 UL	5 UL	5 UL	0.5 UL	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				FB-081110	FB-081111	FB-081117	FB-081119	FB-081120	PW01-0705	PW02-0705	PW04-0705	PW06-0705	PW07-0705	PW2-100202	PW2-100217	PW2-1003	PW2-1003P	PW2-100317	PW3-0911	PW3-0911P	PW3-1001
Sample Date:				11/10/08	11/11/08	11/17/08	11/19/08	11/20/08	5/8/07	5/8/07	5/8/07	5/8/07	5/8/07	2/2/10	2/17/10	3/4/10	3/4/10	3/17/10	11/23/09	11/23/09	1/6/10
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																		
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.96 J
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Acetone	µg/L	22000		35 L	25 J	26 L	25 L	24 L	R	3.7 J	R	3.7 J	R	R	10 U	2.2 B	2 B	R	10 U	10 U	R
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	R	5 U	5 U	5 U
Methylene chloride	µg/L	4.8	5	0.32 B	0.22 B	0.41 B	0.25 J	0.22 J	0.5 U	0.61	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
2-Butanone	µg/L	7100		160 L	14 L	5 U	R	R	5 UL	5 U	5 U	5 U	5 U	R	10 U	R	R	R	10 U	10 U	10 U
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Chloroform	µg/L	0.19		0.79	0.76	0.7	0.71	0.5 U	0.5 U	0.5 U	0.5 U	0.5 B	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.12 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,4-Dioxane	µg/L	6.1							R	R	R	. R	R		R				R	R	R
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 UL	10 U	10 U	10 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.2	0.5 U	0.5 U	0.5 U	1.9	3.5 J	3.4	3.1	5 L	28	28	29
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 UL	10 U	10 U	10 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R	R	R	R	R	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UL	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				PW3-1001P	PW5-0911	PW5-1001	PW5-100202	PW5-100217	PW5-1003	PW5-100317	RB-070507	RB-070508	RB-070509	RB-080212	RB-080312	RB-081104	RB-090930	RB-100109	RB-100201	RB-100202	RB-100203
Sample Date:				1/6/10	11/23/09	1/6/10	2/2/10	2/17/10	3/4/10	3/17/10	5/7/07	5/8/07	5/9/07	12/2/08	12/3/08	11/4/08	9/30/09	10/1/09	2/1/10	2/2/10	2/3/10
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																		
Dichlorodifluoromethane	µg/L	390		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		5 U	0.5 U	0.5 U	R	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R
Chloroethane	µg/L	21000		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		R	R	1.3 B	R	10 U	2 B	R	1.4 J	R	R	28 B	32 B	32 L	R	R	5 U	5 U	R
Carbon Disulfide	µg/L	1000		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		5 U	R	0.5 U	0.5 U	5 U	0.5 U	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	2.3	0.93	0.5 U	0.37 B	0.33 B	0.42 B	0.5 U	0.5 U	0.43 B	0.44 B	1.3
trans-1,2-Dichloroethene	µg/L	110	100	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		10 U	R	R	R	10 U	R	R	5 U	3.1 J	5 U	1.4 J	1.4 J	15 L	5 U	5 U	5 U	5 U	R
Bromochloromethane	µg/L	0.15		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		1.3 B	0.5 U	0.22 J	0.53	5 U	0.5 U	0.3 J	1.7	0.5 U	1.9	0.27 J	0.63	0.69	0.5 U	0.5 U	0.5 U	0.5 U	1
1,1,1-Trichloroethane	µg/L	9100	200	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1		R				R			R	R	R								
Trichloroethene	µg/L	2	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		10 U	5 U	5 U	5 U	10 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.21 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.61
trans-1,3-Dichloropropene	µg/L			5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	30	0.54	0.55	1.2	1.5 J	1.4	1.8 L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		10 U	5 U	5 U	5 U	10 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	R	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				RB-100204	RB-100204B	RB-100205	RB-100207	RB-100208	RB-100209	RB-100215	RB-100216	RB-100218	RB-100219	RB-100220	RB-100221	RB-100222	RB-100223	RB-100316	RB-100317	RI-DEP05D-080312
Sample Date:				2/4/10	2/4/10	2/5/10	2/7/10	2/8/10	2/9/10	2/15/10	2/16/10	2/18/10	2/19/10	2/20/10	2/21/10	2/22/10	2/23/10	3/16/10	3/17/10	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																	
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.049 J	0.5 U	0.5 U	0.12 B	0.15 B	0.17 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Bromomethane	µg/L	8.7		R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.086 B	0.073 B	0.096 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.043 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Acetone	µg/L	22000		R	R	R	R	3.7 J	2.8 J	R	R	R	R	R	3.5 J	R	3.3 J	R	R	R
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 B	0.19 B	0.17 B	0.19 B	0.18 B	0.2 J	0.15 J	0.5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R	R	0.5 U
Methylene chloride	µg/L	4.8	5	1.5	1.3	1.1	1.2	0.87	1	0.95	1.2	1.3	0.81	0.99	0.99	0.92	0.91	0.46 J	0.5 UL	0.18 B
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
2-Butanone	µg/L	7100		R	1.4 J	5 U	1.4 J	1.1 J	R	R	1.7 J	1.6 J	1.3 J	R	1.5 J	1.7 J	1.4 J	R	R	5 U
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Chloroform	µg/L	0.19		1.1 K	0.5 U	0.5 U	0.5 U	5.8	0.82	0.5 U	0.5 U	0.5 U	0.5 U	0.79	0.86	0.5 U	0.78	0.5 UL	0.5 UL	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.05 B	0.033 B	0.5 U	0.039 B	0.041 B	0.05 B	0.036 B	0.033 B	0.034 B	0.04 B	0.034 B	0.5 UL	0.5 UL	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.18 J	0.5 U	0.17 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.093 J	0.066 J	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,4-Dioxane	µg/L	6.1																		
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.99	0.5 U	0.042 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UL	5 UL	5 U
Toluene	µg/L	2300	1000	0.57	0.62	0.3 J	0.41 J	0.44 J	0.39 J	0.25 J	0.4 J	0.33 J	0.19 J	0.25 J	0.26 J	0.3 J	0.25 J	0.5 UL	0.5 UL	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	0.5 U	0.5 U	0.12 J	0.5 U	0.5 U	0.5 U	0.058 J	0.032 J	0.5 U	0.064 J	0.051 J	0.5 U	0.5 U	0.5 UL	0.5 UL	0.15 J
2-Hexanone	µg/L	47		5 U	1.5 J	5 U	1.3 J	1.4 J	5 U	5 U	1.8 J	1.5 J	5 U	5 U	5 U	5 U	1.8 J	5 UL	5 UL	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.11 J	0.5 U	0.15 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.042 J	0.044 J	0.039 J	0.5 U	0.5 UL	0.5 UL	0.5 U
o-Xylene	µg/L	1200		0.08 J	0.087 J	0.5 U	0.034 J	0.042 J	0.5 U	0.5 U	0.039 J	0.041 J	0.033 J	0.04 J	0.056 J	0.08 J	0.054 J	0.5 UL	0.5 UL	0.5 U
m,p-Xylene	µg/L			0.17 J	0.19 J	0.5 U	0.064 J	0.08 J	0.5 U	0.5 U	0.077 J	0.04 J	0.5 U	0.043 J	0.046 J	0.12 J	0.054 J	0.5 UL	0.5 UL	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.023 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.085 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.088 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL	0.5 UL	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				RI-DEP05S-0708	RI-DEP05S-0708P	RI-DEP05S-080312	RI-DEP06-080312	RI-DEP07-080212	RI-DEP08-080212	RI-DEP09-080212	RI-DEP10-080212	RI-EPA01-080312	RI-EPA02-080312	RI-EPA03-080212	RI-EPA04-080212
Sample Date:				8/31/07	8/31/07	12/3/08	12/3/08	12/2/08	12/2/08	12/2/08	12/2/08	12/3/08	12/3/08	12/2/08	12/2/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)												
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		R	R	R	R	R	R	R	R	R	R	R	R
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.84 B	0.88 B	0.16 B	0.5 U	0.5 U	0.13 B	0.15 B	0.13 B	0.14 B	0.14 B	0.13 B	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.35 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		R	R	5 U	R	R	5 U	5 U	5 U	1.1 B	5 U	5 U	R
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.11 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1													
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	570	580	370	2.2	17	40 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				RI-MW06-080312	RI-MW06-080312A	RI-MW11S-080312	RI-PW01-080312	RI-PW02-080312	RI-PW03-0708	RI-PW03-080312	RI-PW04-080312	RI-PW05-080312	RI-PW06-080312	RI-PW07-080312	STRIPPEREFF-0911
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	8/31/07	12/3/08	12/3/08	12/3/08	12/3/08	12/3/08	11/23/09
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)												
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.11 B	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		R	R	R	2.2 B	R	R	R	2.5 B	2.6 B	2.8 B	2.6 B	R
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R
Methylene chloride	µg/L	4.8	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.12 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		5 U	5 U	5 U	R	R	R	5 U	R	R	R	R	R
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1													
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.15 J	0.41 J	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	180 J	190 J	93 J	0.5 U	0.5 U	30	24 J	0.5 U	0.43 J	0.5 U	0.5 U	2.1
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.13 J	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				STRIPPEREFF-1001	STRIPPEREFF-1003	STRIPPEREFF-100317	STRIPPERINF-0911	STRIPPERINF-1001	STRIPPERINF-1003	STRIPPERINF-100317	TB-070507	TB-070508	TB-070509	TB-070831	TB-081104	TB-081107	TB-081108
Sample Date:				1/6/10	3/4/10	3/17/10	11/23/09	1/6/10	3/4/10	3/17/10	5/7/07	5/8/07	5/9/07	8/31/07	11/4/08	11/7/08	11/8/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)														
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		R	1.1 B	R	10 U	R	1.2 B	R	2.3 J	R	R	R	29 L	26 J	35 L
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UL
Methylacetate	µg/L	37000		0.5 U	0.5 U	R	5 U	5 U	0.5 U	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.22 JB	1.7	0.5 U	220	0.7 B	0.26 B	0.36 B
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	R	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		R	5 U	R	10 U	10 U	R	R	5 U	3.3 J	5 U	R	29 L	6.4 L	76 L
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.29 J	0.27 J	0.98	0.5 U	1.9	0.5 U	0.82	0.83	0.82
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1					R	R			R	R	R				
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 UL	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 UL	10 U	10 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	11	0.5 U	0.25 B	11	2.6 J	1.2	1.8 L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		5 U	5 U	5 UL	10 U	10 U	5 U	5 UL	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	R	R	R	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 UL	5 U	5 U	0.5 U	0.5 UL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				TB-081111	TB-081117	TB-081119	TB-081120	TB-091123	TB-100106	TB-100109	TB-100201	TB-100203	TB-100205	TB-100208	TB-100209	TB-100215	TB-100216	TB-100217	TB-100218	TB-100219	TB-100222	TB-100223
Sample Date:				11/11/08	11/17/08	11/19/08	11/20/08	11/23/09	1/6/10	10/1/09	2/1/10	2/3/10	2/5/10	2/8/10	2/2/10	2/15/10	2/16/10	2/17/10	2/18/10	2/19/10	2/22/10	2/23/10
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																			
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.13 B	0.14 B	0.15 B	0.15 B	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.082 B	0.086 B	0.5 U	0.095 B	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		31 J	29 L	27 L	27 L	1.7 B	1.8 J	R	5 U	R	R	5 U	R	R	R	2.8 J	R	3 J	R	3.2 J
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.07 B	0.18 B	0.18 B	0.17 B
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	R	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.56 B	0.42 B	0.26 J	0.27 J	0.5 U	0.5 U	0.5 U	0.36 B	0.88	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1	1	0.91
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		42 L	5 U	R	R	R	R	5 U	5 U	R	1.4 J	1.5 J	R	2 J	1.3 J	1.4 J	R	1.4 J	1.6 J	1.8 J
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.68 K	0.7	0.72	0.76	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.76
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.13 B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.044 J	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.034 B	0.5 U	0.037 B	0.036 B	0.5 U	0.093 B	0.037 B	0.031 B	0.039 B
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.17 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1																				
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.044 J	0.62	0.55	0.53	0.48 J	0.48 J	0.42 J	0.5 J	0.36 J	0.32 J	0.28 J
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.056 J	0.5 U	0.5 U	0.5 U
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.3 J	1.5 J	5 U	1.7 J	1.7 J	5 U	2 J	5 U	5 U	1.7 J
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.053 J	0.043 J	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.1 J	0.085 J	0.5 U	0.064 J	0.053 J	0.5 U	0.07 J	0.12 J	0.1 J	0.078 J
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J	0.15 J	0.5 U	0.1 J	0.098 J	0.5 U	0.14 J	0.15 J	0.13 J	0.082 J
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.027 J	0.053 J	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				TB-100304	TB2-100203	TB-100317	TS-AS01-081111	TS-AS02-081104	TS-AS03-081110	TS-AS04-081108	TS-AS04-081108-A	TS-AS05-081107	TS-AS06-081106	TS-AS07-081120	TS-AS08-081119	TS-DEP05D-093009
Sample Date:				3/4/10	2/3/10	3/17/10	11/11/08	11/4/08	11/10/08	11/8/08	11/8/08	11/7/08	11/6/08	11/20/08	11/19/08	9/30/09
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)													
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 UL	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.2 J	0.5 U	0.5 U	0.1 J	10 U	0.5 U	0.19 J	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 UL	0.5 U
Bromomethane	µg/L	8.7		0.5 U	R	0.5 UL	0.5 U	10 U	0.5 UL	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 UL	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Acetone	µg/L	22000		1.8 B	R	R	32 B	47 B	16 B	26 B	28 B	33 B	56 B	10 B	14 B	R
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.12 J	0.5 U	0.5 U	0.15 J	10 U	0.5 U	0.5 U	0.5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	R	2.3	10 U	0.5 U	0.5 U	0.5 U	0.99	10 U	0.5 U	0.5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.5 U	1.5	0.45 J	0.5 U	5.3 B	0.31 B	0.12 B	0.14 B	0.26 B	5 B	0.5 U	0.16 B	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
2-Butanone	µg/L	7100		R	R	R	15 B	R	760 L	120 B	19 B	580 L	R	3.6 J	5.7 J	5 U
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	1.2 K	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.14 B	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.16 J	0.13 J	0.18 J	0.19 J	10 U	0.14 J	0.5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 UL	0.59	10 U	0.4 J	0.67	0.61	0.5 U	10 U	0.72	0.66	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane	µg/L	6.1														
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.13 J	0.17 J	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.13 J	0.33 J	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 UL	5 U	100 U	5 U	5 U	5 U	5 U	100 U	5 U	5 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.64	0.5 UL	0.62	10 U	0.27 J	0.53	0.5	0.49 J	10 U	0.63	0.66	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	0.5 U	0.5 UL	5.4	210	0.5 U	0.5 U	0.5 U	0.48 J	140	110	64	0.5 U
2-Hexanone	µg/L	47		5 U	5 U	5 UL	5 U	100 U	5 U	5 U	5 U	5 U	100 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 UL	0.11 J	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.11 J	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 UL	0.1 J	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 UL	0.28 J	10 U	0.5 U	0.26 J	0.24 J	0.31 J	10 U	0.15 J	0.23 J	0.5 U
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 UL	0.5 U	10 U	0.5 U	0.13 B	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				TS-DEP05D-1002	TS-DEP05S-100109	TS-DEP05S-1002	TS-DEP06-100109	TS-DEP06-1002	TS-DEP07-093009	TS-DEP07-1002	TS-DEP08-093009	TS-DEP08-1002	TS-EPA01-093009
Sample Date:				2/1/10	10/1/09	2/1/10	10/1/09	2/2/10	9/30/09	2/2/10	9/30/09	2/1/10	9/30/09
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)										
Dichlorodifluoromethane	µg/L	390		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 UL	5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Acetone	µg/L	22000		5 U	20 U	10 U	R	5 U	R	5 U	10 U	10 U	R
Carbon Disulfide	µg/L	1000		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Methylacetate	µg/L	37000		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.38 B	10 U	5 U	0.5 U	0.37 B	0.5 U	0.34 B	5 U	5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
2-Butanone	µg/L	7100		5 U	20 U	10 U	5 U	5 U	5 U	5 U	10 U	10 U	5 U
Bromochloromethane	µg/L	0.15		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,4-Dioxane	µg/L	6.1			R	R					R	R	
Trichloroethene	µg/L	2	5	0.5 U	7.4 B	5 U	0.5 U	0.5 U	0.5 U	0.5 U	6 B	5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	20 U	10 U	5 U	5 U	5 U	5 U	10 U	10 U	5 U
Toluene	µg/L	2300	1000	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	230	69	3.9	5.5	11	15	44	32	0.5 U
2-Hexanone	µg/L	47		5 U	20 U	10 U	5 U	5 U	5 U	5 U	10 U	10 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Styrene	µg/L	1600	100	0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	10 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 UL	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 UL	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	10 U	5 UL	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				TS-EPA01-1002	TS-EPA02-093009	TS-EPA02-1002	TS-EPA03-093009	TS-EPA03-1002	TS-EPA04-093009	TS-EPA04-1002	TS-MW06S-100109	TS-MW06S-100109A	TS-MW06S-1002	TS-MW06S-1002P	TS-MW11S-081117
Sample Date:				2/1/10	9/30/09	2/1/10	9/30/09	2/1/10	9/30/09	2/1/10	10/1/09	10/1/09	2/2/10	2/2/10	11/17/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)												
Dichlorodifluoromethane	µg/L	390		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Chloromethane	µg/L	190		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.13 J
Vinyl chloride	µg/L	0.016	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Bromomethane	µg/L	8.7		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Chloroethane	µg/L	21000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Acetone	µg/L	22000		5 U	R	5 U	R	5 U	R	5 U	20 U	20 U	10 U	10 U	15 B
Carbon Disulfide	µg/L	1000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Methylacetate	µg/L	37000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Methylene chloride	µg/L	4.8	5	0.3 B	0.5 U	0.35 B	0.5 U	0.37 B	0.5 U	0.38 B	10 U	10 U	5 U	5 U	0.26 B
trans-1,2-Dichloroethene	µg/L	110	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Methyltert-butylether	µg/L	12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
2-Butanone	µg/L	7100		5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	20 U	10 U	10 U	2.5 J
Bromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Chloroform	µg/L	0.19		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Cyclohexane	µg/L	13000		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.32 B
Carbon tetrachloride	µg/L	0.2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Benzene	µg/L	0.41	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.33 J
1,2-Dichloroethane	µg/L	0.15	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,4-Dioxane	µg/L	6.1									R	R	R	R	
Trichloroethene	µg/L	2	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	7.6 B	6.9 B	5 U	5 U	0.5 U
Methylcyclohexane	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.17 J
1,2-Dichloropropane	µg/L	0.39	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Bromodichloromethane	µg/L	0.12		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	20 U	10 U	10 U	5 U
Toluene	µg/L	2300	1000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.4 J
trans-1,3-Dichloropropene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	230	200	170	190	16
2-Hexanone	µg/L	47		5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	20 U	10 U	10 U	5 U
Dibromochloromethane	µg/L	0.15		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Chlorobenzene	µg/L	91	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
o-Xylene	µg/L	1200		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
m,p-Xylene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.18 J
Styrene	µg/L	1600	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Bromoform	µg/L	8.5		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
Isopropylbenzene	µg/L	680		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,3-Dichlorobenzene	µg/L			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	10 U	5 U	5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-12
VOCs in Groundwater 2007-2010

Sample Location:				TS-MW11S-100109	TS-MW11S-1002	TS-PW3-100109
Sample Date:				10/1/09	2/2/10	10/1/09
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)			
Dichlorodifluoromethane	µg/L	390		5 U	5 U	0.5 U
Chloromethane	µg/L	190		5 U	5 U	0.5 U
Vinyl chloride	µg/L	0.016	2	5 UL	5 U	0.5 U
Bromomethane	µg/L	8.7		5 U	5 U	0.5 U
Chloroethane	µg/L	21000		5 U	5 U	0.5 U
Trichlorofluoromethane	µg/L	1300		5 U	5 U	0.5 U
1,1-Dichloroethene	µg/L	340	7	5 U	5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	59000		5 U	5 U	0.5 U
Acetone	µg/L	22000		10 U	10 U	R
Carbon Disulfide	µg/L	1000		5 U	5 U	0.5 U
Methylacetate	µg/L	37000		5 U	5 U	0.5 U
Methylene chloride	µg/L	4.8	5	5 U	5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	110	100	5 U	5 U	0.5 U
Methyltert-butylether	µg/L	12		5 U	5 U	0.5 U
1,1-Dichloroethane	µg/L	2.4		5 U	5 U	0.5 U
cis-1,2-Dichloroethene	µg/L	370	70	5 U	5 U	0.5 U
2-Butanone	µg/L	7100		10 U	10 U	5 U
Bromochloromethane	µg/L	0.15		5 U	5 U	0.5 U
Chloroform	µg/L	0.19		5 U	5 U	0.5 U
1,1,1-Trichloroethane	µg/L	9100	200	5 U	5 U	0.5 U
Cyclohexane	µg/L	13000		5 U	5 U	0.5 U
Carbon tetrachloride	µg/L	0.2	5	5 U	5 U	0.5 U
Benzene	µg/L	0.41	5	5 U	5 U	0.5 U
1,2-Dichloroethane	µg/L	0.15	5	5 U	5 U	0.5 U
1,4-Dioxane	µg/L	6.1		R	R	
Trichloroethene	µg/L	2	5	5.7 B	5 U	0.5 U
Methylcyclohexane	µg/L			5 U	5 U	0.5 U
1,2-Dichloropropane	µg/L	0.39	5	5 U	5 U	0.5 U
Bromodichloromethane	µg/L	0.12		5 U	5 U	0.5 U
cis-1,3-Dichloropropene	µg/L			5 U	5 U	0.5 U
4-Methyl-2-pentanone	µg/L	2000		10 U	10 U	5 U
Toluene	µg/L	2300	1000	5 U	5 U	0.5 U
trans-1,3-Dichloropropene	µg/L			5 U	5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.24	5	5 U	5 U	0.5 U
Tetrachloroethene	µg/L	0.11	5	56	66	14
2-Hexanone	µg/L	47		10 U	10 U	5 U
Dibromochloromethane	µg/L	0.15		5 U	5 U	0.5 U
1,2-Dibromoethane	µg/L	0.0065	0.05	5 U	5 U	0.5 U
Chlorobenzene	µg/L	91	100	5 U	5 U	0.5 U
Ethylbenzene	µg/L	1.5	700	5 U	5 U	0.5 U
o-Xylene	µg/L	1200		5 U	5 U	0.5 U
m,p-Xylene	µg/L			5 U	5 U	0.5 U
Styrene	µg/L	1600	100	5 U	5 U	0.5 U
Bromoform	µg/L	8.5		5 U	5 U	0.5 U
Isopropylbenzene	µg/L	680		5 U	5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.067		5 U	5 UL	0.5 U
1,3-Dichlorobenzene	µg/L			5 U	5 U	0.5 U
1,4-Dichlorobenzene	µg/L	0.43	75	5 U	5 U	0.5 U
1,2-Dichlorobenzene	µg/L	370	600	5 U	5 U	0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.00032	0.2	5 U	5 UL	0.5 U
1,2,4-Trichlorobenzene	µg/L	2.3	70	5 U	5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	29		5 U	5 U	0.5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705
Sample Date:				5/8/07	5/8/07	5/9/07	5/9/07	5/9/07	5/9/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Benzaldehyde	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U
Phenol	µg/L	11000		5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5 U	5 U	5 U	5 UL	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5 U	5 U	5 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5 U	5 U	5 U	5 UL	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5 U	5 U	5 U	5 U	5 U
Isophorone	µg/L	71		5 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5 U	5 U	5 U	5 UL	5 U
Naphthalene	µg/L	0.14		5 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5 U	5 U	5 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5 U	5 U	5 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

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Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705
Sample Date:				5/8/07	5/8/07	5/9/07	5/9/07	5/9/07	5/9/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Dimethylphthalate	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5 U	5 U	5 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5 U	5 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5 U	5 U	5 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5 U	5 U	5 U	5 U	5 U
Carbazole	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5 U	0.23 J	5 U	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5 U	5 U	5 U	5 U	5 U
Pyrene	µg/L	1100		5 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	µg/L	35		5 U	5 U	5 U	5 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705
Sample Date:				5/8/07	5/8/07	5/9/07	5/9/07	5/9/07	5/9/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U
Chrysene	µg/L	3		5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	2.1 B	3.4 B	0.6 B	0.59 B	1.6 B	2.8 B
Di-n-octylphthalate	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,l)perylene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5 U	5 U	5 U	5 U	5 U

Notes:

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP09-0705	DEP10-0705	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507
Sample Date:				5/8/07	5/9/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Benzaldehyde	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Phenol	µg/L	11000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5 U	5 U	5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isophorone	µg/L	71		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	µg/L	0.14		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP09-0705	DEP10-0705	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507
Sample Date:				5/8/07	5/9/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Dimethylphthalate	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	10 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbazole	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5 U	0.49 J	5 U	5 U	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Pyrene	µg/L	1100		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	µg/L	35		5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				DEP09-0705	DEP10-0705	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507
Sample Date:				5/8/07	5/9/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chrysene	µg/L	3		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	2.1 B	2.9 B	1.6 B	2.8 B	1.8 B	2.4 B	2.8 J
Di-n-octylphthalate	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,l)perylene	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5 U	5 U	5 U	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				FB-070831	FB-080312	PW01-0705	PW02-0705	PW04-0705	PW06-0705	PW07-0705
Sample Date:				8/31/07	12/3/08	5/8/07	5/8/07	5/8/07	5/8/07	5/8/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Benzaldehyde	µg/L	3700		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Phenol	µg/L	11000		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Isophorone	µg/L	71		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	µg/L	0.14		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		0.61 J	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	11 U	10 U	10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				FB-070831	FB-080312	PW01-0705	PW02-0705	PW04-0705	PW06-0705	PW07-0705
Sample Date:				8/31/07	12/3/08	5/8/07	5/8/07	5/8/07	5/8/07	5/8/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
Dimethylphthalate	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	11 U	10 U	10 U	10 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	11 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	11 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Carbazole	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5.6 U	5 U	5 U	0.64 J	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Pyrene	µg/L	1100		0.85 J	5.6 U	5 U	5 U	5 U	5 U	5 U
Butylbenzylphthalate	µg/L	35		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U

