TETRA TECH

2018 - 2019 ANNUAL GROUNDWATER MONITORING REPORT

(JULY 2018 - JUNE 2019)

HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, HAVERTOWN TOWNSHIP,
DELAWARE COUNTY, PENNSYLVANIA

Contract No. SAP#4000019261
Task Order IRRSC7-1-303

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PRESENTED TO

Pennsylvania Department of Environmental Protection
Hazardous Sites Cleanup Program
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania 19401

PRESENTED BY

Tetra Tech
240 Continental Drive, Suite 200
Newark, DE 19713

Prepared by:
Vadim Petrov

Name: Vadim Petrov
Title: Environmental Scientist | Tetra Tech

Reviewed and Approved by:

Name: Harish Mital
Title: Project Manager
Tetra Tech

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ACRONYMS

ARAR	Applicable, Relevant, or Appropriate Requirement
bgs	Below Ground Surface
BOL	Bureau of Laboratories
CCA	Chromium Copper Arsenate
COC	Contaminant of Concern
CTR	Collection Trench
CW	Cluster Well
CZA	Capture Zone Analyses
DEP	Pennsylvania Department of Environmental Protection
DO	Dissolved Oxygen
EPA	U.S. Environmental Protection Agency Region 3
ft	Feet
GES	Groundwater & Environmental Services, Inc.
gpm	Gallons per Minute
HAV	Havertown Well
IW	Injection Well
J	Estimated Data Qualifier Value
lb	Pound
LTRA	Long Term Response Action
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
mV	Millivolts
MW	Monitoring Well
NA	Not Available
ND	Non-Detect
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NW	National Wood (Preservers) Well
NWP	National Wood Preservers
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAH	Polynuclear Aromatic Hydrocarbon
PCG	Philadelphia Chewing Gum Company
PCP	Pentachlorophenol
PCRR	Penn Central Railroad
PDU	Peroxide Destruction Unit

ACRONYMS (CONTINUED)

PE	Polyethylene
Pg/L	Picogram per Liter
PZ	Piezometer
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RG	Remediation Goal
ROD	Record of Decision
ROS	Recreation and Open Space
RR ROW	Railroad Right-of-Way
RW	Recovery Well
SAP	Sampling and Analysis Plan
SMCL	Secondary Maximum Contaminant Level
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethene
TEQ	Toxicity Equivalent Quotient
µg/L	Micrograms per Liter
U	Non-Detected Laboratory Value
USACE	U.S. Army Corps of Engineers
VOC	Volatile Organic Compound
YMCA	Young Men's Christian Association

1.0 INTRODUCTIONS

Tetra Tech, Inc. (Tetra Tech) was tasked by the Pennsylvania Department of Environmental Protection (DEP), under Contract Number SAP#4000019261, to perform operation and maintenance (O&M) services under Operable Unit 2 (OU-2) and OU-3 for the groundwater treatment facility at the Havertown PCP Superfund Site located in Haverford Township, Pennsylvania.

Activities performed for OU-2 O&M are to operate and maintain the groundwater treatment facility, optimize the facility's performance, perform all required monitoring (groundwater and surface water discharge) associated with this facility, and maintain the cap in accordance with the selected remedy and Remedial Action Objectives (RAOs). Activities conducted for OU-3 O&M are to contain the contaminated deep groundwater plume that is migrating from the site in conjunction with the OU-2 remedy, operate and maintain the OU-3 extraction and monitoring wells in the Recreation and Open Space (ROS) Area, maintain the ROS pumping system through the Railroad Right-of-Way (RR ROW), and operate the in-situ flushing system in conjunction with the OU-2 groundwater treatment system.

This report covers the groundwater monitoring period from July 2018 to June 2019, which includes long-term performance monitoring for the OU-2 and OU-3 remedies. Analytical data collected during this monitoring period were used to evaluate efficacy and capacity of the groundwater collection system; update the site-wide historical database; and present conclusions and recommendations regarding future groundwater sampling. The treatment system's operational performance (including plant discharge monitoring results) is presented in a separate report.

1.1 SITE BACKGROUND

The Havertown PCP Superfund Site (the Site) is located in southeastern Pennsylvania approximately 10 miles west of Philadelphia (**Figure 1**). Commercial establishments, industries, parks, schools, and residential homes surround the Site.

The Site covers approximately 12 to 15 acres and is defined by the extent of contamination attributable to the site. It is roughly delineated by Lawrence Road and Rittenhouse Circle to the south, the former Penn Central Railroad (PCRR) tracks to the north, and the fence on the Continental Motors property to the west, and Naylors Run to the east.

The Havertown PCP site is located in the Piedmont Uplands section of the Piedmont Physiographic Province. Consolidated rock in the vicinity of the site consists of metamorphic schist and gneiss of the Wissahickon Formation. Regionally the unconsolidated deposits that overlay the bedrock consist of saprolite (in-situ weathered bedrock), and occasional sand and gravel terrace deposits, and artificial fill. In the vicinity of the bed of Naylors Run, thicker unconsolidated gravel deposits have been identified above Wissahickon Schist. Groundwater at the Havertown site flows in a southeasterly direction and occurs in two major zones. The upper zone consists of surficial soils and saprolite (heavily weathered rock). The movement of water in the saprolite zone is influenced by the degree of saprolite weathering, relict bedrock structures, compositional variations, and the thickness of the weathered zone. The lower zone consists of fractured schist bedrock, with water movement occurring along interconnected fractures. Vertical hydraulic gradients are small, suggesting that the aquifer at the site is well connected by porous/fracture flow.

Upward flow occurs within the saturated saprolite and presumably provides observed seepage/base flow to Naylors Run southeast of Rittenhouse Circle. The depth to groundwater below the site ranges from approximately 43 feet below ground surface at RW-7 to seepage as springs at ground surface in the ROS Area southeast of Rittenhouse Circle. These permeable zones are closely interconnected, and typically represent one aquifer. Semi-confining layers may locally reduce aquifer interconnection — but are not widespread.

Historically, the Site consisted of a number of distinct properties, including a former wood treatment facility owned by National Wood Preservers (NWP), a bubble gum manufacturing plant owned by the Philadelphia Chewing Gum Company (PCG), and neighboring residential and commercial areas. Former structures on the NWP property (lying north of the intersection of Eagle Road and Lawrence Road) consisted of a sheet metal building with multiple aboveground chemical storage tanks. The two-acre NWP property has since been capped and enclosed within a chain-link fence. The PCG facility consisted of a single, large former gum production building located due east of NWP (northeast of the intersection of Eagle Road and Lawrence Road). Residential areas bordering Rittenhouse Circle and Naylors Run comprise the remainder of the study area (**Figure 2**).

From approximately 1947 to 1963, the NWP property was used to treat wood products using pentachlorophenol (PCP) dissolved in diesel fuel. NWP allegedly disposed of waste materials into a well reportedly located in the vicinity of the former Young's Produce Market, at the corner of Lawrence and Eagle Road. However, the exact location of the well was not identified. In 1977, the NWP facility discontinued the use of PCP and oil to treat wood products and began treating wood using metal salts.

The metal salts consisted of chromium copper arsenate (CCA) in a 0.4% or 0.6% water solution. Other metals used included chromated zinc chloride (a fire retardant) and tributyl tin oxide (an anti-fouling compound). All three water-soluble chemicals were used in pressure treatment of wood products.

The Site was placed on the National Priorities List (NPL) in 1982. The Site was divided into three OUs. OU-1 addressed the discharge to Naylors Run and the on-site wastes at the NWP facility. OU-2 addressed shallow groundwater, and OU-3 addressed deep groundwater in the source area and the groundwater and soil contamination in the ROS Area.

Major contaminants attributable to the Site include volatile organic compounds (VOCs), PCP, polynuclear aromatic hydrocarbons (PAHs), and dioxins/furans.

EPA issued the first Record of Decision (ROD) for the Site in September 1989. The 1989 ROD for OU-1 included provisions for an interim remedial action. It called for the installation of an oil-water separator to address the continued release of contaminants from the Site into the surface water of Naylors Run. In addition, this ROD called for the removal and disposal of the on-site waste.

During a soil investigation, EPA learned that the contamination on the NWP facility was more extensive than originally anticipated. The soil contamination was addressed in a 1996-1997 Superfund Removal Action, during which a synthetic geo-membrane cap was installed over three acres of the Site. The installation of the cap removed the potential for exposure to soils contaminated with arsenic and dioxins/furans by providing an impermeable synthetic barrier and 18 inches of soil cover over the areas of contamination. In the fall of 1997, EPA covered the capped area with an additional 4 feet of fill and planted the fill with a mixture of seed mulch and fertilizer.

EPA issued the ROD for OU-2 on September 30, 1991, which defined the interim remedy. The RAOs of the OU-2 remedy were as follows:

- Design and implement an interim remedial action to protect human health and the environment by removing free product and contaminated groundwater from the shallow groundwater aquifer.
- Collect data on the aquifer and contaminant response to remedial measures.

The primary purpose of the OU-2 ROD is to contain the entire contaminated shallow groundwater plume migrating from the Site under Eagle Road and to treat and discharge it into Naylors Run. The extraction/recovery wells are intended to reduce the size of the oil plume floating on the water table.

Tetra Tech completed the conceptual design for OU-2 (shallow groundwater) in 1994. The Remedial Design (RD) for OU-2 was completed during the period 1997-2000 by several contractors under direction from the U.S. Army Corps of Engineers (USACE). Treatment plant construction was completed in 2001, and the plant became fully operational in August 2001, with treated water being discharged to Naylors Run in accordance with National Pollutant Discharge Elimination System (NPDES) permit limits. Groundwater & Environmental Services, Inc. (GES) operated the plant on behalf of USACE until August 15, 2002. Between 2002 and 2013, Tetra Tech performed O&M activities at the plant on behalf of EPA.

EPA issued the ROD for OU-3 in April 2008. OU-3 was further divided into OU-3A and OU-3B. OU-3A addressed contamination related to deep groundwater in the source area, whereas OU-3B addressed contamination in Haverford Township's ROS Area, located below Rittenhouse Circle and adjacent to Washington Avenue in Havertown. The RAOs for the OU-3 remedy were as follows:

Groundwater

- Mitigate contamination to Applicable, Relevant or Appropriate Requirements (ARARs) and/or risk-based cleanup levels to protect human health and the environment.
- Discharge treated groundwater to surface water (Naylors Run) in concentrations that meet NPDES regulations.
- Prevent exposure to contaminated groundwater in the future.
- Prevent discharge of groundwater to surface water at concentrations of contaminants that would result in exceedances of water quality criteria.
- Contain the contamination plume in the source area and the ROS Area to prevent further off-site migration and to ensure that downgradient groundwater is not impacted.
- Restore groundwater quality at the Site.

Soils of ROS Area

- Eliminate current exposure of human and ecological receptors to contaminated soils.
- Prevent further migration of contaminants in soil to groundwater.
- Prevent transport of contaminants in surface soils via surface water runoff.
- Prevent potential future exposure to contaminants through ingestion and dermal contact by human and ecological receptors.

The purposes of the OU-3 remedy are to contain the contaminated deep groundwater plume migrating from the site in conjunction with the OU-2 remedy, operate and maintain the OU-3 shallow extraction and

monitoring wells in the ROS, maintain the ROS pumping system through the RR ROW, and operate the in-situ flushing system in conjunction with the OU-2 groundwater treatment system. The OU-2 remedy was incorporated into the OU-3 as a final groundwater remedy. The OU-3 remedy consisted of the following elements:

- Installation of an additional groundwater recovery well and associated piping in the Source area of the site.
- Operate and maintain the existing groundwater treatment facility. Upgrade or retrofit the existing groundwater treatment facility to increase the capacity of the facility to process 60 to 70 gallons per minute (gpm) of contaminated water.
- Treat collected groundwater as necessary to meet discharge requirements.
- In-situ flushing in the Source area of the Site, with treated water from the groundwater treatment facility.
- Excavation of an area approximately 50 ft. by 50 ft. around wells SW-8 and SW-9 in the ROS Area, and a narrow zone along the abandoned sewer line about 200 ft. long and 20 ft. wide. The portion of the abandoned sewer line that has not been sealed will be removed. All excavated material will be properly disposed of off-site.
- Backfilling of the excavated area with clean fill, restoration of sidewalks, curbs, utilities, etc. and planting of appropriate vegetation.
- Installation of three groundwater recovery wells and associated piping in the ROS Area to extract groundwater and transport it to the site's groundwater treatment facility for remediation.
- Demonstrate recovery of benthic macroinvertebrate and fish communities, to examine the efficacy of the ROS Area excavation and groundwater treatment to reduce or eliminate the contaminant releases that are the major source of risk to aquatic organisms in Naylors Run.
- Perform groundwater monitoring.
- Implement institutional controls to protect the integrity of the remedy and to prevent the installation of groundwater wells, through groundwater use restrictions and notices for the site and surrounding area, as appropriate.

In November 2008, EPA began work to increase the capacity and optimize the existing groundwater treatment facility and to meet the 2008 OU-3 ROD requirements. EPA redesigned the pretreatment portion of the facility to increase the amount of water being treated. This portion of the Remedial Action (RA) was completed in February 2009 as part of the OU-2 long-term response action (LTRA). The facility currently treats 70 gpm of contaminated groundwater. From March through August 2010, the OU-3 remedy was implemented. Construction involved converting an existing monitoring well (CW-31D) to a deep recovery well (RW-7), adding three new shallow recovery wells (RW 8, RW-9, and RW-10) and three new monitoring wells (CW-32, CW-33, and CW-34) in the ROS Area, and converting three existing shallow recovery wells (RW-1, RW-2, and RW-4) into injection wells (IW-1, IW-2, and IW-3) with an associated pumping system as part of the in-situ flushing system. The treatment plant remained operational during construction.

The groundwater extraction and treatment system consists of six recovery wells, one collection trench (CTR), and an on-site treatment system. The CTR has been online since 2001; RW-5 and RW-6 have been online since February 2006; RW-7 was fully online in October 2010; and RW-8, RW-9, and RW-10 were online in August 2010. Four original recovery wells (RW-1, RW-2, RW-3, and RW-4) have been

offline since February 2006. In 2010, the former RW-1, RW-2, and RW-4 were converted into injection wells (IW-1, IW-2, and IW-3) and placed into service in August 2010. Since IW-1, IW-2, and IW-3 started plugging, two additional wells, IW-4 (formerly CW-29D) and IW-5 (formerly CW-30D), were placed online in July and October 2011, respectively.

To restore contaminated groundwater to beneficial use, remediation implemented under the remedies will operate until remediation goals (RGs) or groundwater clean-up goals are achieved. The RGs for groundwater OU-2 and OU-3 are presented in Table 1.

1.2 GROUNDWATER WELL NETWORK DESCRIPTION

The groundwater well network consists of recovery wells, injection wells, monitoring wells, and the CTR. Well construction data is provided in **Table 2**. These wells are also located on **Figure 2**.

There are six active recovery wells currently including RW-5, RW-6, RW-7, RW-8, RW-9, and RW-10. Four original recovery wells RW-1, RW-2, RW-3, and RW-4 have been offline since February 2006.

There are five injection wells (IW-1 through IW-5) in or near the source area. The injection wells IW-1, IW-2, and IW-3 were placed into service in August 2010. The former monitoring well CW-29D was converted into injection well IW-4 and placed online in July 2011, and the former monitoring well CW-30D was converted into injection well IW-5 and placed online in October 2011.

After IW well redevelopment in June 2013, three IW wells (IW-1, IW-2, and IW-3) were shut down. The injection system remained active with IW-4 and IW-5 until April 2019. Due to flooding issue in some residential areas at Rittenhouse Circle, injection system was shut down on April 19, 2019.

Four piezometers (PZ-1 through PZ-4) are used to monitor water levels in the CTR.

1.3 MONITORING PROGRAM

Presently, there are 61 wells included in the O&M groundwater monitoring program. These wells can be classified as shallow wells above bedrock [about 5 ft. to 30 ft. below ground surface (bgs)] and deep wells in the bedrock (up to 120 ft. deep). This includes 49 monitoring wells, six recovery wells, a collector trench (CTR) sump, and five injection wells.

The purpose of this sampling is to monitor treatment system performance and migration of the PCP plume. Sampling is performed per the revised Sampling and Analysis Plan (SAP) (Tetra Tech, 2016b). Groundwater samples are collected on periodic as follows:

- Quarterly sampling to determine recovery system water quality and extraction system's effectiveness.
- Semi-annual sampling to determine recovery well water quality and effectiveness.
- Bi-annual sampling to monitor the edge of the shallow contaminant capture zone.
- Annual sampling to update the historical database.

Groundwater samples are analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides (low-level pentachlorophenol), metals, pesticides (dieldrin) and dioxin/furans. During well sampling, other parameters are also collected [e.g., pH, temperature, dissolved oxygen (DO), specific conductivity and oxidation-reduction potential (ORP)].

During the July 2018 to June 2019 period, all samples were sent to the ALS Laboratory, Middletown PA, a laboratory procured by Tetra Tech.

2.0 GROUNDWATER MONITORING ACTIVITIES

2.1 SAMPLING METHODS

Groundwater samples were collected from the monitoring wells and injection wells through polyethylene (PE) tubing that was attached to a peristaltic pump with medical-grade flexible silicon tubing. The PE tubing was inserted down the well and set at the approximate midpoint of the screen. Geochemical parameters (DO, specific conductivity, pH, temperature, and ORP) were measured during purging using a water quality meter equipped with an in-line flow through cell. Turbidity was measured using a turbidimeter during purging. The purging rate was set at between 0.1 to 0.4 liter/minute, and water levels were monitored to assure that the static water level was not drawn down into the well screen.

Purged water was monitored for pH, specific conductivity, temperature, ORP, and dissolved oxygen (DO) every five minutes. When levels of these parameters stabilized, and a minimum of two saturated screen volumes had been removed from the well, the purging was considered complete and the groundwater samples were obtained. Parameter stabilization was defined as three successive readings (taken at least 5 minutes apart) within 0.1 unit for pH, 3% for specific conductivity, 10% for DO, and 10 mV for ORP. All monitored parameter measurements (including time, water level, purge rate, temperature, pH, specific conductance, turbidity, DO, and ORP) were recorded on low-flow purge data sheets. Groundwater samples were collected in laboratory-supplied containers after three consistent readings of pH, specific conductivity and temperature. All collected sampled were immediately placed on ice and delivered under proper chain-of-custody protocol to the DEP-designated laboratory and ALS Environmental (June 2019 sampling event).

Groundwater samples of the recovery wells were collected from sampling ports located in the well vaults. After purging 5 gallons of the groundwater from sampling port, the groundwater sample was obtained. Temperature, pH, specific conductance, turbidity, DO and ORP, were measured and recorded on sampling logs.

2.2 GROUNDWATER SAMPLING EVENTS

2.2.1 September 2018 Sampling Event

A quarterly groundwater sampling event was performed on September 11-12, 2018. A total of 12 locations were sampled and analyzed as follows. The analytical results are provided in **Appendix A-1**. **Table 4A** summarizes the contaminants of concern (COCs) detected in well samples during the September 2018 sampling event and compares them to groundwater remediation goals (RGs) (**Table 1**).

- Three groundwater extraction wells (RW-5 thru RW-7), one collection trench (CTR) and eight downgradient monitoring wells (CW-10D, CW-11D, CW-12D, CW-13D, CW-22S & 22D, MW-1 and MW-2) were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

2.2.2 December 2018 Sampling Event

A quarterly groundwater sampling event was conducted on December 13, 2018. A total of 4 locations were sampled and analyzed as follows. The analytical results are provided in **Appendix A-2. Table 4B** summarizes the contaminants of concern (COCs) detected in well samples during the December 2018 sampling event and compares them to groundwater remediation goals (RGs) (**Table 1**).

- Four downgradient monitoring wells (CW-22S & 22D, MW-1, and MW-2) were analyzed for VOCs and SVOCs.

2.2.3 March 2019 Sampling Event

The annual groundwater sampling event was performed from March 18 through March 22, 2019. A total of 66 wells were sampled and analyzed for TCL VOCs, SVOCs, TAL Metals and Pesticides. **Figure 2** presents sample locations. The analytical results are provided in **Appendix A-3**. **Table 4C** summarizes the contaminants of concern (COCs) detected in well samples during the March 2019 sampling event and compares them to groundwater remediation goals (RGs) (**Table 1**).

2.2.4 June 2019 Sampling Event

A quarterly groundwater sampling event was conducted on June 12 and 13, 2019. A total of 12 locations were sampled and analyzed as follows. The analytical results are provided in **Appendix A-4**. **Table 4D** summarizes the contaminants of concern (COCs) detected in well samples during the June 2019 sampling event and compares them to groundwater remediation goals (RGs) (**Table 1**).

- Four downgradient monitoring wells (CW-22S, CW-22D, MW-1 and MW-2) were analyzed for VOCs and SVOCs.
- Four downgradient monitoring wells (HAV-5, CW-3S, CW-3D and CW-4) four source area wells CW-16D, CW-26D and NW-1-81 and an upgradient well NW-6-81 was analyzed for SVOCs. This was done to verify increased PCP concentration found in March 2019.

2.3 WATER-LEVEL MEASUREMENTS

During this reporting period, multiple water-level measurement events were conducted to monitor the groundwater elevation at the site. Depending on the event date, these water-level measurements were collected while either the treatment system was active (ON) or inactive (OFF). These measurements were collected from all available wells and the collection trench sump.

Elevation measurements were obtained during days of no precipitation, and at least 48 hours after the conclusion of any precipitation event. Static water levels were measured in all available wells using an electronic water-level indicator and were recorded to the nearest 0.01 foot. Groundwater level data are provided in **Table 3**.

Figure 3 shows groundwater contours during the March 2019 sampling event in the shallow zone/overburden (while the treatment system was operational).

Figure 4 displays groundwater contours during the March 2019 sampling event for the deep zone/bedrock (while the system was operational).

3.0 DATA EVALUATION

3.1 GROUNDWATER LEVELS

Table 3 presents all water-level data collected for this reporting period. **Figures 3** and **4** indicate a measurable drawdown near the RW wells and CTR.

Pumping at recovery well RW-5 (screened at 36 to 46 ft bgs) continued to draw down water levels in surrounding wells CW-26 and CW-16 S/I/D, and to impact the water level in downgradient wells CW-27D, and CW-4S/I/D.

Pumping at RW-7 (screened from 90 to 120 ft bgs) continued to draw down the water tables in surrounding wells CW-17, CW-28, NW-1, CW-16D, and CW-26 and impacts water levels in downgradient wells CW-3S/I/D, CW-5S/I/D, CW-18D, and CW-19D.

The pumping systems at the CTR (8 to 18 ft bgs) and RW-6 (screened from 25 to 35 ft bgs) continued to draw down water levels in nearby monitoring wells MW-1, MW-2, CW-9S/D, and downgradient wells HAV-07 and CW-21S/D. These two pumping systems also influenced water levels in upgradient wells HAV-04, HAV-05, and MW-3.

3.2 GROUNDWATER CONTAMINANT CONCENTRATIONS AND TRENDS

The shallow aquifer source area encompasses groundwater contamination associated with wells CW-1SCW-2S, R-2, CW-4S, CW-5S, HAV-02 (now B-1), and HAV-04 (Tetra Tech, 1991). The OU-3 ROD (EPA, 2008) further defined the deep aquifer source area as encompassing wells CW-17D, CW-25D (now RW-5) CW-2I, CW-2D, and CW-31D (now RW-7) by establishing the plume of deep free-product oil containing PCP. This area is considered to represent principal threat waste since it is a continuous source of groundwater contamination. The OU-3 ROD also considered well CW-16S to be representative of the shallow aquifer source area.

The complete sets of analytical data generated during the reporting period are included in **Appendix A**. **Tables 4A** through **4D** summarize the contaminants of concern (COCs) detected in well sampled during the 2018-2019 reporting period and compares them to groundwater remediation goals (RGs) (**Table 1**). **Figures 5** and **6** present the PCP concentrations detected during the March 2019 annual sampling event as iso-concentration contour maps for shallow overburden and deep bedrock wells, respectively.

Historical trends were evaluated by comparing current PCP concentrations with those detected during previous sampling events. The historical PCP and dioxin concentrations are presented in **Table 5** from March 2011 to June 2019. **Appendix B** graphically represent the historical trends of PCP concentrations during the period February 2008 through March 2019 in the source area wells (recovery wells, injection wells and surrounding wells); recovery trench area wells; plume perimeter wells; and ROS Area recovery wells and surrounding wells.

3.2.1 Recovery Well and Collection Trench PCP Concentrations and Trends

PCP concentrations in the recovery wells (RW) fluctuated as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
RW-5	3,820 µg/L	3,500 µg/L	650 µg/L	800 µg/L	4,760 µg/L
RW-6	498 µg/L	418 µg/L	110 µg/L	200 µg/L	373 µg/L
RW-7	2,110 µg/L	3,050 µg/L	320 µg/L	960 µg/L	2,420 µg/L

µg/L = Micrograms per liter

Based on the 2018-2019 data, PCP concentrations of RW-8, RW-9 and RW-10 have continued to be non-detect (ND) or below the groundwater RG of 1 µg/L since December 2012.

For CTR samples, PCP concentrations varied from 500 µg/L (March 2013) to 415 µg/L (April 2014) to 255 µg/L (April 2015) to 430 µg/L (March 2016) to 43 µg/L (March 2017) to 130 µg/L (March 2018) to 260 µg/L (March 2019). More detailed information may be found in **Table 5**.

3.2.2 Monitoring Well PCP Concentrations and Trends

From April 2015-March 2019, operation of deep extraction well RW-5 affected concentrations of PCP in the source area deep wells as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-16D	3.7 µg/L	7.3 µg/L	ND	ND	10.7 µg/L
CW-26D	4.1 µg/L	3.6 µg/L	ND	ND	1,460 µg/L
CW-27D	1,950 µg/L	1,310 µg/L	490 µg/L	5 J µg/L	1,550 µg/L

PCP concentrations in other adjacent wells near RW-5 fluctuated as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-24D	1,920 µg/L	1,180 µg/L	620 µg/L	890 µg/L	1,330 µg/L
CW-28D	3,230 µg/L	219 µg/L	490 µg/L	390 µg/L	291 µg/L

Operation of deep extraction well RW-7 continued to affect deep wells near RW-7 (**Figures 7, 8, 9,** and **10**). During the period of 2013 to 2019, PCP concentrations in adjacent wells near RW-7 fluctuated as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-3D	209 µg/L	215 µg/L	59 µg/L	170 µg/L	608 µg/L
CW-4D	1,260 µg/L	2,030 µg/L	320 µg/L	54 µg/L	3,240 µg/L
CW-5D	6 µg/L	ND	ND	ND	ND
CW-17D	1,300 µg/L	2,800 µg/L	410 µg/L	1,300 µg/L	2,120 µg/L
CW-18D	59.8 µg/L	ND	ND	ND	14.2 µg/L
CW-19D	554 µg/L	1,040 µg/L	390 µg/L	450 µg/L	560 µg/L

After the YMCA building addition, wells HAV-02, CW-6D, CW-6I, and CW-6S were abandoned in mid-2012 and are no longer part of the groundwater monitoring program.

Operation of deep extraction well RW-6 and CTR also continued to affect groundwater around the CTR area and downgradient wells (see **Figure 9**). Specifically:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-21S	892 µg/L	523 µg/L	450 µg/L	260 µg/L	565 µg/L
CW-21D	1,030 µg/L	827 µg/L	530 µg/L	430 µg/L	576 µg/L
MW-1	ND	ND	ND	ND	ND
MW-2	2.8 µg/L	3 µg/L	ND	ND	ND

PCP concentrations for wells HAV-04, HAV-05, and MW-3 were as follows:

Well	April 2015	March 2016	March 2017	June 2017	March 2018	March 2019
HAV-04	4,180 µg/L	5,910 µg/L	1,300 µg/L	1,700 µg/L	990 µg/L	4,910 µg/L
HAV-05	3,490 µg/L	502 µg/L	190 µg/L	94 µg/L	200 µg/L	1,370 µg/L
MW-3	599 µg/L	773 µg/L	49 µg/L	-	510 µg/L	582 µg/L

HAV-4 and HAV-5 were also sampled in September 2017, and PCP concentrations were 1,200 µg/L and 270 µg/L respectively. HAV-5 was also sampled in December 2017, PCP concentration was 190 µg/L. From downgradient of HAV-4 and HAV-5 wells and upgradient of ROS Area, PCP in four deep wells (CW-9D, CW-11D, CW-12D and CW-13D) located southeast of the main groundwater contaminant plume has been non-detect since April 2015 sampling. PCP in another deep well CW-10D, just north of CW-13D, was non-detect in 2014 and 2015 sampling, 6.2 µg/L in March 2016, and non-detect in March

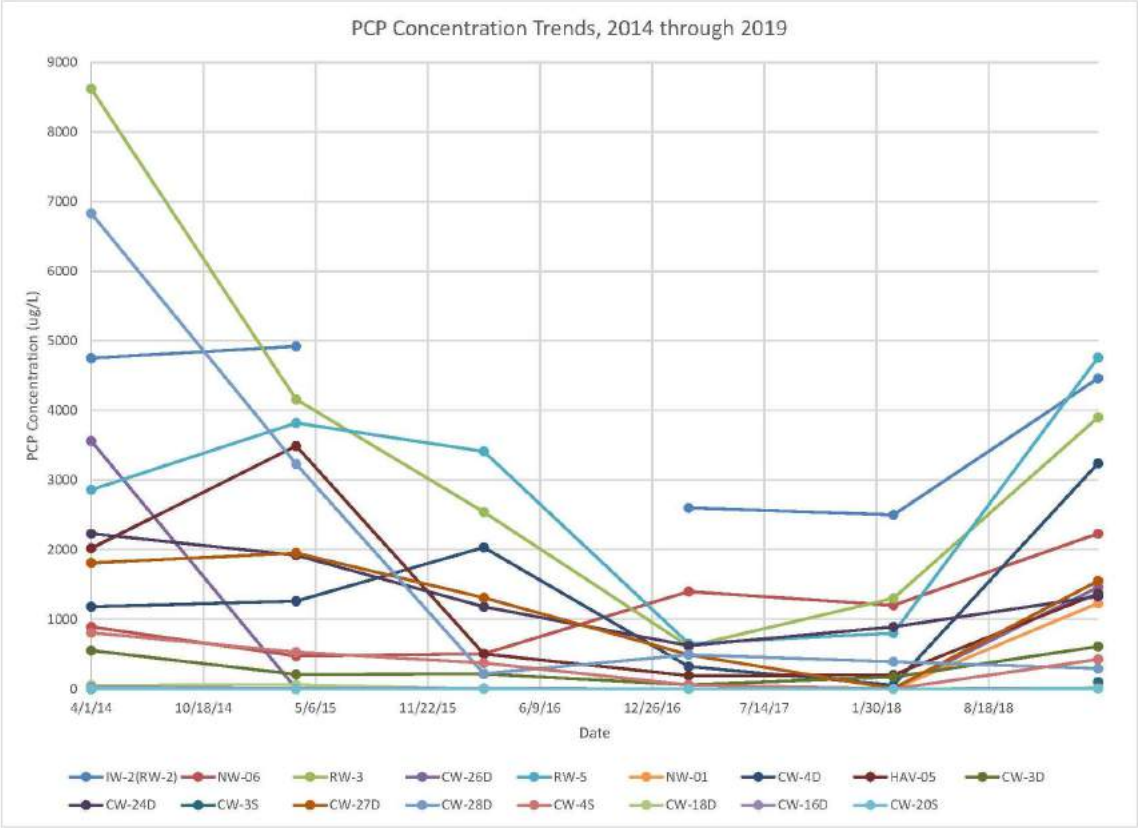
2017, March 2018 and March 2019 sampling. The PCP concentrations reported for these wells since 2014 are as follows:

Well	April 2014	April 2015	March 2016	March 2017	March 2018	March 2019
CW-9D	ND	ND	ND	ND	-	ND
CW-10D	ND	ND	6.2 µg/L	ND	ND	ND
CW-11D	ND	ND	ND	ND	-	ND
CW-12D	4 µg/L	ND	ND	ND	ND	ND
CW-13D	115 µg/L	ND	ND	ND	ND	ND

Figure 10 presents the historical trends of PCP concentrations detected in the downgradient plume perimeter wells.

3.2.3 Monitoring Well PCP Concentrations and Trends Discussion

Review of the data from 2016 through 2019 indicated a trend to increasing concentrations of PCP in several of the site monitoring wells, as depicted in the figure below:



The data was reviewed using a linear regression analysis from 2016 through 2019, which indicated an increase in PCP concentration in 17 wells during the 2016 through 2019 period, with wells IW-2, NW-06, RW-3, CW-26D, RW-5, and NW-01 all demonstrating a significant increase during that time period. The wells with the highest increase in concentration over this time period are all located along Eagle Road. Of particular note was the presence of PCP in NW-01, which has not had detectable levels of PCP in a long time.

This data was compared to other non-mechanical site characteristics, such as groundwater level, precipitation amounts, and geology. However, these other non-mechanical features did not demonstrate a corollary trend with the PCP concentrations. Further discussion of these increased PCP concentrations is included in the CSM in section 3.2.7.

Based on June 2019 sampling data, several monitoring wells (HAV-5, CW-16D, CW-26D and NW-6-81) have even higher PCP concentration as compared to March 2019 data as follows:

Well	March 2019	June 2019
HAV-5	1370 µg/L	5070 µg/L
CW-16D	10.7 µg/L	25.7 µg/L
CW-26D	1460 µg/L	3750 µg/L
NW-6-81	2230 µg/L	5330 µg/L

In-Situ Flushing System PCP Concentrations and Trends

Operation of the in-situ flushing system continued to influence both the injection wells and deep wells near the injection system. IW-4 and IW-5 were both operational during the monitoring period from March 2013 to April 2019. IW-1, IW-2, and IW-3 were non-operational since June 2013. **Figure 11** presents historical trends of PCP concentrations in the injection wells.

For injection wells IW-4 and IW-5, PCP concentrations were as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
IW-4	97.1 µg/L	47.8 µg/L	50 µg/L	ND	2 µg/L
iW-5	37.5 µg/L	172 µg/L	3 J µg/L	ND	1.6 µg/L

PCP concentrations for non-operational wells IW-1, IW-2, and IW-3 fluctuated as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
IW-1	981 µg/L	1,060 µg/L	360 µg/L	ND	4.3 µg/L
IW-2	4,750 µg/L	11 µg/L	2,600 µg/L	2,500 µg/L	4,460 µg/L

Well	March 2012	June 2012	April 2014	March 2019
IW-3	1,700 µg/L	3,100 µg/L	980 µg/L	10.6 µg/L

Between 2016 and 2019, PCP concentrations for three deep wells were reported as follows:

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-26D	4.1 µg/L	3.7 µg/L	ND	ND	1,460 µg/L
CW-27D	1,950 µg/L	1,450 µg/L	490 µg/L	5 J µg/L	1,550 µg/L

Well	April 2015	March 2016	March 2017	March 2018	March 2019
CW-28D	3,230 µg/L	219 µg/L	490 µg/L	390 µg/L	291 µg/L

3.2.4 Other Groundwater Contaminants

Tables 4A through **D** provide a summary of the groundwater concentrations detected during the 2018-2019 reporting period. Trends for several other contaminants are discussed below.

Trichloroethene (TCE) and Vinyl Chloride: During the March 2019 annual sampling event, TCE was detected above the groundwater RG of 5 µg/L in wells CW-1S and RW-5 at concentrations of 233 µg/L, and 15.1 µg/L, respectively. Additionally, TCE concentration exceeded its RG of 5 µg/L in well RW-5 (6.8 µg/L) during the September 2018 sampling event.

TCE concentrations contained in well cluster CW-1 (upgradient of the site) were as follows:

Well	2015	March 2016	March 2017	March 2018	March 2019
CW-1S	ND	401 µg/L	230 µg/L	200 µg/L	233 µg/L
CW-1D	3.6 µg/L	4.4 µg/L	14 µg/L	8 µg/L	2 µg/L

TCE was also contained in downgradient wells CW-10D, and HAV-04 and source area recovery wells RW-5 and RW-7 as reported below:

Well	2015	March 2016	March 2017	March 2018	March 2019
CW-10D	2.9 µg/L	2 µg/L	1.5 µg/L	0.6 µg/L	0.48 µg/L
HAV-04	7.2 µg/L	2.9 µg/L	Dry	0.9 µg/L	1.7 µg/L
RW-5	7.6 µg/L	9.5 µg/L	8.7 µg/L	6.6 µg/L	15.1 µg/L
RW-7	3.8 µg/L	2.2 µg/L	2.2 µg/L	1.4 µg/L	1.7 µg/L

Vinyl chloride was also detected during the March 2019 sampling event above the groundwater RG of 5 µg/L in well CW-1S, at a concentration of 21.2 µg/L.

Benzene was detected during the March 2019 sampling event in wells CW-4S, CW-4I, CW-4D, CW-17D, CW-24D and HAV-05 at concentrations exceeding its RG of 5 µg/L. Benzene concentrations ranged from 5.3 µg/L contained in well CW-4S to 63.2 µg/L in well CW-4D.

2-Methylnaphthalene was detected during the March 2019 sampling event above the groundwater RG of 2 µg/L, in wells CW-16S, CW-24D, HAV-04, RW-3, RW-5, R-2, CW-4D and CW-4I at concentrations ranging from 2.2 µg/L contained in well CW-4I to 198 µg/L in well R-2.

Benzo(a)pyrene was detected during the March 2019 sampling event above the groundwater RG of 0.2 µg/L in wells CW-11S, CW-16S, CW-23D and IW-3 at concentrations of 0.47 J µg/L, 0.62 J µg/L, 2.1 J µg/L and 0.69 µg/L, respectively.

Dibenzofuran was detected during the March 2019 sampling event above the groundwater RG of 4 µg/L in wells CW-24D, HAV-05, R-2, RW-3, RW-5 and RW-7 at concentrations of 7.5 µg/L, 4.1 µg/L, 6.1 µg/L, 4.3 µg/L, 6.3 µg/L and 4.1 µg/L respectively.

Naphthalene was detected during the March 2019 sampling event above the groundwater RG of 3 µg/L in 11 wells during the reporting period. Concentrations were ranging from 3.1 µg/L in well CW-16S to 620 µg/L in well R-2.

From 2015-March 2019, Naphthalene concentrations fluctuated as follows. It should be noted, however, that wells CW-4I, CW-4D, IW-2, and HAV-04 showed a significant spike in concentrations compared to 2018 concentrations.