Notes:

370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				FB-070831	FB-080312	PW01-0705	PW02-0705	PW04-0705	PW06-0705	PW07-0705
Sample Date:				8/31/07	12/3/08	5/8/07	5/8/07	5/8/07	5/8/07	5/8/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Chrysene	µg/L	3		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	0.19 J	5.6 U	2.6 B	5.1 B	3.5 B	3 B	3.2 B
Di-n-octylphthalate	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	0.2 J
Benzo(b)fluoranthene	µg/L	0.029		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
Benzo(g,h,I)perylene	µg/L			5 U	5.6 U	5 U	5 U	5 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5.6 U	5 U	5 U	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RB-070507	RB-070508	RB-070509	RB-080212	RB-080312	RI-DEP05D-080312
Sample Date:				5/7/07	5/8/07	5/9/07	12/2/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Benzaldehyde	µg/L	3700		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Phenol	µg/L	11000		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
2-Chlorophenol	µg/L	180		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
2-Methylphenol	µg/L	1800		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Acetophenone	µg/L	3700		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
4-Methylphenol	µg/L	180		5 U	5 U	5 U	5.4 U	5.4 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Hexachloroethane	µg/L	4.8		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Nitrobenzene	µg/L	0.12		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Isophorone	µg/L	71		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2-Nitrophenol	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Naphthalene	µg/L	0.14		5 U	5 U	5 U	5.4 U	5.4 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Caprolactam	µg/L	18000		5 U	5 U	5 U	5.4 U	5.4 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5 U	5 U	5.4 U	5.4 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2-Nitroaniline	µg/L	370		10 U	10 U	10 U	11 U	11 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RB-070507	RB-070508	RB-070509	RB-080212	RB-080312	RI-DEP05D-080312
Sample Date:				5/7/07	5/8/07	5/9/07	12/2/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
Dimethylphthalate	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Acenaphthylene	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
3-Nitroaniline	µg/L			10 U	10 U	10 U	11 U	11 U	10 U
Acenaphthene	µg/L	2200		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	10 U	10 U	11 U	11 U	10 U
4-Nitrophenol	µg/L			10 U	10 U	10 U	11 U	11 U	10 U
Dibenzofuran	µg/L	37		5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
Diethylphthalate	µg/L	29000		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Fluorene	µg/L	1500		5 U	5 U	5 U	5.4 U	5.4 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	10 U	10 U	11 U	11 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	10 U	10 U	11 U	11 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 UL	5 U	5 U	5.4 U	5.4 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5 U	5 U	5.4 U	5.4 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5 U	5 U	5.4 U	5.4 U	5 U
Atrazine	µg/L	0.29	3	5 U	5 U	5 U	5.4 U	5.4 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	10 U	10 U	11 U	11 U	10 U
Phenanthrene	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
Anthracene	µg/L	11000		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Carbazole	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Fluoranthene	µg/L	1500		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Pyrene	µg/L	1100		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Butylbenzylphthalate	µg/L	35		5 U	5 U	5 U	5.4 U	5.4 U	5 U

Notes:

370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RB-070507	RB-070508	RB-070509	RB-080212	RB-080312	RI-DEP05D-080312
Sample Date:				5/7/07	5/8/07	5/9/07	12/2/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Chrysene	µg/L	3		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	2.8 J	1.4 J	20	2.9 J	5.4 U	5 U
Di-n-octylphthalate	µg/L			0.27 J	5 U	5 U	5.4 U	5.4 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5 U	5 U	5.4 U	5.4 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5 U	5 U	5.4 U	5.4 U	5 U
Benzo(g,h,I)perylene	µg/L			5 U	5 U	5 U	5.4 U	5.4 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5 U	5 U	5.4 U	5.4 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

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J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location: Sample Date:				RI-DEP05S-0708 8/31/07	RI-DEP05S-0708P 8/31/07	RI-DEP05S-080312 12/3/08	RI-DEP06-080312 12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Benzaldehyde	µg/L	3700		5 U	5 U	5 U	5 U
Phenol	µg/L	11000		5 U	5 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5 U	5 U	5 U
Isophorone	µg/L	71		5 U	5 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5 U	5 U	5 U
Naphthalene	µg/L	0.14		5 U	5 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-DEP05S-0708	RI-DEP05S-0708P	RI-DEP05S-080312	RI-DEP06-080312
Sample Date:				8/31/07	8/31/07	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Dimethylphthalate	µg/L			5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	10 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	10 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	10 U	10 U	10 U
Phenanthrene	µg/L			5 U	5 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5 U	5 U	5 U
Carbazole	µg/L			5 U	5 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5 U	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5 U	5 U	5 U
Pyrene	µg/L	1100		5 U	5 U	5 U	5 U
Butylbenzylphthalate	µg/L	35		5 U	5 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-DEP05S-0708	RI-DEP05S-0708P	RI-DEP05S-080312	RI-DEP06-080312
Sample Date:				8/31/07	8/31/07	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5 U	5 U	5 U
Chrysene	µg/L	3		5 U	5 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	0.22 B	0.38 B	5 U	5 U
Di-n-octylphthalate	µg/L			5 U	5 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5 U	5 U	5 U
Benzo(g,h,I)perylene	µg/L			5 U	5 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-DEP07-080212	RI-DEP08-080212	RI-DEP09-080212	RI-DEP10-080212	RI-EPA01-080312
Sample Date:				12/2/08	12/2/08	12/2/08	12/2/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Benzaldehyde	µg/L	3700		5 U	5 U	5 U	5 U	5.4 U
Phenol	µg/L	11000		5 U	5 U	5 U	5 U	5.4 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5 U	5 U	5 U	5.4 U
2-Chlorophenol	µg/L	180		5 U	5 U	5 U	5 U	5.4 U
2-Methylphenol	µg/L	1800		5 U	5 U	5 U	5 U	5.4 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5 U	5 U	5 U	5.4 U
Acetophenone	µg/L	3700		5 U	5 U	5 U	5 U	5.4 U
4-Methylphenol	µg/L	180		5 U	5 U	5 U	5 U	5.4 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5 U	5 U	5 U	5.4 U
Hexachloroethane	µg/L	4.8		5 U	5 U	5 U	5 U	5.4 U
Nitrobenzene	µg/L	0.12		5 U	5 U	5 U	5 U	5.4 U
Isophorone	µg/L	71		5 U	5 U	5 U	5 U	5.4 U
2-Nitrophenol	µg/L			5 U	5 U	5 U	5 U	5.4 U
2,4-Dimethylphenol	µg/L	730		5 U	5 U	5 U	5 U	5.4 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5 U	5 U	5 U	5.4 U
2,4-Dichlorophenol	µg/L	110		5 U	5 U	5 U	5 U	5.4 U
Naphthalene	µg/L	0.14		5 U	5 U	5 U	5 U	5.4 U
4-Chloroaniline	µg/L	0.34		5 U	5 U	5 U	5 U	5.4 U
Hexachlorobutadiene	µg/L	0.86		5 U	5 U	5 U	5 U	5.4 U
Caprolactam	µg/L	18000		5 U	5 U	5 U	5 U	5.4 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5 U	5 U	5 U	5.4 U
2-Methylnaphthalene	µg/L	150		5 U	5 U	5 U	5 U	5.4 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5 U	5 U	5 U	5.4 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5 U	5 U	5 U	5.4 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5 U	5 U	5 U	5.4 U
1,1'-Biphenyl	µg/L	1800		5 U	5 U	5 U	5 U	5.4 U
2-Chloronaphthalene	µg/L	2900		5 U	5 U	5 U	5 U	5.4 U
2-Nitroaniline	µg/L	370		10 U	10 U	10 U	10 U	11 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-DEP07-080212	RI-DEP08-080212	RI-DEP09-080212	RI-DEP10-080212	RI-EPA01-080312
Sample Date:				12/2/08	12/2/08	12/2/08	12/2/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Dimethylphthalate	µg/L			5 U	5 U	5 U	5 U	5.4 U
2,6-Dinitrotoluene	µg/L	37		5 U	5 U	5 U	5 U	5.4 U
Acenaphthylene	µg/L			5 U	5 U	5 U	5 U	5.4 U
3-Nitroaniline	µg/L			10 U	10 U	10 U	10 U	11 U
Acenaphthene	µg/L	2200		5 U	5 U	5 U	5 U	5.4 U
2,4-Dinitrophenol	µg/L	73		10 U	10 U	10 U	10 U	11 U
4-Nitrophenol	µg/L			10 U	10 U	10 U	10 U	11 U
Dibenzofuran	µg/L	37		5 U	5 U	5 U	5 U	5.4 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5 U	5 U	5 U	5.4 U
Diethylphthalate	µg/L	29000		5 U	5 U	5 U	5 U	5.4 U
Fluorene	µg/L	1500		5 U	5 U	5 U	5 U	5.4 U
4-Chlorophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5.4 U
4-Nitroaniline	µg/L	3.4		10 U	10 U	10 U	10 U	11 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	10 U	10 U	10 U	11 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5 U	5 U	5 U	5.4 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5 U	5 U	5 U	5.4 U
4-Bromophenyl-phenylether	µg/L			5 U	5 U	5 U	5 U	5.4 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5 U	5 U	5 U	5.4 U
Atrazine	µg/L	0.29	3	5 U	5 U	5 U	5 U	5.4 U
Pentachlorophenol	µg/L	0.56	1	10 U	10 U	10 U	10 U	11 U
Phenanthrene	µg/L			5 U	5 U	5 U	5 U	5.4 U
Anthracene	µg/L	11000		5 U	5 U	5 U	5 U	5.4 U
Carbazole	µg/L			5 U	5 U	5 U	5 U	5.4 U
Di-n-butylphthalate	µg/L	3700		5 U	5 U	5 U	5 U	5.4 U
Fluoranthene	µg/L	1500		5 U	5 U	5 U	5 U	5.4 U
Pyrene	µg/L	1100		5 U	5 U	5 U	5 U	5.4 U
Butylbenzylphthalate	µg/L	35		5 U	5 U	5 U	5 U	5.4 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-DEP07-080212	RI-DEP08-080212	RI-DEP09-080212	RI-DEP10-080212	RI-EPA01-080312
Sample Date:				12/2/08	12/2/08	12/2/08	12/2/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5 U	5 U	5 U	5.4 U
Benzo(a)anthracene	µg/L	0.029		5 U	5 U	5 U	5 U	5.4 U
Chrysene	µg/L	3		5 U	5 U	5 U	5 U	5.4 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	5 U	5 U	5 U	5 U	5.4 U
Di-n-octylphthalate	µg/L			5 U	5 U	5 U	5 U	5.4 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5 U	5 U	5 U	5.4 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5 U	5 U	5 U	5.4 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5 U	5 U	5 U	5.4 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5 U	5 U	5 U	5.4 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5 U	5 U	5 U	5.4 U
Benzo(g,h,I)perylene	µg/L			5 U	5 U	5 U	5 U	5.4 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5 U	5 U	5 U	5.4 U

Notes:

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location: Sample Date:				RI-EPA02-080312 12/3/08	RI-EPA03-080212 12/2/08	RI-EPA04-080212 12/2/08	RI-MW06-080312 12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Benzaldehyde	µg/L	3700		5.6 U	5 U	5 U	5 U
Phenol	µg/L	11000		5.6 U	5 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5.6 U	5 U	5 U	5 U
2-Chlorophenol	µg/L	180		5.6 U	5 U	5 U	5 U
2-Methylphenol	µg/L	1800		5.6 U	5 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5.6 U	5 U	5 U	5 U
Acetophenone	µg/L	3700		5.6 U	5 U	5 U	5 U
4-Methylphenol	µg/L	180		5.6 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5.6 U	5 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5.6 U	5 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5.6 U	5 U	5 U	5 U
Isophorone	µg/L	71		5.6 U	5 U	5 U	5 U
2-Nitrophenol	µg/L			5.6 U	5 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5.6 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5.6 U	5 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5.6 U	5 U	5 U	5 U
Naphthalene	µg/L	0.14		5.6 U	5 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5.6 U	5 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5.6 U	5 U	5 U	5 U
Caprolactam	µg/L	18000		5.6 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5.6 U	5 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5.6 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5.6 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5.6 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5.6 U	5 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5.6 U	5 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5.6 U	5 U	5 U	5 U
2-Nitroaniline	µg/L	370		11 U	10 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-EPA02-080312	RI-EPA03-080212	RI-EPA04-080212	RI-MW06-080312
Sample Date:				12/3/08	12/2/08	12/2/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
Dimethylphthalate	µg/L			5.6 U	5 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5.6 U	5 U	5 U	5 U
Acenaphthylene	µg/L			5.6 U	5 U	5 U	5 U
3-Nitroaniline	µg/L			11 U	10 U	10 U	10 U
Acenaphthene	µg/L	2200		5.6 U	5 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		11 U	10 U	10 U	10 U
4-Nitrophenol	µg/L			11 U	10 U	10 U	10 U
Dibenzofuran	µg/L	37		5.6 U	5 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5.6 U	5 U	5 U	5 U
Diethylphthalate	µg/L	29000		5.6 U	5 U	5 U	5 U
Fluorene	µg/L	1500		5.6 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5.6 U	5 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		11 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		11 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5.6 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5.6 U	5 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5.6 U	5 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5.6 U	5 U	5 UL	5 U
Atrazine	µg/L	0.29	3	5.6 U	5 U	5 UL	5 U
Pentachlorophenol	µg/L	0.56	1	11 U	10 U	10 U	10 U
Phenanthrene	µg/L			5.6 U	5 U	5 UL	5 U
Anthracene	µg/L	11000		5.6 U	5 U	5 UL	5 U
Carbazole	µg/L			5.6 U	5 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5.6 U	5 U	5 U	5 U
Fluoranthene	µg/L	1500		5.6 U	5 U	5 UL	5 U
Pyrene	µg/L	1100		5.6 U	5 U	5 UL	5 U
Butylbenzylphthalate	µg/L	35		5.6 U	5 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater provided by ORNL (Updated December 2009)

Data Qualifiers:

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-EPA02-080312	RI-EPA03-080212	RI-EPA04-080212	RI-MW06-080312
Sample Date:				12/3/08	12/2/08	12/2/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)				
3,3'-Dichlorobenzidine	µg/L	0.15		5.6 U	5 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5.6 U	5 U	5 UL	5 U
Chrysene	µg/L	3		5.6 U	5 U	5 UL	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	5.6 U	5 U	8.3	330
Di-n-octylphthalate	µg/L			5.6 U	5 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5.6 U	5 U	5 UL	5 U
Benzo(k)fluoranthene	µg/L	0.29		5.6 U	5 U	5 UL	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5.6 U	5 U	5 UL	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5.6 U	5 U	5 UL	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5.6 U	5 U	5 UL	5 U
Benzo(g,h,I)perylene	µg/L			5.6 U	5 U	5 UL	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5.6 U	5 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-MW06-080312A	RI-MW11S-080312	RI-PW01-080312	RI-PW02-080312	RI-PW03-0708
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	8/31/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Benzaldehyde	µg/L	3700		5 U	5.6 U	5.4 U	5 U	5 U
Phenol	µg/L	11000		5 U	5.6 U	5.4 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5.6 U	5.4 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5.6 U	5.4 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5.6 U	5.4 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5.6 U	5.4 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5.6 U	5.4 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5.6 U	5.4 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5.6 U	5.4 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5.6 U	5.4 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5.6 U	5.4 U	5 U	5 U
Isophorone	µg/L	71		5 U	5.6 U	5.4 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5.6 U	5.4 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5.6 U	5.4 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5.6 U	5.4 U	5 U	5 U
Naphthalene	µg/L	0.14		5 U	5.6 U	5.4 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		R	5.6 U	5.4 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5.6 U	5.4 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5.6 U	5.4 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5.6 U	5.4 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5.6 U	5.4 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	R	5.6 U	5.4 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5.6 U	5.4 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5.6 U	5.4 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5.6 U	5.4 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5.6 U	5.4 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	11 U	11 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

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Data Qualifiers:

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Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-MW06-080312A	RI-MW11S-080312	RI-PW01-080312	RI-PW02-080312	RI-PW03-0708
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	8/31/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Dimethylphthalate	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5.6 U	5.4 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	11 U	11 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5.6 U	5.4 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	11 U	11 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	11 U	11 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5.6 U	5.4 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5.6 U	5.4 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5.6 U	5.4 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5.6 U	5.4 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	11 U	11 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	11 U	11 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5.6 U	5.4 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5.6 U	5.4 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5.6 U	5.4 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5.6 U	5.4 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	11 U	11 U	10 U	10 U
Phenanthrene	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5.6 U	5.4 U	5 U	5 U
Carbazole	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5.6 U	5.4 U	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5.6 U	5.4 U	5 UL	5 U
Pyrene	µg/L	1100		5 U	5.6 U	5.4 U	5 UL	5 U
Butylbenzylphthalate	µg/L	35		5 U	5.6 U	5.4 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-MW06-080312A	RI-MW11S-080312	RI-PW01-080312	RI-PW02-080312	RI-PW03-0708
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	8/31/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
3,3'-Dichlorobenzidine	µg/L	0.15		R	5.6 U	5.4 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5.6 U	5.4 U	5 UL	5 U
Chrysene	µg/L	3		5 U	5.6 U	5.4 U	5 UL	5 U
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	5 U	4.3 J	5.4 U	5 U	0.23 B
Di-n-octylphthalate	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5.6 U	5.4 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5.6 U	5.4 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5.6 U	5.4 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5.6 U	5.4 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5.6 U	5.4 U	5 U	5 U
Benzo(g,h,I)perylene	µg/L			5 U	5.6 U	5.4 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5.6 U	5.4 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-PW03-080312	RI-PW04-080312	RI-PW05-080312	RI-PW06-080312	RI-PW07-080312
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Benzaldehyde	µg/L	3700		5 U	5.3 U	5.3 U	5 U	5 U
Phenol	µg/L	11000		5 U	5.3 U	5.3 U	5 U	5 U
Bis(2-Chloroethyl)ether	µg/L	0.012		5 U	5.3 U	5.3 U	5 U	5 U
2-Chlorophenol	µg/L	180		5 U	5.3 U	5.3 U	5 U	5 U
2-Methylphenol	µg/L	1800		5 U	5.3 U	5.3 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	µg/L	0.32		5 U	5.3 U	5.3 U	5 U	5 U
Acetophenone	µg/L	3700		5 U	5.3 U	5.3 U	5 U	5 U
4-Methylphenol	µg/L	180		5 U	5.3 U	5.3 U	5 U	5 U
N-Nitroso-di-n-propylamine	µg/L	0.0096		5 U	5.3 U	5.3 U	5 U	5 U
Hexachloroethane	µg/L	4.8		5 U	5.3 U	5.3 U	5 U	5 U
Nitrobenzene	µg/L	0.12		5 U	5.3 U	5.3 U	5 U	5 U
Isophorone	µg/L	71		5 U	5.3 U	5.3 U	5 U	5 U
2-Nitrophenol	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
2,4-Dimethylphenol	µg/L	730		5 U	5.3 U	5.3 U	5 U	5 U
Bis(2-chloroethoxy)methane	µg/L	110		5 U	5.3 U	5.3 U	5 U	5 U
2,4-Dichlorophenol	µg/L	110		5 U	5.3 U	5.3 U	5 U	5 U
Naphthalene	µg/L	0.14		5 U	5.3 U	5.3 U	5 U	5 U
4-Chloroaniline	µg/L	0.34		5 U	5.3 U	5.3 U	5 U	5 U
Hexachlorobutadiene	µg/L	0.86		5 U	5.3 U	5.3 U	5 U	5 U
Caprolactam	µg/L	18000		5 U	5.3 U	5.3 U	5 U	5 U
4-Chloro-3-methylphenol	µg/L	3700		5 U	5.3 U	5.3 U	5 U	5 U
2-Methylnaphthalene	µg/L	150		5 U	5.3 U	5.3 U	5 U	5 U
Hexachlorocyclopentadiene	µg/L	220	50	5 U	5.3 U	5.3 U	5 U	5 U
2,4,6-Trichlorophenol	µg/L	6.1		5 U	5.3 U	5.3 U	5 U	5 U
2,4,5-Trichlorophenol	µg/L	3700		5 U	5.3 U	5.3 U	5 U	5 U
1,1'-Biphenyl	µg/L	1800		5 U	5.3 U	5.3 U	5 U	5 U
2-Chloronaphthalene	µg/L	2900		5 U	5.3 U	5.3 U	5 U	5 U
2-Nitroaniline	µg/L	370		10 U	11 U	11 U	10 U	10 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-PW03-080312	RI-PW04-080312	RI-PW05-080312	RI-PW06-080312	RI-PW07-080312
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
Dimethylphthalate	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
2,6-Dinitrotoluene	µg/L	37		5 U	5.3 U	5.3 U	5 U	5 U
Acenaphthylene	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
3-Nitroaniline	µg/L			10 U	11 U	11 U	10 U	10 U
Acenaphthene	µg/L	2200		5 U	5.3 U	5.3 U	5 U	5 U
2,4-Dinitrophenol	µg/L	73		10 U	11 U	11 U	10 U	10 U
4-Nitrophenol	µg/L			10 U	11 U	11 U	10 U	10 U
Dibenzofuran	µg/L	37		5 U	5.3 U	5.3 U	5 U	5 U
2,4-Dinitrotoluene	µg/L	0.22		5 U	5.3 U	5.3 U	5 U	5 U
Diethylphthalate	µg/L	29000		5 U	5.3 U	5.3 U	5 U	5 U
Fluorene	µg/L	1500		5 U	5.3 U	5.3 U	5 U	5 U
4-Chlorophenyl-phenylether	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
4-Nitroaniline	µg/L	3.4		10 U	11 U	11 U	10 U	10 U
4,6-Dinitro-2-methylphenol	µg/L	3.7		10 U	11 U	11 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	14		5 U	5.3 U	5.3 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	µg/L	11		5 U	5.3 U	5.3 U	5 U	5 U
4-Bromophenyl-phenylether	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
Hexachlorobenzene	µg/L	0.042	1	5 U	5.3 U	5.3 U	5 U	5 U
Atrazine	µg/L	0.29	3	5 U	5.3 U	5.3 U	5 U	5 U
Pentachlorophenol	µg/L	0.56	1	10 U	11 U	11 U	10 U	10 U
Phenanthrene	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
Anthracene	µg/L	11000		5 U	5.3 U	5.3 U	5 U	5 U
Carbazole	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
Di-n-butylphthalate	µg/L	3700		5 U	5.3 U	1.5 J	5 U	5 U
Fluoranthene	µg/L	1500		5 U	5.3 U	5.3 UL	5 UL	5 UL
Pyrene	µg/L	1100		5 U	5.3 U	5.3 UL	5 UL	5 UL
Butylbenzylphthalate	µg/L	35		5 U	5.3 U	5.3 U	5 U	5 U

Notes: 370

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
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U - nondetect

Table A-13
SVOCs in Groundater, 2007-2008

Sample Location:				RI-PW03-080312	RI-PW04-080312	RI-PW05-080312	RI-PW06-080312	RI-PW07-080312
Sample Date:				12/3/08	12/3/08	12/3/08	12/3/08	12/3/08
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
3,3'-Dichlorobenzidine	µg/L	0.15		5 U	5.3 U	5.3 U	5 U	5 U
Benzo(a)anthracene	µg/L	0.029		5 U	5.3 U	5.3 UL	5 UL	5 UL
Chrysene	µg/L	3		5 U	5.3 U	5.3 UL	5 UL	5 UL
Bis(2-ethylhexyl)phthalate	µg/L	4.8	6	5 U	5.3 U	3 J	5 U	5 U
Di-n-octylphthalate	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
Benzo(b)fluoranthene	µg/L	0.029		5 U	5.3 U	5.3 U	5 U	5 U
Benzo(k)fluoranthene	µg/L	0.29		5 U	5.3 U	5.3 U	5 U	5 U
Benzo(a)pyrene	µg/L	0.0029	0.2	5 U	5.3 U	5.3 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	µg/L	0.029		5 U	5.3 U	5.3 U	5 U	5 U
Dibenzo(a,h)anthracene	µg/L	0.0029		5 U	5.3 U	5.3 U	5 U	5 U
Benzo(g,h,I)perylene	µg/L			5 U	5.3 U	5.3 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	µg/L	1100		5 U	5.3 U	5.3 U	5 U	5 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL = EPA Region 3 Risk Based Concentration Values for Residential Tapwater
provided by ORNL (Updated December 2009)

Data Qualifiers:

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L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-14
Pesticides and PCBs in Groundwater, 2007

Sample Location:				DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705
Sample Date:				5/8/07	5/8/07	5/9/07	5/10/07	5/9/07	5/9/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)						
4,4'-DDD	µg/L	0.28		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
4,4'-DDE	µg/L	0.2		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
4,4'-DDT	µg/L	0.2		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Aldrin	µg/L	0.004		0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL
alpha-BHC	µg/L	0.011		0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
beta-BHC	µg/L	0.037		0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Chlordane	µg/L			1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Chlordane,gamma	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Chlordene,alpha	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
delta-BHC				-	-	-	-	-	-
Dieldrin	µg/L	0.0042		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndosulfanI	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
EndosulfanII	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndosulfanSulfate	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Endrin	µg/L	11	2	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndrinAldehyde	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Endrinketone	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
gamma-BHC(Lindane)	µg/L	0.061	0.2	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Heptachlor	µg/L	0.015	0.4	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
HeptachlorEpoxide	µg/L	0.0074	0.2	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Methoxychlor	µg/L	180	40	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U
Toxaphene	µg/L	0.061	3	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U
Aroclor-1016	µg/L	0.96		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1221	µg/L	0.0068		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1232	µg/L	0.0068		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1242	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1248	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1254	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1260	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1262	µg/L			-	-	-	-	-	-
Aroclor-1268	µg/L			-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-14
Pesticides and PCBs in Groundwater, 2007

Sample Location:				DEP09-0705	DEP10-0705	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507
Sample Date:				5/8/07	5/9/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
4,4'-DDD	µg/L	0.28		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
4,4'-DDE	µg/L	0.2		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
4,4'-DDT	µg/L	0.2		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
Aldrin	µg/L	0.004		0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.062 UL
alpha-BHC	µg/L	0.011		0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
beta-BHC	µg/L	0.037		0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
Chlordane	µg/L			1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Chlordane,gamma	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
Chlordene,alpha	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
delta-BHC				-	-	-	-	-	-	-
Dieldrin	µg/L	0.0042		0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
EndosulfanI	µg/L			0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
EndosulfanII	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
EndosulfanSulfate	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
Endrin	µg/L	11	2	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
EndrinAldehyde	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
Endrinketone	µg/L			0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.125 U
gamma-BHC(Lindane)	µg/L	0.061	0.2	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
Heptachlor	µg/L	0.015	0.4	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
HeptachlorEpoxide	µg/L	0.0074	0.2	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.062 U
Methoxychlor	µg/L	180	40	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U	0.625 U
Toxaphene	µg/L	0.061	3	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U	6.25 U
Aroclor-1016	µg/L	0.96		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1221	µg/L	0.0068		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1232	µg/L	0.0068		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1242	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1248	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1254	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1260	µg/L	0.034		1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.25 U
Aroclor-1262	µg/L			-	-	-	-	-	-	-
Aroclor-1268	µg/L			-	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-14
Pesticides and PCBs in Groundwater, 2007

Sample Location:				FB-070831	PW01-0705	PW02-0705	PW04-0705	PW06-0705	PW07-0705	RB-070507
Sample Date:				8/31/07	5/8/07	5/8/07	5/8/07	5/8/07	5/8/07	5/7/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)							
4,4'-DDD	µg/L	0.28		0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
4,4'-DDE	µg/L	0.2		0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
4,4'-DDT	µg/L	0.2		0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Aldrin	µg/L	0.004		0.05 U	0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL	0.051 UL
alpha-BHC	µg/L	0.011		0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
beta-BHC	µg/L	0.037		0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Chlordane	µg/L				1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Chlordane,gamma	µg/L			0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Chlordene,alpha	µg/L			0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
delta-BHC				0.05 U	-	-	-	-	-	-
Dieldrin	µg/L	0.0042		0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndosulfanI	µg/L			0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
EndosulfanII	µg/L			0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndosulfanSulfate	µg/L			0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Endrin	µg/L	11	2	0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
EndrinAldehyde	µg/L			0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
Endrinketone	µg/L			0.1 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U	0.101 U
gamma-BHC(Lindane)	µg/L	0.061	0.2	0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Heptachlor	µg/L	0.015	0.4	0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
HeptachlorEpoxide	µg/L	0.0074	0.2	0.05 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U	0.051 U
Methoxychlor	µg/L	180	40	0.5 U	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U	0.505 U
Toxaphene	µg/L	0.061	3	5 U	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U	5.05 U
Aroclor-1016	µg/L	0.96		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1221	µg/L	0.0068		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1232	µg/L	0.0068		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1242	µg/L	0.034		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1248	µg/L	0.034		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1254	µg/L	0.034		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1260	µg/L	0.034		1 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
Aroclor-1262	µg/L			1 U	-	-	-	-	-	-
Aroclor-1268	µg/L			1 U	-	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-14
Pesticides and PCBs in Groundwater, 2007

Sample Location:				RB-070508	RB-070509	RI-DEP05S-0708	RI-DEP05S-0708P	RI-PW03-0708
Sample Date:				5/8/07	5/9/07	8/31/07	8/31/07	8/31/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)					
4,4'-DDD	µg/L	0.28		0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	µg/L	0.2		0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	µg/L	0.2		0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
Aldrin	µg/L	0.004		0.051 UL	0.051 UL	0.05 U	0.05 U	0.05 U
alpha-BHC	µg/L	0.011		0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
beta-BHC	µg/L	0.037		0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
Chlordane	µg/L			1.01 U	1.01 U	-	-	-
Chlordane,gamma	µg/L			0.051 U	0.051 U	0.05 U	0.0011 J	0.05 U
Chlordene,alpha	µg/L			0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
delta-BHC				-	-	0.05 U	0.05 U	0.05 U
Dieldrin	µg/L	0.0042		0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
EndosulfanI	µg/L			0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
EndosulfanII	µg/L			0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
EndosulfanSulfate	µg/L			0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
Endrin	µg/L	11	2	0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
EndrinAldehyde	µg/L			0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
Endrinketone	µg/L			0.101 U	0.101 U	0.1 U	0.1 U	0.1 U
gamma-BHC(Lindane)	µg/L	0.061	0.2	0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
Heptachlor	µg/L	0.015	0.4	0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
HeptachlorEpoxide	µg/L	0.0074	0.2	0.051 U	0.051 U	0.05 U	0.05 U	0.05 U
Methoxychlor	µg/L	180	40	0.505 U	0.505 U	0.5 U	0.5 U	0.5 U
Toxaphene	µg/L	0.061	3	5.05 U	5.05 U	5 U	5 U	5 U
Aroclor-1016	µg/L	0.96		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1221	µg/L	0.0068		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1232	µg/L	0.0068		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1242	µg/L	0.034		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1248	µg/L	0.034		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1254	µg/L	0.034		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1260	µg/L	0.034		1.01 U	1.01 U	1 U	1 U	1 U
Aroclor-1262	µg/L			-	-	1 U	1 U	1 U
Aroclor-1268	µg/L			-	-	1 U	1 U	1 U

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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U - nondetect

Table A-15
Metals in Groundwater, 2007-2008

Sample Location:				DEP05D-0705	DEP05S-0705	DEP06-0705	DEP06-0705P	DEP07-0705	DEP08-0705	DEP09-0705	DEP10-0705	EPA01-0705	EPA02-0705	EPA03-0705	EPA04-0705	FB-070507	FB-070831	PW01-0705	PW02-0705	PW04-0705
Sample Date:				5/8/07	5/8/07	5/9/07	5/9/2007 & 5/10/2007	5/9/07	5/9/07	5/8/07	5/9/07	5/8/07	5/7/07	5/7/07	5/7/07	5/7/07	8/31/07	5/8/07	5/8/07	5/8/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)																	
Aluminum	µg/L	37000		200 U	425	200 U	200 U	281	200 U	200 U	1480	200 U	391	1660	200 U	200 U	UL	200 U	200 U	200 U
Antimony	µg/L	15	6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	U	5 U	5 U	5 U
Arsenic	µg/L	0.045	10	2.5 U	1.2	2.5 U	2.5 U	2.5 U	2.5 U	1.2	5.1	2.5 U	1.3 J	4	2.5 U	2.5 U	U	2.5 U	2.5 U	2.5 U
Barium	µg/L	7300	2000	84.8	60.4	87	80.4	108	66.6	94.1	80.7	53.9	97.8	83.2	36.3	25 U	U	66.3	82	86
Beryllium	µg/L	73	4	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.36 B	2.5 U	2.5 U	2.5 U
Cadmium	µg/L	18	5	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	U	2.5 U	2.5 U	2.5 U
Calcium	µg/L			92200	130000	87400	84500	92500	114000	79400	125000	84000	123000	135000	96100	500 U	22.7 B	97900	116000	120000
Chromium	µg/L		100	6.25 U	95.2	2.1	2.1	4.5	6.25 U	13.9	5.2	5.1	8.1	12	4.2	6.25 U	U	6.25 U	6.25 U	6.25 U
Cobalt	µg/L	11		6.3	15.9	2.2	2.1	6.3	2.4	3.8	10.1	2.5 U	7.2	13.4	6.1	2.5 U	U	2.5 U	2.5 U	2.5 U
Copper	µg/L	1500	1300	2.9	14.6	5 U	5 U	3.9	2	2.9	11.9	5 U	4.3	11.5	2.1	5 U	1.8 B	5 U	12.7	3.2
CYANIDE	µg/L	730	200	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	U	0.00002 U	0.00002 U	0.00002 U
Iron	µg/L	26000		100 U	2780	555	419	844	642	1680	4850	147	1600	5160	501	100 U	U	100 U	100 U	100 U
Lead	µg/L		15	2.5 U	1.7	2.5 U	2.5 U	1.1	2.5 U	2.5 U	5.4	2.5 U	1.6	4.8	2.5 U	2.5 U	U	2.5 U	1.2	2.5 U
Magnesium	µg/L			12600	11000	12000	11600	11800	10800	11500	11800	12100	12900	12200	9930	500 U	15.7 B	9400	11700	9880
Manganese	µg/L	880		28.6	124	181	157	903	29	1190	258	28	95.2	562	55.3	2.5 U	U	2.5 U	2.5 U	2.5 U
Mercury	µg/L	0.57	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	UL	0.2 U	0.2 U	0.2 U
Nickel	µg/L	730		5.2	175	4.5	4.3	8	5.4	41.5	12.1	7.3	10.4	17.8	6.5	2.5 U	U	2.7	3.7	4
Potassium	µg/L			2000 U	3000	2000 U	2000 U	2000 U	2340	3370	2160	2000 U	2000 U	2340	2000 U	2000 U	U	2000 U	2000 U	2000 U
Selenium	µg/L	180	50	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	U	12.5 U	12.5 U	12.5 U
Silver	µg/L	180		2.5 U	7.7	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	U	2.5 U	2.5 U	2.5 U
Sodium	µg/L			28900	38300	16900	16600	14100	25200	22700	22300	11100	16500	16400	8250	1000 U	22.7 B	9170	13700	9500
Thallium	µg/L		2	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	U	2.5 U	2.5 U	2.5 U
Vanadium	µg/L	2.6		12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	U	12.5 U	12.5 U	12.5 U
Zinc	µg/L	11000		6.8	11.8	12.5 U	12.5 U	7.3	5.7	12.5 U	19.9	5.6	9.3	21.3	12.5 U	12.5 U	27.7 J	12.5 U	27.1	8.9
Aluminum_dissolved	µg/L			200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	-	-	-	-	-
Antimony_dissolved	µg/L			5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	-	-	-	-	-
Arsenic_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Barium_dissolved	µg/L			87.8	58	81.6	76.5	50.1	66.2	83.9	60.7	55.9	93.3	54.6	33.9	-	-	-	-	-
Beryllium_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Cadmium_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Calcium_dissolved	µg/L			96800	130000	84800	86800	91300	114000	76100	120000	84000	123000	128000	95500	-	-	-	-	-
Chromium_dissolved	µg/L			6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	6.25 U	-	-	-	-	-
Cobalt_dissolved	µg/L			5.2	3.8	2.5 U	2.5 U	3.6	1.4	1.8	1.5	2.5 U	4.6	5	4.5	-	-	-	-	-
Copper_dissolved	µg/L			2.1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	-	-	-	-	-
Iron_dissolved	µg/L			100 U	112	100 U	100 U	100 U	100 U	591	100 U	100 U	100 U	100 U	100 U	-	-	-	-	-
Lead_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Magnesium_dissolved	µg/L			13100	9940	11700	11900	11600	10500	11500	10200	12100	12700	11300	9750	-	-	-	-	-
Manganese_dissolved	µg/L			3.2	22.9	4.1	4.1	4.6	4.1	1070	17.9	2.5 U	14	2.5	2.5 U	-	-	-	-	-
Mercury_dissolved	µg/L			0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	-	-	-
Nickel_dissolved	µg/L			4.7	62.1	3.5	3.1	4.9	4.7	8.1	4.7	4.6	5.3	6.3	4.3	-	-	-	-	-
Potassium_dissolved	µg/L			2000 U	2940	2000 U	2000 U	2000 U	2280	3260	2000 U	2000 U	2000 U	2000 U	2000 U	-	-	-	-	-
Selenium_dissolved	µg/L			12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	-	-	-	-	-
Silver_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Sodium_dissolved	µg/L			29300	37700	16600	16900	13800	24900	20500	22000	10800	16000	16000	8290	-	-	-	-	-
Thallium_dissolved	µg/L			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	-	-	-	-	-
Vanadium_dissolved	µg/L			12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	-	-	-	-	-
Zinc_dissolved	µg/L			5.4	12	12.5 U	7.3	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	12.5 U	-	-	-	-	-

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

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L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Table A-15
Metals in Groundwater, 2007-2008

Sample Location:				PW06-0705	PW07-0705	RB-070507	RB-070508	RB-070509	RI-DEP05S-0708	RI-DEP05S-0708P	RI-PW03-0708
Sample Date:				5/8/07	5/8/07	5/7/07	5/8/07	5/9/07	8/31/07	8/31/07	8/31/07
Analyte	Result Unit	RSL (µg/L)	MCL (µg/L)								
Aluminum	µg/L	37000		200 U	200 U	200 U	-	200 U	1010	918	UL
Antimony	µg/L	15	6	5 U	5 U	5 U	-	5 U	U	U	U
Arsenic	µg/L	0.045	10	2.5 U	2.5 U	2.5 U	-	2.5 U	U	U	U
Barium	µg/L	7300	2000	54.8	38.3	25 U	-	25 U	51.5 J	51.7 J	73.1 J
Beryllium	µg/L	73	4	2.5 U	2.5 U	2.5 U	-	2.5 U	0.43 B	0.41 B	0.32 B
Cadmium	µg/L	18	5	2.5 U	2.5 U	2.5 U	-	2.5 U	U	U	U
Calcium	µg/L			91900	74900	500 U	-	500 U	97900	100000	98600
Chromium	µg/L		100	6.25 U	6.25 U	6.25 U	-	6.25 U	4.6 J	4.3 J	1.5 J
Cobalt	µg/L	11		2.5 U	2.5 U	2.5 U	-	2.5 U	3.2 J	3.4 J	U
Copper	µg/L	1500	1300	11.3	10.2	5 U	-	5 U	6.8 B	6.5 B	3.5 B
CYANIDE	µg/L	730	200	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	U	U	4.3 J
Iron	µg/L	26000		100 U	100 U	100 U	-	100 U	2140	2010	U
Lead	µg/L		15	1.7	1.3	2.5 U	-	2.5 U	U	U	U
Magnesium	µg/L			10400	8150	500 U	-	500 U	7240	7350	10900
Manganese	µg/L	880		1 U	15.9	2.5 U	-	2.5 U	118	110	0.58 J
Mercury	µg/L	0.57	2	0.2 U	0.2 U	0.2 U	-	0.2 U	UL	UL	UL
Nickel	µg/L	730		3.4	2.9	2.5 U	-	2.5 U	6 J	5.8 J	1.6 J
Potassium	µg/L			2000 U	2000 U	2000 U	-	2000 U	2760 J	2800 J	2060 J
Selenium	µg/L	180	50	12.5 U	12.5 U	12.5 U	-	12.5 U	U	U	U
Silver	µg/L	180		2.5 U	2.5 U	2.5 U	-	2.5 U	U	U	U
Sodium	µg/L			9970	9760	1000 U	-	1000 U	27700 J	28100 J	16900 J
Thallium	µg/L		2	2.5 U	2.5 U	2.5 U	-	2.5 U	U	U	U
Vanadium	µg/L	2.6		12.5 U	12.5 U	12.5 U	-	12.5 U	2.7 J	2.6 J	U
Zinc	µg/L	11000		7.9	12.5 U	12.5 U	-	12.5 U	42.4 B	39.4 B	39.5 B
Aluminum_dissolved	µg/L			-	-	-	-	-	UL	UL	UL
Antimony_dissolved	µg/L			-	-	-	-	-	U	U	U
Arsenic_dissolved	µg/L			-	-	-	-	-	U	U	U
Barium_dissolved	µg/L			-	-	-	-	-	42.5 J	43.7 J	73.6 J
Beryllium_dissolved	µg/L			-	-	-	-	-	0.2 B	0.2 B	0.22 B
Cadmium_dissolved	µg/L			-	-	-	-	-	U	U	U
Calcium_dissolved	µg/L			-	-	-	-	-	99300	102000	101000
Chromium_dissolved	µg/L			-	-	-	-	-	U	11.1	U
Cobalt_dissolved	µg/L			-	-	-	-	-	U	U	U
Copper_dissolved	µg/L			-	-	-	-	-	2 B	1.8 B	2.7 B
Iron_dissolved	µg/L			-	-	-	-	-	U	U	U
Lead_dissolved	µg/L			-	-	-	-	-	U	U	U
Magnesium_dissolved	µg/L			-	-	-	-	-	6810	6990	11100
Manganese_dissolved	µg/L			-	-	-	-	-	2.5 J	2.8 J	U
Mercury_dissolved	µg/L			-	-	-	-	-	UL	UL	UL
Nickel_dissolved	µg/L			-	-	-	-	-	2.3 J	7.2 J	U
Potassium_dissolved	µg/L			-	-	-	-	-	2360 J	2430 J	2140 J
Selenium_dissolved	µg/L			-	-	-	-	-	U	U	U
Silver_dissolved	µg/L			-	-	-	-	-	U	U	U
Sodium_dissolved	µg/L			-	-	-	-	-	26700 J	27500 J	26400 J
Thallium_dissolved	µg/L			-	-	-	-	-	U	U	U
Vanadium_dissolved	µg/L			-	-	-	-	-	U	U	U
Zinc_dissolved	µg/L			-	-	-	-	-	30.2 B	28.8 B	43.7 B

Notes:

µg/L - microgram per liter

MCL - maximum contaminant level, December 2009.

RSL - Regional Screening Level - May 2010

Data Qualifiers:

B - Analyte not detected substantially above the level reported in laboratory or field blanks.

J - Analyte Present. Reported value may not be accurate or precise.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

U - nondetect

Appendix B

Soil Boring and Well Construction Logs

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-01
Well Permit No.: MV00287-0008-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/11/08
North: 711249.23 **East:** 1752113.69

Surface Elevation (ft.amsl): 616.13
Total Depth: 92.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 58
Depth to Bedrock (ft. bgs): 91
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.33		■	ASPHALT, Asphalt
1	0.33 - 1.5	0	○	GP, Base rock, Sand silt gravel, dark grey with coarse gravel to small cobble, debris present, ceramic tile, (yellow 0.5") brick and occassional steel (pipe flange).
2	1.5 - 3	0	▥	ML, Silt, Brown, 10YR 4/3, moist.
3 4 5 6 7 8	3 - 9	0	▥	ML, Same as above except color 10YR 4/6 with sand.
9	9 - 10	0	░	SM, Silty sand, brown, 10YR 4/6 moist.
10	10 - 10.5	0	■	ASPHALT, Asphalt
11	10.5 - 12	0	░	SM, Silty sand, brown, 10YR 4/6, moist.
12 13	12 - 14	0	▥	MLS, Silt with clay and fine sand, light brown, 10YR 4/6 moist, low plasticity.
14 15 16 17 18 19 20	14 - 20	0	░	SM, Sand with silt, sub angular medium sand, with occassional pieces of gravel up to 2", loose moist lense with black fines at approximately 19'.

Total Depth of Boring = 92.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-01
Well Permit No.: MV00287-0008-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/11/08
North: 711249.23 **East:** 1752113.69

Surface Elevation (ft.amsl): 616.13
Total Depth: 92.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 58
Depth to Bedrock (ft. bgs): 91
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	20 - 21	1.2		MLS, Sandy silt, fine sand, dark brown 10YR 3/3, wet.
21	21 - 21.5	1.2		SW-SM, Silty sand with gravel, fine to medium sand, brown 10YR 4/4 gravel upto 0.5".
22 23 24	21.5 - 25	0.3		SW-SM, Well sorted medium sand with silt, occassional gravel upto 1" light brown 10YR 5/6 loose moist.
25	25 - 26	0.1		SW-SM, Well sorted silty sand, fine sand, light brown 7.5YR 5/6, loose, moist.
26	26 - 26.5	0		SM, Black silty sand, loose moist medium sand.
27	26.5 - 28	0		SM, Sand with silt, well sorted medium sand , brown 10YR 5/6, loose moist.
28	28 - 29	0		ML, Clayey silt with sand, light brown 10YR 5/6, wet, soft.
29 30	29 - 31	0		SW-SM, Silty sand, dark brown, 10YR 3/3, Well sorted medium sand, loose, moist.
31 32 33 34	31 - 35	0.5		SW-SM, SAND with silt, SP well sorted medium sand brown 10 YR 4/4.
35 36 37 38 39 40	35 - 40	1		SW-SM, Same as above, color 10YR 4/4.

Total Depth of Boring = 92.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: **AS-01**
Well Permit No.: MV00287-0008-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/11/08
North: 711249.23 **East:** 1752113.69

Surface Elevation (ft.amsl): 616.13
Total Depth: 92.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 58
Depth to Bedrock (ft. bgs): 91
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42 43 44	40 - 45	0.2	▨	SW-SM, Same as above.
45 46 47 48 49	45 - 50	1.2	▨	SW-SM, Same as above.
50 51 52 53	50 - 54	0.4	▨	SW-SM, Same as above, 3' recovery on 5' sample run.
54	54 - 55	0.2	▨	SW-SM, SAND with silt, medium to coarse sand (Coarse sand, brown 10 YR 4/4, loose, moist, subrounded sand, one 2" piece of gravel.
55 56 57	55 - 58	0	▨	SW-SM, Same as above except wet at 58.
∇ 58 59 60	58 - 60	0	▨	SW-SM, Same as above.

Total Depth of Boring = 92.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: **AS-01**
Well Permit No.: MV00287-0008-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method:. Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/11/08
North: 711249.23 **East:** 1752113.69

Surface Elevation (ft.amsl): 616.13
Total Depth: 92.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 58
Depth to Bedrock (ft. bgs): 91
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			░	SW-SM, Same as above, occassional pieces of gravel to 2".
61			░	
62			░	
63			░	
64			░	
65	60 - 70	0.2	░	
66			░	
67			░	
68			░	
69			░	
70			░	SW-SM, Same as above, 5' of recovery on 10' sample interval.
71			░	
72			░	
73			░	
74			░	
75	70 - 80	0	░	
76			░	
77			░	
78			░	
79			░	
80				

Total Depth of Boring = 92.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-01
Well Permit No.: MV00287-0008-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/11/08
North: 711249.23 **East:** 1752113.69

Surface Elevation (ft.amsl): 616.13
Total Depth: 92.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 58
Depth to Bedrock (ft. bgs): 91
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
				SW-SM, Same as above.
81				
82				
83				SWG, Gravelly sand with silt, poorly sorted medium to coarse sand, pieces of gravel to 2" brown 10YR 4/4.
84				
85	80 - 90 83 - 83.5	0 0		
86				
87				
88				
89				
90	90 - 91	0		SWG, Gravelly sand with silt, subrounded gravels upto 2" ocassional cobble up to 4" poorly sorted medium to coarse sand, brown 10YR 4/4
91	91 - 92.5	0		SANDSTONE, Sandstone and weathered sandstone, grey 2.5YR 6/1.
92				
93				
94				
95				
96				
97				
98				
99				
100				

Total Depth of Boring = 92.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-02
Well Permit No.: MV00287-0009-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711173.88 **East:** 1752126.23

Surface Elevation (ft.amsl): 615.06
Total Depth: 93.25 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.3			ASPHALT,
1	0.3 - 2	0		SP, Sand with silt, well sorted medium sand, brown, moist.
2 3 4 5	2 - 5.5	0		ML, Silt with clay, light brown, soft, moist.
6 7 8	5.5 - 9	0		CL, Silty clay, light brown, soft, moist with 2" lenses of sand at 6'.
9 10 11	9 - 12	0		SP-SM, Silty sand, well sorted, light brown, fined grained, loose.
12	12 - 12.5	0		SP, Sand with gravel, well sorted medium sand, subrounded, few pieces of fine gravel, loose, moist.
13	12.5 - 14	0		ML, Silt with clay, light brown, moist.
14 15 16 17	14 - 18	0		SP-SM, Sand with silt, well sorted fine grained subrounded sand, few pieces of fine to coarse gravel, light brown, loose, moist.
18	18 - 19	0		SP-SM, Sand with silt, well sorted fine grained subrounded sand, few fine to coarse gravels, light brown, loose, moist.
19 20	19 - 23.5	0		SP-SM, Same as above, with lense of black organic material at 22'.

Total Depth of Boring = 93.25 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Page 2 of 5

Boring Name: AS-02
Well Permit No.: MV00287-0009-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711173.88 **East:** 1752126.23

Surface Elevation (ft.amsl): 615.06
Total Depth: 93.25 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23	19 - 23.5	0	░	
	23.5 - 24	0	░	SP-SM, Sand with silt, medium sand, light brown, moist.
24 25 26 27	24 - 27.5	0	▥	ML, Silt with clay, light brown, soft, moist.
28	27.5 - 29	0	▒	SM, Sand with silt, medium sand, light brown except 28-28.5 reddish brown, moist.
29 30 31 32 33	29 - 34	0	░	SP-SM, Sand with silt, poorly sorted sand with some coarse sand and pieces of fine gravel, light brown, moist.
34 35 36 37 38	34 - 39	0	░	SP-SM, Sand with silt, medium sand with few fine subrounded gravel, light brown, moist.
39 40	39 - 41.5	0	░	SP-SM, Same as above.

Total Depth of Boring = 93.25 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-02
Well Permit No.: MV00287-0009-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711173.88 **East:** 1752126.23

Surface Elevation (ft.amsl): 615.06
Total Depth: 93.25 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41	39 - 41.5	0		
42	41.5 - 42.5	0		SP-SM, Same as above.
43 44	42.5 - 44	0		SM, Sand with silt, fine grained sand, light brown, loose, moist.
45 46 47	44 - 47.5	0		SM, Same as above.
48 49	47.5 - 49	0		SM, Sand with silt, medium grained sand, light brown, loose, moist
50 51 52 53 54	49 - 54	0		SM, Same as above.
55 56 ∇ 57 58 59	54 - 59	0		SM, Same as above, wet at 59'.
60	59 - 64	NR		SM, No recovery. Formation heaved into casing, used 4" sampler to clear heave from casing.

Total Depth of Boring = 93.25 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-02
Well Permit No.: MV00287-0009-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711173.88 **East:** 1752126.23

Surface Elevation (ft.amsl): 615.06
Total Depth: 93.25 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
61 62 63	59 - 64	NR	▨	
64 65 66	64 - 66.5	0	▨	SM, Same as above.
67	66.5 - 68	0	▨	SP-SM, Sand, well sorted medium sand, light brown, subrounded, wet.
68 69 70	68 - 71	0	▨	SP-SM, Same as above.
71 72 73 74 75 76	71 - 77	0	▨	SP-SM, Sand, well sorted medium sand, light brown, loose, wet.
77 78 79 80	77 - 82	0	▨	SP-SM, Same as above.