Well	2015	March 2016	March 2017	March 2018	March 2019
HAV-04	12.4 µg/L	216 µg/L	310 µg/L	1 µg/L	40.7 µg/L
RW-5	60.7 µg/L	62 µg/L	27 µg/L	21 µg/L	70.1 µg/L
CW-2D	ND	76.9 µg/L	48 µg/L	ND	ND
CW-4I	1.5 µg/L	9.7 µg/L	ND	ND	69.8 µg/L
CW-4D	3.4 µg/L	6.9 µg/L	ND	ND	121 µg/L
CW-4S	4.2 µg/L	ND	ND	ND	ND
CW-17D	ND	0.39 µg/L	0.2 J µg/L	ND	0.2 J µg/L
CW-26D	5.9 µg/L	ND	0.6 µg/L	23 µg/L	0.9 J µg/L
CW-27D	4.2 µg/L	ND	2.5 µg/L	1 µg/L	1.1 J µg/L
CW-28D	698 µg/L	127 µg/L	5.3 µg/L	21 µg/L	0.21 J µg/L
RW-3	1.7 µg/L	168 µg/L	1 µg/L	49 µg/L	37.5 µg/L
RW-7	78.6 µg/L	89.4 µg/L	4 µg/L	11 µg/L	14.1 µg/L
CW-16S	ND	ND	ND	1 µg/L	3.1 µg/L
CW-24D	193 µg/L	546 µg/L	180 µg/L	240 µg/L	53.6 µg/L
HAV-05	310 µg/L	3.4 µg/L	0.3 J µg/L	3 µg/L	6.4 µg/L

Well	2015	March 2016	March 2017	March 2018	March 2019
IW-2	3.5 µg/L	-	3.0 µg/L	ND	48.3 µg/L

4,6-Dinitro-2-methylphenol was detected during the March 2019 sampling event above the groundwater RG of 1.7 µg/L in well CW-3D at a concentration of 54 µg/L.

Dioxins/Furans: Total 2,3,7,8-TCDD, reported as Dioxin Toxicity Equivalent Quotient (TEQ), was detected in wells R-2, NW-1, and CW-24D at concentrations exceeding its RG of 30 pg/L. Specifically:

Well	2014	2015	March 2016	March 2017	March 2018	June 2018	March 2019
NW-1	25 pg/L	35 pg/L	101 pg/L	64.7 pg/L	44.9 pg/L		2,000 pg/L
R-2						0.026 pg/L	266 pg/L
CW-24D	0.00603 pg/L	0.00147 pg/L	0.00674 pg/L	0.0296 pg/L			40 pg/L

3.2.5 ROS Area Wells

Table 6 provides a comparison of groundwater remediation goals to sampling results of ROS wells during the 2012 to 2019 sampling events. Trends for COCs (PCP, TAL metals, and dieldrin) in regards to the ROS Area Shutdown Memo and subsequent EPA comments are as follows:

In March 2019, all six ROS area wells were tested for low PCP reporting detection limits (as herbicide). Based on these results, PCP concentration was non-detect (or below RDL) in all six ROS area wells.

All six ROS area wells were tested for dieldrin (as pesticide) beginning with December 2016 sampling event. Based on the results obtained during the 2016 and 2017 calendar year that showed little fluctuation and upon further discussion with PADEP, it was decided to reduce sampling frequency of ROS area wells to once a year. Based on these results, dieldrin was detected in all six ROS area wells at concentrations exceeding its remediation goal of 0.038 µg/L during the reporting period.

Well	March 2017	June 2017	Sept 2017	Dec 2017	March 2018	March 2019
RW-8	0.42 µg/L	0.29 µg/L	0.18 µg/L	0.24 µg/L	0.23 µg/L	0.28 µg/L
RW-9	0.27 µg/L	0.24 µg/L	0.15 µg/L	0.30 µg/L	0.087 µg/L	0.12 µg/L
RW-10	0.30 µg/L	0.29 µg/L	0.28 µg/L	0.26 µg/L	0.11 µg/L	0.25 µg/L
CW-32	0.74 µg/L	0.66 µg/L	0.39 µg/L	-	-	0.65 µg/L
CW-33	0.66 µg/L	0.47 µg/L	0.41 µg/L	-	-	0.58 µg/L
CW-34	0.32 µg/L	0.25 µg/L	0.24 µg/L	-	-	0.37 µg/L

Furthermore, all six ROS are wells were sampled for TAL metals in March 2019.

- **Aluminum** was not detected above the groundwater RG of 200 µg/L in any of the six ROS wells.
- **Iron** was detected above the groundwater RG of 300 µg/L at CW-34 at a concentration of 310 µg/L.
- **Manganese** was detected above the groundwater RG of 50 µg/L in wells RW-9, RW-10, CW-34 at concentrations of 59 µg/L, 670 µg/L and 150 µg/L, respectively.

3.2.6 Conceptual Site Model (CSM)

Per the EPAs request, the Conceptual Site Model (CSM) for the site was updated to include the data from the 2019 sampling events. The purpose of this updated CSM is to depict current site conditions and compare them with historical conditions. The current CSM is based on the original CSM generated in 2006 and modified in 2014, and updated in 2018.

This updated CSM was generated using ArcGIS technology along with the most recent available aerial photograph as a background. It should be noted that site conditions have changed since this aerial was taken in 2010, and the former Gum Factory has been replaced with a new YMCA. Aerial photographs depicting the new YMCA were not available at the time this CSM update was performed.

New data was added to the map using the ESRI shapefile format for the groundwater levels, PCP concentration levels, and contours. The overhead view of the CSM is shown on **Figure 12**. A close up view of the plume, showing comparisons of recent plume morphologies is depicted on **Figure 12A**.

The three cross-section alignments generated during the 2014 update were updated with the March and June 2019 data as well. The alignment locations are shown on **Figure 12**. These cross-sections were generated in AutoCAD to depict the subsurface conditions at key locations and include the following:

- Parallel to the flow direction (cross-section A-A', **Figure 13**);
- Parallel to Eagle Road and perpendicular to the primary flow direction (cross-section B-B', **Figure 14**);
- Perpendicular to primary flow direction in the vicinity of historic groundwater discharge to the stream (cross-section C-C', **Figure 15**).

The electronic files of the surface map and the subsurface cross-sections constitutes the site CSM. Using this electronic resource, a variety of figures depicting different aspects of the CSM can be generated based on the requirements of the user.

Review of the data indicates that the primary contaminant demonstrating the extent of contamination is PCP. While other contaminants, such as naphthalene, are present at levels of concern, they do not have the overall lateral extent nor the consistently high concentrations of PCP. Therefore, for mapping and visual interpretation purposes, PCP is the most appropriate/conservative site chemical to depict the extent of contamination.

Historical CSM interpretation of the site is that that there are two distinct zones of contamination, a shallow zone and a deep zone. While it is possible to separate out the contamination into these zones, comparison of the two indicates that with the exception of the occasional hot spots, plume morphology between depths is very similar. This is a result of the local geology which includes overburden, weathered rock which transition to bedrock in a heterogeneous manner across the site. However, with this in mind

for the purposes of the CSM, the deep plume (which is the larger of the two plumes) was utilized to depict the overall extent of the contamination. This is considered the most conservative approach to depicting the current conditions of the CSM.

Review of pump test and boring log data at RW-5, RW-6, and RW-7 indicated a zone of vertical fracturing near the area shown on **Figure 12**. At this time, the fracture zone has not been fully delineated, and the approximate alignment shown on the map is the area estimated to have an impact on the wells currently included in the O&M monitoring. Based on the alignment of Naylor's Run, the rocks observed in the creek, and the approximate alignment of the fractures on the historic Naylor's Run stream channel, it is probable that the fracture zone extends further north and south away from the approximate alignment shown on the map.

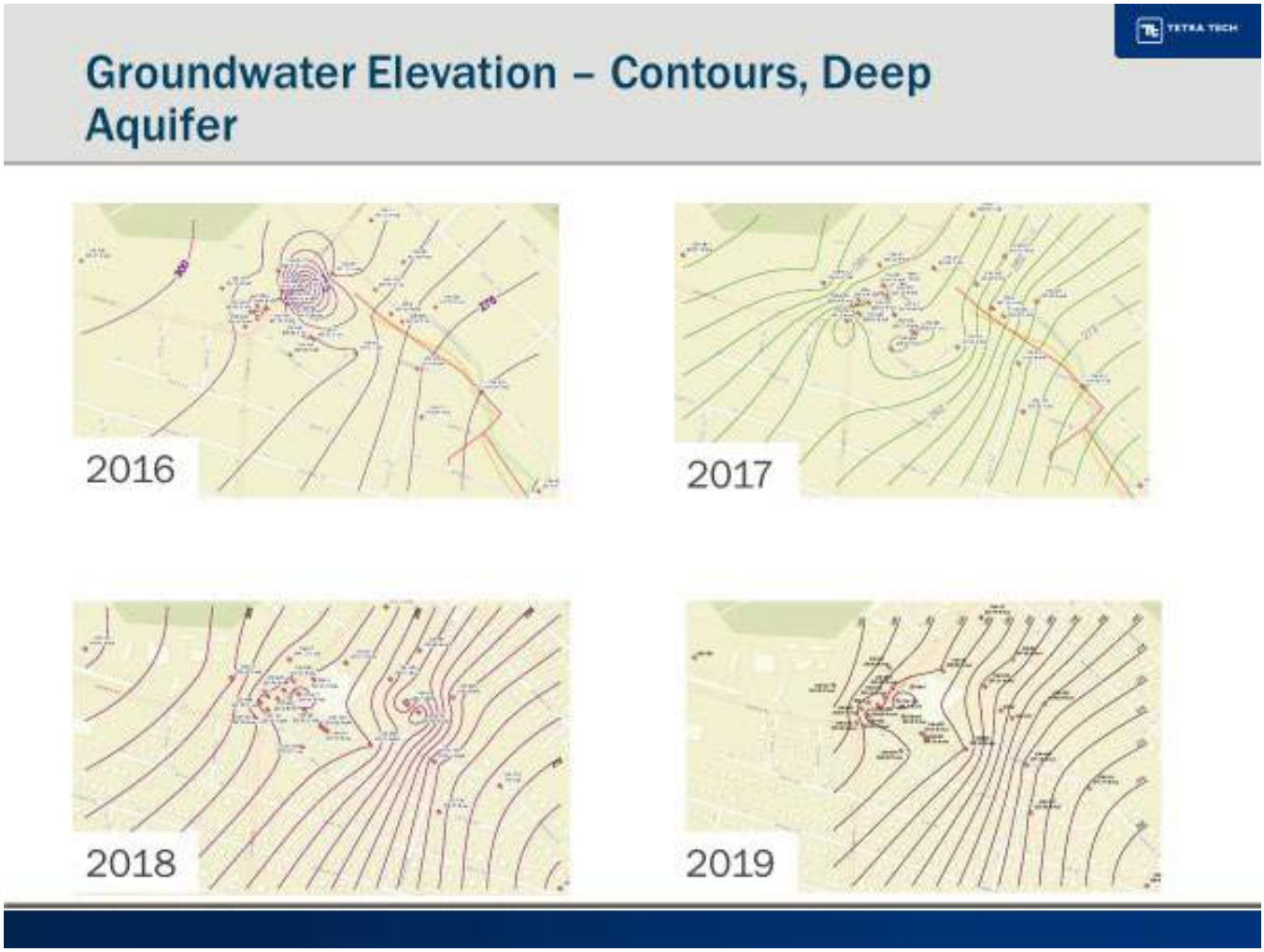
A review of the updated CSM indicates that the vast majority of the plume is currently being captured by the existing remediation system. While 100% capture may not always occur due to abnormal conditions (such as an excessively rainy season, or technical issues) the remediation system has reduced the overall size of the plume from the 2005 extent and appears to contain it. However, since the 2017 CSM update, there does not appear to have a significant change in plume volume, though there has been a change in morphology, as seen by the extent of the 2018 plume when compared to the 2017 plume. Thus, the plume appears to be within the capture zone.

Vertically, the extent of the plume is based on the groundwater model and analytical data, and the capture zone analysis indicates that groundwater capture extends below the bottom of the recovery wells. Cross-sections showing the estimated extent of vertical contamination are shown in **Figures 13, 14, and 15**. Overall, there has been little changed in the vertical profile of the plume when comparing the 2017 plumes.

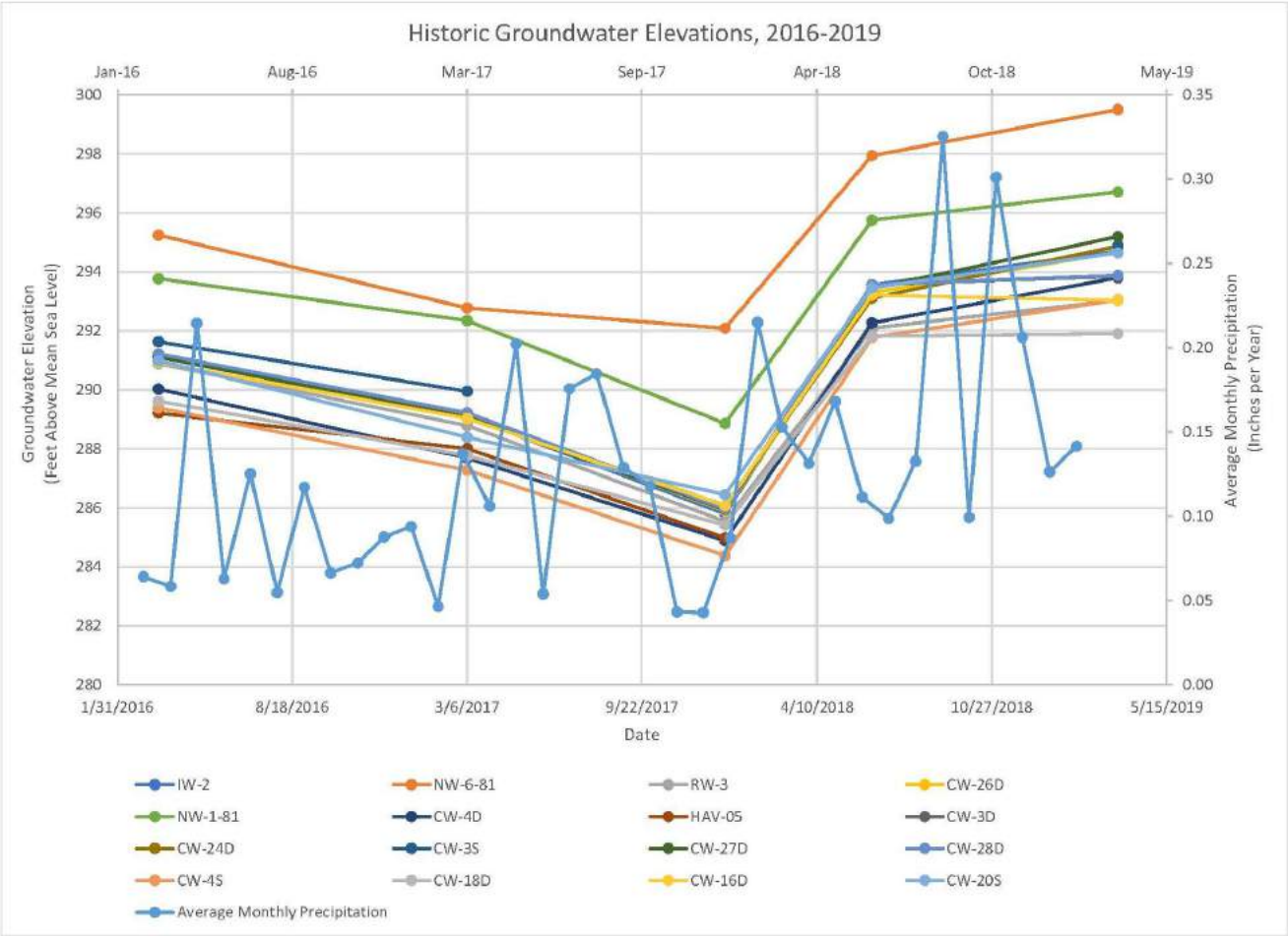
Review of the cross-sections B-B' and C-C' indicate that while the contamination is migrating primarily in a northwest to southeast orientation, there is some migration away from the inferred source areas perpendicular to the primary regional flow direction. The CZA indicates that most of this migration is captured by the treatment system. It should also be noted that unlike the previous year's plumes, there has been a significant change in plume morphology. During the 2017 and 2018 CSM updates, the plume for the deep aquifer demonstrated a "pinching out" shape parallel to the alignment of Eagle Road. During 2019, this effect had been reversed. In addition, the plume has expanded to the north to include NW-1, which has not had detectable concentrations of PCP in years. The cause for this change is currently unknown.

At the same time as the plume has expanded to the north, increased water levels have been noted in the yards and homes south of the YMCA. The cause of this is unknown. However, in combination with the expansion of the plume to the north, it appears to be the result of an increase of water within the aquifer system which has increased the water table elevation and overall flow.

Additional data was reviewed during the investigation into the increase of PCP in wells along Eagle Road and the increased water levels near wells HAV-04 and HAV-05. Water table elevation maps from 2016 through 2019 were comparted to determine if there had been a significant change in flow direction or water table elevation. Review of these contour maps, presented below, show a very similar groundwater flow regime throughout the period reviewed.

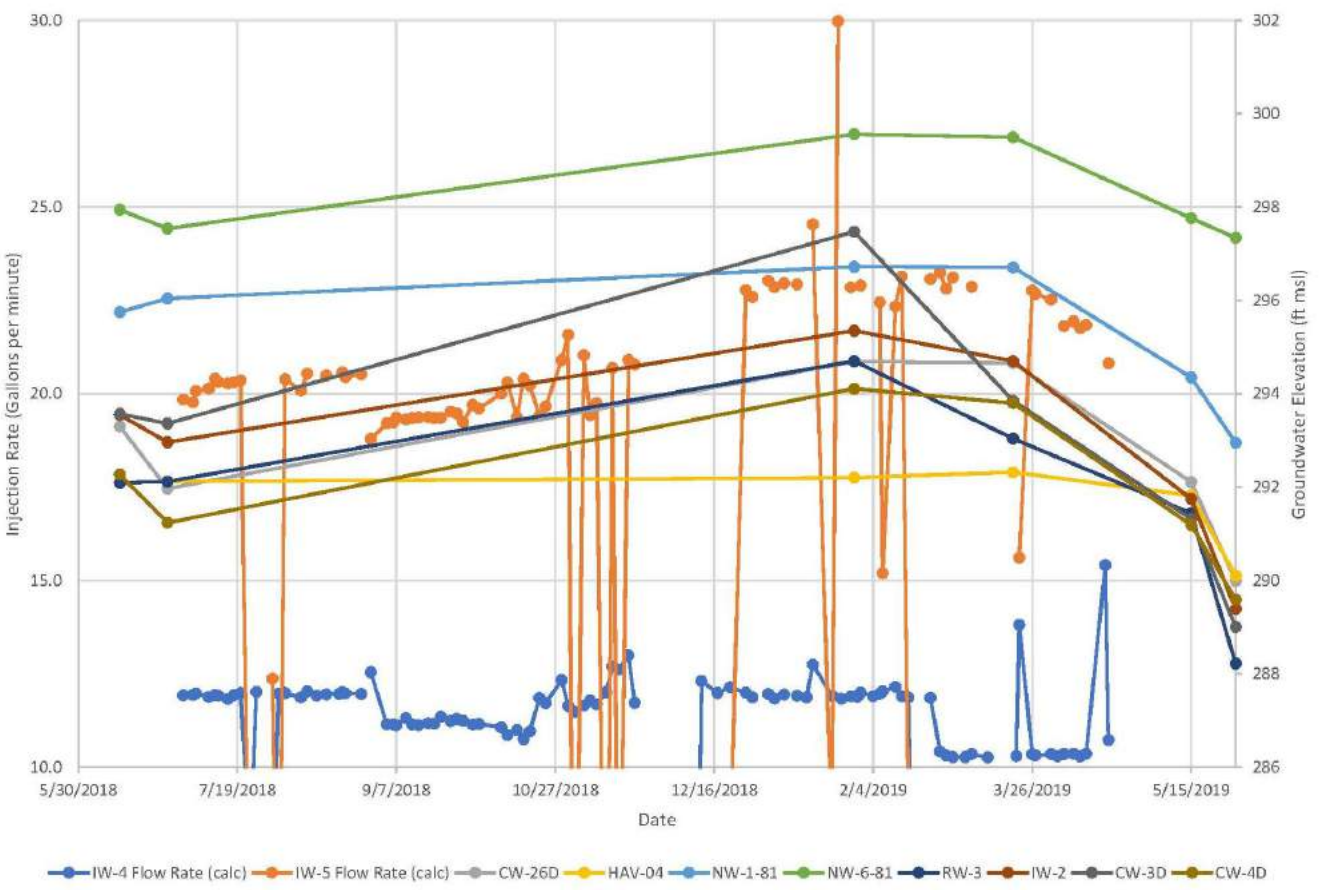


Groundwater levels and precipitation levels were also compared to determine if there was a corollary trend. Though a regional investigation could not be completed under the current scope of work, it was noted that there has been an increase in rainfall within the time period in question, though the total increase in rainfall does not appear to be as significant a change as the change in elevation, as depicted below:



It has been noted that there has been an increase in the injection rate into the aquifer from the plant. Therefore, an elevation comparison between the injection rates and the groundwater elevation along Eagle Road was made, and depicted below. It should be noted that when the injection was stopped, the water table elevation decreased.