Total Depth of Boring = 93.25 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-02
Well Permit No.: MV00287-0009-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711173.88 **East:** 1752126.23

Surface Elevation (ft.amsl): 615.06
Total Depth: 93.25 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
81	77 - 82	0		
82 83 84	82 - 85	0		GW, Silty sandy gravel, poorly sorted, light brown, coarse gravel to cobbles >4", sub-rounded, loose, wet.
85 86 87 88 89	85 - 90	0		SP-SM, Sand with silt, well sorted medium sand, light brown, wet.
90 91 92 93	90 - 93.25	0		SANDSTONE, Sandstone and decomposed sandstone, light olive green.
94 95 96 97 98 99 100				

Total Depth of Boring = 93.25 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-03
Well Permit No.: MV00287-0010-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/10/08
North: 711186.12 **East:** 1752068.16

Surface Elevation (ft.amsl): 614.41
Total Depth: 91 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.3			ASPHALT,
1	0.3 - 1.5	0		SM, Sand with silt, poorly sorted medium grained, light brown 10YR 5/6, moist.
2	1.5 - 3	0		MLS, Sandy silt, light brown, 10YR 5/6, poorly sorted fine sand, moist.
3 4 5 6 7 8 9	3 - 10	0		ML, Silt with fine sand and clay, light brown 10YR 5/6 medium toughness, moderate plasticity.
10 11 12 13 14 15	10 - 16	0		SM, Silty sand, well sorted fine grained sand, light brown 10YR 4/4, moist, 13' recovery on 10' run.
16	16 - 16.5	0		SWG, Silty gravely sand (20-20-60) subrounded medium to coarse sand, fine to coarse gravel (up to 2") brown 7.5YR 4/3, moist.
	16.5 - 17	0		CL, Clay, moist, soft, extensive ribbon > 2" brown.
17 18 19 20	17 - 20	0		SW-SM, Sand with silt, well sorted fine to medium, occassional 1" pieces of gravel, loose, moist, brown 10YR 5/4.

Total Depth of Boring = 91 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-03
Well Permit No.: MV00287-0010-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/10/08
North: 711186.12 **East:** 1752068.16

Surface Elevation (ft.amsl): 614.41
Total Depth: 91 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24 25	20 - 25	0.1	░	SW-SM, Same as above.
26 27 28 29 30	25 - 30	0	░	SW-SM, Same as above.
31 32 33 34 35	30 - 35	0	░	SW-SM, Same as above.
36 37 38 39 40	35 - 40	0	░	SW-SM, Same as above except 0.5" black lense of organic matter at 36' (no discernable change in lithology)

Total Depth of Boring = 91 ft. bgs

Remarks:

RAVENSWOOD BORING LOG (20-FT) RAVENSWOOD.GPJ FEDERAL.GDT 09/30/10

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-03
Well Permit No.: MV00287-0010-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/10/08
North: 711186.12 **East:** 1752068.16

Surface Elevation (ft.amsl): 614.41
Total Depth: 91 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42 43	40 - 44	0		SW-SM, Sand with silt, poorly sorted medium sand, brown, 10YR 4/4, loose, moist.
44	44 - 45	0		SM, Silty sand, brown 10YR 4/3, loose moist, occassional pieces of gravel to 0.5", medium to coarse.
45 46	45 - 47	0		SM, Same as above.
47 48 49	47 - 50	0		SW-SM, Sand with silt, well sorted fine to medium sand, 7.5YR 4/6, loose.
50	50 - 51	0		SW-SM, Silty sand, well sorted medium sand with silt brown 10YR 4/3.
51				
52 53 54 55	52 - 56	0		SW-SM, Sand with silt, well sorted fine sand, loose moist, brown 10YR 4/3.
56 ∇ 57 58 59 60	56 - 60	0		SW-SM, Same as above.

Total Depth of Boring = 91 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

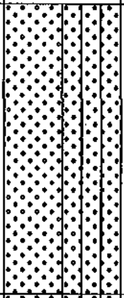
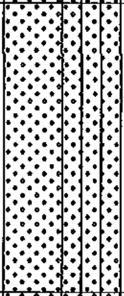
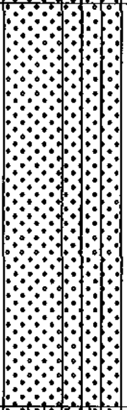
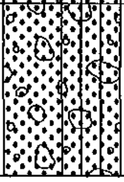
Boring Name: AS-03
Well Permit No.: MV00287-0010-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/10/08
North: 711186.12 **East:** 1752068.16

Surface Elevation (ft.amsl): 614.41
Total Depth: 91 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
61 62 63 64	60 - 65	0		SW-SM, Same as above.
65 66 67 68 69	65 - 70	0		SW-SM, Same as above, 3' recovery on 5' run.
70 71 72 73 74 75 76	70 - 80	0		SW-SM, Same as above.
77 78 79 80	77 - 81	0		SWG, Gravelly sand with silt, brown, poorly sorted medium to fine sand, subrounded occasional pieces of gravel to 1", wet.

Total Depth of Boring = 91 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-03
Well Permit No.: MV00287-0010-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/10/08
North: 711186.12 **East:** 1752068.16

Surface Elevation (ft.amsl): 614.41
Total Depth: 91 ft. bgs
Depth to Initial Water Level (ft. bgs): 57
Depth to Bedrock (ft. bgs): 90
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	77 - 81	0		
81 82 83 84 85 86 87 88 89	81 - 90	0		SP, Sand with silt, well sorted medium sand, occassional rounded pieces of gravel (2-4"), brown 10YR 4/3, loose, moist.
90	90 - 91			SANDSTONE, Sandstone and decomposed sandstone, grey 2.5Y 6/1
91 92 93 94 95 96 97 98 99 100				

Total Depth of Boring = 91 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-04
Well Permit No.: MV00287-0011-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711119.24 **East:** 1752046.15

Surface Elevation (ft.amsl): 613.05
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.5
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.33		■	ASPHALT, Asphalt
1	0.33 - 1.5	0	▨	GR-CO, Base rock Sand-Silt-Gravel, olive grey with cobbles up to 2", sandstone rock.
2 3 4 5	1.5 - 6	0	░	SM, Well sorted medium sand with silt light brown 10YR loose, moist.
6 7 8 9	6 - 10	0	▥	ML, Sandy silt, light brown 10YR 5/6, moist.
10 11 12	10 - 13	0.3	▒	SW-SM, Silty Sand, poorly sorted fine grained sand brown, 10YR 4/4 moist.
13 14 15	13 - 15.5	0.5	░	SP-SM, Sand with silt, yellowish brown, 10YR 5/6, black lense of decomposed organic matter (<0.5") at 14' and 15.5'.
16 17				
18 19	18 - 35	0.4	░	SP-SM, Sand with silt, poorly sorted medium sand, loose, occasssional 1" gravel, brown, 10YR 4/4 moist.
20				

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-04
Well Permit No.: MV00287-0011-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711119.24 **East:** 1752046.15

Surface Elevation (ft.amsl): 613.05
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.5
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24 25 26 27 28 29 30 31 32 33 34	18 - 35	0.4	░	
35 36 37	35 - 37.5	0.3	░	SP-SM, Same as above.
38				
39 40	39 - 40	1.5	░	SP-SM, Silty sand, well sorted fine sand, brown 10YR 3/4 with cemented lenses of very dark brown 10YR 2/2 silty sand, lenses are friable, dry (hard drilling).

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-04
Well Permit No.: MV00287-0011-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711119.24 **East:** 1752046.15

Surface Elevation (ft.amsl): 613.05
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.5
Logged by [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	40 - 41	2.5		SP-SM, Same as above.
41 42 43 44	41 - 44.5	0.2		SP-SM, Sand with silt, well sorted medium sand, light brown, 10YR 5/6, loose, moist.
45	44.5 - 46	0.4		SM, Silty sand, fine sand with cemented lenses occassional coarse sand to fine gravel dry, loose, brown 10YR 4/6.
46	46 - 46.5	0.4		SM, Same as above except color 10YR 6/6.
47	46.5 - 48	0.9		SP, Sand, well sorted medium grain, loose, moist.
48 49 50	48 - 50.5	0.4		MLS, Sandy silt, ML, fine to medium sand (40%) brown 10YR 4/4, dry, soft.
51 52 53 ∇ 54	50.5 - 55	0		SW-SM, Sand, poorly sorted fine to medium sand, occassional pieces of gravel and coarse sand, brown 10YR 4/3 loose moist, except at 54', wet.
55 56 57 58 59 60	55 - 60	0		SW-SM, Same as above except darker brown 10YR 4/3.

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-04
Well Permit No.: MV00287-0011-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711119.24 **East:** 1752046.15

Surface Elevation (ft.amsl): 613.05
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.5
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			░	SW-SM, Sand with silt, poorly sorted fine grained sand, brown 10YR 4/3, wet loose.
61			░	
62			░	
63			░	
64			░	
65	60 - 70	0.3	░	
66			░	
67			░	
68			░	
69			░	
70			░	SW-SM, Same as above, 5' recovery on 10 sample run.
71			░	
72			░	
73			░	
74			░	
75	70 - 80	0.3	░	
76			░	
77			░	
78			░	
79			░	
80				

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

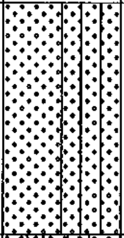
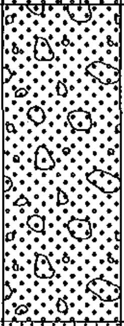
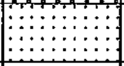
Boring Name: AS-04
Well Permit No.: MV00287-0011-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/04/08
North: 711119.24 **East:** 1752046.15

Surface Elevation (ft.amsl): 613.05
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.5
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
81 82 83 84	80 - 84	0.2		SW-SM, Poorly sorted medium sand with silt light brown 7.4 YR 5/4 loose wet.
85 86 87 88 89	84 - 89.5	0		SWG, Gravelly silty sand (20-20-60), poorly sorted with occassional cobbles and large gravel, brown 10YR 3/2, loose, wet.
90	89.5 - 90.5	0		Sandstone, Decomposed Sandstone, grey, 25YR 6/1.
91 92 93 94 95 96 97 98 99 100				

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-05
Well Permit No.: MV00287-0012-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/07/08
North: 711053.50
East: 1752070.08

Surface Elevation (ft.amsl): 613.31
Total Depth: 90.41 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.33			ASPHALT,
1	0.33 - 1.25	0		GWS, Sandy gravel with silt, road base olive grey, well sorted.
	1.25 - 1.5	0		Sandstone, Rock.
2 3	1.5 - 4	0.4		SM, Sand with silt, well sorted medium grained sand, light brown 10YR 5/6, loose, moist.
4 5	4 - 6	0.2		ML, Sandy silt, light brown, 10YR 4/6, moist.
6 7 8 9	6 - 10	0.8		ML, Same as above, fine sand.
10 11 12	10 - 13	0.4		ML, Same as above, Sample run 10-20 ft, 7' recovery
13 14 15	13 - 16	0.3		SP, Well sorted medium sand with silt, light brown 10YR 5/6, loose, moist.
16 17 18	16 - 19	0.3		SM, Silty sand with gravel (30-60-10), poorly sorted, coarse gravel up to 1", coarse sand, subrounded, brown 10YR 3/3, loose, moist.
19 20	19 - 20	1.3		SP-SM, Sand with silt, well sorted medium sand, brown 10YR 4/4 loose, moist.

Total Depth of Boring = 90.41 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-05
Well Permit No.: MV00287-0012-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/07/08
North: 711053.50 **East:** 1752070.08

Surface Elevation (ft.amsl): 613.31
Total Depth: 90.41 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21	20 - 22	0.5	▨	SP-SM, Same as above.
22			▨	SP-SM, Sand with silt, medium well sorted sand, light brown 10YR 5/6, moist, loose.
23			▨	
24			▨	
25			▨	
26	22 - 30	0.4	▨	
27			▨	
28			▨	
29			▨	
30			▨	SP-SM, Same as above with occassional black lenses of decomposed organic matter at approximately 37' ft, brown 10YR 4/3.
31			▨	
32			▨	
33			▨	
34			▨	
35	30 - 40	0.6	▨	
36			▨	
37			▨	
38			▨	
39			▨	
40				

Total Depth of Boring = 90.41 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-05
Well Permit No.: MV00287-0012-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/07/08
North: 711053.50 **East:** 1752070.08

Surface Elevation (ft.amsl): 613.31
Total Depth: 90.41 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42				SP-SM, Same as above.
43	40 - 45 42 - 43	0.8 0.4		SP, Fine grain sand with silt occassional pieces of gravel.
44 45				
46	45 - 46	1.5		SP-SM, Sand with silt, brown 10YR 3/3 occassional pieces of gravel and lenses of black silt, loose, moist.
47 48 49 50	46 - 50	1.5		SP-SM, Same as above, except color light brown 10YR 5/6.
51 52 53 ∇ 54	50 - 54	1		SP-SM, Same as above.
55	54 - 55	0.1		SP-SM, Same as above except darker brown 10YR 4/3, wet.
56 57 58 59 60	55 - 60	0.2		SP-SM, Same as above except no black silt.

Total Depth of Boring = 90.41 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-05
Well Permit No.: MV00287-0012-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/07/08
North: 711053.50 **East:** 1752070.08

Surface Elevation (ft.amsl): 613.31
Total Depth: 90.41 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
61 62 63 64 65 66	60 - 67	0.4	▨	SP-SM, Same as above, 5 ft recovery from 60-70 ft, poorly sorted fine sand with silt 5 ft recovery on 10 ft run.
67 68 69	67 - 70	0.4	▩	SP, Fine grained sand, light brown 10YR 4/4 loose, wet.
70 71 72 73 74 75 76 77 78 79 80	70 - 80	0	▨	SP-SM, Silty sand, well sorted medium subrounded sand with few pieces of gravel and cobble >3", brown 10YR 4/3, loose, wet, 5' recovery on 10' run.

Total Depth of Boring = 90.41 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-05
Well Permit No.: MV00287-0012-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/07/08
North: 711053.50 **East:** 1752070.08

Surface Elevation (ft.amsl): 613.31
Total Depth: 90.41 ft. bgs
Depth to Initial Water Level (ft. bgs): 54
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			░	SP-SM, Same as above.
81			░	
82			░	
83			░	
84			░	
85	80 - 89.6	0	░	
86			░	
87			░	
88			░	
89			░	
90	89.6 - 90.5	0	░	Sandstone, Sandstone, olive grey, decomposed
91				
92				
93				
94				
95				
96				
97				
98				
99				
100				

Total Depth of Boring = 90.41 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-06
Well Permit No.: MV00287-0013-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/06/08
North: 710984.00 **East:** 1752074.96

Surface Elevation (ft.amsl): 613.80
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 52
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.25	0		ASPHALT,
	0.25 - 0.5	0		GWS, Sandy gravel with silt, road base, olive grey.
1 2 3 4 5	0.5 - 6	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 4/4.
6	6 - 7	0		SP-SM, Same as above.
7 8	7 - 8.5	0		ML, Sandy silt, light brown 10YR 4/4, moist.
9 10 11 12 13	8.5 - 14	0		SP-SM, Silty sand, fine to medium sand, light brown 10YR 5/6, moist, loose 6' recovery on 10' run from 10 ft to 20 ft.
14 15 16 17 18	14 - 19	0		GPS, Sandy gravel with silt, subangular gravel, light brown 10YR 5/6.
19 20	19 - 20	0		SM, Silty sand with gravel, poorly sorted, coarse gravel pieces up to 1", coarse sand, sub rounded loose, moist, brown 10YR 3/3.

Total Depth of Boring = 90.5 ft. bgs

Remarks:

Boring Name: AS-06
Well Permit No.: MV00287-0013-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/06/08
North: 710984.00 **East:** 1752074.96

Surface Elevation (ft.amsl): 613.80
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 52
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21				SP-SM, Same as above, 6' recovery in 10 run from 20 ft to 30 ft. Soft material maybe pushed aside instead of entering core barrel.
22				
23				
24				
25	20 - 30	0		
26				
27				
28				
29				
30				SP-SM, Same as above
31				
32	30 - 34	0		
33				
34	34 - 35	0		SP-SM, Silty sand, well sorted fine sand, light brown 10YR 5/6, moist, poor recovery in 30 ft to 40 ft sample interval.
35				SP-SM, Sand with silt, well sorted medium sand, occasional pieces of gravel, brown 10YR 3/3, loose, moist.
36				
37	35 - 40.5	0		
38				
39				
40				

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM	14420 Albemarle Point Place Suite 210 Chantilly, VA 20151	Page 3 of 5 **Boring Name:** AS-06 **Well Permit No.:** MV00287-0013-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/06/08
North: 710984.00 **East:** 1752074.96

Surface Elevation (ft.amsl): 613.80
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 52
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	35 - 40.5	0	▨	
41 42 43 44	40.5 - 45	0	▨	SP-SM, Sand with silt, well sorted medium sand, brown 10YR 5/6, loose, moist.
45	45 - 46	0	▨	SM, Silty sand, brown 10YR 3/3, loose, moist.
46 47 48 49	46 - 50	0	▨	SP-SM, Sand with silt, brown 10YR 3/3 occassional pieces of fine to coarse gravel and lenses of black silt, loose, moist.
50 51 ∇ 52 53 54	50 - 55	0	▨	SP-SM, Same as above, except wet at 52', darker color 10YR 3/3.
55 56 57 58 59 60	55 - 60	0	▨	SP-SM, Same as above.

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-06
Well Permit No.: MV00287-0013-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/06/08
North: 710984.00 **East:** 1752074.96

Surface Elevation (ft.amsl): 613.80
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 52
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
61 62 63 64	60 - 65	0		No recovery.
65 66 67 68 69	65 - 70	0	▒	SP, Sand, well sorted medium sand, some cementation at approximately 69', light brown, 10YR 4/4, loose, wet.
70 71 72 73 74 75 76 77 78 79 80	70 - 80	0	░	SP-SM, Sand with silt, well sorted medium sand, brown 10YR 4/4, loose, moist. 6' recovery in 70-80' interval.

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Page 5 of 5

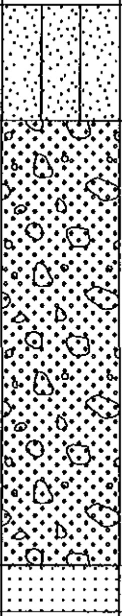
Boring Name: AS-06
Well Permit No.: MV00287-0013-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/06/08
North: 710984.00 **East:** 1752074.96

Surface Elevation (ft.amsl): 613.80
Total Depth: 90.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 52
Depth to Bedrock (ft. bgs): 89.67
Logged by: [redacted]



Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
81	80 - 82	0		SP-SM, Same as above
82–89	82 - 89.7	0		SWG, Gravelly sand with silt, poortly sorted, subrounded pieces of gravel up to 1.5", light brown to medium brown, 10YR 4/3, wet, loose.
90	89.7 - 90.5			Sandstone, Sandstone and decomposed sandstone, light olive green.
91–100				

Total Depth of Boring = 90.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

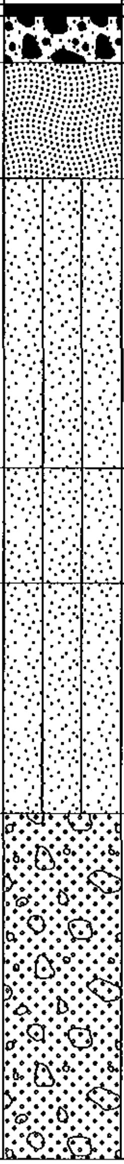
Boring Name: AS-07
Well Permit No.: MV00287-0014-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/20/08
North: 710897.99 **East:** 1752046.67

Surface Elevation (ft.amsl): 611.61
Total Depth: 89.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 88
Logged by: [redacted]



Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.2			ASPHALT,
	0.2 - 1	0		GWS, Base rock with sand and silt 1-3" rock with olive grey silt.
1 2	1 - 3	0		SP, Sand with silt, medium sand, light brown 10YR 4/6, loose, moist.
3 4 5 6 7	3 - 8	0		SP-SM, Silty sand, well sorted medium, brown 10YR 4/6, loose, moist.
8 9	8 - 10	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6 loose moist.
10 11 12 13	10 - 14	0		SP-SM, Same as above, 6' of sample recovery from 10 ft to 20 ft.
14 15 16 17 18 19 20	14 - 20	0		SWG, Gravelly sand with silt medium sand with some coarse sand, fine to coarse gravel to 1" subangular, brown 10YR 4/4 loose, moist.

Total Depth of Boring = 89.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-07
Well Permit No.: MV00287-0014-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/20/08
North: 710897.99 **East:** 1752046.67

Surface Elevation (ft.amsl): 611.61
Total Depth: 89.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 88
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21	20 - 21.5	0		CL, Clay with silt, dark brown 10YR 3/4, stiff, moist.
	21 - 21.5	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/4, occassional rounded pieces of gravel to 1", loose, moist.
22 23 24				
25 26 27 28 29	25 - 30	0		SP-SM, Same as above with occassional pieces of gravel to 2" color 10YR 5/3, except 27-27.5 dark brown sand with silt 10YR 3/3 with a 2' lense of black sand with silt.
30 31 32 33 34	30 - 35	0.3		SP-SM, Same as above.
35 36	35 - 37	0		SP-SM, Same as above.
37	37 - 37.5	0		SWG, Gravelly sand with silt, medium to coarse sand and fine pieces of gravel to 0.5" color 10YR 4/3 loose, moist
38 39 40	37.5 - 40	0		SP-SM, Sand with silt, occassional pieces of gravel to 2", brown 10YR 5/3, loose, moist.

Total Depth of Boring = 89.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-07
Well Permit No.: MV00287-0014-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/20/08
North: 710897.99 **East:** 1752046.67

Surface Elevation (ft.amsl): 611.61
Total Depth: 89.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 88
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42 43 44 45	40 - 45	0	░	SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist, lens of black silty sandt at 42 ft.
46 47 48 49 ∇ 50	45 - 50	0	░	SP-SM, Same as above.
51 52 53 54 55	50 - 55	0	░	SP-SM, Same as above except color 10YR 4/3, wet.
56 57 58 59 60	55 - 60	0	░	SP-SM, Same as above.

Total Depth of Boring = 89.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-07
Well Permit No.: MV00287-0014-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/20/08
North: 710897.99 **East:** 1752046.67

Surface Elevation (ft.amsl): 611.61
Total Depth: 89.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 88
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
				SP-SM, Same as above 3' recovery in sampler in 10 ft from 60 ft to 70 ft.
61				
62				
63				
64				
65	60 - 70	0		
66				
67				
68				
69				
70				SP-SM, Same as above 4 recovery in sampler in 10 ft from 70 ft to 80 ft.
71				
72				
73				
74				
75	70 - 80	0		
76				
77				
78				
79				
80				

Total Depth of Boring = 89.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-07
Well Permit No.: MV00287-0014-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/20/08
North: 710897.99 **East:** 1752046.67

Surface Elevation (ft.amsl): 611.61
Total Depth: 89.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 88
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
81 82 83	80 - 84	0	▨	SP-SM, Same as above.
84 85	84 - 86	0	▨	SWG, Gravelly sitly sand, medium to coarse sand, pieces of gravel to 1.5" brown 10YR 4/3 loose, wet.
86 87	86 - 88	0	▨	SP-SM, Sand with silt, well sorted medium sand, 10YR 4/3, loose, wet.
88 89	88 - 89.5	0	▨	Sandstone, Sandstone and decomposed sandstone, green 5YR 4/3 with grey silty on rock faces, 2.5YR 6/1, wet.
90 91 92 93 94 95 96 97 98 99 100				

Total Depth of Boring = 89.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Page 1 of 5

Boring Name: **AS-08**
Well Permit No.: MV00287-0015-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/19/08
North: 710878.02 **East:** 1751978.76

Surface Elevation (ft.amsl): 610.39
Total Depth: 88 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 86
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.3			ASPHALT,
1	0.3 - 1	NR		GWS, Sandy gravel with silt, base rock coarse gravel to cobble, dark olive grey moist.
	1 - 1.5	NR		SWG, Gravelly sand with silt, medium sand, brown 10YR 4/4, moist.
2 3 4 5	1.5 - 6	0		SP-SM, Sand with Silt, well sorted medium sand, brown 10YR 4/4, moist.
6 7 8 9	6 - 9.5	0.3		SP-SM, Same as Above.
10	9.5 - 10	0.6		SW-SM, Gravelly silty sand, well sorted medium sand, fine gravels up to 0.5", brown 10YR 4/4, loose.
11	10 - 11	1.3		SW-SM, Same as above.
12 13 14	11 - 14.5	2.2		SW-SM, Gravelly sand with silt, medium to coarse sand with fine to coarse gravels up to 2", 10 YR 4/3, loose, moist.
15	14.5 - 15	0.7		SP-SM, Sand with silt well sorted medium sand, light brown 10YR 5/6 loose, moist.
16 17 18 19 20	15 - 20	0		SP-SM, Same ss sbove with occassional fine pieces of gravel, lenses of black silty sand at 19.5.

Total Depth of Boring = 88 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-08
Well Permit No.: MV00287-0015-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/19/08
North: 710878.02 **East:** 1751978.76

Surface Elevation (ft.amsl): 610.39
Total Depth: 88 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 86
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24	20 - 25	0		SP-SM, Same as above.
25 26 27 28	25 - 29	1.7		SP-SM, Same as above.
29	29 - 30	1.9		SWG, Gravelly sand with silt, poorly sorted sand, fine to medium grained with a few coarse sand and pieces of fine gravel to 0.25", brown 10YR 4/3 loose, moist.
30 31	30 - 32	0.7		SP-SM, Silty sand with gravel well sorted medium sand with occassional coarse sand to fine gravel, brown 10YR 4/3 loose, moist.
32 33 34	32 - 35	0.9		SI-SA-S-GR, Silty Sand with Gravel, well sorted medium sand <15% gravels to 1" brown 10YR 4/3, loose, moist
35 36 37 38 39 40	35 - 40	0.8		SI-SA-S-GR, Same as above except gravels present to 36' lens of black organic matter at 38'

Total Depth of Boring = 88 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-08
Well Permit No.: MV00287-0015-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/19/08
North: 710878.02 **East:** 1751978.76

Surface Elevation (ft.amsl): 610.39
Total Depth: 88 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 86
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42 43 44 45	40 - 45	0.4		SI-SA-S-GR, Same as Above with occassional gravel upto 1.5"
46 47 48 49 ∇ 50	45 - 50	0		SP-SM, Sand with Silt medium to coarse sand, brown 10YR 4/4 loose, wet (2' recovery on 5' run)
51 52 53 54 55 56 57 58 59 60	50 - 60	0		SP-SM, Same as Above

Total Depth of Boring = 88 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-08
Well Permit No.: MV00287-0015-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/19/08
North: 710878.02 **East:** 1751978.76

Surface Elevation (ft.amsl): 610.39
Total Depth: 88 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 86
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			▨	SP-SM, Same as above, 5' recovery on sample intervatl 60 ft to 70 ft.
61			▨	
62			▨	
63			▨	
64			▨	
65	60 - 70	0	▨	
66			▨	
67			▨	
68			▨	
69			▨	
70			▨	SP-SM, Same as above 4' recovery sample interval 70 ft to 80 ft.
71			▨	
72			▨	
73			▨	
74			▨	
75	70 - 80	0	▨	
76			▨	
77			▨	
78			▨	
79			▨	
80				

Total Depth of Boring = 88 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: AS-08
Well Permit No.: MV00287-0015-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/19/08
North: 710878.02 **East:** 1751978.76

Surface Elevation (ft.amsl): 610.39
Total Depth: 88 ft. bgs
Depth to Initial Water Level (ft. bgs): 50
Depth to Bedrock (ft. bgs): 86
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
81				SWG, Gravelly silty sand, poorly sorted medium to coarse sand and fine to coarse subrounded gravel, brown 10YR 3/4, 1 large cobble > 4" at 84', loose, wet.
82				
83	80 - 86	0		
84				
85				
86				Sandstone, Sandstone and decomposed sandstone 4" and 2" long pieces recovered 5YR 4/3.
87	86 - 88	NR		
88				
89				
90				
91				
92				
93				
94				
95				
96				
97				
98				
99				
100				

Total Depth of Boring = 88 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Page 1 of 1

Boring Name: AS-09
Well Permit No.: MV00287-0016-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: N/A
Drilling Date: 11/22/08
North: 710875.35 **East:** 1751976.76

Surface Elevation (ft.amsl): 610.41
Total Depth: 116 ft. bgs
Depth to Initial Water Level (ft. bgs): N/A
Depth to Bedrock (ft. bgs): 115
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 -			Well AS-09 was drilled at an angle of 39.9 degrees from vertical. Lithologic logging was not conducted during the well drilling.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Total Depth of Boring = 116 ft. bgs

Remarks: Well installed at an angle of 39.9 degrees from vertical. Vertical depth of well 88.22 calculated based on length of well and angle of installation.

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-06S
Well Permit No.: MV00287-0019-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/21/08
North: 710886.65 **East:** 1752018.96

Surface Elevation (ft.amsl): 611.70
Total Depth: 64.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 53
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.2	0		ASPHALT,
1 2 3 4 5	0.2 - 6	0		SM, Silty sand, light brown 10YR 4/6, loose, moist.
6 7	6 - 8	0		SM, Same as above.
8 9	8 - 10	0		SM, Sand with silt, light brown 10YR 4/6, loose moist.
10 11 12	10 - 13	0		SM, Same as above.
13 14 15 16 17	13 - 18	0		SWG, Gravelly sand with silt (fine to coarse gravel to 1" light brown 10YR 4/6.
18 19 20	18 - 20	0		SP-SM, Sand with silt, light brown 10YR 4/6, loose, moist.

Total Depth of Boring = 64.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-06S
Well Permit No.: MV00287-0019-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/21/08
North: 710886.65 **East:** 1752018.96

Surface Elevation (ft.amsl): 611.70
Total Depth: 64.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 53
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24	20 - 25	0		SP-SM, Same as above.
25	25 - 26	0		SP-SM, Same as above.
26 27 28	26 - 29	0		SP-SM, Sand with silt, fine grained sand, 10YR 4/6 loose, moist.
29	29 - 30	0		SP-SM, Sand with silt, medium sand, light reddish brown 7.5YR 5/6, loose, moist.
30 31 32 33 34	30 - 35	0		SP-SM, Same as above with occassional 0.5" gravels, color 10YR 4/6.
35 36	35 - 37	0		SP-SM, Same as above.
37	37 - 37.5	0		SWG, Gravelly sand with silt, medium to coarse sand to fine gravels up to 0.5", brown 10YR 4/4, loose, moist.
38 39 40	37.5 - 40	0		SP-SM, Sand with silt medium sand, light reddish brown 7.5YR 5/6 loose, moist.

Total Depth of Boring = 64.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-06S
Well Permit No.: MV00287-0019-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/21/08
North: 710886.65 **East:** 1752018.96

Surface Elevation (ft.amsl): 611.70
Total Depth: 64.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 53
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41 42 43 44 45	40 - 45	0		SP-SM, Sand with silt, well sorted medium sand with occassional gravel, brown 10YR 5/3 loose moist 1" black sand with silt at 42'.
46 47 48 49 50	45 - 50	0		SP-SM, Same as above except no gravel.
51 52 ∇ 53 54 55	50 - 55	0		SP-SM, Same as above, wet at 53.
56 57 58 59 60	55 - 60	0		SP-SM, Same as above.

Total Depth of Boring = 64.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Page 4 of 4

Boring Name: MW-06S
Well Permit No.: MV00287-0019-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/21/08
North: 710886.65 **East:** 1752018.96

Surface Elevation (ft.amsl): 611.70
Total Depth: 64.5 ft. bgs
Depth to Initial Water Level (ft. bgs): 53
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			⁙	SP-SM, Same as above.
61			⁙	
62	60 - 64	0	⁙	
63			⁙	
64				
65				
66				
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				

Total Depth of Boring = 64.5 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-11S
Well Permit No.: MV00287-0018-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/17/08
North: 711169.42 **East:** 1752112.02

Surface Elevation (ft.amsl): 615.27
Total Depth: 65 ft. bgs
Depth to Initial Water Level (ft. bgs): 56
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.25			ASPHALT,
1	0.25 - 2	0		PO-SA-S1-$, Sand with silt, light brown, well sorted fine grained sand, loose, moist.
2 3 4 5	2 - 5.5	0		ML, Silt with clay, light brown, moist.
6 7 8 9	5.5 - 10	0		ML, Silt with clay and fine sand, light brown 10YR 5/6, moist.
10 11	10 - 12	0		ML, Same as above.
12	12 - 12.5	0		SM, Silty sand, fine grained sand, light brown 10YR 5/6, loose, moist.
13 14 15 16 17 18 19 20	12.5 - 20	0		SP-SM, Sand with silt, well sorted medium sand, few fine gravels to 0.5", dark brown 10YR 3/3, loose, moist.

Total Depth of Boring = 65 ft. bgs

Remarks:

CDM
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-11S
Well Permit No.: MV00287-0018-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/17/08
North: 711169.42 **East:** 1752112.02

Surface Elevation (ft.amsl): 615.27
Total Depth: 65 ft. bgs
Depth to Initial Water Level (ft. bgs): 56
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	20 - 21	0	░	SP-SM, Same as above.
21 22 23 24	21 - 25	0	░	SP-SM, Sand with silt, well sorted medium sand, occassionally fine to coarse gravels, light reddish brown 10YR 5/6, loose, moist.
25 26 27 28 29	25 - 30	0.4	░	SP-SM, Same as above except lense of black silty sand at 26'.
30 31 32 33 34	30 - 35	0.6	░	SP-SM, Same as above except at 34', dark brown 10YR 4/3.
35				
36 37 38 39	36 - 40	0	░	SP-SM, Sand with silt, well sorted medium sand with occassional lense of silt, light brown 10YR 5/6, loose, moist.
40				

Total Depth of Boring = 65 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: MW-11S
Well Permit No.: MV00287-0018-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/17/08
North: 711169.42 **East:** 1752112.02

Surface Elevation (ft.amsl): 615.27
Total Depth: 65 ft. bgs
Depth to Initial Water Level (ft. bgs): 56
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	40 - 40.5	0		ML, Sandy silt, dark brown 10YR 3/3, loose, moist.
41 42 43 44	40.5 - 45	1.1		SP-SM, Sand with silt, well sorted medium sand, occassional fine gravel to 0.25", light reddish brown 10YR 5/6, loose, moist.
45 46 47 48 49	45 - 50	0.3		SP-SM, Sand with silt, well sorted medium sand, 10YR 5/6, loose, moist.
50 51 52 53 54 55 ∇ 56 57 58 59 60	50 - 60	0.3		SP-SM, Same as above, 4' recovery on sample interval 50 ft to 60 ft.

Total Depth of Boring = 65 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: **MW-11S**
Well Permit No.: MV00287-0018-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/17/08
North: 711169.42 **East:** 1752112.02

Surface Elevation (ft.amsl): 615.27
Total Depth: 65 ft. bgs
Depth to Initial Water Level (ft. bgs): 56
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
			░	SP-SM, Same as above.
61			░	
62			░	
	60 - 65	0	░	
63			░	
64			░	
65				
66				
67				
68				
69				
70				
71				
72				
73				
74				
75				
76				
77				
78				
79				
80				

Total Depth of Boring = 65 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-01
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/05/08
North: 711202.59 **East:** 1752105.64

Surface Elevation (ft.amsl): 614.89
Total Depth: 47.67 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.3			ASPHALT,
1	0.5 - 1.5	0		SP-SM, Sand with silt, well sorted, medium grained, light brown 10YR 5/6, moist.
2	1.5 - 3	0		ML, Sandy silt, light brown 10YR 4/4, moist.
3 4 5 6 7 8	3 - 9	0		CL-ML, Clay with silt, low plasticity, light brown 10YR 5/6, moist
9 10 11 12 13 14	9 - 14.5	0		CL-ML, Same as above.
15 16 17 18	14.5 - 19	0		SP-SM, Sand with silt well sorted, medium grained, sub-rounded, dark brown 10YR 3/4, few fine and coarse pieces of gravel present, loose, moist
19 20	19 - 29	0		SP-SM, Sand with silt, occassional 0.5" gravel, black friable chunks observed at 23 ft, loose, light brown 10YR 5/6, dry.

Total Depth of Boring = 47.67 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-01
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/05/08
North: 711202.59 **East:** 1752105.64

Surface Elevation (ft.amsl): 614.89
Total Depth: 47.67 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24 25 26 27 28	19 - 29	0	░	
29	29 - 30	0	░	SP-SM, Sandy silt with gravel, light brown 10YR 4/4, few coarse pieces of gravel present.
30 31 32 33 34 35 36 37 38	30 - 39	0	░	SP-SM, SAND with silt, poorly sorted fine grained sand, light brown 10YR 4/4, loose, occassional subrounded pieces of gravel to 1" moist
39 40	39 - 47	0	░	SP-SM, Same as above except 46 ft to 47 ft color reddish-brown 10YR 6/6.

Total Depth of Boring = 47.67 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-01
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/05/08
North: 711202.59 **East:** 1752105.64

Surface Elevation (ft.amsl): 614.89
Total Depth: 47.67 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41	39 - 47	0	▨	
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				

Total Depth of Boring = 47.67 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-02
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/12/08
North: 711070.48 **East:** 1752043.53

Surface Elevation (ft.amsl): 613.58
Total Depth: 49.17 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.5			ASPHALT,
1	0.5 - 1	0		GR-CO, Gravel, with sand and silt, dark grey gravels > 2" few cobbles to 4".
	1 - 1.5	0		SI-SA, Silty sand, dark brown, 10 YR 3/2, loose, moist.
2 3 4	1.5 - 5	0		SP-SM, Sand with silt, medium sand, yellowish brown 10YR 5/6, loose moist.
5 6 7 8 9 10 11	5 - 12	0.9		MLS, Sandy silt, light brown, 10YR 4/4 moist.
12 13	12 - 13.5	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
	13.5 - 14	1.5		GPS, Silty sand, fine grained well, sorted sand, 10YR 4/4, moist.
14	14 - 15	0		GPS, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
15 16	15 - 17	0		GPS, Sandy gravel with silt, poorly sorted fine to medium sand with gravels to 1", subangular, dark brown 10YR 3/3 with lenses of black organic silts < 0.5" thick, loose, moist.
17 18	17 - 19	2.5		GPS, Gravely sand with silt, medium to coarse sand, subangular, lenses of black organic silts <0.5" thick, dark brown 10YR 4/4, loose, moist.
19 20	19 - 29	NR		No recovery, water added to free stuck casing, which washed sample out of core barrel.

Total Depth of Boring = 49.17 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-02
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/12/08
North: 711070.48 **East:** 1752043.53

Surface Elevation (ft.amsl): 613.58
Total Depth: 49.17 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24 25 26 27 28	19 - 29	NR		
29 30 31 32 33 34 35 36 37 38	29 - 39	NR		Sampler washing core out of sampler. Boring clear to 36' with outer casing advanced to 40', No sample recovered 29'-36', slough recovered 36'-40'.
39 40	39 - 49	0	▨	SP-SM, Sand with silt, well sorted medium sand, 10YR 5/6 , loose, wet. 5' recovered in sampler from 39' to 49'.

Total Depth of Boring = 49.17 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-02
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/12/08
North: 711070.48 **East:** 1752043.53

Surface Elevation (ft.amsl): 613.58
Total Depth: 49.17 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41	39 - 49	0	⠿	
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				
58				
59				
60				

Total Depth of Boring = 49.17 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

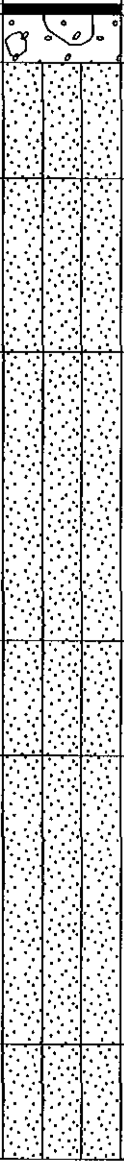
Boring Name: SVE-03
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/22/08
North: 710882.12 **East:** 1751998.40

Surface Elevation (ft.amsl): 611.16
Total Depth: 46.75 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	~~0 - 0.17~~			ASPHALT,
	0.17 - 1	0		GR-CO, Gravel with sand and silt, coarse baserock gravel and cobble to >2" olive grey, dry.
1 2	1 - 3	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 4/4 loose, moist.
3 4 5	3 - 6	0		SP-SM, Same as above except color 10YR 5/6.
6 7 8 9 10	6 - 11	0		SP-SM, Same as above.
11 12	11 - 13	0		SP-SM, Same as above.
13 14 15 16 17	13 - 18	0		SP-SM, Sand with gravel and silt, medium to coarse sand with fine to coarse gravel up to 1.5" brown 10YR 5/6 loose, moist.
18 19 20	18 - 20	0		SP-SM, Sand with silt well sorted medium sand, brown 10YR 4/4 loose, moist.

Total Depth of Boring = 46.75 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-03
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/22/08
North: 710882.12 **East:** 1751998.40

Surface Elevation (ft.amsl): 611.16
Total Depth: 46.75 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24	20 - 25	0		SP-SM, Sand with silt well sorted medium sand, occassional sub rounded gravel to 0.5", brown 10YR 4/6 loose, moist.
25	25 - 26	0		SP-SM, Same as above.
26 27 28	26 - 29	0		SP-SM, Sand with silt, well sorted fine grained sand, reddish brown 7.5YR 5/6, loose, moist.
29	29 - 30	0		SP-SM, Sand with silt well sorted medium sand, brown 10YR 4/6, loose moist.
30 31 32 33 34	30 - 35	0		SP-SM, Same as above.
35 36				SP-SM, Same as above.
37	37 - 37.5	0		SWG, Gravelly sand with silt, medium to coarse sand and pieces of gravel up to 1", brown 10YR 4/4, loose, moist.
	35 - 40	0		
38 39 40	37.5 - 40	0		SP-SM, Sand with silt, well sorted medium sand, brown 10YR 4/6, loose moist.

Total Depth of Boring = 46.75 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: SVE-03
Well Permit No.: N/A

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/22/08
North: 710882.12 **East:** 1751998.40

Surface Elevation (ft.amsl): 611.16
Total Depth: 46.75 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
41	40 - 46.75	0	░	SP-SM, Same as above, boring open to 46.75'.
42				
43				
44				
45				
46				
47				
48				
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57				
58				
59				
60				

Total Depth of Boring = 46.75 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: VP-01
Well Permit No.: MV00287-0017-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/18/08
North: 711067.89 **East:** 1752081.57

Surface Elevation (ft.amsl): 613.55
Total Depth: 50 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	0 - 0.5	0		ML, Sandy Silt, dark brown, moist.
1 2 3 4 5	0.5 - 5.5	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
6 7 8 9	5.5 - 10	0		ML, Sandy Silt, fine grained sand, slightly plastic silt, light brown 10YR 5/6 moist.
10 11	10 - 11.5	0		ML, Sandy Silt, fine grained sand, slightly plastic silt, light brown 10YR 5/6, moist.
12 13 14 15	11.5 - 16	0		ML, Same as above.
16	16 - 16.5	0		SP, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
17 18	16.5 - 19	0		SWG, Gravelly sand with silt, gravels to 1", medium sand loose, moist.
19 20	19 - 20	0		SM, Silty sand, dark brown, 10YR 3/3, moist.

Total Depth of Boring = 50 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Boring Name: VP-01
Well Permit No.: MV00287-0017-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/18/08
North: 711067.89 **East:** 1752081.57

Surface Elevation (ft.amsl): 613.55
Total Depth: 50 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]

Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
21 22 23 24	20 - 25	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
25 26 27 28 29	25 - 30	0		SP-SM, Same as above, except occassional lens of black decomposed organic material.
30 31 32 33 34	30 - 35	0		SP-SM, Same as above.
35 36 37 38	35 - 39	0		SP-SM, Same as above, except at 34' black organic material in marl with silt, light brown 10YR 4/6.
39 40	39 - 40.5	0.5		SP-SM, Same as above

Total Depth of Boring = 50 ft. bgs

Remarks:

CDM

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

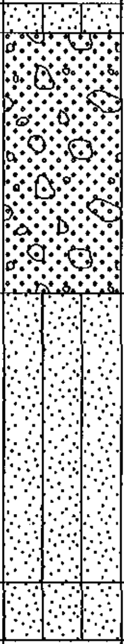
Boring Name: VP-01
Well Permit No.: MV00287-0017-08

Client: U.S. Environmental Protection Agency
Project Location: Ravenswood, West Virginia

Project Name: Ravenswood PCE Site
Project Number: 3330-025

Drilling Contractor: Boart Longyear
Drilling Method: Rotosonic
Sample Method: Drive Casing
Drilling Date: 11/18/08
North: 711067.89
East: 1752081.57

Surface Elevation (ft.amsl): 613.55
Total Depth: 50 ft. bgs
Depth to Initial Water Level (ft. bgs): None
Depth to Bedrock (ft. bgs): NA
Logged by: [redacted]



Depth (ft. bgs)	Sample Interval (ft bgs)	PID Reading (ppm)	Graphic Log	Material Description
	39 - 40.5	0.5		
41 42 43 44	40.5 - 45	0		SWG, Gravelly sand with silt, light brown well sorted medium sand with gravel to 1", dark brown 10YR 4/4, loose, moist
45 46 47 48 49	45 - 50	0		SP-SM, Sand with silt, well sorted medium sand, light brown 10YR 5/6, loose, moist.
50	50 - 51	0		SP-SM, Same as above.
51 52 53 54 55 56 57 58 59 60				

Total Depth of Boring = 50 ft. bgs

Remarks:

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-01

North: 711249.23 **East:** 1752113.69

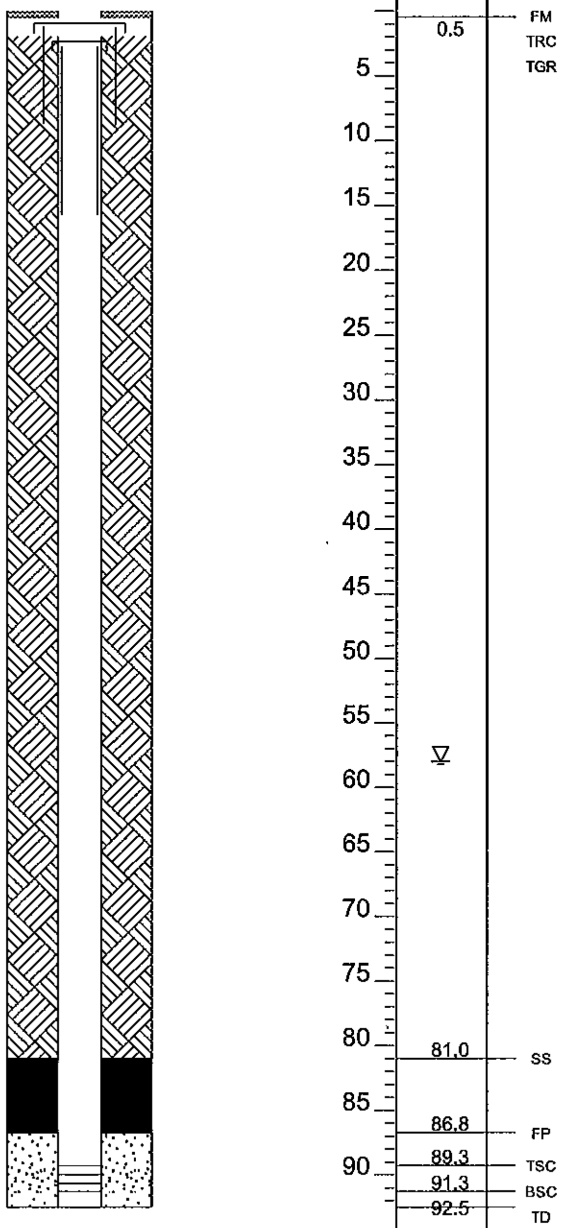
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/12/08
Date Completed: 11/12/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 92.5 ft. bgs
Elevation (ft. above msl): 616.1
Depth to Water (ft. bgs): 58

WELL DIAGRAM | DEPTH (ft.) | INTERVAL



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 89.3

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 81.0

SAND SEAL
Type: Bentonite
Interval: 81.0 - 86.75

SANDPACK
Type: Global Filter #5 Sand
Interval: 86.75 - 92.5

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 89.3 - 91.3

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

- ▥ FILTER PACK
- ▮ BENTONITE CHIPS
- ▨ CEMENT GROUT
- ▤ SCREEN
- ▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-02

North: 711173.88 **East:** 1752126.23

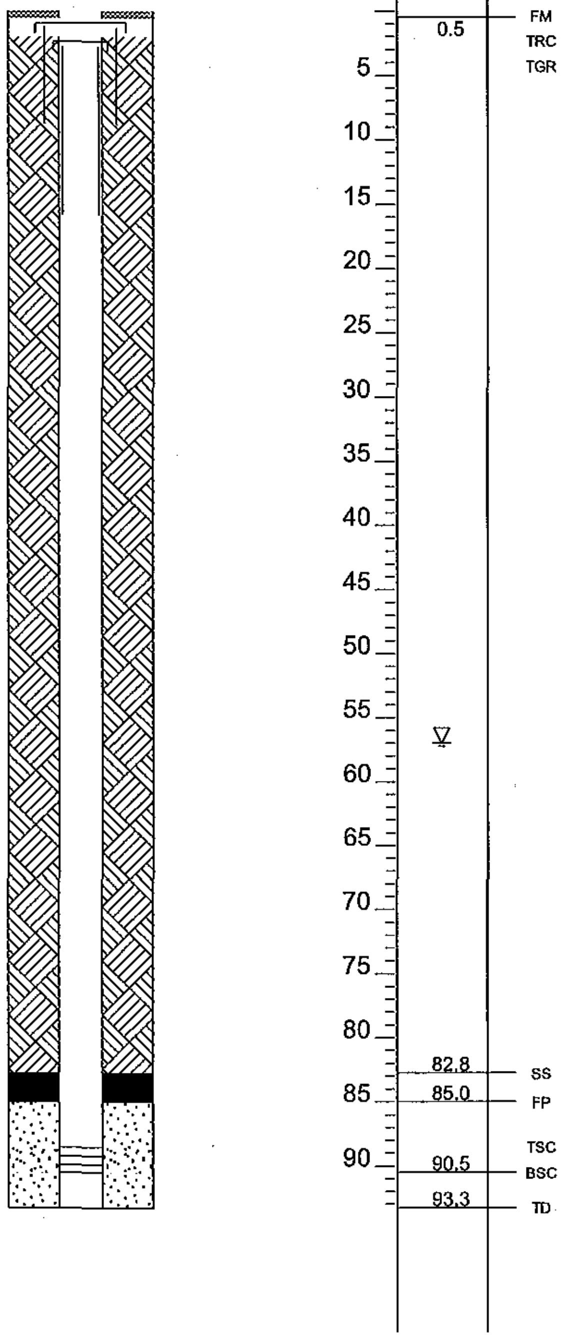
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/05/08
Date Completed: 11/05/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 93.25 ft. bgs
Elevation (ft. above msl): 615.1
Depth to Water (ft. bgs): 57

WELL DIAGRAM | DEPTH (ft.) | INTERVAL



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 88.5

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 82.75

SAND SEAL
Type: Bentonite
Interval: 82.75 - 85.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 85.0 - 93.25