Injection Rates vs. Groundwater Elevations



Based on the data review, several possible causes for the increase groundwater flow in the area include, but are not limited to:

- An imbalance between the water being injected and the water being withdrawn from the aquifer by the treatment plant - As the water is being reinjected after treatment, it adds to the overall flow in the groundwater. Due to the capacity of the plant, the withdrawal rate cannot be increased to a high enough level to capture both the locally flowing groundwater and the injected groundwater.
- Increased rainfall – Recent years have seen record levels of rainfall, which is contributing to increase recharge and a higher water table.
- Increased stormwater infiltration – Both the Mr. Storage and the YMCA have groundwater infiltration systems for their stormwater to prevent the majority of the stormwater from becoming runoff. Historically, most of the water at these locations would have runoff the property. While recent tracer tests of the YMCA stormwater management system would indicate that the majority of the stormwater discharges rapidly to Naylor's Run, observations into the manholes of the system indicate that there was not being water retained in the system, so any portion not discharging to Naylor's Run is likely infiltrating into the ground.
- A combination of the above listed causes
- Unknown source

Additional investigation will be necessary to determine if these conditions indicate a permeant change which will need to be incorporated into the CSM, or a temporary condition that can be mitigated within the understanding of the CSM as it is currently described.

3.3 DISCUSSION

Based upon a review of the groundwater data generated through March 2019, there has been contaminant reduction in both shallow and deep zones in general. Contaminant concentrations in some wells fluctuated over the past three years and did not indicate a decreasing trend over time. **Appendix B** presents historical PCP concentrations in wells from February 2008 to March 2019.

Based on the 2018-2019 data, PCP concentrations in monitoring wells CW-13D and CW-22D continued to be non-detect. In March 2019, PCP concentrations in monitoring wells CW-5D, CW-5S, CW-16S, CS-20D, and CW-34 were also non-detect. Free product was observed at well R-2; however, the floating product depth continued to be non-existent at those wells formerly containing product.

Based on the 2012-2019 data, PCP concentrations for RW-8, RW-9, and RW-10 and monitoring wells (CW-32, CW-33, and CW-34) continued to be non-detect or remained well below the remediation goal. In March 2019, these three wells along with ROS area monitoring wells (CW-32, CW-33, and CW-34) were analyzed for SVOC using a reporting limit of 1 µg/L or lower based on EPA and DEP's mutual agreement.

Three ROS area wells (RW-8 thru RW-10) were tested for dieldrin (as pesticide) in September 2017, December 2017, March 2018, and March 2019. Other three ROS area wells (CW-32, CW-33, and CW-34) were also tested for dieldrin in September 2017 and March 2019. Based on the results, dieldrin was detected in all six ROS area wells at concentrations exceeding its remediation goal of 0.038 µg/L.

PCP concentrations in HAV-04 and HAV-05 increased by at least an order of magnitude. PCP concentration in downgradient wells (CW-10D and CW-13D) located southeast of the main groundwater contaminant plume has been non-detect since March 2017.

Dioxins concentration in source area wells R-2 and NW-1 showed an increase by orders of magnitude, compared to previous year. The highest increase was observed in monitoring well NW-1 where concentration increased from 44.9 pg/L in March 2018 to 2,000 pg/L in March 2019.

Similar to dioxin, naphthalene concentrations in several downgradient and source area wells had increased during this reporting period. Monitoring wells CW-4I, CW-4D, HAV-04 and injection well IW-2 all showed an uptrend in naphthalene concentrations. Downgradient wells CW-4I, CW-4D, and HAV-04 that were non-detect in March 2018 showed naphthalene concentrations of 69.8 ug/L, 121 ug/L, and 40.7 ug/L, respectively. All exceeding its remediaton goal of 3 ug/L.

During the latest round of sampling in June 2019, PCP was detected at concentrations exceeding the remediation goal of 1 µg/L in down-gradient monitoring wells NW-01 and CW-26D (1230 ug/L and 1460 ug/L, respectively). Historically, PCP concentrations in both wells have been non-detect or low. This unexpected spike in concentration could potentially be attributed, but not limited, to the following:

- An imbalance between the water being injected and the water being withdrawn from the aquifer by the treatment plant - As the water is being reinjected after treatment, it adds to the overall flow in the groundwater. Due to the capacity of the plant, the withdrawal rate cannot be increased to a high enough level to capture both the locally flowing groundwater and the injected groundwater.

- Increased rainfall – Recent years have seen record levels of rainfall, which is contributing to increase recharge and a higher water table.
- Increased stormwater infiltration – Both the Mr. Storage and the YMCA have groundwater infiltration systems for their stormwater to prevent the majority of the stormwater from becoming runoff. Historically, most of the water at these locations would have runoff the property. While recent tracer tests of the YMCA stormwater management system would indicate that the majority of the stormwater discharges rapidly to Naylor's Run, observations into the manhole's of the system indicate that there was not being water retained in the system, so any portion not discharging to Naylor's Run is likely infiltrating into the ground.
- A combination of the above listed causes
- Unknown source

Further investigation will be necessary to determine the source of the increase and develop a remedy.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The following conclusions have been made based on the analytical and hydrogeologic data collected over the monitoring period:

- There has been an increase in contaminant concentrations in several monitoring wells at the Site from 2018 to 2019.
- The overall areal extent of the PCP plume based on 2019 data has changed compared to 2018 based on PCP groundwater concentrations.
- PCP concentrations for ROS Area recovery wells RW-8, RW-9, and RW-10 and ROS area monitoring wells CW-32, CW-33, and CW-34 continued to be non-detect.

4.2 RECOMMENDATIONS.

The following recommendations are made with respect to the groundwater monitoring results:

- Continue evaluating analytical and hydrogeologic data to determine the long-term effects of the extraction system on reducing the extent of the contaminant plume and the removal of contaminants.
- Continue monitoring the ROS Area recovery wells and nearby monitoring wells on an annual basis, as these wells have met the cleanup goal for VOCs and SVOC, except for dieldrin.
- Monitor for anomalous fluctuations in PCP concentration in downgradient wells and conduct additional investigation.

5.0 REFERENCES

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1 Remediation Goals for Groundwater

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6 Comparison of Groundwater Remediation Goals to Sampling Results of ROS Wells

TABLE 1
REMEDIATION GOALS FOR GROUNDWATER
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

CHEMICAL	GOAL	UNIT	OU [(1) (2)]
Benzene	5 (MCL)	µg/L	2
Benzo(a)pyrene	0.2 (MCL)	µg/L	Both
Dieldrin	0.038 (Risk-Based)	µg/L	3
Bis(2-ethylhexyl)phthalate	6 (MCL)	µg/L	Both
Dibenzofuran	4 (Risk-Based)	µg/L	3
Ethylbenzene	700 (MCL)	µg/L	2
2-Methylnaphthalene	2 (Risk-Based)	µg/L	3
Naphthalene	3 (Risk-Based)	µg/L	3
Pentachlorophenol (PCP)	1 (MCL)	µg/L	Both
Phenanthrene	41 (Risk-Based)	µg/L	Both
Toluene	1,000 (MCL)	µg/L	2
Total 2,3,7,8-TCDD	0.00003 (MCL)	µg/L	Both
TCE	5 (MCL)	µg/L	2
1,2-Trichloroethylene	100 (MCLG)	µg/L	2
1,2,4-Trimethylbenzene	16 (Risk-Based)	µg/L	3
1,3,5-Trimethylbenzene	16 (Risk-Based)	µg/L	3
4,6-Dinitro-2-methylphenol	1.7 (Risk-Based)	µg/L	3
Vinyl chloride	5 (MCL)	µg/L	2
Xylene	10,000 (MCL)	µg/L	2
Aluminum	50-200 (SMCL)	µg/L	3
Arsenic	50 (MCL) (OU-2); 10 (MCL) (OU-3)	µg/L	Both
Chromium	100 (MCL)	µg/L	3
Barium	2,000 (MCL)	µg/L	3
Manganese	50 (SMCL)	µg/L	Both
Iron	300 (SMCL)	µg/L	3
Vanadium	3.1 (Risk-Based)	µg/L	3

References:

[1] Table 23 in OU-2 ROD, dated September 1991.
[2] Table 15 in OU-3 ROD, dated April 2008.

TABLE 2
WELL CONSTRUCTION DETAILS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Well-ID	Well diameter	Top of Casing Elevation	Well depth below top of casing	Screen interval below TOC	Location	Installed	Comments
			ft.	top bot.			
CW-1D	2"	312.70	57.60	52.60 - 57.60	Continental Auto Parts off Lawrence Road	February 1988	Sample annually (March)
CW-1I	2"	312.27	34.10	24.10 - 34.10	Continental Auto Parts off Lawrence Road	February 1988	Deleted from sampling program March 2010
CW-1S	2"	312.17	21.30	11.30 - 21.30	Continental Auto Parts off Lawrence Road	February 1988	Sample annually (March)
CW-2D	2"	316.51	65.20	57.20 - 65.20	GWTP Property, NE corner of cap	February 1988	Sample annually (March)
CW-2I	2"	316.45	41.20	31.20 - 41.20	GWTP Property, NE corner of cap	February 1988	Sample annually (March)
CW-2S	2"	316.38	26.20	16.20 - 26.20	GWTP Property, NE corner of cap	February 1988	Deleted from sampling program March 2010
CW-3D	2"	303.67	45.05	35.05 - 45.05	YMCA parking lot, NW building corner	February 1988	Sample annually (March)
CW-3I	2"	303.66	19.10	14.10 - 19.10	YMCA parking lot, NW building corner	February 1988	Deleted from sampling program March 2010
CW-3S	2"	303.80	15.60	5.60 - 15.60	YMCA parking lot, NW building corner	February 1988	2016 SAP - Sample biennial (March)
CW-4D	2"	304.29	49.25	39.25 - 49.25	YMCA property SW building corner	February 1988	Sample annually (March)
CW-4I	2"	304.41	34.30	24.30 - 34.30	YMCA property SW building corner	February 1988	Sample annually (March)
CW-4S	2"	304.53	23.02	8.02 - 23.02	YMCA property SW building corner	February 1988	Sample annually (March)
CW-5D	2"	301.63	45.30	35.30 - 45.30	YMCA property SE building corner	February 1988	Sample annually (March)
CW-5I	2"	301.80	30.65	20.65 - 30.65	YMCA property SE building corner	February 1988	Deleted from sampling program March 2010
CW-5S	2"	302.16	16.93	8.00 - 18.00	YMCA property SE building corner	February 1988	Sample annually (March)
CW-6D	2"	299.97	46.75	38.50 - 48.50	PCG parking lot, NE building corner	February 1988	Abandoned 2012 by YMCA
CW-6I	2"	299.83	33.90	26.90 - 33.90	PCG parking lot, NE building corner	February 1988	Abandoned 2012 by YMCA
CW-6S	2"	299.60	22.40	8.50 - 24.50	PCG parking lot, NE building corner	February 1988	Abandoned 2012 by YMCA
CW-7D	4"	302.90	49.60	40.00 - 50.00	PECO Oakmont substation property	1991	2016 SAP - Sample every 5 years (Mar 2020)
CW-7S	4"	301.74	29.40	20.00 - 30.00	PECO Oakmont substation property	1991	2016 SAP - Sample every 5 years (Mar 2020)
CW-8D	4"	298.26	53.50	33.50 - 53.50	End of Ralston Ave.	1991	2016 SAP - Sample every 5 years (Mar 2020)
CW-8S	4"	299.11	30.00	20.00 - 30.00	End of Ralston Ave.	1991	2016 SAP - Sample every 5 years (Mar 2020)
CW-9D	4"	293.92	63.14	53.14 - 63.14	Rittenhouse Circle (near #453)	September 2002	2016 SAP - Sample biennial (March 2019)
CW-9S	2"	293.79	35.60	25.60 - 35.60	Rittenhouse Circle (near #453)	September 2002	Sample only if there is an exceedance in CW-9D
CW-10D	4"	279.90	54.28	39.28 - 54.28	Rittenhouse Circle (near #432)	September 2002	Sample annually (March)
CW-10S	2"	280.10	24.30	9.30 - 24.30	Rittenhouse Circle (near #432)	September 2002	Sample only if there is an exceedance in CW-10D
CW-11D	2"	276.92	71.03	56.03 - 71.03	Rittenhouse Circle (near #400)	September 2002	2016 SAP - Sample biennial (March 2019)
CW-11S	2"	276.92	39.70	29.70 - 39.70	Rittenhouse Circle (near #400)	September 2002	Sample only if there is an exceedance in CW-11D
CW-12D	4"	269.70	49.53	39.53 - 49.53	Rittenhouse Circle (near #305)	September 2002	Sample Quarterly (Mar/Jun/Sep/Dec)
CW-12S	4"	269.67	34.80	24.80 - 34.80	Rittenhouse Circle (near #305)	September 2002	Sample only if there is an exceedance in CW-12D
CW-13D	2"	292.12	75.25	60.25 - 75.25	Lawrence Road (between #428 & #432)	September 2002	Sample Quarterly (Mar/Jun/Sep/Dec)
CW-13S	4"	292.01	45.14	33.14 - 45.14	Lawrence Road (between #428 & #432)	September 2002	Sample only if there is an exceedance in CW-13D
CW-14D	2"	320.74	82.21	67.21 - 82.21	Lawrence Road Park behind rowhomes	September 2002	Deleted from sampling program March 2010
CW-14S	2"	320.43	40.55	25.55 - 40.55	Lawrence Road Park behind rowhomes	September 2002	Deleted from sampling program March 2010
CW-15S	2"	249.26	33.92	23.92 - 33.92	Bailey Park NW end of basketball courts	September 2002	Deleted from sampling program March 2010
CW-16D	2"	314.2	90.00	75.0 - 90.0	Zac's Hamburgers	August 2004	Sample annually (March)
CW-16I	2"	314.3	68.00	53.0 - 68.0	Zac's Hamburgers	August 2004	Deleted from sampling program March 2010
CW-16S	6"	314.0	55.00	38.0 - 55.0	Zac's Hamburgers	March 2005	Sample annually (March)
CW-17D	2"	308.6	78.00	62.0 - 77.0	SW corner PCG near RW-3	August 2004	Sample annually (March)
CW-18D	2"	302.2	68.00	58.0 - 68.0	SE corner PCG near CW-5S	August 2004	Sample annually (March)
CW-19D	2"	299.1	101.00	68.0 - 78.0	rear PCG parking lot near CW-6D	August 2004	Source Area - Sample annually (March)
CW-20D	2"	310.2	66.00	50.0 - 65.0	Lawrence Road (between #553 & #549)	August 2004	Sample annually (March)
CW-20S	2"	310.1	35.00	15.0 - 35.0	Lawrence Road (between #553 & #549)	August 2004	Sample annually (March)
CW-21D	2"	281.3	65.00	55.0 - 65.0	(#441 Rittenhouse Circle) rear yard	April 2005	Sample annually (March)
CW-21S	2"	281.3	40.00	30.0 - 40.0	(#441 Rittenhouse Circle) rear yard	April 2005	Sample annually (March)
CW-22D	2"	295.9	55.00	48.0 - 58.0	rear PCG R.O.W.	March 2005	Sample Quarterly (Mar/Jun/Sep/Dec)
CW-22S	2"	297.0	28.30	18.0 - 28.0	rear PCG R.O.W.	January 2005	Sample Quarterly (Mar/Jun/Sep/Dec)
CW-23D	2"	314.3	50.00	35.0 - 50.0	Toni Roni's Pizza near R-4	March 2005	2016 SAP - Sample every 5 years (Mar 2020)
CW-24D	6"	315.0	50.00	35.0 - 50.0	Toni Roni's Pizza	March 2005	Source Area - Sample annually (March)
CW-25D	6"	313.3	46.00	36.0 - 46.0	Swiss Farm exit lane	April 2005	Converted to RW-5 12/21/2005
CW-26D	6"	312.7	45.00	35.0 - 45.0	Swiss Farm near RW-4	April 2005	Source Area - Sample annually (March)
CW-27D	6"	311.5	45.00	35.0 - 45.0	Swiss Farm front yard	April 2005	Source Area - Sample annually (March)
CW-28D	6"	310.1	45.00	35.0 - 45.0	Swiss Farm front yard	April 2005	Source Area - Sample annually (March)
CW-29D	6"	310.8	45.00	30.0 - 45.0	Cap area rear of Swiss Farm	April 2005	Converted to IW-4 June 2011

TABLE 2
WELL CONSTRUCTION DETAILS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Well-ID	Well diameter	Top of Casing Elevation	Well depth below top of casing	Screen interval below TOC	Location	Installed	Comments
			ft.	top bot.			
CW-30D	6"	311.4	45.00	35.0 - 45.0	Cap area rear of Swiss Farm	April 2005	Converted to IW-5 September 2011
CW-31D	4"	307.34	120.00	90.0 - 120.0	Loading Dock area of PCG	Former B-2 (converted November 2008)	Converted to RW-7 April 2005
EW-1	6"	303.09	80.00	40.00 - 80.00	PCG behind rear parking lot	December 1995	Abandoned May 2005
EW-2	6"	301.74	75.00	40.00 - 75.00	PCG behind rear parking lot	December 1995	Converted to MW-3 May 2005
EW-3	6"	298.07	82.00	44.00 - 82.00	PCG rear parking lot	December 1995	Abandoned May 2005
CW-32	2"	261.47	23.00	13.00 - 23.00	ROS area	April 2010	ROS area monitoring well - sample semi-annually
CW-33	2"	260.31	16.00	6.00 - 16.00	ROS area	April 2010	ROS area monitoring well - sample semi-annually
CW-34	2"	260.78	26.00	16.00 - 26.00	ROS area	April 2010	ROS area monitoring well - sample semi-annually
HAV-02	2"	305.70	28.30	18.30 - 28.30	PCG property, outside office entrance	July 1981	Abandoned 2012 by YMCA
HAV-04	2"	292.62	6.77	3.00 - 6.77	(#453 Rittenhouse Circle) rear yard	July 1981	Per EPA - Sample Quarterly (Mar/Jun/Sep/Dec)
HAV-05	2"	292.56	10.05	6.50 - 11.50	(#453 Rittenhouse Circle) rear yard	July 1981	Per EPA - Sample Quarterly (Mar/Jun/Sep/Dec)
HAV-07	2"	281.59	8.82	6.00 - 11.00	(#441 Rittenhouse Circle) rear yard	July 1981	2016 SAP - Sample biennial (March 2019)
NW-1-81	4"	306.56	26.00	14.50 - 26.00	Along Eagle Road near GWTP	November 1981	2016 SAP - Sample biennial (March 2019)
NW-6-81	4"	308.19	24.00	14.00 - 24.00	Continental Auto Parts off Lawrence Road	November 1981	Sample annually (March)
R-2	4"	311.36	29.00	9.00 - 29.00	Swiss Farm Market near RW-2	November 1981	Sample annually (March)
R-4	4"	314.76	33.83	20.33 - 33.83	Toni Roni's Pizza	November 1981	Deleted from sampling program March 2010
MW-1	2"	283.96	21.65	4.50 - 24.50	Collection Trench	prior to 1999?	Sample Quarterly (Mar/Jun/Sep/Dec)
MW-2	2"	284.29	11.30	1.50 - 11.50	(#441 Rittenhouse Circle) rear yard	prior to 1999?	Sample Quarterly (Mar/Jun/Sep/Dec)
MW-3	2"	301.37	63.00	53.0 - 63.0	YMCA rear parking lot	Former EW-2	Sample annually (March)
RW-1	6"	307.05	28.71	8.00 - 28.04	west side Eagle Road	August 1998	Offline March 2006; Converted to IW-1 June 2010
RW-2	6"	309.60	26.10	6.50 - 26.10	west side Eagle Road, Swiss Farm Mkt.	August 1998	Offline December 2005; Converted to IW-2 June 2010
RW-3	6"	306.59	25.75	9.10 - 25.75	east side Eagle Road, YMCA property	August 1998	Sample annually (March)
RW-4	6"	311.22	26.10	6.52 - 26.10	west side Eagle Road, Young's Produce	August 1998	Offline August 2005; Converted to IW-3 June 2010
RW-5	6"	~309.80	46.00	36.00 - 46.00	Swiss Farm exit lane	Former CW-25D (online Feb 2006)	Sample semi-annually (Mar/Sep)
RW-6	6"	283.25	35.00	25.00 - 35.00	downgradient of Collection Trench	2005 (online Apr 2006)	Sample semi-annually (Mar/Sep)
RW-7	4"	306.84	120.00	90.00 - 120.00	In front of gum factory/YMCA	Former CW-31D (converted 2010)	Sample semi-annually (Mar/Sep)
RW-8	4"	256.32	17.00	7.00 - 17.00	ROS area	April 2010	Sample Quarterly (Mar/Jun/Sep/Dec)
RW-9	4"	256.78	18.00	8.00 - 18.00	ROS area	April 2010	Sample Quarterly (Mar/Jun/Sep/Dec)
RW-10	4"	257.87	18.00	8.00 - 18.00	ROS area	April 2010	Sample Quarterly (Mar/Jun/Sep/Dec)
IW-1	6"	307.05	28.71	8.00 - 28.04	west side Eagle Road	Former RW-1 (converted June 2010)	Online August 2010 Sample annually (March)
IW-2	6"	309.60	26.10	6.50 - 26.10	west side Eagle Road, Swiss Farm Mkt.	Former RW-2 (converted June 2010)	Online August 2010 Sample annually (March)
IW-3	6"	311.22	26.10	6.52 - 26.10	west side Eagle Road, Toni's Pizza	Former RW-4 (converted June 2010)	Online August 2010 Sample annually (March)
IW-4	6"	310.8	45.00	30.00 - 45.00	Cap area rear of Swiss Farm	Former CW-29D (converted June 2011)	Online July 2011 Sample annually (March)
IW-5	6"	311.4	45.00	35.00 - 45.00	Cap area rear of Swiss Farm	Former CW-30D (converted September 2011)	Online October 2011 Sample annually (March)
B-1	4"	306.84	120.00	open borehole	In front of YMCA	October 2008	Observation Well
B-2/CW-31D	4"	307.34	120.00	open borehole	In front of PCG loading dock	October 2008	Converted to CW-31D November 2008
B-3	4"	306.84	120.00	open borehole	In front of YMCA	October 2008	Observation Well
PZ-1	1"	286.49	8.97	n/a	Collection Trench	1999	Piezometer
PZ-2	1"	291.60	13.70	n/a	Collection Trench	1999	Piezometer
PZ-3	1"	285.26	11.92	n/a	Collection Trench	1999	Piezometer
PZ-4	1"	285.60	11.94	n/a	Collection Trench	1999	Piezometer - not found
TCE MW-1S	2"	308.30	15.00	5.00 - 15.00	SE corner Direct Paint	July 2011 TCE Study well - Weston	Site background well
TCE MW-1I	2"	308.13	25.00	15.00 - 25.00	SE corner Direct Paint	July 2011 TCE Study well - Weston	Site background well
TCE MW-2S	2"	307.31	16.00	6.00 - 16.00	rear of Joe's Auto Repair	July 2011 TCE Study well - Weston	Site background well
TCE MW-2I	2"	307.32	30.00	20.00 - 30.00	rear of Joe's Auto Repair	July 2011 TCE Study well - Weston	Site background well

Table 3
June 2018 Well Groundwater Level Data

	System Status >>						OFF/OFF	OFF/OFF	ON/OFF	ON/OFF
Well ID	Total Depth	Top of Well Elev	Depth to Water (1/29/19)	GW Elev (1/29/19)	Depth to Water (3/20/19)	GW Elev (3/20/19)	Depth to Water (5/15/19)	GW Elev (5/15/19)	Depth to Water (5/29/19)	GW Elev (5/29/19)
	ft	msl								
CW-1D	57.60	312.70	10.8	301.90	10.75	301.95	11.66	301.04	12.88	299.82
CW-1S	21.30	312.17	10.65	301.52	10.3	301.87	12.11	300.06	12.41	299.76
CW-2D	65.20	316.51			19.6	296.91	23.95	292.56	25.71	290.80
CW-2I	41.20	316.45	16.75	299.70	19.4	297.05	22.62	293.83	25.36	291.09
CW-2S	26.20	316.38	18.7	297.68			23.21	293.17	24.87	291.51
CW-3D	45.05	303.67	6.2	297.47	9.82	293.85	12.35	291.32	14.67	289.00
CW-3S	15.60	303.80	8.12	295.68	8.9	294.90	11.99	291.81	13.61	290.19
CW-4D	49.25	304.29	10.18	294.11	10.49	293.80	13.1	291.19	14.7	289.59
CW-4I	34.30	304.41			10.88	293.53				
CW-4S	23.02	304.53	11.45	293.08	11.48	293.05	14.18	290.35	16.02	288.51
CW-5D	45.30	301.63	7.1	294.53	7.4	294.23	9.62	292.01	10.86	290.77
CW-5S	16.93	302.16	7.5	294.66	7.74	294.42	10.06	292.10	11.27	290.89
CW-7D	49.60	302.90	9.2	293.70	9.74	293.16	8.65	294.25	10.12	292.78
CW-7S	29.40	301.74	8.3	293.44	8.85	292.89	9.63	292.11	9.25	292.49
CW-8D	53.50	298.26	10.05	288.21	10.37	287.89	10.64	287.62	9.85	288.41
CW-8S	30.00	299.11	6.05	293.06	9.28	289.83	9.55	289.56	10.92	288.19
CW-9D	63.14	293.92	1.95	291.97	2	291.92	3.55	290.37	3.97	289.95
CW-9S	35.60	293.79			0.2	293.59	1.56	292.23	3.38	290.41
CW-10D	54.28	279.90	2.3	277.60	2.75	277.15	3.55	276.35	3.62	276.28
CW-10S	24.30	280.10	3.05	277.05	3.45	276.65	2.84	277.26	4.35	275.75
CW-11D	71.03	276.92	4.72	272.20	5.15	271.77	6.71	270.21	4.96	271.96
CW-11S	39.70	276.92	6.52	270.40	6.8	270.12	3.96	272.96	7.16	269.76
CW-12D	49.53	269.70	4.47	265.23	4.1	265.60	4.35	265.35	4.82	264.88
CW-12S	34.80	269.67	4.27	265.40	4.38	265.29	4.8	264.87	4.5	265.17
CW-13D	75.25	292.12	16.27	275.85	16.5	275.62	15.4	276.72	17.41	274.71
CW-13S	45.14	292.01	14.8	277.21	15.18	276.83	16.94	275.07	15.98	276.03
CW-14D	82.21	320.74	15.3	305.44			13.25	307.49	16.29	304.45
CW-14S	40.55	320.43	11.32	309.11			15.87	304.56	13.25	307.18
CW-15S	33.92	249.26	2.21	247.05			2.45	246.81	2.63	246.63
CW-16D	90.00	314.18	19.87	294.31	21.15	293.03	23.91	290.27	23.11	291.07
CW-16S	55.00	313.98	18.72	295.26	19	294.98	21.62	292.36	22.97	291.01
CW-17D	78.00	308.55	15.73	292.82	18.45	290.10	18.73	289.82	23.05	285.50
CW-18D	68.00	302.17	11.2	290.97	10.27	291.90	11.43	290.74	15.36	286.81
CW-19D	101.00	299.06	11.79	287.27	11.85	287.21	10.92	288.14	15.75	283.31
CW-20D	66.00	310.17	15.32	294.85	15.75	294.42	17.31	292.86	18	292.17
CW-20S	35.00	310.14	15.15	294.99	15.5	294.64	17.18	292.96	17.8	292.34
CW-21D	65.00	281.29	artesian		artesian		0	281.29	0.83	280.46
CW-21S	40.00	281.29	0.13	281.16	artesian		0	281.29	artesian	
CW-22D	55.00	295.85	15.63	280.22	16	279.85	16.82	279.03	14.87	280.98
CW-22S	28.30	297.04	13.45	283.59	13.8	283.24	14.58	282.46	17.02	280.02
CW-23D	50.00	314.28	16.51	297.77	16.75	297.53	18.01	296.27	18.16	296.12
CW-24D	50.00	314.97	20.13	294.84	20.1	294.87	22.61	292.36	24.52	290.45
CW-25D										0.00
CW-26D	45.00	312.66	17.97	294.69	18	294.66	20.55	292.11	22.67	289.99
CW-27D	45.00	311.49	16.44	295.05	16.3	295.19	19.7	291.79	21.91	289.58
CW-28D	45.00	310.07	14.8	295.27	16.19	293.88	18.35	291.72	20.87	289.20
CW-29D	45.00	310.83								
CW-30D	45.00	311.41								
CW-32	23.00	261.47	3.95	257.52	3.9	257.57	3.87	257.60	4.09	257.38
CW-33	16.00	260.31	4.1	256.21	4.15	256.16	4.08	256.23	4.21	256.10
CW-34	26.00	260.78	5.1	255.68	5.05	255.73	4.82	255.96	5.21	255.57
EW-1	85.00	303.09								
EW-2	80.00	301.74								
EW-3	82.00	298.07								
HAV-02	27.92	305.70								
HAV-04	6.77	292.62	0.42	292.20	0.3	292.32	0.8	291.82	2.52	290.10
HAV-05	10.05	292.56					1.84	290.72	3.48	289.08
HAV-07	8.82	281.59	0.45	281.14	artesian		0	281.59	1.13	280.46
MW-1	21.65	283.96	7.34	276.62	1.7	282.26	1	282.96	4.33	279.63
MW-2	11.30	284.29	7.35	276.94	2.3	281.99	1.73	282.56	4.81	279.48
MW-3	63.00	301.37	15.15	286.22	13.05	288.32	13.28	288.09	16.9	284.47
CTR	NA	NA								
MW-1I	5.27	302.58								
MW-1S	5.28	302.54								
MW-2I	0.91	305.95								
MW-2S	0.91	305.69								
NW-1-81	26.60	306.56	9.84	296.72	9.85	296.71	12.21	294.35	13.61	292.95
NW-6-81	24.00	308.19	8.63	299.56	8.69	299.50	10.43	297.76	10.85	297.34
R-2	28.61	311.36	15.66	295.70	16.36	295.00	19.51	291.85	22.04	289.32

Table 3
June 2018 Well Groundwater Level Data

	System Status >>						OFF/OFF	OFF/OFF	ON/OFF	ON/OFF
Well ID	**Total Depth**	**Top of Well Elev**	**Depth to Water (1/29/19)**	**GW Elev (1/29/19)**	**Depth to Water (3/20/19)**	**GW Elev (3/20/19)**	**Depth to Water (5/15/19)**	**GW Elev (5/15/19)**	**Depth to Water (5/29/19)**	**GW Elev (5/29/19)**
R-4	33.83	314.76	16.98	297.78			18.51	296.25	18.62	296.14
RW-1	28.04	307.05								
RW-2	26.10	309.60								
RW-3	25.75	306.59	11.89	294.70	13.55	293.04	15.15	291.44	18.37	288.22
RW-4	26.10	311.22								
RW-5	42.50	310.37	15.68	294.69			14.9	295.47	12.1	298.27
RW-6	36.75	283.25	15.1	268.15			33.5	249.75	19.9	263.35
RW-7	120.00	306.84	11.98	294.86			64.8	242.04	43.8	263.04
RW-8	17.00	256.32	Under water				53	203.32	53	203.32
RW-9	18.00	256.78	14.4	242.38	1	255.78	15.1	241.68	14.2	242.58
RW-10	18.00	257.87	11.4	246.47			36.6	221.27	36.6	221.27
PZ-1	8.90	286.49								
PZ-2	13.70	291.60								
PZ-3	11.92	285.26								
PZ-4	11.94	285.60								
PZ-5										
IW-1	28.04	307.05	9.21	297.84	9.15	297.90	14.31	292.74	16.17	290.88
IW-2	26.10	309.60	14.25	295.35	14.9	294.70	17.85	291.75	20.21	289.39
IW-3	26.10	311.22	16.52	294.70	16.45	294.77	19.15	292.07	21	290.22
IW-4	45.00	310.83	9.06	301.77	15	295.83	21.8	289.03	20.61	290.22
IW-5	45.00	311.41	8.28	303.13	16.5	294.91	20.93	290.48	20.86	290.55
B-1	120.00	307.19	11.12	296.07			14.25	292.94	23.38	283.81
B-3	120.00	307.03	10.14	296.89			14.61	292.42	17.02	290.01
Trench Sump	17.50	268.00	9.2	258.80			15.2	252.80	9.6	258.40

nd = No Data

TABLE 4A
SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CTR**		**HAV-LTR-CW10D**		**HAV-LTR-CW11D**		**HAV-LTR-CW12D**		**HAV-LTR-CW13D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**	
Sample Date:	**Goals for**	**9/11/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**																
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	5	0.24	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	2.1		1	U	1	U	4.9		1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	5.9	U	5.8	U	6.3	U	5.7	U	6.3	U	6.3	U
2-Methylnaphthalene	2	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U
bis(2-Ethylhexyl)phthalat	6	3.1	U	3	U	0.63	J	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U
Dibenzofuran	4	0.4	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U
Naphthalene	3	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U
Pentachlorophenol	1	**194**		6.1	U	5.9	U	5.8	U	6.3	U	5.7	U	6.3	U	**4.4**	J
Phenanthrene	41	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4A
SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-MW02**		**HAV-LTR-RW05**		**HAV-LTR-DUP01**		**HAV-LTR-RW06**		**HAV-LTR-RW07**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**9/12/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**					**HAV-LTR-RW05**									
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	5	1	U	**8.2**		**8.4**		0.84	J	0.55	J	1	U	1	U
Ethylbenzene	700	1	U	11.1		11		1	U	1.6		1	U	1	U
Toluene	1000	1	U	2.1		2		1	U	0.54	J	1	U	1	U
Trichloroethene	5	1	U	**6.8**		**6.6**		0.91	J	1.4		1	U	1	U
Vinyl Chloride	5	1	U	0.65	J	0.71	J	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**NA**	
2-Methyl-4,6-dinitropheno	1.7	6.3	U	5.8	U	5.9	U	6.1	U	5.9	U	6.1	U	NA	
2-Methylnaphthalene	2	1.6	U	**10**		**8.4**		1.5	U	0.41	J	1.5	U	NA	
Benzo(a)pyrene	0.2	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	NA	
bis(2-Ethylhexyl)phthalat	6	0.63	J	2.9	U	2.9	U	3	U	2.9	U	3	U	NA	
Dibenzofuran	4	3.1	U	4		3.7		0.84	J	3.2		3	U	NA	
Naphthalene	3	1.6	U	**50.1**		**42.3**		1.5	U	**8.2**		1.5	U	NA	
Pentachlorophenol	1	**27.8**		**3070**		**2350**		**572**		**2900**		6.1	U	NA	
Phenanthrene	41	1.6	U	9.8		8.7		1.5	U	6.4		1.5	U	NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

TABLE 4B
SUMMARY OF DECEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-DUP01**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**	
Duplicate of:	**Groundwater**									**HAV-LTR-MW02**					
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	1.2		1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**NA**	
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	6.1	U	5.6	U	6.1	U	5.6	U	NA	
2-Methylnaphthalene	2	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
bis(2-Ethylhexyl)phthalat	6	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Dibenzofuran	4	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Naphthalene	3	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Pentachlorophenol	1	6.1	U	6.1	U	**1.8**	J	5.6	U	6.1	U	5.6	U	NA	
Phenanthrene	41	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