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 88.5 - 90.5

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

█ BENTONITE CHIPS

▨ CEMENT GROUT

☷ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-03

North: 711186.12 **East:** 1752068.16

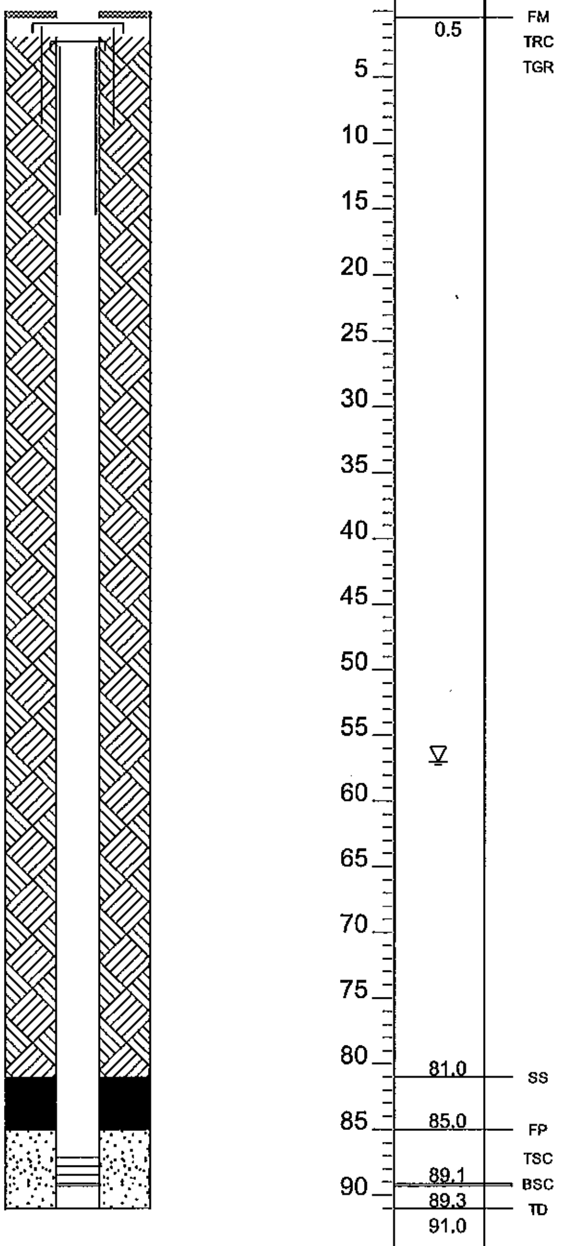
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/10/08
Date Completed: 11/10/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 91 ft. bgs
Elevation (ft. above msl): 614.4
Depth to Water (ft. bgs): 57

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 87.1

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 81.0

SAND SEAL
Type: Bentonite
Interval: 81.0 - 85.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 85.0 - 91

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 87.1 - 89.3

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

■ BENTONITE CHIPS

▧ CEMENT GROUT

⁞ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-04

North: 711119.24 **East:** 1752046.15

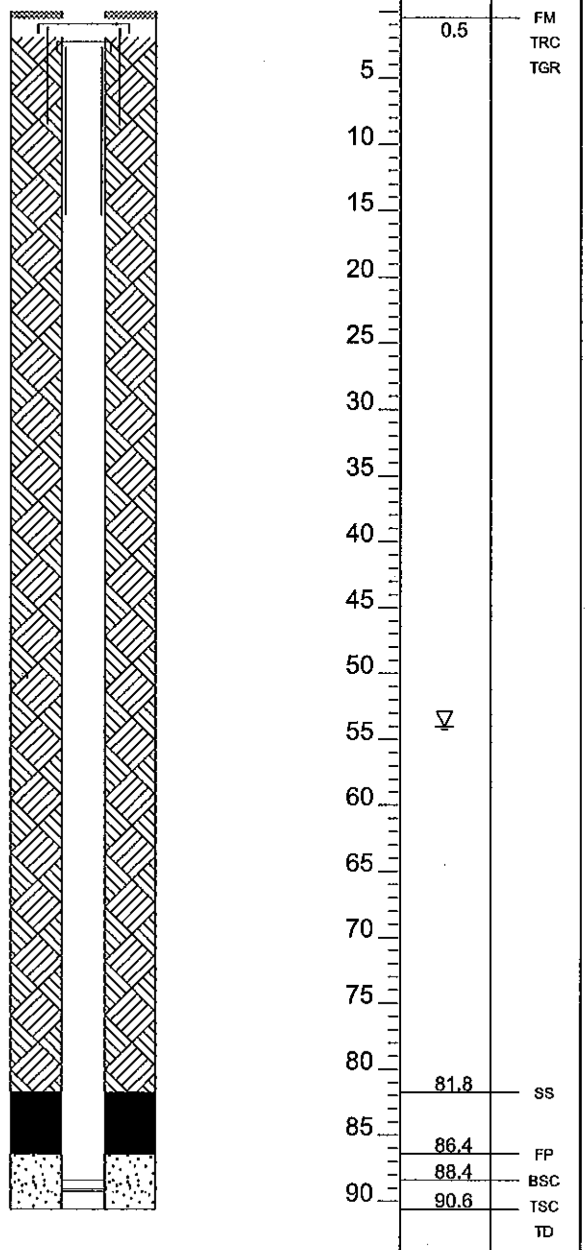
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/09/08
Date Completed: 11/09/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 90.5 ft. bgs
Elevation (ft. above msl): 613.1
Depth to Water (ft. bgs): 54

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 86.4

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 81.75

SAND SEAL
Type: Bentonite
Interval: 81.75 - 84.5

SANDPACK
Type: Global Filter #5 Sand
Interval: 84.5 - 90.5

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 86.4 - 88.40

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING

▥	FILTER PACK
■	BENTONITE CHIPS
▨	CEMENT GROUT
▤	SCREEN
▩	CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

WELL DIAGRAM 1 RAVENSWOOD.GPJ FEDERAL.GDT 09/30/10

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-05

North: 711053.5 **East:** 1752070.08

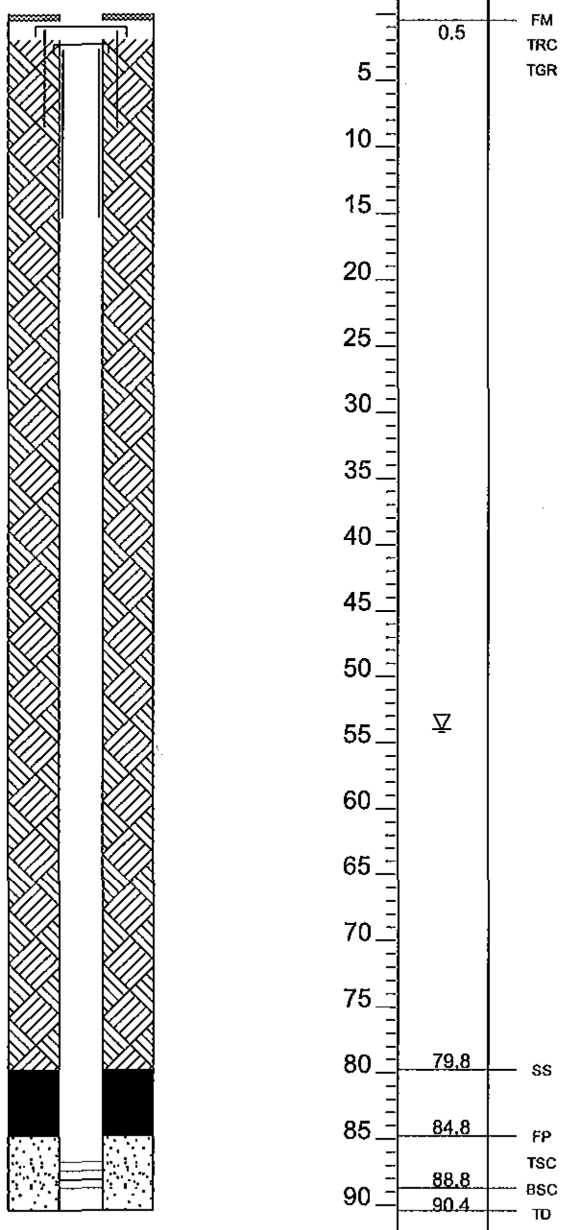
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/08/08
Date Completed: 11/08/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 90.41 ft. bgs
Elevation (ft. above msl): 613.3
Depth to Water (ft. bgs): 54

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 87.0

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 79.75

SAND SEAL
Type: Bentonite
Interval: 79.75 - 84.75

SANDPACK
Type: Global Filter #5 Sand
Interval: 84.75 - 90.41

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 87.0 - 88.75

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

█ BENTONITE CHIPS

▧ CEMENT GROUT

⊞ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

WELL DIAGRAM 1 RAVENSWOOD.GPJ FEDERAL.GDT 09/30/10

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-06

North: 710984 **East:** 1752074.96

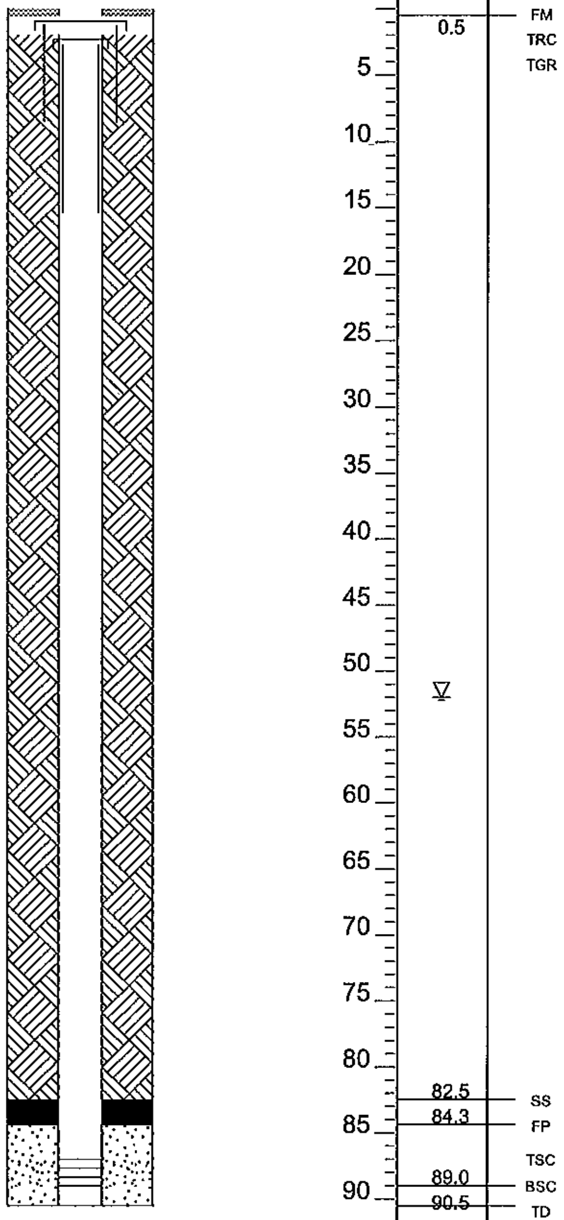
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/07/08
Date Completed: 11/07/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 90.5 ft. bgs
Elevation (ft. above msl): 613.8
Depth to Water (ft. bgs): 52

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 87.0

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 82.5

SAND SEAL
Type: Bentonite
Interval: 82.5 - 84.33

SANDPACK
Type: Global Filter #5 Sand
Interval: 84.33 - 90.5

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 87.0 - 89.0

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞	FILTER PACK	FM	FLUSH MOUNT
▮	BENTONITE CHIPS	TPC	TOP PROTECTIVE CASING
▧	CEMENT GROUT	TRC	TOP OF RISER CASING
⊞	SCREEN	TGR	TOP OF GROUT
▩	CONCRETE PAD	SS	SAND SEAL
		FP	FILTER PACK
		TSC	TOP OF SCREEN
		BSC	BOTTOM OF SCREEN
		TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-07

North: 710897.99 **East:** 1752046.67

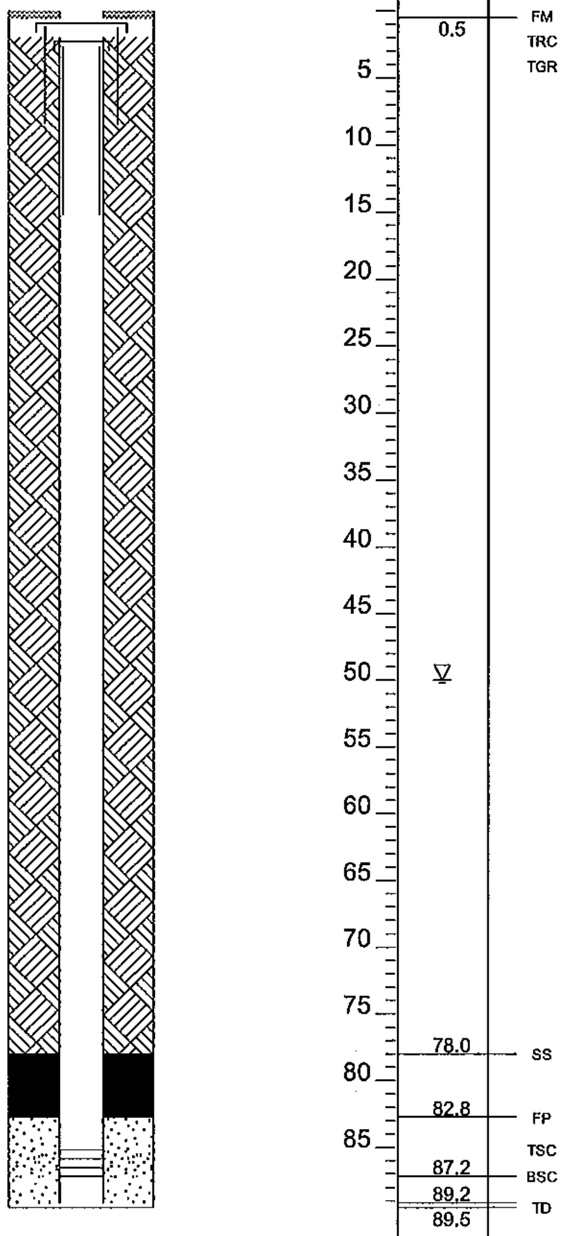
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/20/08
Date Completed: 11/20/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 89.5 ft. bgs
Elevation (ft. above msl): 611.6
Depth to Water (ft. bgs): 50

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 85.2

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 78.0

SAND SEAL
Type: Bentonite
Interval: 78.0 - 82.75

SANDPACK
Type: Global Filter #5 Sand
Interval: 82.75 - 89.5

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 85.2 - 87.17

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

▥ FILTER PACK

■ BENTONITE CHIPS

▨ CEMENT GROUT

▦ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

WELL DIAGRAM 1 RAVENSWOOD.GPJ FEDERAL.GDT 09/30/10

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-08

North: 710878.02 **East:** 1751978.76

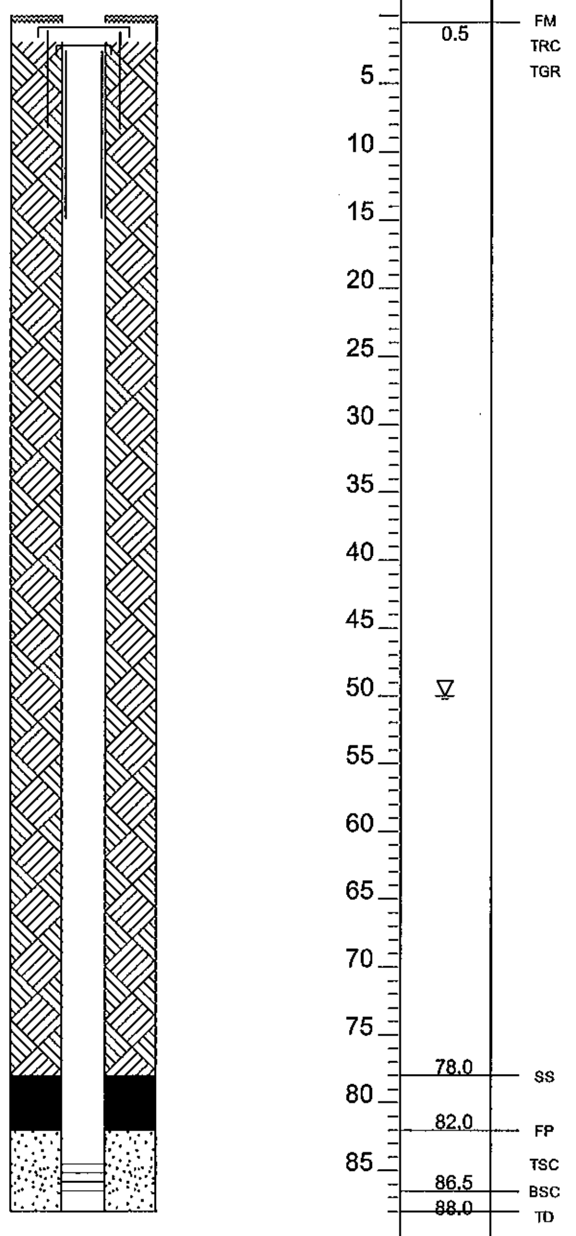
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/19/08
Date Completed: 11/19/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 88 ft. bgs
Elevation (ft. above msl): 610.4
Depth to Water (ft. bgs): 50

WELL DIAGRAM | DEPTH (ft.) | INTERVAL | WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 84.5

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 78.0

SAND SEAL
Type: Bentonite
Interval: 78.0 - 82.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 82.0 - 88

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 84.5 - 86.5

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

█ BENTONITE CHIPS

▧ CEMENT GROUT

▦ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: AS-09

North: 710875.35 **East:** 1751976.76

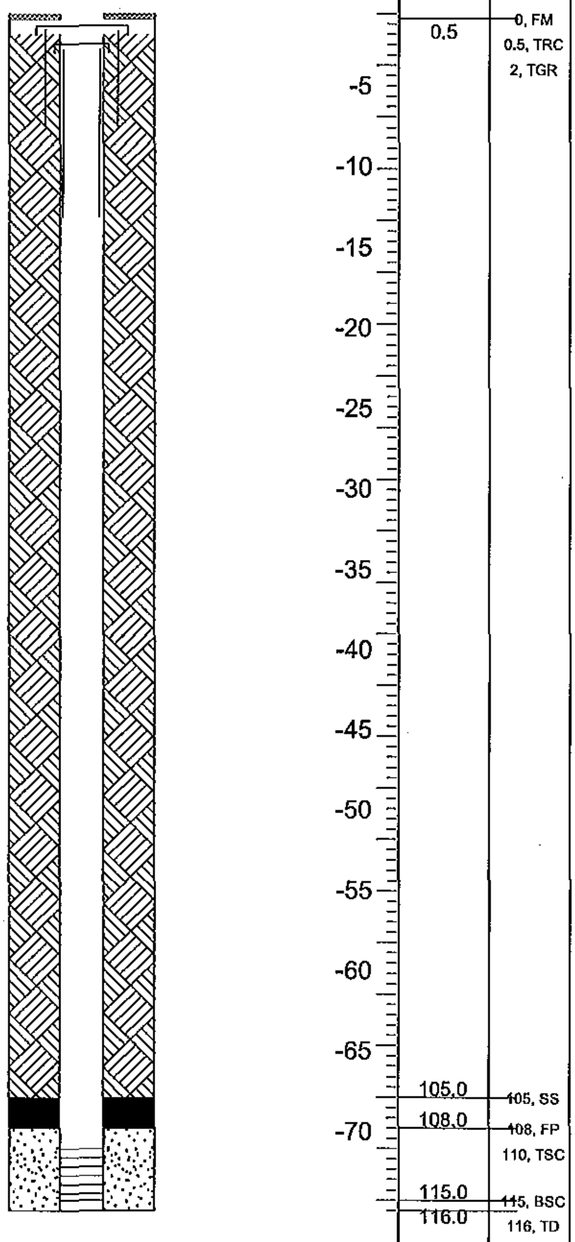
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/24/08
Date Completed: 11/24/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: ft. bgs
Elevation (ft. above msl): 610.4
Depth to Water (ft. bgs): N/A

WELL DIAGRAM | DEPTH (ft.) | INTERVAL



WELL CONSTRUCTION DETAILS

COMMENTS

Comment: Well installed at an angle of 39.9 degrees from vertical. Vertical depth of well 88.22 calculated based on length of well and angle of installation.
Total length of well = 115.0
Total length of boring = 610.4

(in feet bgs, along length of borehole)

CONCRETE PAD

Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:

Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 0.5 - 110.0

GROUT

Type: Cement/Bentonite Grout
Interval: 2 - 105.0

SAND SEAL

Type: Bentonite
Interval: 105.0 - 108.0

SANDPACK

Type: Global Filter #5 Sand
Interval: 108.0 - 116

SCREEN

Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 110.0 - 115.0

LEGEND

⁝	FILTER PACK
■	BENTONITE CHIPS
▧	CEMENT GROUT
⊞	SCREEN
▩	CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

WELL DIAGRAM 1 - AS-09 RAVENSWOOD.GPJ FEDERAL.GDT 09/30/10

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-06S

North: 710886.65 **East:** 1752018.96

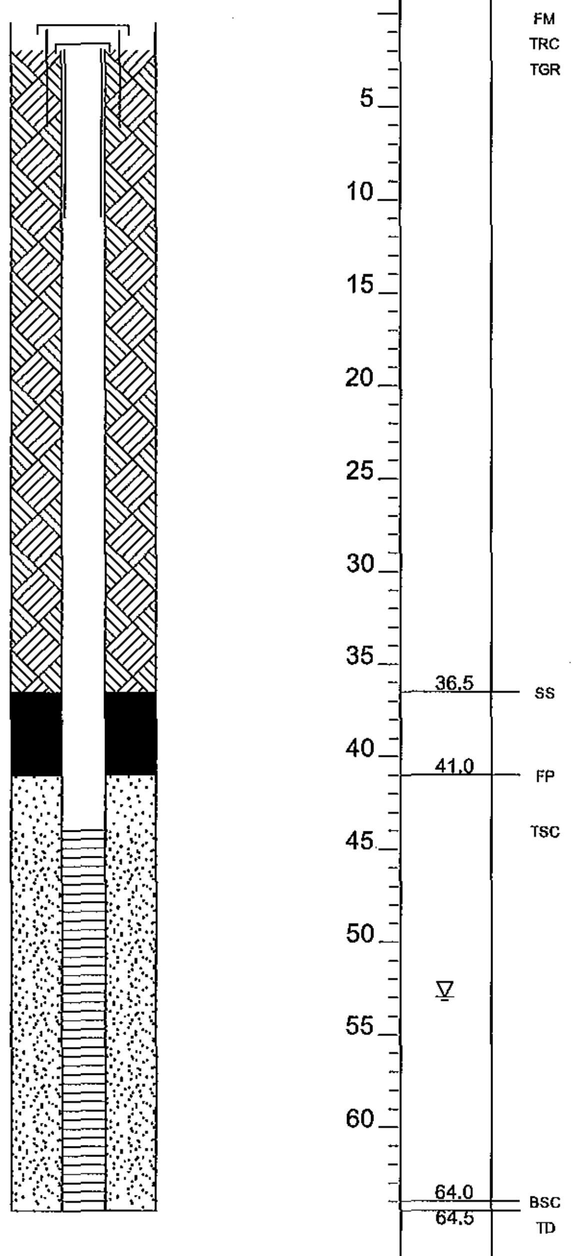
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/21/08
Date Completed: 11/21/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 64.5 ft. bgs
Elevation (ft. above msl): 611.7
Depth to Water (ft. bgs): 53

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 44

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 36.5

SAND SEAL
Type: Bentonite
Interval: 36.5 - 41.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 41.0 - 64.5

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 44 - 64

COMMENTS
Comment:

LEGEND

▽ WATER LEVEL DURING DRILLING

▥ FILTER PACK

▮ BENTONITE CHIPS

▨ CEMENT GROUT

▤ SCREEN

▩ CONCRETE PAD

FM FLUSH MOUNT
TPC TOP PROTECTIVE CASING
TRC TOP OF RISER CASING
TGR TOP OF GROUT
SS SAND SEAL
FP FILTER PACK
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: MW-11S

North: 711169.42 **East:** 1752112.02

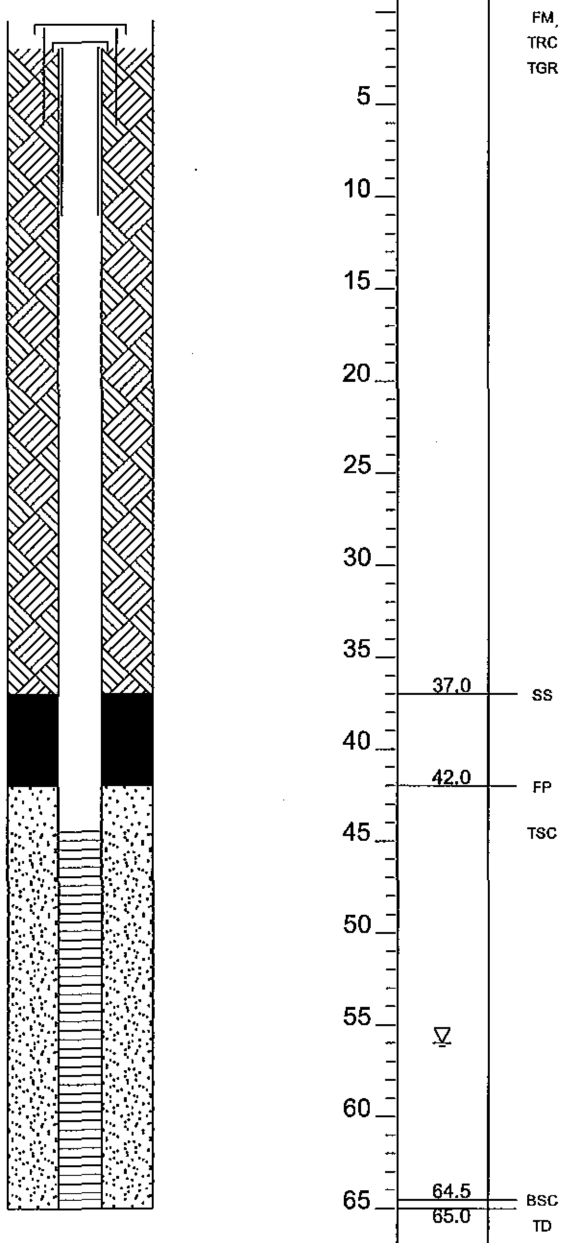
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/17/08
Date Completed: 11/17/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 65 ft. bgs
Elevation (ft. above msl): 615.3
Depth to Water (ft. bgs): 56

WELL DIAGRAM | DEPTH (ft.) | INTERVAL



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 44.5

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 37.0

SAND SEAL
Type: Bentonite
Interval: 37.0 - 42.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 42.0 - 65

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 44.5 - 64.5

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING
▥ FILTER PACK
■ BENTONITE CHIPS
▧ CEMENT GROUT
▦ SCREEN
▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: SVE-01