			ROS AREA WELLS															
Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-CW32**		**HAV-LTR-CW33**		**HAV-LTR-CW34**		**HAV-LTR-RW8**		**HAV-LTR-RW8X**		**HAV-LTR-RW9**		**HAV-LTR-RW10**		**HAV-LTR-CTR**		**HAV-LTR-CW10D**	
Sample Date:		**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/19/2019**		**3/18/2019**	
Duplicate of:		**Groundwater**									**HAV-LTR-RW8**									
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.07	J	0.053	J	0.19		0.089	U	0.089	U	0.032	J	0.089	U	0.089	U	**1.6**	
Arsenic, Total	7440-38-2	0.01	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U
Barium, Total	7440-39-3	2	0.21		0.15		0.14		0.12		0.12		0.057		0.099		0.13		0.14	
Iron, Total	7439-89-6	0.3	0.042	J	0.1		**0.31**		0.04	J	0.088		0.23		**0.56**		**3.9**		0.22	
Manganese, Total	7439-96-5	0.05	0.039		0.006		**0.15**		0.0044	J	0.004	J	**0.059**		**0.67**		**9**		**0.13**	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0008	J
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	**0.65**		**0.58**		**0.37**		**0.28**		**0.29**		**0.12**		**0.25**		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	NA		NA		NA		NA		NA		NA		NA		0.264		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.82	J	1	U
Ethylbenzene	100-41-4	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	108-88-3	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	79-01-6	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.48	J
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.3	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.2	U
2-Methylnaphthalene	91-57-6	2	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	50-32-8	0.2	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	3.2	U	3.1	U	0.91	J	3.1	U	3	U	3.1	U	3	U	3.1	U	1.9	J
Dibenzofuran	132-64-9	4	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	0.64	J	3.1	U
Naphthalene	91-20-3	3	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Pentachlorophenol	87-86-5	1	6.3	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	**260**		6.2	U
Phenanthrene	85-01-8	41	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	cas_rn	Remediation	HAV-LTR-CW10S		HAV-LTR-CW11D		HAV-LTR-CW11S		HAV-LTR-CW12D		HAV-LTR-CW12S		HAV-LTR-CW13D		HAV-LTR-CW13S		HAV-LTR-CW13X		HAV-LTR-CW16D	
Sample Date:		Goals for	3/18/2019		3/18/2019		3/18/2019		3/18/2019		3/18/2019		3/18/2019		3/18/2019		3/18/2019		3/20/2019	
Duplicate of:		Groundwater															HAV-LTR-CW13D			
			Result		Result		Result		Result		Result		Result		Result		Result		Result	
INORGANICS		mg/L	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
Aluminum, Total	7429-90-5	0.2	0.071	J	0.54		0.11		0.38		0.38		1.2		0.15		1		0.11	
Arsenic, Total	7440-38-2	0.01	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0059	U	0.0033	U
Barium, Total	7440-39-3	2	0.17		0.11		0.23		0.094		0.23		0.095		0.22		0.091		0.18	
Iron, Total	7439-89-6	0.3	0.088		0.15		0.17		0.62		0.36		0.57		0.14		0.5		8.9	
Manganese, Total	7439-96-5	0.05	0.0043	J	0.023		0.49		0.05		0.36		0.033		0.015		0.031		0.62	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0017	J	0.0012	J	0.0022	U	0.004	U	0.0022	U
PESTICIDES		µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		pg/L	pg/L		pg/L		pg/L		pg/L		pg/L		pg/L		pg/L		pg/L		pg/L	
Toxicity Equivalent Quotient (TEQ)		30	NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES		µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Benzene	71-43-2	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	100-41-4	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	108-88-3	1000	1	U	1	U	3.4		1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	79-01-6	5	1	U	0.77	J	1	U	1	U	1	U	4.1		1	U	4.1		1	U
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
2-Methylnaphthalene	91-57-6	2	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	50-32-8	0.2	1.5	U	1.5	U	0.47	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	0.23	J	3.1	U	0.62	J	3.1	U	3.1	U	0.37	J	3	U	0.4	J	0.31	J
Dibenzofuran	132-64-9	4	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U	3	U	3.1	U
Naphthalene	91-20-3	3	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Pentachlorophenol	87-86-5	1	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	10.7	
Phenanthrene	85-01-8	41	1.5	U	1.5	U	0.48	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-CW16S**		**HAV-LTR-CW17D**		**HAV-LTR-CW18D**		**HAV-LTR-CW19D**		**HAV-LTR-CW1D**		**HAV-LTR-CW1S**		**HAV-LTR-CW20D**		**HAV-LTR-CW20S**		**HAV-LTR-CW21D**	
Sample Date:		**Goals for**	**3/20/2019**		**3/22/2019**		**3/20/2019**		**3/22/2019**		**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**	
Duplicate of:		**Groundwater**																		
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.044	J	0.089	U	0.14		0.089	U	0.065	J	0.057	J	0.19		0.098		0.13	
Arsenic, Total	7440-38-2	0.01	0.0033	U	0.0023	J	0.0019	J	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0019	J	0.0033	U
Barium, Total	7440-39-3	2	0.008		0.094		0.18		0.076		0.13		0.035		0.26		0.23		0.085	
Iron, Total	7439-89-6	0.3	**1.7**		**2.1**		**21.7**		**26.1**		**57.6**		**15.7**		**0.99**		**24.3**		**20.5**	
Manganese, Total	7439-96-5	0.05	**0.058**		**5.9**		**2.8**		**2.1**		**4.9**		**4.2**		0.0095		**5**		**1.3**	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	0.001	J	0.0022	U	0.0022	U	0.0022	U	0.00082	J	0.0022	U	0.0022	U
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	2.36		NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	0.23	J	**6.7**		1	U	0.66	J	1	U	1	U	1	U	1	U	2.3	
Ethylbenzene	100-41-4	700	1	U	1	U	1	U	0.59	J	1	U	1	U	1	U	1	U	0.6	J
Toluene	108-88-3	1000	1	U	1	U	1	U	0.39	J	1	U	1	U	1	U	1	U	1	U
Trichloroethene	79-01-6	5	1	U	2.2		1	U	1	J	2		**233**		1	U	1	U	1	
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	2.7		**21.2**		1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	6.6	U	6.1	U	6.2	U	6	U	6	U	6.2	U	6.1	U	6.1	U
2-Methylnaphthalene	91-57-6	2	**2.4**		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U
Benzo(a)pyrene	50-32-8	0.2	**0.62**	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	0.29	J	3.3	U	0.85	J	3.1	U	3	U	3	U	2	J	3	U	3	U
Dibenzofuran	132-64-9	4	0.74	J	2.9	J	3	U	1.2	J	0.17	J	0.17	J	3.1	U	0.91	J	1.4	J
Naphthalene	91-20-3	3	**3.1**		0.2	J	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	0.22	J	1.5	U
Pentachlorophenol	87-86-5	1	6.1	U	**2120**		**14.2**		**560**		**3.1**	J	**35.4**		6.2	U	**5**	J	**576**	
Phenanthrene	85-01-8	41	0.65	J	6.1		0.2	J	1.5	U	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	cas_rn	Remediation	HAV-LTR-CW21S	HAV-LTR-CW21X	HAV-LTR-CW22D	HAV-LTR-CW22S	HAV-LTR-CW23D	HAV-LTR-CW24D	HAV-LTR-CW26D	HAV-LTR-CW27D	HAV-LTR-CW28D
Sample Date:		**Goals for**	**3/19/2019**	**3/19/2019**	**3/19/2019**	**3/19/2019**	**3/20/2019**	**3/20/2019**	**3/20/2019**	**3/21/2019**	**3/22/2019**
Duplicate of:		**Groundwater**		**HAV-LTR-CW21D**							
			Result	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
INORGANICS		**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Aluminum, Total	7429-90-5	0.2	**0.64**	0.098	**0.66**	0.097	**0.65**	0.12	0.089 U	NA	0.089 U
Arsenic, Total	7440-38-2	0.01	0.0033 U	0.0033 U	0.0033 U	0.0014 J	0.0017 J	**0.014**	0.0049	NA	0.0033 U
Barium, Total	7440-39-3	2	0.098	0.08	0.48	0.28	0.17	0.23	0.038	NA	0.057
Iron, Total	7439-89-6	0.3	**34.3**	**19.4**	**8.8**	**3**	**0.65**	**105**	**32.8**	NA	**23.3**
Manganese, Total	7439-96-5	0.05	**1.5**	**1.1**	**0.063**	**0.51**	0.024	**10.5**	**2.2**	NA	**1.8**
Vanadium, Total	7440-62-2	0.0031	0.0021 J	0.0022 U	0.0017 J	0.0022 U	**0.0034**	0.0012 J	0.0022 U	NA	0.0017 J
PESTICIDES		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Dieldrin	60-57-1	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIOXINS/FURANS		**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**	**pg/L**
Toxicity Equivalent Quotient (TEQ)		30	NA	NA	NA	NA	NA	40	NA	NA	NA
VOLATILES		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
Benzene	71-43-2	5	2	2.4	1 U	1 U	1 U	**9.6**	0.48 J	1 U	1 U
Ethylbenzene	100-41-4	700	1 U	0.61 J	1 U	1 U	1 U	2.2	1.7	2	1 U
Toluene	108-88-3	1000	1 U	1 U	1 U	1 U	1 U	1.2	1.2	0.91 J	1 U
Trichloroethene	79-01-6	5	0.82 J	1.1	1 U	1 U	1 U	1 U	3.2	1.6	1 U
Vinyl Chloride	75-01-4	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
SEMIVOLATILES		**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**
2-Methyl-4,6-dinitropheno	534-52-1	1.7	5.6 U	6.1 U	5.7 U	6.1 U	6.1 U	6.1 U	6 U	6 U	6.2 U
2-Methylnaphthalene	91-57-6	2	1.4 U	1.5 U	1.4 U	1.5 U	1.5 U	**12.4**	1.5 U	1.5 U	1.5 U
Benzo(a)pyrene	50-32-8	0.2	1.4 U	1.5 U	1.4 U	1.5 U	**2.1**	1.5 U	1.5 U	1.5 U	1.5 U
bis(2-Ethylhexyl)phthalat	117-81-7	6	2.8 U	3 U	2.8 U	3 U	0.31 J	0.41 J	3 U	0.22 J	4.6
Dibenzofuran	132-64-9	4	1.5 J	1.4 J	2.8 U	3 U	0.25 J	**7.5**	1.3 J	0.94 J	3.1 U
Naphthalene	91-20-3	3	1.4 U	1.5 U	1.4 U	1.5 U	1.5 U	**53.6**	0.9 J	1.1 J	0.21 J
Pentachlorophenol	87-86-5	1	**565**	**486**	5.7 U	6.1 U	6.1 U	**1330**	**1460**	**1550**	**291**
Phenanthrene	85-01-8	41	1.4 U	1.5 U	1.4 U	1.5 U	4.2	33.9	0.54 J	1.5 U	1.5 U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

			OTHER SITE WELLS																	
Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-CW2D**		**HAV-LTR-CW2I**		**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-CW4I**		**HAV-LTR-CW4S**		**HAV-LTR-CW4X**		**HAV-LTR-CW5D**	
Sample Date:		**Goals for**	**3/21/2019**		**3/21/2019**		**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**	
Duplicate of:		**Groundwater**															**HAV-LTR-CW4I**			
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.084	J	0.037	J	0.18		**0.42**		0.092		0.14		0.064	J	**0.28**		**0.28**	
Arsenic, Total	7440-38-2	0.01	0.0033	U	0.0033	U	0.0033	U	0.0033	U	**0.011**		**0.016**		0.0059	U	**0.017**		0.0031	J
Barium, Total	7440-39-3	2	0.064		0.057		0.17		0.11		0.18		0.14		0.11		0.16		0.019	
Iron, Total	7439-89-6	0.3	**1.4**		**0.44**		**22.9**		**5.8**		**31.7**		**30.9**		0.097	J	**33.6**		**2.1**	
Manganese, Total	7439-96-5	0.05	**1.3**		0.0075		**7.1**		**1.4**		**11.3**		**12.6**		**8.8**		**12.5**		**0.16**	
Vanadium, Total	7440-62-2	0.0031	0.0018	J	0.0023		0.0022	U	**0.0037**		0.0022	U	0.00091	J	0.004	U	0.001	J	0.0022	J
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	1	U	1	U	1	U	1	U	**63.2**		**54**		**5.3**		**52.7**		1	U
Ethylbenzene	100-41-4	700	0.47	J	1	U	1	U	1	U	14.6		9.9		1	U	9.8		1	U
Toluene	108-88-3	1000	0.43	J	1	U	1	U	1	U	4.6		3.5		1	U	3.5		1	U
Trichloroethene	79-01-6	5	1	U	1	U	1	U	0.5	J	1.7		1.6		1	U	1.7		1	U
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	6.1	U	**54**		0.42	J	6.1	U	6.1	U	6	U	**185**		6.2	U
2-Methylnaphthalene	91-57-6	2	1.5	U	1.5	U	1.7	U	1.7	U	**13.6**		**2.2**		1.5	U	**2.1**		1.5	U
Benzo(a)pyrene	50-32-8	0.2	1.5	U	1.5	U	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	1.1	J	0.41	J	3.5	U	3.3	J	3	U	3	U	3	U	3	U	3.1	U
Dibenzofuran	132-64-9	4	3	U	3	U	0.52	J	3.4	U	3.2		2.8	J	0.88	J	2.9	J	3.1	U
Naphthalene	91-20-3	3	1.5	U	1.5	U	0.35	J	1.7	U	**121**		**69.8**		1.5	U	**67.5**		1.5	U
Pentachlorophenol	87-86-5	1	**1120**		**1.4**	J	**608**		**100**		**3240**		**3120**		**424**		**3040**		6.2	U
Phenanthrene	85-01-8	41	1.5	U	1.5	U	1.7	U	1.7	U	3.3		3.2		0.21	J	3.3		1.5	U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-CW5S**		**HAV-LTR-CW7D**		**HAV-LTR-CW7S**		**HAV-LTR-CW8D**		**HAV-LTR-CW8S**		**HAV-LTR-CW9D**		**HAV-LTR-CW9S**		**HAV-LTR-HAV04**	
Sample Date:		**Goals for**	**3/20/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/18/2019**		**3/18/2019**		**3/22/2019**	
Duplicate of:		**Groundwater**																
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.12		0.14		0.089	U	0.083	J	**4.4**		**1.4**		0.11		0.13	
Arsenic, Total	7440-38-2	0.01	0.002	J	0.0033	U	0.0033	U	0.0033	U	0.002	J	0.0013	J	0.0033	U	0.0033	U
Barium, Total	7440-39-3	2	0.16		0.2		0.43		0.85		0.44		0.076		0.21		0.12	
Iron, Total	7439-89-6	0.3	**8.2**		**3.4**		0.023	J	**0.45**		**5.8**		**7.7**		0.079		**4.2**	
Manganese, Total	7439-96-5	0.05	**7.9**		**0.15**		**0.3**		**0.52**		**0.15**		**0.052**		0.014		**20.5**	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	0.0022	U	0.0022	U	**0.011**		**0.0052**		0.0022	U	0.0015	J
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.5	
Ethylbenzene	100-41-4	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	6	
Toluene	108-88-3	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.37	J
Trichloroethene	79-01-6	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.7	
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	5.7	U	5.7	U	5.6	U	5.6	U	6.3	U	6.2	U	5.7	U
2-Methylnaphthalene	91-57-6	2	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	**24.6**	
Benzo(a)pyrene	50-32-8	0.2	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	3	U	2.8	U	2.9	U	2.8	U	2.8	U	0.88	J	3.1	U	2.8	U
Dibenzofuran	132-64-9	4	0.26	J	2.8	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	1	J
Naphthalene	91-20-3	3	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	**40.7**	
Pentachlorophenol	87-86-5	1	6.1	U	5.7	U	5.7	U	5.6	U	5.6	U	6.3	U	6.2	U	**4910**	
Phenanthrene	85-01-8	41	1.5	U	1.4	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	3.2	

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-HAV05**		**HAV-LTR-HAV07**		**HAV-LTR-IW1**		**HAV-LTR-IW2**		**HAV-LTR-IW3**		**HAV-LTR-IW4**		**HAV-LTR-IW5**		**HAV-LTR-MW1**		**HAV-LTR-MW2**	
Sample Date:		**Goals for**	**3/22/2019**		**3/19/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/19/2019**		**3/19/2019**	
Duplicate of:		**Groundwater**																		
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.13		**0.45**		0.068	J	0.089	U	0.089	U	0.089	U	0.032	J	0.2	U	0.035	J
Arsenic, Total	7440-38-2	0.01	0.0015	J	0.0033	U	0.0011	J	0.0012	J	0.0068		0.0033	U	0.0033	U	0.0074	U	0.0033	U
Barium, Total	7440-39-3	2	0.2		0.22		0.056		0.13		0.35		0.014		0.042		0.16		0.13	
Iron, Total	7439-89-6	0.3	**35.4**		**0.79**		**5**		**14**		**33.4**		**1.1**		**4**		**0.33**		**0.33**	
Manganese, Total	7439-96-5	0.05	**12.2**		0.031		**0.26**		**3.4**		**2.1**		**0.078**		**0.97**		**0.087**		**0.31**	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	**0.0044**		0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.005	U	0.002	J
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	5.08		NA		NA		NA		NA		0.266		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	**8.2**		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	100-41-4	700	23.2		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	108-88-3	1000	0.66	J	1	U	1	U	1.3		1	U	1	U	0.89	J	1	U	1	U
Trichloroethene	79-01-6	5	1.3		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.2	U	6.1	U	6.1	U	6.1	U
2-Methylnaphthalene	91-57-6	2	1.5	U	1.5	U	1.5	U	1.7		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	50-32-8	0.2	1.5	U	1.5	U	1.5	U	1.5	U	**0.69**	J	1.5	U	1.5	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	3.1	U	3	U	0.35	J	0.77	J	0.9	J	3.1	U	1.9	J	3	U	3	U
Dibenzofuran	132-64-9	4	**4.1**		3	U	3	U	0.79	J	3	U	3.1	U	3	U	3	U	3	U
Naphthalene	91-20-3	3	**6.4**		1.5	U	1.5	U	**48.5**		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Pentachlorophenol	87-86-5	1	**1370**		6.1	U	**4.3**	J	**4460**		**10.6**		**2**	J	**1.6**	J	6.1	U	6.1	U
Phenanthrene	85-01-8	41	12.9		1.5	U	1.5	U	1.5	U	0.49	J	1.5	U	1.5	U	1.5	U	1.5	U

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-MW3**		**HAV-LTR-NW01**		**HAV-LTR-NW06**		**HAV-LTR-R2**		**HAV-LTR-RW3**		**HAV-LTR-RW5**		**HAV-LTR-RW5X**		**HAV-LTR-RW6**		**HAV-LTR-RW7**	
Sample Date:		**Goals for**	**3/19/2019**		**3/21/2019**		**3/22/2019**		**3/21/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/22/2019**	
Duplicate of:		**Groundwater**													**HAV-LTR-RW5**					
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.089	U	0.068	J	0.089	U	0.089	U	0.098	J	0.089	U	0.089	U	0.089	U	0.089	U
Arsenic, Total	7440-38-2	0.01	0.0033	U	0.0033	U	0.01		0.0043		0.0059	U	0.0046		0.0046		0.0033	U	0.0018	J
Barium, Total	7440-39-3	2	0.081		0.11		0.051		0.2		0.15		0.062		0.062		0.12		0.096	
Iron, Total	7439-89-6	0.3	**26.5**		0.27		**7.1**		**11.4**		**9.4**		**19.2**		**19.1**		**28.6**		**12.2**	
Manganese, Total	7439-96-5	0.05	**1.5**		**1.2**		**2.7**		**7.7**		**5.1**		**8.7**		**8.6**		**3.3**		**6.9**	
Vanadium, Total	7440-62-2	0.0031	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
PESTICIDES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	NA		2000		NA		266		NA		0.229		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	0.64	J	1	U	1	U	5	U	1	U	3.5		3.5		0.46	J	0.74	J
Ethylbenzene	100-41-4	700	1.1		1	U	1	U	13.8		9.3		6.9		7.1		1	U	2.1	
Toluene	108-88-3	1000	1.2		1	U	1	U	4.7	J	2.6		3.4		3.4		0.45	J	0.59	J
Trichloroethene	79-01-6	5	1.9		1	U	0.68	J	5	U	0.62	J	**15.1**		**15.3**		0.84	J	1.7	
Vinyl Chloride	75-01-4	5	1	U	1	U	1	U	5	U	1	U	1.3		1.2		1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.1	U	6.2	U	6	U	6.2	U	6.2	U	6.1	U	6.1	U	6.2	U	6.2	U
2-Methylnaphthalene	91-57-6	2	1.5	U	1.5	U	1.5	U	**198**		**4.2**		**15.3**		**17.2**		1.5	U	0.74	J
Benzo(a)pyrene	50-32-8	0.2	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
bis(2-Ethylhexyl)phthalat	117-81-7	6	0.24	J	0.31	J	3	U	0.7	J	3.1	U	3.1	U	3.1	U	3.1	U	0.69	J
Dibenzofuran	132-64-9	4	1.1	J	3.1	U	3	U	**6.1**		**4.3**		**6.3**		**5.9**		0.94	J	**4.1**	
Naphthalene	91-20-3	3	1.5	U	1.5	U	1.5	U	**620**		**37.5**		**70.1**		**74.8**		1.5	U	**14.1**	
Pentachlorophenol	87-86-5	1	**582**		**1230**		**2230**		**9830**		**3900**		**4760**		**4620**		**373**		**2420**	
Phenanthrene	85-01-8	41	1.5	U	1.5	U	1.5	U	19.9		12		15.3		14.4		1.5	U	8.4	

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4C
SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

				FIELD QC																	
Sample ID:	**cas_rn**	**Remediation**	**HAV-LTR-RW7X**	**HAV-LTR-FB01**		**HAV-LTR-FB02**		**HAV-LTR-FB03**		**HAV-LTR-TB01**		**HAV-LTR-TB02**		**HAV-LTR-TB03**		**HAV-LTR-TB04**		**HAV-LTR-TB05**	
Sample Date:		**Goals for**	**3/22/2019**	**3/18/2019**		**3/19/2019**		**3/22/2019**		**3/18/2019**		**3/19/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**	
Duplicate of:		**Groundwater**	**HAV-LTR-RW7**																
			Result	**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS		**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	7429-90-5	0.2	0.089	0.089	U	0.089	U	0.089	U	NA		NA		NA		NA		NA	
Arsenic, Total	7440-38-2	0.01	0.0016	0.0033	U	0.0033	U	0.0033	U	NA		NA		NA		NA		NA	
Barium, Total	7440-39-3	2	0.097	0.0056	U	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Iron, Total	7439-89-6	0.3	**12.1**	0.023	J	0.027	J	0.15		NA		NA		NA		NA		NA	
Manganese, Total	7439-96-5	0.05	**7**	0.0056	U	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Vanadium, Total	7440-62-2	0.0031	0.0022	0.0022	U	0.0022	U	0.0022	U	NA		NA		NA		NA		NA	
PESTICIDES		**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	60-57-1	0.038	NA	0.019	U	NA		NA		NA		NA		NA		NA		NA	
DIOXINS/FURANS		**pg/L**	**pg/L**	**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**		**pg/L**	
Toxicity Equivalent Quotient (TEQ)		30	NA	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES		**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Benzene	71-43-2	5	0.74	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	100-41-4	700	2.1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	108-88-3	1000	0.59	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	79-01-6	5	1.5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	75-01-4	5	1	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES		**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2-Methyl-4,6-dinitropheno	534-52-1	1.7	6.7	6.1	U	6.4	U	6.2	U	NA		NA		NA		NA		NA	
2-Methylnaphthalene	91-57-6	2	0.58	1.5	U	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Benzo(a)pyrene	50-32-8	0.2	1.7	1.5	U	1.6	U	1.5	U	NA		NA		NA		NA		NA	
bis(2-Ethylhexyl)phthalat	117-81-7	6	3.4	3	U	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Dibenzofuran	132-64-9	4	3.7	3	U	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Naphthalene	91-20-3	3	**11.8**	1.5	U	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Pentachlorophenol	87-86-5	1	**2210**	6.1	U	6.4	U	6.2	U	NA		NA		NA		NA		NA	
Phenanthrene	85-01-8	41	8	1.5	U	1.6	U	1.5	U	NA		NA		NA		NA		NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4D
SUMMARY OF JUNE 2019 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SITE
HAVERTOWN, PENNSYLVANIA

		SITE WELLS																							
Sample ID:	**Remediation**	**HAV-LTR-CW16D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW26D**		**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-HAV5**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-DUP01**	
Sample Date:	**Goals for**	**6/13/2019**		**6/12/2019**		**6/12/2019**		**6/13/2019**		**6/13/2019**		**6/13/2019**		**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/12/2019**	
Duplicate of:	**Groundwater**																					**HAV-LTR-MW02**	
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Chloroform	-	NA		0.48	J	0.31	J	NA		NA		NA		NA		NA		1	U	1	U	1	U
trans-1,2-Dichloroethene	-	NA		1	U	1	U	NA		NA		NA		NA		NA		1	U	0.32	J	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2,3,4,6-Tetrachlorophenol	-	0.52	J	3.2	U	3.2	U	251		10.9		5.6		25.8		317		3.2	U	3.1	U	3.1	U
2,4,5-Trichlorophenol	-	3	U	3.2	U	3.2	U	21.5		0.56	J	3.1	U	1.8	J	22.4		3.2	U	3.1	U	3.1	U
2,4,6-Trichlorophenol	-	3	U	3.2	U	3.2	U	20.8		0.68	J	3.1	U	4.7		2	J	3.2	U	3.1	U	3.1	U
2,4-Dichlorophenol	-	3	U	3.2	U	3.2	U	2.4	J	2.9	U	3.1	U	3.2	U	2.7	J	3.2	U	3.1	U	3.1	U
2-Methylnaphthalene	2	1.5	U	1.6	U	1.6	U	**2.8**		1.4	U	1.5	U	1.6	U	**8.8**		1.6	U	1.5	U	1.5	U
Acenaphthene	-	1.5	U	1.6	U	1.6	U	2.3		1.4	U	1.5	U	1	J	3.6		1.6	U	1.5	U	1.5	U
Acenaphthylene	-	1.5	U	1.6	U	1.6	U	0.55	J	1.4	U	1.5	U	1.6	U	1.5	U	1.6	U	1.5	U	1.5	U
Acetophenone	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U	3.1	U	3.2	U	3.1	U	3.1	U
Anthracene	-	1.5	U	1.6	U	1.6	U	0.83	J	1.4	U	1.5	U	0.62	J	0.91	J	1.6	U	1.5	U	1.5	U
Benzaldehyde	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U	3.1	U	3.2	U	3.1	U	3.1	U
Biphenyl	-	3	U	3.2	U	3.2	U	9.6		2.9	U	3.1	U	2.3	J	3.6		3.2	U	3.1	U	3.1	U
bis(2-Ethylhexyl)phthalat	6	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U	0.35	J	3.2	U	3.1	U	3.1	U
Carbazole	-	3	U	3.2	U	3.2	U	0.73	J	2.9	U	3.1	U	3.2	U	3.1	U	3.2	U	3.1	U	3.1	U
Dibenzofuran	4	3	U	3.2	U	3.2	U	2.7	J	2.9	U	3.1	U	1.3	J	1.6	J	3.2	U	3.1	U	3.1	U
Di-n-Butylphthalate	-	0.29	J	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U	0.37	J	3.2	U	3.1	U	3.1	U
Fluoranthene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U	0.87	J	1.6	U	1.5	U	1.5	U
Fluorene	-	1.5	U	1.6	U	1.6	U	6.2		1.4	U	1.5	U	3.2		2.9		1.6	U	1.5	U	1.5	U
mp-Cresol	-	3	U	3.2	U	3.2	U	1.5	J	2.9	U	3.1	U	3.2	U	1.9	J	3.2	U	3.1	U	3.1	U
Naphthalene	3	1.5	U	1.6	U	1.6	U	**86**		1.4	U	1.5	U	2.1		**6.7**		1.6	U	1.5	U	1.5	U
Pentachlorophenol	1	**25.7**		6.4	U	6.5	U	**3750**		**463**		**269**		**305**		**5070**		1	J	6.2	U	6.2	U

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 4D
SUMMARY OF JUNE 2019 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SITE
HAVERTOWN, PENNSYLVANIA

						FIELD QC			
Sample ID:	**Remediation**	**HAV-LTR-NW1**		**HAV-LTR-NW6**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**6/13/2019**		**6/13/2019**		**6/12/2019**		**6/14/2019**	
Duplicate of:	**Groundwater**								
		Result		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Chloroform	-	NA		NA		1	U	1	U
trans-1,2-Dichloroethene	-	NA		NA		0.29	J	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**	
2,3,4,6-Tetrachlorophenol	-	2.9	U	217		3.1	U	NA	
2,4,5-Trichlorophenol	-	2.9	U	0.75	J	3.1	U	NA	
2,4,6-Trichlorophenol	-	2.9	U	2.3	J	3.1	U	NA	
2,4-Dichlorophenol	-	2.9	U	3.1	U	3.1	U	NA	
2-Methylnaphthalene	2	1.4	U	1.5	U	1.5	U	NA	
Acenaphthene	-	1.4	U	1.5	U	1.5	U	NA	
Acenaphthylene	-	1.4	U	1.5	U	1.5	U	NA	
Acetophenone	-	2.9	U	3.1	U	3.1	U	NA	
Anthracene	-	1.4	U	1.5	U	1.5	U	NA	
Benzaldehyde	-	2.9	U	3.1	U	0.44	J	NA	
Biphenyl	-	2.9	U	3.1	U	3.1	U	NA	
bis(2-Ethylhexyl)phthalat	6	2.9	U	3.1	U	3.1	U	NA	
Carbazole	-	2.9	U	3.1	U	3.1	U	NA	
Dibenzofuran	4	2.9	U	3.1	U	3.1	U	NA	
Di-n-Butylphthalate	-	2.9	U	3.1	U	3.1	U	NA	
Fluoranthene	-	1.4	U	1.5	U	1.5	U	NA	
Fluorene	-	1.4	U	0.28	J	1.5	U	NA	
mp-Cresol	-	2.9	U	3.1	U	3.1	U	NA	
Naphthalene	3	1.4	U	1.5	U	1.5	U	NA	
Pentachlorophenol	1	0.49	J	**5330**		6.2	U	NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation
5.5 - Exceeds Remediation Goal for GW

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Well Location	Mar. 11		Jun. 11	Sep. 11		Dec. 11	Mar. 12		Jun. 12	Sep. 12		Dec. 12	Mar. 13		Jun. 13	Nov. 13	Jan. 14	Apr. 14		Jul. 14	Sep. 14		Dec. 14	Apr. 15	
	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)
CW-1S	180+						13						160					145						97	
CW-1I																									
CW-1D	30	0.00025					20						8.9					11.4	0.00004					7.3	
CW-2S																									
CW-2I			4200				2800+						2500					657						327	
CW-2D	1800+	0.00132					1700+						1800					2310	0.00038					2675	
CW-3S			3.1				54						2.3					ND						ND	
CW-3I																									
CW-3D	220+	0.00207					120+						140					552	0.000559					209	
CW-4S	410+						68						1000					807						528	
CW-4I			640				740+						1400					956						1660	
CW-4D	120+	0.00036					ND						1700					1180	0.000246					1260	
CW-5S			ND				ND						240					3.3						108	
CW-5I																									
CW-5D	ND	0.00033					ND						16					ND	0.000184					6	
CW-6S			ND				ND		*WELL ABANDONE*																
CW-6I									*WELL ABANDONE*																
CW-6D	440+	0.00073					150+		*WELL ABANDONE*																
CW-7S							ND											ND						ND	
CW-7D							ND											ND						ND	
CW-8S	ND												ND											ND	
CW-8D	0.54												ND											ND	
R-2	500+	0.369					6000+	0.297					3300	0.176											
R-4																									
HAV-02	3700+	0.356					7800		*WELL ABANDONE*																
HAV-04			4900				4000						2900					3290						4180	
HAV-07	0.18		ND	ND		ND	ND		ND	0.48		0.59	ND		ND	ND	ND			ND			ND	ND	
HAV-05	660+	0.134	270	860+		360+	3100	0.0244	4600	4500		6000	3600	0.073	3100	5960	4130	2020	0.0188	1800			3920	3490	0.028
NW-01	9.3	0.0866				9.3	ND	0.0525					9.8	0.1060				ND	0.025					ND	0.035
NW-06	1100+	0.00051				1100+	1600+						520					891	0.00042					471	
CW-9S							ND																		
CW-9D				0.51						0.31								ND						ND	
CW-10S	ND												ND												
CW-10D				180+	0.00022					6.70	0.0000068							ND	0.000068					ND	0.000080
CW-11S	ND												ND												
CW-11D				ND						1.20								ND						ND	
CW-12S							ND																	ND	
CW-12D				0.19						0.86								4						ND	
CW-13S							ND																	ND	
CW-13D				ND						63		ND						115						ND	
CW-14S	ND						ND						ND												
CW-14D	ND						ND						ND												

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

	Mar. 11		Jun. 11	Sep. 11		Dec. 11	Mar. 12		Jun. 12	Sep. 12		Dec. 12	Mar. 13		Jun. 13	Nov. 13	Jan. 14	Apr. 14		Jul. 14	Sep. 14		Dec. 14	Apr. 15	
Well Location	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)
CW-15	ND						ND						ND					ND							
IW-1(RW-1)	41					130+	430+		210	410		190	ND			643		358						981	
IW-2(RW-2)	5.6					4000+	2400+		6200	5200		5500	4800			10200		4750						4920	
RW-3	4300+						5000						3800					8620						4160	0.00230
IW-3(RW-4)	2.5					510+	1700		3100			*DRY*	*DRY*					980						DRY	
RW-5	1300+	0.00026		2900+			1900	0.000697		2000	0.0017		5200	0.00013		4040		2860	0.00328		2350	0.00016		3820	0.00009
RW-6	310+	0.000009		780+			460			470			700			289		306	0.00033		279			498	
RW-7	2300+			3700+			3100+			2300			3200			2850		2580			2680			2110	0.00005
RW-8							ND			ND		ND	ND		ND	ND	ND	ND		ND	ND		ND	ND	
RW-9							ND			ND		ND	ND		ND	ND	ND	ND		ND	ND		ND	ND	
RW-10							ND			160		ND	ND		ND	ND	ND	ND		ND	ND		2.4 J	ND	
CTR	330+	0.0040		710+			420+	0.00233		1200	0.000031		500	0.00227		775		415	0.00018		509	0.00959		255	0.00565
Plant Inf.	1700	0.00012	1600	3300	0.0019	2200	1900	0.197	3600	1900	0.0000	1800	2400	0.0014	2200	3620		3240	0.00014	2740				1710	0.00012
MW-1	2.6		5.0	27		8.1	ND		18	81		19	2.4		ND	10.6	3.4	ND		ND	3.3		ND	ND	
MW-2	0.50		ND	2.9		3.7	12		ND	0.73		1.3	ND		ND	ND	ND	4.3		ND	1.70		ND	2.8	
MW-3	1500+						900+						920					1040		1040				599	
CW-16S	1200+						470+	0.00833					2300	0.022				101	0.00274					8.4	0.00310
CW-16I																									
CW-16D	48	0.00105					31						33					29.55	0.00048					3.7	
CW-17D	2500+						2700						1800					3780						1300	
CW-18D	0.30						10						ND					52.6						59.8	
CW-19D	2400+						1800+						1300					1030						554	
CW-20S	9.2						ND						6.5					5.0						2.1	
CW-20D	2.2						ND						ND					ND						ND	
CW-21S	770+		410	690+		350+	710		990	1000		1700	1300		2000	1340	1370	833		985			883	892	
CW-21D	660+		530	610+		370+	590		660	780		1600	1300		2100	1360	1070	830		846			864	1030	
CW-22S	ND		ND	0.28		16.0	ND		ND	1.10		ND	ND		ND	ND	ND	ND		ND	ND		ND	ND	
CW-22D	ND		ND	0.22		8.2	ND		ND	54		ND	ND		0.97	ND	ND	ND		ND	8		ND	ND	
CW-23D	1.0						ND						ND					ND						ND	
CW-24D				3900	0.0093		2700+	0.00503					4000	0.0062				2230	0.00603					1920	0.00147
CW-25D																									
CW-26D	88+					2500	2100+		3400	2800		2900	1300			3260		3560						4.1	
CW-27D	1500+					4800	2400		6100	3600		5200	4600			3740		1810						1950	
CW-28D	3000+						3000+						1800					6830						3230	
IW-4(CW-29D)			4200			430+	73	0.00180	ND	450		250	2.9	0.00087		112		11	0.00025					97.1	0.00031
IW-5(CW-30D)	2400+					2800+	ND		46	380		250	ND			3.65		33.2						37.5	
CW-31D																									
CW-32							ND			ND		ND	ND		ND		ND	ND		ND			ND	ND	
CW-33							ND			ND		ND	ND		ND		ND	ND		ND			ND	ND	
CW-34							ND			ND		ND	ND		ND		ND	ND		ND			ND	ND	

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

	Jul. 15	Sep. 15		Dec.15	Mar. 16		Jun. 16	Sep. 16		Dec.16		Mar. 17			Jun. 17		Sep. 17	
Well Location	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dieldrin ug/L
CW-1S					202							210				ND		
CW-1I																		
CW-1D					2.7							5.0 J						
CW-2S																		
CW-2I					1340							420						
CW-2D					2260							760						
CW-3S					ND							DRY						
CW-3I																		
CW-3D					215							59{54}						
CW-4S					373							55						
CW-4I					2350							420						
CW-4D					2030							320						
CW-5S					5.9							1.0 J						
CW-5I																		
CW-5D					ND							ND						
CW-6S	*ED DUE TO YMCA BUILDING*																	
CW-6I	*ED DUE TO YMCA BUILDING*																	
CW-6D	*ED DUE TO YMCA BUILDING*																	
CW-7S																		
CW-7D																		
CW-8S																		
CW-8D																		
R-2																		
R-4																		
HAV-02	*ED DUE TO YMCA BUILDING*																	
HAV-04					5910							1300			1700		1200	
HAV-07	ND				ND							ND						
HAV-05	2150				502	0.0179						190	0.154		94		270	
NW-01					ND	0.101						ND	0.0674			ND		
NW-06					504							1400						
CW-9S												ND						
CW-9D					ND							ND						
CW-10S												ND						
CW-10D					6.2	0.00115						ND						
CW-11S																		
CW-11D					ND							ND						
CW-12S																		
CW-12D					ND		ND	ND		ND		ND			ND		ND	
CW-13S												ND						
CW-13D					ND		ND	ND		ND		ND{ND}			ND		ND	
CW-14S																		
CW-14D																		

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

	Jul. 15	Sep. 15		Dec.15	Mar. 16		Jun. 16	Sep. 16		Dec.16		Mar. 17			Jun. 17		Sep. 17	
Well Location	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dieldrin ug/L
CW-15																		
IW-1(RW-1)					1060							360						
IW-2(RW-2)					DRY							2600						
RW-3					2540							610						
IW-3(RW-4)					DRY							DRY						
RW-5		2740	0.00030		3410	0.00259		2050{2220}	0.000175{0.000162}			650{470}	0.000398{0.00047}			0.022	600{480}	
RW-6		400			418			436				110					200	
RW-7		2080			2740			1970				320				0.012 J	160	
RW-8	0.056	ND		ND	ND		ND	ND/ND		ND/ND	0.24	ND/ND{ND}		0.42{0.56}	0.034 J	0.29{0.31}	0.063{0.068}/ND{ND}	0.18
RW-9	0.076	0.079 J		0.44 J	ND		ND	ND/ND{ND}		0.099/ND	0.14	0.14/ND		0.27	0.14	0.24	0.11/ND	0.15
RW-10	0.062	ND		0.30 J	ND		ND	ND/ND		0.076/ND	0.18	ND/ND		0.30	0.048 J	0.29	0.032 JP/ND	0.28
CTR		287	0.00071		430	0.00048		575	0.000518			43	0.000156				73	
Plant Inf.		2010	0.00051	1780	1530	0.00128	1530	1790	0.000381	600		690	0.000127		920		630	
MW-1	ND	ND		1.8	ND		ND	ND		ND		ND			ND		3 J	
MW-2	ND	ND		0.52	3.0 J		ND	ND		ND		ND			ND		ND	
MW-3					773							49						
CW-16S					7.0	0.0166						3.0 J	0.000849					
CW-16I																		
CW-16D					7.3							ND						
CW-17D					2800							410						
CW-18D					ND							ND						
CW-19D					1040							390						
CW-20S					3.7 J							1.0 J						
CW-20D					ND							ND						
CW-21S	475				523							450						
CW-21D	496				806							530{500}						
CW-22S	ND	ND		ND	ND		ND	ND		ND		ND			ND	0.17	ND	
CW-22D	ND	ND		ND	ND		ND	ND		ND		ND			ND		ND	
CW-23D					ND													
CW-24D					1180	0.00674						620	0.0296					
CW-25D																		
CW-26D					3.7 J							ND						
CW-27D					1310							490{540}				ND		
CW-28D					219							490						
IW-4(CW-29D)					47.8	0.00075						50						
IW-5(CW-30D)					172							3.0 J						
CW-31D																		
CW-32	ND				ND			ND/ND			0.54	ND/ND		0.74		0.66	ND/ND	0.39
CW-33	ND				ND			ND/ND			0.45	ND/ND		0.66		0.47	ND/ND	0.41
CW-34	0.10 J				ND			0.098J/ND			0.30	0.088/ND		0.32		0.25	0.11/ND	0.24