North: 711202.59 **East:** 1752105.64

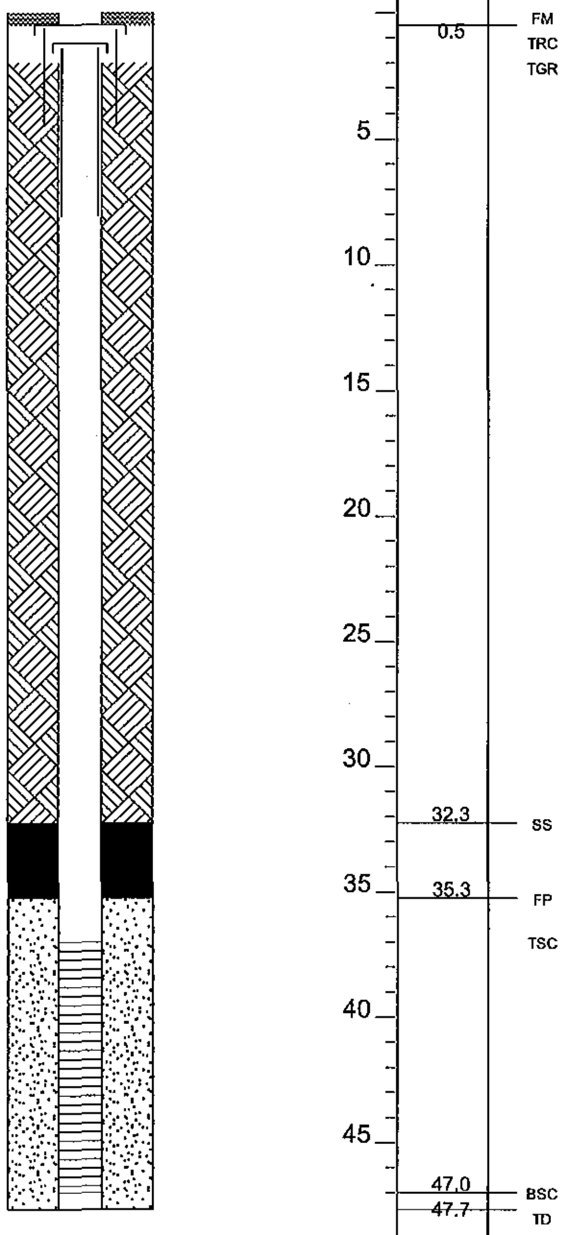
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/6/08
Date Completed: 11/6/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 47.67 ft. bgs
Elevation (ft. above msl): 614.9
Depth to Water (ft. bgs): None

WELL DIAGRAM	DEPTH (ft.)	INTERVAL	WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 37

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 32.25

SAND SEAL
Type: Bentonite
Interval: 32.25 - 35.25

SANDPACK
Type: Global Filter #5 Sand
Interval: 35.25 - 47.67

SCREEN
Diameter: 4"ID
Type: Schedule 40 PVC
Interval: 37 - 47.0

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

▮ BENTONITE CHIPS

▨ CEMENT GROUT

▤ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: SVE-02

North: 711070.48 **East:** 1752043.53

Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/12/08
Date Completed: 11/12/08
Logged By: [redacted]
Drilling Method: Rotosonic

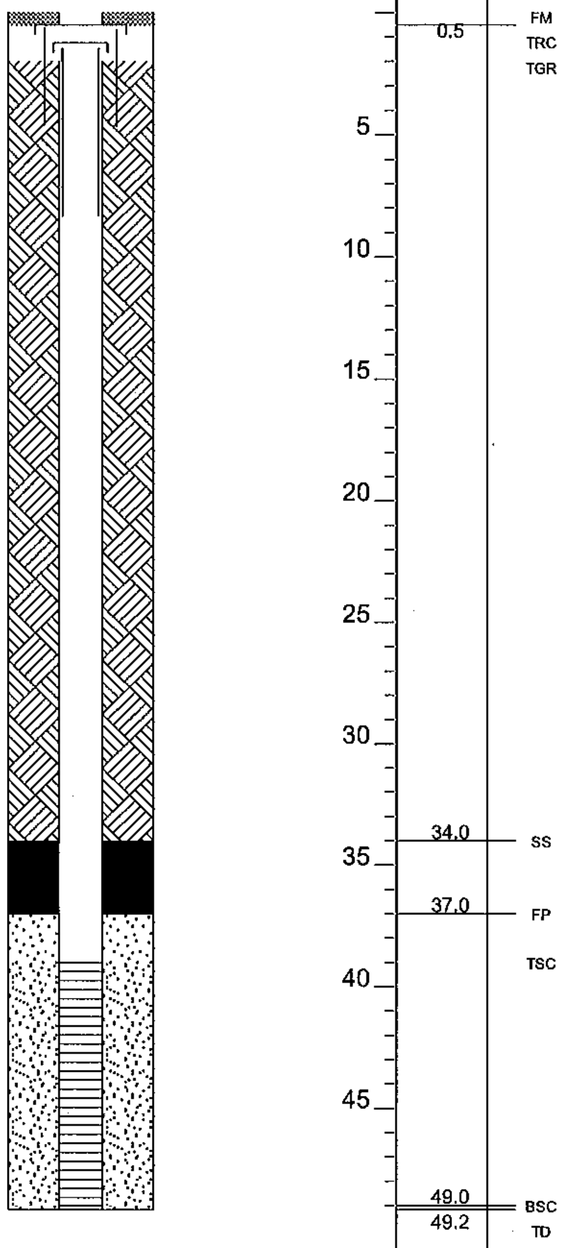
Hole Depth: 49.17 ft. bgs
Elevation (ft. above msl): 613.6
Depth to Water (ft. bgs): None

WELL DIAGRAM

DEPTH (ft.)

INTERVAL

WELL CONSTRUCTION DETAILS



(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 39

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 34.0

SAND SEAL
Type: Bentonite
Interval: 34.0 - 37.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 37.0 - 49.17

SCREEN
Diameter: 4"ID
Type: Schedule 40 PVC
Interval: 39 - 49.0

COMMENTS
Comment:

LEGEND

- ▽ WATER LEVEL DURING DRILLING
- ⁞ FILTER PACK
- ■ BENTONITE CHIPS
- ▧ CEMENT GROUT
- ☷ SCREEN
- ▒ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation
14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: SVE-03

North: 710882.12 **East:** 1751998.4

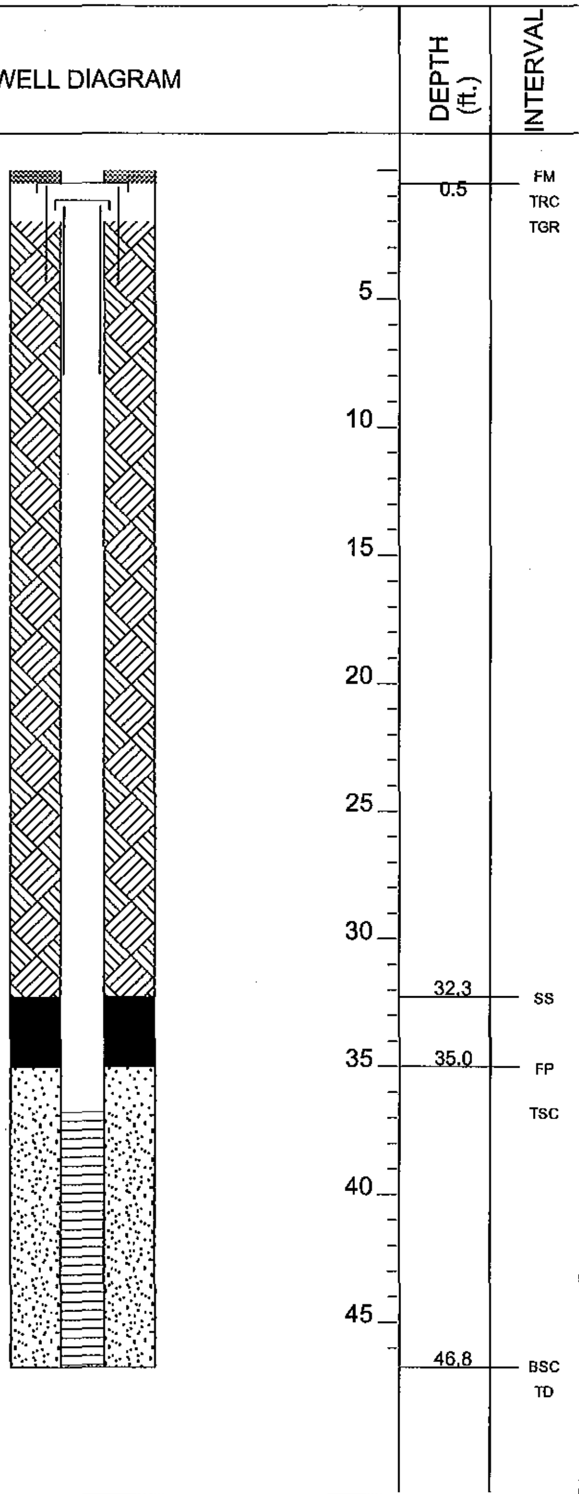
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/22/08
Date Completed: 11/22/08
Logged By: DEW
Drilling Method: Rotosonic

Hole Depth: 46.75 ft. bgs
Elevation (ft. above msl): 611.2
Depth to Water (ft. bgs): None

WELL DIAGRAM



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 36.75

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 32.25

SAND SEAL
Type: Bentonite
Interval: 32.25 - 35.0

SANDPACK
Type: Global Filter #5 Sand
Interval: 35.0 - 46.75

SCREEN
Diameter: 4"ID
Type: Schedule 40 PVC
Interval: 36.75 - 46.75

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

⁞ FILTER PACK

▮ BENTONITE CHIPS

▨ CEMENT GROUT

▤ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

CDM Federal Programs Corporation

14420 Albemarle Point Place
Suite 210
Chantilly, VA 20151

Well Name: VP-01

North: 711067.89 **East:** 1752081.57

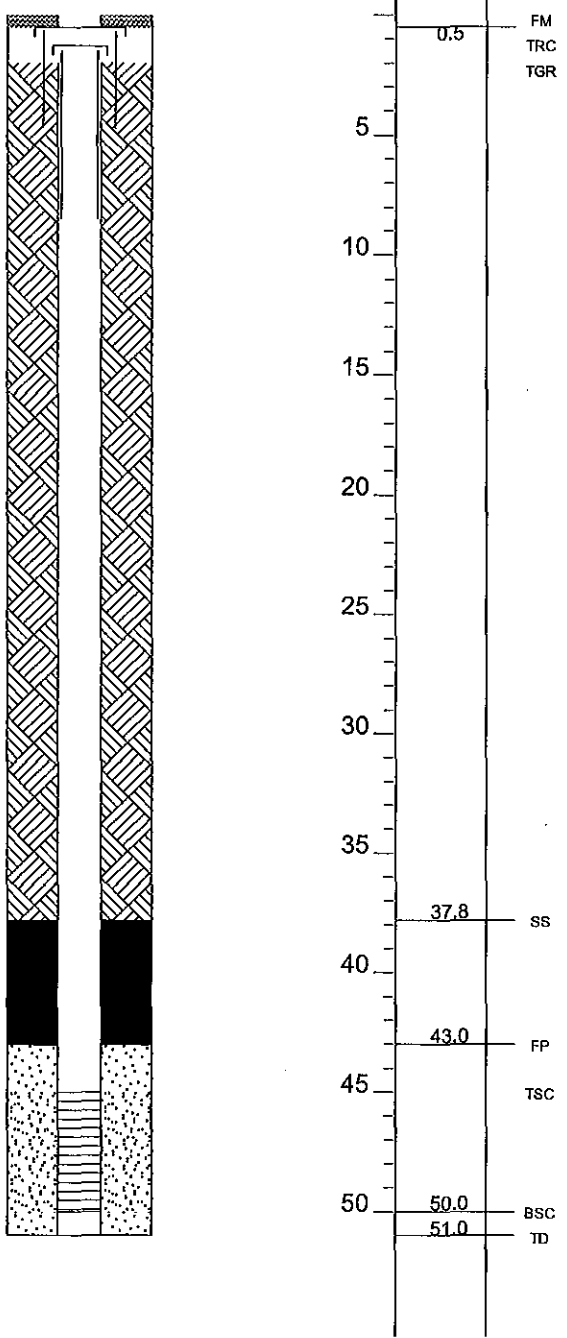
Client: U.S. Environmental Protection Agency
Drilling Company: Boart Longyear

Project Location: Ravenswood, West Virginia
Project Name: Ravenswood PCE Site
Project Number: 3330-025

Date Started: 11/18/08
Date Completed: 11/18/08
Logged By: [redacted]
Drilling Method: Rotosonic

Hole Depth: 50 ft. bgs
Elevation (ft. above msl): 613.6
Depth to Water (ft. bgs): None

WELL DIAGRAM | DEPTH (ft.) | INTERVAL



WELL CONSTRUCTION DETAILS

(in feet bgs, unless otherwise indicated)

CONCRETE PAD
Dimensions: 2'x2'
Mount: Flush mount

RISER CASING:
Diameter:
Type: Schedule 40 PVC
Interval: 0.5 - 45

GROUT
Type: Cement/Bentonite Grout
Interval: 2 - 37.8

SAND SEAL
Type: Bentonite
Interval: 37.8 - 43

SANDPACK
Type: Global Filter #5 Sand
Interval: 43 - 50

SCREEN
Diameter: 2"ID
Type: Schedule 40 PVC
Interval: 45 - 50

COMMENTS
Comment:

LEGEND

∇ WATER LEVEL DURING DRILLING

▥ FILTER PACK

▮ BENTONITE CHIPS

▨ CEMENT GROUT

▤ SCREEN

▩ CONCRETE PAD

FM	FLUSH MOUNT
TPC	TOP PROTECTIVE CASING
TRC	TOP OF RISER CASING
TGR	TOP OF GROUT
SS	SAND SEAL
FP	FILTER PACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH

Appendix C

Quality Assurance Report

Appendix C
Quality Assurance/Quality Control Report

C.1 Controlling Documents

This Quality Assurance/Quality Control Report includes all groundwater data generated during the RI. The quality evaluation of the vapor data completed as part of the Treatability Study is included in a QA/QC Report in the Final FS (CDM, 2010b). The QA/QC program developed for this project is documented in the EPA-approved Final Site Management Plan for the Ravenswood PCE Superfund Site groundwater investigation (CDM, 2007), and its two addenda (CDM, 2008 and CDM, 2010c). The results of the program are documented below.

C.2 Deviations from the Site Management Plan

C.2.1 2007 Groundwater Sampling

Two City production wells were not sampled as originally planned in the Final SMP. PW-3 and PW-5 were not sampled due to mechanical failures of the City's well pumps and air stripper at the time of CDM's May 2007 sampling event. Because these wells were subsequently sampled in August 2007, this deviation did not create a data gap.

The quantitation limits of the natural attenuation parameters are higher than originally specified in the Final SMP due to limitations on laboratory analytical capability assigned through EPA Region III's ASQAB. Despite the higher than specified quantitation limits, the quantitiation limits are considered to be sufficient to detect the parameters at the levels required for this study. Sulfate and nitrate were detected at levels above the laboratory quantitiation limits.

Samples for methane, ethane, and ethene, which were originally scheduled to be collected as indicators of natural degradation of PCE, were not collected, because ASQAB was not able to procure a laboratory to perform the analyses during the time that the sampling was being conducted. A review of the impact of the missing data determined that the lack of data for methane, ethane, and ethene did not impact the findings of the RI, because no other indicators of natural degradation of PCE were observed.

C.2.2 Treatability Study Well Installation

Three groundwater monitoring wells were planned for installation as part of the TS system. Based on the existing well network, CDM, in consultation with EPA, elected to install one vapor monitoring well instead of the third, deep groundwater monitoring well.

Access to the planned installation location of well AS-09 was limited due to overhead and underground utilities and buildings. CDM, in consultation with EPA, elected to install well AS-09 as an angled well. This deviation allowed for air sparging in approximately the same location as originally planned, while avoiding the need to drill near buildings and utility lines. Additionally, the need to install approximately 60 feet of trenching for the AS piping was avoided.

It was originally planned for screening level groundwater samples to be collected from each AS and groundwater monitoring well. The installation of a vapor monitoring well, which did not extend to groundwater, precluded the collection of a groundwater sample at VP-1. Because wells MW-6S and AS-09 were installed toward the end of the drilling program, it was determined that the collection of the screening level sample was not necessary, as the data would not be used to guide additional well installation locations. In the case of MW-6S, a groundwater sample of higher quality was collected from the well following the well installation. As described in Section 3.4.2.5, well AS-09 was drilled using hydrostatic pressure to force soil cuttings out of the drilling tools. The use of water during drilling would have affected the concentrations of VOCs in groundwater and would have compromised the samples; therefore, no groundwater samples were collected.

C.2.3 DPT Groundwater Investigation

During the first and second mobilizations, two and six additional Step-Out sampling points, respectively, were added to the sampling program. In addition, one Source Identification Point was added to the program during the second mobilization. These additions to the sampling program enhanced the definition of the plume delineation.

The SMP stated that the turbidity of the samples should be below 10 NTU. However, during sampling, this criterion was determined to be unachievable in this aquifer using the DPT screening level technology. Because VOCs do not significantly adsorb to fine soil particles, the presence of excess turbidity would have no impact on data quality for these screening level samples.

C.3 Data Validation

Rounds of samples collected during the investigation were analyzed through the EPA Contract Laboratory Program. EPA's Environmental Services Assistance Team (ESAT) contractor performed data validation in accordance with EPA Region III "Modifications to the National Functional Guidelines for Data Review," (U.S. EPA 1993 and 1994). The analytical results and corresponding data validation results have been incorporated into the database.

Analytical results of the environmental samples have been appropriately flagged as having blank contamination by the data validators based on the results of associated rinsate, trip, field, and laboratory blanks.

In addition to the ESAT data validation, data usability worksheets were completed by CDM for the groundwater data collected in May 2007, because these data were used to prepare the Human Health Risk Assessment (CDM, 2010a). The worksheets are included in an Appendix C to that report. The usability of the remaining analytical data was evaluated by reviewing the validation reports and querying the investigation team.

C.4 Data Evaluation

QA/QC samples are samples analyzed for the purpose of assessing the quality of the sampling procedures and laboratory analysis. QA/QC samples include field samples that were collected or prepared by the field team and sent to the CLP designated laboratory for analysis to diagnose problems related to sampling, shipment, and laboratory analysis. Field QA/QC samples collected for this field investigation include equipment rinsate blanks, field blanks, trip blanks, and duplicate samples. The QA/QC samples measure possible factors that could influence the results reported for the environmental samples. Results for each type of QA/QC sample are discussed below, and the analytical results are presented in **Table C-1a, Table C-1b, and Table C-1c.**

C.4.1 Equipment Rinsate Blanks

Equipment rinsate blank samples represent final rinse waters collected on decontaminated sampling equipment to evaluate the effectiveness of decontamination procedures. Rinsate blanks were prepared by pouring analyte-free water over decontaminated sampling equipment and collecting the rinse water directly into sample containers. Rinsate blanks were collected at a minimum frequency of one per 20 samples or one per day, whichever was most frequent. Rinsate blanks were analyzed for the same parameters as those for which the samples collected that day were analyzed.

In total, 25 VOCs, five SVOCs, three pesticides, three PCBs, and two total metals (and cyanide) rinsate blanks were collected. In total, 21 VOCs and two SVOCs were detected in the rinsate blanks. Some of the VOCs detected in the rinsate blanks (acetone, methylene chloride, chloroform, and toluene) are common laboratory contaminants, and detections may not be representative of the effectiveness of decontamination procedures. Other VOCs of interest commonly detected in the rinsate blanks include: 2-butanone, o-xylene, m,p-xylene, carbon tetrachloride, and PCE. The vast majority of the VOC concentrations in these samples are very low (estimated concentrations below the quantitation limits), but PCE is of note as it is a COPC for the Site. Detections of PCE in rinsate blanks are all associated with rinsates collected during the February 2010 DPT sampling event. All of these rinsate results are lower concentrations than any values reported for environmental samples. Also, because the critical value for that investigation was the MCL (5 µg/L) and all of the results in the rinsates were 1 to 3 orders of magnitude below the MCL, the impact of these detections in the rinsates on the overall goals of the investigation is negligible.

Also of note is a relatively high concentration of 2-butanone (15L µg/L) reported in the rinsate blank from the screening level borehole groundwater sampling conducted during the installation of the Treatability Study system. This compound was regularly detected in blank samples collected throughout the RI. Out of a total of 209 VOCs analyses performed during the RI, 2-butanone was detected 43 times. Thirty-one of these detections were reported from blank samples (e.g. trip blanks, rinsate blanks), while the remaining twelve detections were associated with groundwater samples. The high proportion of 2-butanone detections in blank samples suggests that the presence of this compound is not related to groundwater contaminants but may be due to the presence of 2-butanone in the air or some other artifact of the sample collection and handling procedures. The 'L' flag indicates that the result may be biased low and the actual value is expected to be higher.

Bis(2-ethylhexyl)phthalate and di-n-octylphthalate were the only SVOCs detected in the rinsate blanks, and both were detected at low levels. These compounds are not considered to be Site-related.

C.4.2 Trip Blanks

Trip blanks are samples of analyte-free water (preserved to pH <2 with hydrochloric acid). A trip blank accompanies the samples through shipment and serves as a check for cross-contamination of VOCs during shipment to the laboratory. Trip blanks were submitted at the rate of one per cooler containing VOC groundwater samples. In total, 28 trip blanks were collected and analyzed.

Nineteen VOCs were detected in the trip blanks. Acetone, 2-butanone, methylene chloride, methyl tert-butyl ether, and toluene were the most common VOCs detected in the trip blanks. These analytes are common laboratory contaminants and may not be representative of cross contamination occurring during sample handling. The trip blank collected during the August 2007 sampling event contained 220 µg/L of methylene chloride. The field blank, collected at the same time, also contained 210 µg/L of methylene chloride. Groundwater samples associated with these blanks did not contain methylene chloride. The source of the methylene chloride in these blank samples is unknown.

Other detected VOCs of interest included bromoform, chloroform, and PCE. PCE, a COPC for the Site, was detected in one trip blank from the DPT sampling event in February 2010; however, the concentration in that sample (0.056 J µg/L) is two orders of magnitude below the MCL for PCE. The majority of the concentrations of VOCs detected in the trip blanks were below the reported quantitation limits.

C.4.3 Field Blanks

Field blanks are samples of the water used for decontamination and rinsate water samples and are used to evaluate whether contaminants are being introduced into the sample by the source water. One analyte-free water sample was collected during each of the three sampling rounds by pouring the source water directly into the sample containers. Source water blanks were analyzed for the same set of compounds and analytes as the environmental samples analyzed during the site investigation. Eleven VOCs, three SVOCs, two pesticides, two PCBs, two total metals (with cyanide), and two dissolved metals (with cyanide) field blank samples were collected.

Five VOCs were detected in the field blanks including acetone, methylene chloride, 2-butanone, chloroform, and cyclohexane. All VOCs were found at low levels, with one exception. Methylene chloride was detected at 210 µg/L during the August 2008 sampling event. As discussed above, methylene chloride was detected at a similar concentration in the trip blank; however, the source of this compound is unknown. Two SVOCs (pyrene and bis(2-ethylhexyl)phthalate) were also found in field blanks, both at low levels. Six metals were detected, all at low levels. No pesticides or PCBs were detected in field blanks.

C.4.4 Precision (Duplicates)

Field duplicate samples were sent to the laboratory blind (i.e., not marked as duplicate samples) to provide a check on the field sampler's technique and the homogeneity of the environmental media. These samples were collected as a separate aliquot. Duplicate samples were collected and analyzed at the minimum frequency of one per ten samples.

Twelve VOCs, three SVOCs, two pesticides, two PCBs, two total metals (with cyanide), and two dissolved metals (with cyanide) duplicate groundwater samples were collected. The total number of environmental groundwater samples collected and analyzed for these same parameters were 117, 38, 18, 18, 18, and 13, respectively.

As described in the SMP, precision was estimated using the relative percent difference (RPD) calculated by the following equation:

$$RPD = \frac{100\,(D1 - D2)}{\frac{(D1 + D2)}{2}}$$

where: D1 = the larger of the two values
D2 = the smaller of the two values

RPDs were calculated for each set of the primary environmental sample and its associated field duplicate. RPDs were calculated only when a chemical was detected in both the environmental sample and the associated field duplicate. RPDs were not calculated when one or both sample results had no detection, because a quantitative value was not available for the calculation. In addition, the RPD was not calculated when one of the analytical results was qualified "B" indicating that it was also found in the associated QC samples. **Table C-2** presents RPDs for each data set. RPDs for VOCs ranged from 0% to 145%, for SVOCs from 0% to 53%, for total metals and cyanide from 0% to 28%, and for dissolved metals and cyanide from 0% to 103%. Compounds where RPDs exceed 20% are bolded in **Table C-1**.

The acceptable RPD limits for field duplicates are less than or equal to 20%. Most of the compounds where the RPD exceeded this limit were detected at low levels. At low concentrations, very small differences in the analytical values result in large RPDs, because the differences are presented as a percentage of the average concentration.

One sample is of note because of the extreme differences between the sample and duplicate values. In sample RI-MW06-080312, the bis(2-ethylhexyl)phthalate result (330 µg/L) disagreed with the duplicate result (<5.0 µg/L). Because bis(2-ethylhexyl) phthalate is not considered to be Site-related and it can be a laboratory contaminant, this result is not likely to affect data useability.

C.4.5 Temperature Blanks

Temperature blanks are samples of tap water that are used to ensure that coolers maintain a temperature at or below 4.0 degrees Celsius (+/- 2.0 degrees Celsius). Without maintaining this temperature, it is possible that compounds could off gas, resulting in samples that may not be fully representative of true concentrations.

A cooler shipped on March 18, 2010, containing samples for VOC analyses from locations: STRIPPERINF, STRIPPEREFF, BLEND, PW2, PW5, DP27, DP28, DP29, DP30, DP31, and DP32, was received with an interior temperature of 7.0 degrees Celsius by the laboratory. Reported results associated with this cooler have been qualified by the laboratory with "L" and "UL", respectively (except where a "J", "B" or "R" qualifier superseded it). A "UL" qualifier indicates a non-detect, with a higher probable quantitation limit than expected. An "L" qualifier indicates a detection with a higher probable quantitation limit than expected.

C.4.6 Accuracy (Matrix Spike/Matrix Spike Duplicate Samples)

Accuracy is the measure of bias in a system. It is the degree of agreement of a measurement with an accepted reference or true value. Accuracy for this project was estimated from the analysis of QC samples whose true values are known (surrogate or matrix spikes) and was expressed as percent recovery. Data which do not meet accuracy criteria are flagged J-estimated or R-rejected as appropriate.

C.4.7 Representativeness and Comparability

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population at a sampling point, process condition, or environmental condition. Comparability expresses the confidence with which one data set can be compared to another. Representativeness and comparability are qualitative objectives that were met by following standard operating procedures for sample collection and analysis.

C.4.8 Completeness

Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under current normal conditions. The SMP had established a completeness goal of 90% for this project for data quality objective (DQO) definitive analytical results, which was met (239 rejected data points out of 14,850 total data points, for a completeness value of 98.39%).

Of the groundwater samples, 58% of the bromomethane data, 38% of the 2-butanone data, and 1,4-dioxane were rejected (not including duplicates). This loss of data is not considered to significantly affect the overall completeness of the study, because these chemicals are not considered to be Site-related.

C.5 Audits

The RAC III QA program includes both self-assessments and independent assessments as checks on quality of data generated on this work assignment. Self-assessments include management systems reviews, trend analyses, calculation checking, and technical reviews. Independent assessments include office, field, and laboratory audits and performance audits.

The contract Quality Management Plan requires that office audits be performed once per year for each work assignment (WA), and that one field audit be performed for every five weeks of field work that involve sample collection. However, on this work assignment, EPA has approved the replacement of office audits with self assessments.

Field activities associated with the RI included 4 groundwater sampling events, each lasting less than 1 week, and a DPT study which was conducted over 4 weeks. No field audits were performed, however, technical reviews were performed on all technical submittals and three self assessments have been performed since the start of the work assignment.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	FB-070507	FB-070831	FB-080312	FB-081106	FB-081107	FB-081108	FB-081110	FB-081111	FB-081117
Dichlorodifluoromethane	µg/L										
Chloromethane	µg/L										
Trichlorofluoromethane	µg/L										
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L										
Acetone	µg/L		3.4 J		25 B	32 L	32 L	33 L	35 L	25 J	26 L
Carbon Disulfide	µg/L										
Methylene chloride	µg/L	5	0.55 B	210	0.23 B	0.63 B	0.63 B	0.57 B	0.32 B	0.22 B	0.41 B
2-Butanone	µg/L				1 J	31 L		37 L	160 L	14 L	
Chloroform	µg/L		0.86		0.62	0.82	0.86	0.81	0.79	0.76	0.7
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L										0.12 B
Carbon tetrachloride	µg/L	5									
Benzene	µg/L	5									
Bromodichloromethane	µg/L										
Toluene	µg/L	1000									
Tetrachloroethene	µg/L	5									
2-Hexanone	µg/L										
Dibromochloromethane	µg/L										
Ethylbenzene	µg/L	700									
o-Xylene	µg/L										
m,p-Xylene	µg/L										
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75									
1,2,4-Trichlorobenzene	µg/L	70									

Notes:
All results are in microgram per liter (µg/L)
Blank cells indicate analyte not detected
MCL - maximum contaminant level, December 2009
Data Qualifiers:
B - Analyte not detected substantially above the level reported
in laboratory or field blanks
K - Analyte present. Reported value may be biased high.
Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value
is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	FB-081119	FB-081120	RB-070507	RB-070508	RB-070509	RB-080212	RB-080312	RB-081104	RB-100201
Dichlorodifluoromethane	µg/L										
Chloromethane	µg/L								0.16 J		
Trichlorofluoromethane	µg/L										
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L										
Acetone	µg/L		25 L	24 L	1.4 J			28 B	32 B	32 L	
Carbon Disulfide	µg/L										
Methylene chloride	µg/L	5	0.25 J	0.22 J	2.3	0.93		0.37 B	0.33 B	0.42 B	0.43 B
2-Butanone	µg/L					3.1 J		1.4 J	1.4 J	15 L	
Chloroform	µg/L		0.71		1.7		1.9	0.27 J	0.63	0.69	
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L										
Carbon tetrachloride	µg/L	5									
Benzene	µg/L	5									
Bromodichloromethane	µg/L										
Toluene	µg/L	1000						0.21 J			
Tetrachloroethene	µg/L	5									
2-Hexanone	µg/L										
Dibromochloromethane	µg/L										
Ethylbenzene	µg/L	700									
o-Xylene	µg/L										
m,p-Xylene	µg/L										
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75									
1,2,4-Trichlorobenzene	µg/L	70									

Notes:
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is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	RB-100202	RB-100203	RB-100204	RB-100204B	RB-100205	RB-100207	RB-100208	RB-100209	RB-100215
Dichlorodifluoromethane	µg/L							0.049 J			0.12 B
Chloromethane	µg/L										0.14 J
Trichlorofluoromethane	µg/L										0.086 B
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L							0.043 J			
Acetone	µg/L								3.7 J	2.8 J	
Carbon Disulfide	µg/L										
Methylene chloride	µg/L	5	0.44 B	1.3	1.5	1.3	1.1	1.2	0.87	1	0.95
2-Butanone	µg/L					1.4 J		1.4 J	1.1 J		
Chloroform	µg/L			1	1.1 K				5.8	0.82	
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L										
Carbon tetrachloride	µg/L	5						0.05 B	0.033 B		0.039 B
Benzene	µg/L	5				0.18 J		0.17 J			
Bromodichloromethane	µg/L								0.99		0.042 J
Toluene	µg/L	1000		0.61	0.57	0.62	0.3 J	0.41 J	0.44 J	0.39 J	0.25 J
Tetrachloroethene	µg/L	5						0.12 J			
2-Hexanone	µg/L					1.5 J		1.3 J	1.4 J		
Dibromochloromethane	µg/L						0.11 J		0.15 J		
Ethylbenzene	µg/L	700									
o-Xylene	µg/L				0.08 J	0.087 J		0.034 J	0.042 J		
m,p-Xylene	µg/L				0.17 J	0.19 J		0.064 J	0.08 J		
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75									
1,2,4-Trichlorobenzene	µg/L	70						0.085 B			

Notes:
All results are in microgram per liter (µg/L)
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in laboratory or field blanks
K - Analyte present. Reported value may be biased high.
Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value
is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	RB-100216	RB-100218	RB-100219	RB-100220	RB-100221	RB-100222	RB-100223	TB-070507	TB-070508
Dichlorodifluoromethane	µg/L		0.15 B	0.17 B							
Chloromethane	µg/L		0.13 J								
Trichlorofluoromethane	µg/L		0.073 B	0.096 B							
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L										
Acetone	µg/L						3.5 J		3.3 J	2.3 J	
Carbon Disulfide	µg/L				0.18 B	0.19 B	0.17 B	0.19 B	0.18 B		
Methylene chloride	µg/L	5	1.2	1.3	0.81	0.99	0.99	0.92	0.91	0.22 JB	1.7
2-Butanone	µg/L		1.7 J	1.6 J	1.3 J		1.5 J	1.7 J	1.4 J		3.3 J
Chloroform	µg/L					0.79	0.86		0.78	0.98	
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L										
Carbon tetrachloride	µg/L	5	0.041 B	0.05 B	0.036 B	0.033 B	0.034 B	0.04 B	0.034 B		
Benzene	µg/L	5					0.093 J	0.066 J			
Bromodichloromethane	µg/L										
Toluene	µg/L	1000	0.4 J	0.33 J	0.19 J	0.25 J	0.26 J	0.3 J	0.25 J		
Tetrachloroethene	µg/L	5	0.058 J	0.032 J		0.064 J	0.051 J				
2-Hexanone	µg/L		1.8 J	1.5 J					1.8 J		
Dibromochloromethane	µg/L										
Ethylbenzene	µg/L	700				0.042 J	0.044 J	0.039 J			
o-Xylene	µg/L		0.039 J	0.041 J	0.033 J	0.04 J	0.056 J	0.08 J	0.054 J		
m,p-Xylene	µg/L		0.077 J	0.04 J		0.043 J	0.046 J	0.12 J	0.054 J		
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75			0.023 B						
1,2,4-Trichlorobenzene	µg/L	70			0.088 J						

Notes:
All results are in microgram per liter (µg/L)
Blank cells indicate analyte not detected
MCL - maximum contaminant level, December 2009
Data Qualifiers:
B - Analyte not detected substantially above the level reported in laboratory or field blanks
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	TB-070509	TB-070831	TB-081104	TB-081107	TB-081108	TB-081111	TB-081117	TB-081119	TB-081120
Dichlorodifluoromethane	µg/L										
Chloromethane	µg/L										
Trichlorofluoromethane	µg/L										
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L										
Acetone	µg/L				29 L	26 J	35 L	31 J	29 L	27 L	27 L
Carbon Disulfide	µg/L										
Methylene chloride	µg/L	5		220	0.7 B	0.26 B	0.36 B	0.56 B	0.42 B	0.26 J	0.27 J
2-Butanone	µg/L				29 L	6.4 L	76 L	42 L			
Chloroform	µg/L		1.9		0.82	0.83	0.82	0.68 K	0.7	0.72	0.76
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L								0.13 B		
Carbon tetrachloride	µg/L	5									
Benzene	µg/L	5									
Bromodichloromethane	µg/L										
Toluene	µg/L	1000									
Tetrachloroethene	µg/L	5									
2-Hexanone	µg/L										
Dibromochloromethane	µg/L										
Ethylbenzene	µg/L	700									
o-Xylene	µg/L										
m,p-Xylene	µg/L										
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75									
1,2,4-Trichlorobenzene	µg/L	70									

Notes:
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Data Qualifiers:
B - Analyte not detected substantially above the level reported in laboratory or field blanks
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	TB-091123	TB-100106	TB-100201	TB-100203	TB-100205	TB-100208	TB-100209	TB-100215	TB-100216
Dichlorodifluoromethane	µg/L									0.13 B	0.14 B
Chloromethane	µg/L									0.16 J	
Trichlorofluoromethane	µg/L									0.082 B	0.086 B
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L										
Acetone	µg/L		1.7 B	1.8 J							
Carbon Disulfide	µg/L										
Methylene chloride	µg/L	5			0.36 B	0.88	1.3	1.3	1.3	1.3	1.4
2-Butanone	µg/L						1.4 J	1.5 J		2 J	1.3 J
Chloroform	µg/L								1		
1,1,1-Trichloroethane	µg/L	200									
Cyclohexane	µg/L										
Carbon tetrachloride	µg/L	5						0.034 B		0.037 B	0.036 B
Benzene	µg/L	5						0.17 J			
Bromodichloromethane	µg/L										
Toluene	µg/L	1000				0.044 J	0.62	0.55	0.53	0.48 J	0.48 J
Tetrachloroethene	µg/L	5									
2-Hexanone	µg/L						1.3 J	1.5 J		1.7 J	1.7 J
Dibromochloromethane	µg/L										
Ethylbenzene	µg/L	700									
o-Xylene	µg/L						0.1 J	0.085 J		0.064 J	0.053 J
m,p-Xylene	µg/L						0.18 J	0.15 J		0.1 J	0.098 J
Isopropylbenzene	µg/L										
1,4-Dichlorobenzene	µg/L	75									
1,2,4-Trichlorobenzene	µg/L	70									

Notes:
All results are in microgram per liter (µg/L)
Blank cells indicate analyte not detected
MCL - maximum contaminant level, December 2009
Data Qualifiers:
B - Analyte not detected substantially above the level reported in laboratory or field blanks
K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.

Table C-1a
Quality Control Blanks: VOCs

Analyte	Result Units	MCL	TB-100217	TB-100218	TB-100219	TB-100222	TB-100223	TB-100304	TB2-100203
Dichlorodifluoromethane	µg/L		0.15 B	0.15 B					
Chloromethane	µg/L		0.16 J						
Trichlorofluoromethane	µg/L			0.095 B					
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L								
Acetone	µg/L		2.8 J		3 J		3.2 J	1.8 B	
Carbon Disulfide	µg/L			0.07 B	0.18 B	0.18 B	0.17 B		
Methylene chloride	µg/L	5	1.4	1.4	1	1	0.91		1.5
2-Butanone	µg/L		1.4 J		1.4 J	1.6 J	1.8 J		
Chloroform	µg/L						0.76		1.2 K
1,1,1-Trichloroethane	µg/L	200		0.044 J					
Cyclohexane	µg/L								
Carbon tetrachloride	µg/L	5		0.093 B	0.037 B	0.031 B	0.039 B		
Benzene	µg/L	5							
Bromodichloromethane	µg/L								
Toluene	µg/L	1000	0.42 J	0.5 J	0.36 J	0.32 J	0.28 J		0.64
Tetrachloroethene	µg/L	5		0.056 J					
2-Hexanone	µg/L			2 J			1.7 J		
Dibromochloromethane	µg/L								
Ethylbenzene	µg/L	700			0.053 J	0.043 J			
o-Xylene	µg/L			0.07 J	0.12 J	0.1 J	0.078 J		
m,p-Xylene	µg/L			0.14 J	0.15 J	0.13 J	0.082 J		
Isopropylbenzene	µg/L			0.027 J	0.053 J				
1,4-Dichlorobenzene	µg/L	75							
1,2,4-Trichlorobenzene	µg/L	70							

Notes:
All results are in microgram per liter (µg/L)
Blank cells indicate analyte not detected
MCL - maximum contaminant level, December 2009
Data Qualifiers:
B - Analyte not detected substantially above the level reported
in laboratory or field blanks
K - Analyte present. Reported value may be biased high.
Actual value is expected to be lower.
J - Analyte Present. Reported value may not be accurate or precise.
L - Analyte present. Reported value may be biased low. Actual value
is expected to be higher.

Table C-1b
Quality Control Blanks: SVOCs

Analyte	Result Unit	MCL	FB-070507	FB-070831	FB-080312	FB-081106	FB-081107	FB-081108	FB-081110	FB-081111
4-Chloro-3-methylphenol	µg/L			0.61 J						
Pyrene	µg/L			0.85 J						
Bis(2-ethylhexyl)phthalate	µg/L	6	2.8 J	0.19 J						
Di-n-octylphthalate	µg/L									

Analyte	Result Unit	MCL	FB-081117	FB-081119	FB-081120	RB-070507	RB-070508	RB-070509	RB-080212	RB-080312
4-Chloro-3-methylphenol	µg/L									
Pyrene	µg/L									
Bis(2-ethylhexyl)phthalate	µg/L	6				2.8 J	1.4 J	20	2.9 J	
Di-n-octylphthalate	µg/L					0.27 J				

Analyte	Result Unit	MCL	RB-081104	RB-100201	RB-100202	RB-100203	RB-100204	RB-100204B	RB-100205	RB-100207
4-Chloro-3-methylphenol	µg/L									
Pyrene	µg/L									
Bis(2-ethylhexyl)phthalate	µg/L	6								
Di-n-octylphthalate	µg/L									

Analyte	Result Unit	MCL	RB-100208	RB-100209	RB-100215	RB-100216	RB-100218	RB-100219	RB-100220	RB-100221
4-Chloro-3-methylphenol	µg/L									
Pyrene	µg/L									
Bis(2-ethylhexyl)phthalate	µg/L	6								
Di-n-octylphthalate	µg/L									

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected

MCL - maximum contaminant level, December 2009

NA - not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table C-1b
Quality Control Blanks: SVOCs

Analyte	Result Unit	MCL	RB-100222	RB-100223	TB-070507	TB-070508	TB-070509	TB-070831	TB-081104	TB-081107
4-Chloro-3-methylphenol	µg/L				NA	NA	NA	NA	NA	NA
Pyrene	µg/L				NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/L	6			NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	µg/L				NA	NA	NA	NA	NA	NA

Analyte	Result Unit	MCL	TB-081108	TB-081111	TB-081117	TB-081119	TB-081120	TB-091123	TB-100106	TB-100201
4-Chloro-3-methylphenol	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/L	6	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	µg/L		NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Result Unit	MCL	TB-100203	TB-100205	TB-100208	TB-100209	TB-100215	TB-100216	TB-100217	TB-100218
4-Chloro-3-methylphenol	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/L	6	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	µg/L		NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Result Unit	MCL	TB-100219	TB-100222	TB-100223	TB-100304	TB2-100203
4-Chloro-3-methylphenol	µg/L		NA	NA	NA	NA	NA
Pyrene	µg/L		NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/L	6	NA	NA	NA	NA	NA
Di-n-octylphthalate	µg/L		NA	NA	NA	NA	NA

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected

MCL - maximum contaminant level, December 2009

NA - not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

Table C-1c
Quality Control Blanks: Metals

Analyte	Result Units	MCL	FB-070507	FB-070831	FB-080312	FB-081106	FB-081107	FB-081108	FB-081110	FB-081111
BERYLLIUM	µg/L	4		0.36 B						
CALCIUM	µg/L			22.7 B						
COPPER	µg/L	1300		1.8 B						
MAGNESIUM	µg/L			15.7 B						
SODIUM	µg/L			22.7 B						
ZINC	µg/L			27.7 J						

Analyte	Result Units	MCL	FB-081117	FB-081119	FB-081120	RB-070507	RB-070508	RB-070509	RB-080212	RB-080312
BERYLLIUM	µg/L	4								
CALCIUM	µg/L									
COPPER	µg/L	1300								
MAGNESIUM	µg/L									
SODIUM	µg/L									
ZINC	µg/L									

Analyte	Result Units	MCL	RB-081104	RB-100201	RB-100202	RB-100203	RB-100204	RB-100204B	RB-100205	RB-100207
BERYLLIUM	µg/L	4								
CALCIUM	µg/L									
COPPER	µg/L	1300								
MAGNESIUM	µg/L									
SODIUM	µg/L									
ZINC	µg/L									

Analyte	Result Units	MCL	RB-100208	RB-100209	RB-100215	RB-100216	RB-100218	RB-100219	RB-100220	RB-100221
BERYLLIUM	µg/L	4								
CALCIUM	µg/L									
COPPER	µg/L	1300								
MAGNESIUM	µg/L									
SODIUM	µg/L									
ZINC	µg/L									

Notes:

All results are in microgram per liter (µg/L)

Blank cells indicate analyte not detected

MCL - maximum contaminant level, December 2009

NA - not analyzed

Data Qualifiers:

J - Analyte Present. Reported value may not be accurate or precise.

B - Analyte not detected substantially above the level reported
in laboratory or field blanks

Table C-1c
Quality Control Blanks: Metals

Analyte	Result Units	MCL	RB-100222	RB-100223	TB-070507	TB-070508	TB-070509	TB-070831	TB-081104	TB-081107
BERYLLIUM	µg/L	4			NA	NA	NA	NA	NA	NA
CALCIUM	µg/L				NA	NA	NA	NA	NA	NA
COPPER	µg/L	1300			NA	NA	NA	NA	NA	NA
MAGNESIUM	µg/L				NA	NA	NA	NA	NA	NA
SODIUM	µg/L				NA	NA	NA	NA	NA	NA
ZINC	µg/L				NA	NA	NA	NA	NA	NA

Analyte	Result Units	MCL	TB-081108	TB-081111	TB-081117	TB-081119	TB-081120	TB-091123	TB-100106	TB-100201
BERYLLIUM	µg/L	4	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
COPPER	µg/L	1300	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
ZINC	µg/L		NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Result Units	MCL	TB-100203	TB-100205	TB-100208	TB-100209	TB-100215	TB-100216	TB-100217	TB-100218
BERYLLIUM	µg/L	4	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
COPPER	µg/L	1300	NA	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	µg/L		NA	NA	NA	NA	NA	NA	NA	NA
ZINC	µg/L		NA	NA	NA	NA	NA	NA	NA	NA

Analyte	Result Units	MCL	TB-100219	TB-100222	TB-100223	TB-100304	TB2-100203
BERYLLIUM	µg/L	4	NA	NA	NA	NA	NA
CALCIUM	µg/L		NA	NA	NA	NA	NA
COPPER	µg/L	1300	NA	NA	NA	NA	NA
MAGNESIUM	µg/L		NA	NA	NA	NA	NA
SODIUM	µg/L		NA	NA	NA	NA	NA
ZINC	µg/L		NA	NA	NA	NA	NA

Notes:
All results are in microgram per liter (µg/L)
Blank cells indicate analyte not detected
MCL - maximum contaminant level, December 2009
NA - not analyzed
Data Qualifiers:
J - Analyte Present. Reported value may not be accurate or preci
B - Analyte not detected substantially above the level reported
in laboratory or field blanks

Table C-2 Duplicate Samples
Ravenswood PCE

Sample ID	DEP06-0705	DEP06-0705P	Units	Relative Percent Difference
Sample Location	DEP06	DEP06		
Sample Date	May-07	May-07		
VOLATILE ORGANICS				
Tetrachloroethene	2.2	2.3	µg/L	4
TOTAL METALS				
Barium	87	80.4	µg/L	8
Calcium	87400	84500	µg/L	3
Chromium	2.1	2.1	µg/L	0
Cobalt	2.2	2.1	µg/L	5
Iron	**555**	**419**	**µg/L**	**28**
Magnesium	12000	11600	µg/L	3
Manganese	181	157	µg/L	14
Nickel	4.5	4.3	µg/L	5
Sodium	16900	16600	µg/L	2
Average Value				8
DISSOLVED METALS				
Barium_dissolved	81.6	76.5	µg/L	6
Calcium_dissolved	84800	86800	µg/L	2
Magnesium_dissolved	11700	11900	µg/L	2
Manganese_dissolved	4.1	4.1	µg/L	0
Nickel_dissolved	3.5	3.1	µg/L	12
Sodium_dissolved	16600	16900	µg/L	2
Average Value				4

µg/L - micrograms per liter

J - Analyte present. Reported value may not be accurate or precise.

Table C-2 Duplicate Samples
Ravenswood PCE

Sample ID Sample Location Sample Date	RI-DEP05S-0708 DEP05S August-07		RI-DEP05S-0708P DEP05S August-07		Units	Relative Percent Difference
VOLATILE ORGANICS						
Tetrachloroethene	570		580		µg/L	2
TOTAL METALS						
Aluminum	1010		918		µg/L	10
Barium	51.5	J	51.7	J	µg/L	0
Calcium	97900		100000		µg/L	2
Chromium	4.6	J	4.3	J	µg/L	7
Cobalt	3.2	J	3.4	J	µg/L	6
Iron	2140		2010		µg/L	6
Magnesium	7240		7350		µg/L	2
Manganese	118		110		µg/L	7
Nickel	6	J	5.8	J	µg/L	3
Potassium	2760	J	2800	J	µg/L	1
Sodium	27700	J	28100	J	µg/L	1
VANADIUM	2.7	J	2.6	J	µg/L	4
					Average Value	4
DISSOLVED METALS						
Barium_dissolved	42.5	J	43.7	J	µg/L	3
Calcium_dissolved	99300		102000		µg/L	3
Magnesium_dissolved	6810		6990		µg/L	3
Manganese_dissolved	2.5	J	2.8	J	µg/L	11
Nickel_dissolved	**2.3**	**J**	**7.2**	**J**	**µg/L**	**103**
Potassium_Dissolved	2360	J	2430	J	µg/L	3
Sodium_dissolved	26700	J	27500	J	µg/L	3
					Average Value	18

µg/L - micrograms per liter

J - Analyte present. Reported value may not be accurate or precise.

Table C-2 Duplicate Samples
Ravenswood PCE

Sample ID	TS-AS04-081108	TS-AS04-081108A	Units	Relative Percent Difference
Sample Location	AS04	AS04		
Sample Date	November-08	November-08		
VOLATILE ORGANICS				
Cyclohexane	**0.13 J**	**0.18 J**	**µg/L**	**32**
Benzene	0.67	0.61	µg/L	9
Toluene	0.53	0.5	µg/L	6
m,p-Xylene	0.26 J	0.24 J	µg/L	8
			Average Value	14

Sample ID	RI-MW06-080312	RI-MW06-080312A	Units	Relative Percent Difference
Sample Location	MW06S	MW06S		
Sample Date	December-08	December-08		
VOLATILE ORGANICS				
Tetrachloroethene	180 J	190 J	µg/L	5

Sample ID	PW3-0911	PW3-0911P	Units	Relative Percent Difference
Sample Location	PW3	PW3		
Sample Date	September-09	September-09		
VOLATILE ORGANICS				
Tetrachloroethene	28	28	µg/L	0

Sample ID	PW3-1001	PW3-1001P	Units	Relative Percent Difference
Sample Location	PW3	PW3		
Sample Date	January-10	January-10		
VOLATILE ORGANICS				
Tetrachloroethene	29	30	µg/L	3
			Average Value	3

µg/L - micrograms per liter

J - Analyte present. Reported value may not be accurate or precise.

Table C-2 Duplicate Samples
Ravenswood PCE

Sample ID Sample Location Sample Date	TS-MW06S-100109 MW06S January-10	TS-MW06S-100109A MW06S January-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	230	200	µg/L	14

Sample ID Sample Location Sample Date	DP-06 DP-06 February-10	DP-06P DP-06 February-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	10	9.4	µg/L	6
			Average Value	6

Sample ID Sample Location Sample Date	DP-13 DP-13 February-10	DP-13P DP-13 February-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	**1.8 J**	**1.3 J**	**µg/L**	**32**

Sample ID Sample Location Sample Date	BLEND-100217 - February-10	BLEND-100217P - February-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	0.59	0.78	µg/L	**28**
Dibromochloromethane	0.38 J	0.25 J	µg/L	**41**
			Average Value	35

µg/L - micrograms per liter

J - Analyte present. Reported value may not be accurate or precise.

Table C-2 Duplicate Samples
Ravenswood PCE

Sample ID Sample Location Sample Date	TS-MW06S-1002 MW06S February-10	TS-MW06S-1002P MW06S February-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	170	190	µg/L	11

Sample ID Sample Location Sample Date	PW2-1003 PW2 March-10	PW2-1003P PW2 March-10	Units	Relative Percent Difference
VOLATILE ORGANICS				
Tetrachloroethene	3.4	3.1	µg/L	9

µg/L - micrograms per liter

J - Analyte present. Reported value may not be accurate or precise.