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

	Dec.17		Mar. 18			Jun. 18		Sep. 18	Dec.18	Mar. 19			Jun. 19	
Well Location	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	Well Location
CW-1S			210							35.4				CW-1S
CW-1I														CW-1I
CW-1D			ND							3.1 J				CW-1D
CW-2S														CW-2S
CW-2I			1 J							1.4 J				CW-2I
CW-2D			37							1120				CW-2D
CW-3S										100			*269*	CW-3S
CW-3I														CW-3I
CW-3D			170							608			*463*	CW-3D
CW-4S			ND							424				CW-4S
CW-4I			330							3120(3040)				CW-4I
CW-4D			54							3240			*305*	CW-4D
CW-5S			ND							ND				CW-5S
CW-5I														CW-5I
CW-5D			ND							ND				CW-5D
CW-6S														CW-6S
CW-6I														CW-6I
CW-6D														CW-6D
CW-7S										ND				CW-7S
CW-7D										ND				CW-7D
CW-8S										ND				CW-8S
CW-8D										ND				CW-8D
R-2						7410{7960}	0.026			9830	0.266			R-2
R-4														R-4
HAV-02														HAV-02
HAV-04			990							4910				HAV-04
HAV-07										ND				HAV-07
HAV-05	190		200	0.0356						1370	0.00508		5070	HAV-05
NW-01			ND	0.0449						1230	2			NW-01
NW-06			1200							2230			5330	NW-06
CW-9S										ND				CW-9S
CW-9D										ND				CW-9D
CW-10S										ND				CW-10S
CW-10D			ND					ND		ND				CW-10D
CW-11S										ND				CW-11S
CW-11D								ND		ND				CW-11D
CW-12S										ND				CW-12S
CW-12D	ND		ND			17.4		ND		ND				CW-12D
CW-13S										ND				CW-13S
CW-13D	ND		ND{ND}			ND		ND		ND(ND)				CW-13D
CW-14S														CW-14S
CW-14D														CW-14D

TABLE 5
HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Well Location	Dec.17		Mar. 18			Jun. 18		Sep. 18	Dec.18	Mar. 19			Jun. 19	Well Location
	PCP ug/L	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	Dioxin ppt (ng/l)	PCP ug/L	PCP ug/L	PCP ug/L	Dioxin ppt (ng/l)	Dieldrin ug/L	PCP ug/L	
CW-15														CW-15
IW-1(RW-1)			ND							4.3 J				IW-1(RW-1)
IW-2(RW-2)			2500							4460				IW-2(RW-2)
RW-3			1300							3900				RW-3
IW-3(RW-4)			DRY							10.6				IW-3(RW-4)
RW-5			800{760}	0.00114{0.00096}				3070(2350)		4760(4620)	0.000229			RW-5
RW-6			200					572		373				RW-6
RW-7			960					2900		2420(2210)				RW-7
RW-8	ND{ND}/ND{ND}	0.24	ND{ND}/ND{ND}		0.23{0.23}					ND(ND)		0.28(0.29)		RW-8
RW-9	0.038 JP/ND	0.30	0.065/ND		0.09					ND		0.12		RW-9
RW-10	0.12/ND	0.26	ND/ND		0.11					ND		0.25		RW-10
CTR			130	0.000336				194		260	0.000264			CTR
Plant Inf.	680		510	0.000268		2610				2780				Plant Inf.
MW-1	ND		ND			7.6 J		4.4 J	1.8 J	ND				MW-1
MW-2	ND		ND			44		27.80	ND(ND)	ND				MW-2
MW-3			510							582				MW-3
CW-16S			ND	0.012400						ND	0.00236			CW-16S
CW-16I														CW-16I
CW-16D			ND							10.7			*25.7*	CW-16D
CW-17D			1300							2120				CW-17D
CW-18D			ND							14.2				CW-18D
CW-19D			450							560				CW-19D
CW-20S			1 J							5 J				CW-20S
CW-20D			ND							ND				CW-20D
CW-21S			260							565				CW-21S
CW-21D			430{510}							576(486)				CW-21D
CW-22S	ND		ND			ND		ND	ND	ND				CW-22S
CW-22D	ND		ND			ND		ND	ND	ND				CW-22D
CW-23D										ND				CW-23D
CW-24D			890							1330	0.040			CW-24D
CW-25D														CW-25D
CW-26D			ND							1460			3750	CW-26D
CW-27D			5 J{4 J}							1550				CW-27D
CW-28D			390							291				CW-28D
IW-4(CW-29D)			ND							2 J	0.000266			IW-4(CW-29D)
IW-5(CW-30D)			ND							1.6 J				IW-5(CW-30D)
CW-31D														CW-31D
CW-32			ND/ND							ND		0.65		CW-32
CW-33			ND/ND							ND		0.58		CW-33
CW-34			0.084/ND							ND		0.37		CW-34

TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-RW-8																								
Sample Date:	Goals for Groundwater	3/19/2012	9/24/2012	12/17/2012	3/19/2013	6/12/2013	11/12/2013	1/27/2014	4/29/2014	6/30/2014	10/1/2014	12/30/2014	4/20/2015	7/1/2015	9/21/2015	12/16/2015	3/21/2016	6/14/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	12/12/2017	3/19/2018	3/18/2019
INORGANICS	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Aluminum	200	200 U	NA	NA	1510	NA	NA	NA	89 U	NA	NA	NA	89 U	NA	NA	NA	NA	NA	0.11	NA	8.58	NA	NA	NA	21.5 U	89 U
Arsenic	10	10 U	NA	NA	10 U	NA	NA	NA	3	NA	NA	NA	3 U	NA	NA	NA	NA	NA	0.003 U	NA	0.0024	NA	NA	NA	0.72 U	3.3 U
Barium	2000	90.4 J	NA	NA	231 J	NA	NA	NA	81	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.097	NA	0.251	NA	NA	NA	134	120
Iron	300	100 U	NA	NA	6180 J	NA	NA	NA	23	NA	NA	NA	52 J	NA	NA	NA	NA	NA	0.43	NA	15.9	NA	NA	NA	1,190	400
Manganese	50	865	NA	NA	1830	NA	NA	NA	760	NA	NA	NA	4.8 J	NA	NA	NA	NA	NA	0.54	NA	0.333	NA	NA	NA	13.4	4.4
Vanadium	3.1	50 U	NA	NA	50 U	NA	NA	NA	2.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0021 J	NA	0.0215	NA	NA	NA	0.21 U	2.2 U
SEMIVOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
2-Methyl-4,6-dinitrophenol	1.7	10 U	10 U	10 U	10 U	10 U	7.6 U	7.5 U	7.5 U	7.5 U	7.6 U	7.5 U	7.6 U	7.5 U	7.7 U	6 U	5.6 U	5.7 U	6 U	5 U	5 U	5 U	15 U	16 U	5 U	6.1 U
2-Methylnaphthalene	2	5 U	5 U	5 U	5 U	5 U	1.9 U	1.9 U	1.4 U	1.4 U	1.9 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Benzo(a)pyrene	0.2	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Bis(2-ethylhexyl)phthalate	6	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.9 U	3 U	2 U	2 U	2 U	5 U	5 U	2 U	3.1 U
Dibenzofuran	4	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.9 U	3 U	0.5 U	0.5 U	0.5 U	1 U	1 U	0.5 U	3.1 U
Naphthalene	3	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Pentachlorophenol	1	10 U	10 U	10 U	10 U	10 U	15.2 U	15.1 U	15 U	15.1 U	0.93 U	15.1 U	14.9 U	15 U	0.19 U	0.19 U	5.6 U	0.19 U	6 U	1 U	1 U	1 U	5 U	5 U	1 U	6.1 U
Phenanthrene	41	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	0.018 J	1.4 U	1.4 U	1.4 U	1.4 U	0.1 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
VOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	5	5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
Ethylbenzene	700	5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.2 J	0.2 J
Toluene	1000	5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.2 J	0.5 U	0.1 J	0.1 J
Trichloroethene	5	5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
Vinyl Chloride	5	5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	0.1 U
HERBICIDES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.063	0.048 U	0.027 U	6.1 U
PESTICIDES	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Dieldrin	0.038	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.24**	**0.42**	**0.29**	**0.18**	**0.24**	**0.23**	**0.28**

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-RW-9																								
Sample Date:	Goals for Groundwater	3/19/2012	9/24/2012	12/20/2012	3/19/2013	6/12/2013	11/12/2013	1/27/2014	4/29/2014	6/30/2014	10/1/2014	12/30/2014	4/20/2014	7/1/2015	9/21/2015	12/16/2015	12/16/2015	3/21/2016	6/14/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	12/12/2017	3/19/2018	3/18/2019
INORGANICS	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Aluminum	200	200 U	NA	NA	200 U	NA	NA	NA	89 U	NA	NA	NA	590	NA	NA	NA	NA	NA	NA	0.36	NA	0.0528 J	NA	NA	NA	30.1 J	32 J
Arsenic	10	10 U	NA	NA	10 U	NA	NA	NA	3	NA	NA	NA	3 U	NA	NA	NA	NA	NA	NA	0.003 U	NA	0.003 U	NA	NA	NA	0.72 U	3.3 U
Barium	2000	85.5 J	NA	NA	200 U	NA	NA	NA	82	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	NA	0.107	NA	NA	NA	29.7	57
Iron	300	100 U	NA	NA	100 U	NA	NA	NA	19	NA	NA	NA	220	NA	NA	NA	NA	NA	NA	0.92	NA	0.232	NA	NA	NA	1,050	230
Manganese	50	1940	NA	NA	364	NA	NA	NA	730	NA	NA	NA	35	NA	NA	NA	NA	NA	NA	1.7	NA	0.991	NA	NA	NA	626	59
Vanadium	3.1	50 U	NA	NA	50 U	NA	NA	NA	2.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0029	NA	0.00077	NA	NA	NA	0.7	2.2 U
SEMIVOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
2-Methyl-4,6-dinitrophenol	1.7	10 U	10 U	10 U	10 U	10 U	7.6 U	7.6 U	7.4 U	7.7 U	8.1 U	7.6 U	7.4 U	7.6 U	7.5 U	5.9 U	5.9 U	5.6 U	5.6 U	5.9 U	5 U	5 U	5 U	15 U	15 U	5 U	6.1 U
2-Methylnaphthalene	2	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Benzo(a)pyrene	0.2	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Bis(2-ethylhexyl)phthalate	6	5 U	5 U	5 U	5 U	5 U	2.9 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.8 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.8 U	3 U	2 U	2 U	2 U	5 U	5 U	2 U	3.1 U
Dibenzofuran	4	5 U	5 U	5 U	5 U	5 U	2.9 U	2.8 U	2.8 U	2.9 U	3 U	2.8 U	2.8 U	2.82.9 U	2.8 U	2.9 U	3 U	2.8 U	2.8 U	3 U	0.5 U	0.5 U	0.5 U	1 U	1 U	0.5 U	3.1 U
Naphthalene	3	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	0.75 J	1.4 U	1.4 U	0.72 J	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Pentachlorophenol	1	10 U	10 U	10 U	10 U	10 U	15.2 U	15.2 U	14.8 U	15.5 U	16.2 U	15.2 U	14.9 U	15 U	0.079 J	0.41	0.43	5.6 U	0.19 U	5.9 U	1 U	1 U	1 U	5 U	5 U	1 U	6.1 U
Phenanthrene	41	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.4 U	0.098 U	0.099 U	1.4 U	1.4 U	0.14 J	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
VOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	5	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Ethylbenzene	700	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Toluene	1000	0.5 U	5 U	0.75 J	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Trichloroethene	5	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Vinyl Chloride	5	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
HERBICIDES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	0.038 JP	0.065	6.1 U
PESTICIDES	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Dieldrin	0.038	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.14**	**0.27**	**0.24**	**0.15**	**0.3**	**0.087**	**0.12**

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-RW-10																								
Sample Date:	Goals for Groundwater	3/19/2012	10/2/2012	12/20/2012	3/19/2013	6/12/2013	11/12/2013	1/27/2014	4/29/2014	6/30/2014	10/1/2014	12/30/2014	4/20/2015	7/1/2015	9/21/2015	12/16/2015	3/21/2016	6/14/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	12/12/2017	3/19/2018	3/18/2019
INORGANICS	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Aluminum	200	200 U	NA	NA	200 U	NA	NA	NA	44 U	NA	NA	NA	180	NA	NA	NA	NA	NA	0.2	NA	0.1 U	NA	NA	NA	22.1 J	89 U
Arsenic	10	10 U	NA	NA	10 U	NA	NA	NA	3	NA	NA	NA	3 U	NA	NA	NA	NA	NA	0.003 U	NA	0.003 U	NA	NA	NA	0.72 U	3.3 U
Barium	2000	85.8 J	NA	NA	200 U	NA	NA	NA	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.21	NA	0.125	NA	NA	NA	102	99
Iron	300	100 U	NA	NA	2850 J	NA	NA	NA	390	NA	NA	NA	540	NA	NA	NA	NA	NA	1.3	NA	0.262	NA	NA	NA	**1,660**	**560**
Manganese	50	1600	NA	NA	1240	NA	NA	NA	1400	NA	NA	NA	480	NA	NA	NA	NA	NA	3.2	NA	1.1	NA	NA	NA	**1,240**	**670**
Vanadium	3.1	50 U	NA	NA	50 U	NA	NA	NA	0.85 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0027	NA	0.00031 J	NA	NA	NA	1.1	2.2 U
SEMIVOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
2-Methyl-4,6-dinitrophenol	1.7	10 U	10 U	10 U	10 U	10 U	7.5 U	7.6 U	7.5 U	7.5 U	7.5 U	7.7 U	7.6 U	7.4 U	7.7 U	5.7 U	6.2 U	5.8 U	5.9 U	5 U	5 U	5 U	15 U	16 U	5 U	6.1 U
2-Methylnaphthalene	2	5 U	2.7 J	5 U	5 U	5 U	1.9 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Benzo(a)pyrene	0.2	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Bis(2-ethylhexyl)phthalate	6	5 U	5 U	5 U	5 U	5 U	2.8 U	2.9 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.8 U	2.9 U	2.8 U	3.1 U	2.9 U	3 U	2 U	2 U	2 U	5 U	5 U	2 U	3 U
Dibenzofuran	4	5 U	0.21 J	5 U	5 U	5 U	2.8 U	2.9 U	2.8 U	2.8 U	2.8 U	2.9 U	2.8 U	2.8 U	2.9 U	2.8 U	3.1 U	2.9 U	3 U	0.5 U	0.5 U	0.5 U	1 U	1 U	0.5 U	3 U
Naphthalene	3	5 U	13	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U	1.4 U	1.5 U	0.1 JB	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
Pentachlorophenol	1	10 U	160 J	10 U	10 U	10 U	15.1 U	15.2 U	15 U	15.1 U	0.94 U	2.4 J	15.2 U	14.9 U	0.19 U	0.19 U	6.2 U	0.19 U	5.9 U	1 U	1 U	1 U	5 U	5 U	1 U	6.1 U
Phenanthrene	41	5 U	0.5 J	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.4 U	0.094 U	1.4 U	1.4 U	1.4 U	1.4 U	0.095 U	1.5 U	1.4 U	1.5 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1.5 U
VOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	5	0.5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Ethylbenzene	700	0.5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Toluene	1000	0.5 U	5 U	1.2 J	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.0	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 J	1 U
Trichloroethene	5	0.5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
Vinyl Chloride	5	0.5 U	5 U	5 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U	0.5 U	0.5 U	0.1 U	1 U
HERBICIDES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.032 JP	0.12	0.027 U	6.1 U
PESTICIDES	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**µg/L**	**µg/L**	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Dieldrin	0.038	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.18**	**0.3**	**0.29**	**0.28**	**0.26**	**0.11**	**0.25**

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-CW32																			
Sample Date:	Goals for Groundwater	10-May	10-Dec	3/19/2012	9/24/2012	12/17/2012	3/19/2013	6/12/2013	1/27/2014	4/29/2014	6/30/2014	12/30/2014	4/20/2015	7/1/2015	3/21/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	3/19/2018	3/18/2019
INORGANICS	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Aluminum	200	NA	NA	70.7 J	NA	NA	200 U	NA	NA	150	NA	NA	69 J	NA	NA	**950**	NA	628	NA	NA	**1,100**	70 J
Arsenic	10	NA	NA	10 U	NA	NA	10 U	NA	NA	3 U	NA	NA	3 U	NA	NA	3 U	NA	ND	NA	NA	0.72 U	3.3 U
Barium	2000	NA	NA	180 J	NA	NA	200 UJ	NA	NA	200	NA	NA	NA	NA	NA	240	NA	241	NA	NA	264	210
Iron	300	NA	NA	100 U	NA	NA	100 UJ	NA	NA	150	NA	NA	56 U	NA	NA	**1300**	NA	**740**	NA	NA	**1,330**	42 J
Manganese	50	NA	NA	48.6	NA	NA	42.9	NA	NA	49	NA	NA	**51**	NA	NA	**77**	NA	**66.1**	NA	NA	**84.6**	39
Vanadium	3.1	NA	NA	50 U	NA	NA	50 U	NA	NA	1	NA	NA	NA	NA	NA	**3.8**	NA	1.7	NA	NA	2.8	2.2 U
SEMIVOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
2-Methyl-4,6-dinitrophenol	1.7	10 U	9 U	9.9 U	10 U	10 U	10 U	10 U	7.5 U	7.5 U	7.4 U	8.4 U	7.6 U	7.8 U	5.8 U	5.8 U	NA	ND	NA	16 U	5 U	6.3 U
2-Methylnaphthalene	2	5 U	4 U	5 U	5 U	5 U	5 U	5 U	1.9 U	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.6 U
Benzo(a)pyrene	0.2	5 U	4 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.6 U
Bis(2-ethylhexyl)phthalate	6	5 U	4 B	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.8 U	3.2 U	2.8 U	2.9 U	2.9 U	0.27 J	NA	ND	NA	5 U	2 U	3.2 U
Dibenzofuran	4	5 U	4 U	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.8 U	3.2 U	2.8 U	2.9 U	2.9 U	2.9 U	NA	ND	NA	1 U	0.5 U	3.2 U
Naphthalene	3	5 U	4 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.6 U
Pentachlorophenol	1	10 U	**1** J	9.9 UJ	10 U	10 U	10 U	10 U	15.1 U	15.1 U	14.8 U	16.8 U	15.2 U	0.19 U	5.8 U	5.8 U	NA	ND	NA	5 U	1 U	6.3 U
Phenanthrene	41	5 U	4 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.6 U	1.4 U	1.5 U	1.5 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.6 U
VOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	5	5 U	5 U	0.5 UJ	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Ethylbenzene	700	5 U	5 U	0.5 UJ	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Toluene	1000	5 U	5 U	0.5 UJ	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Trichloroethene	5	5 U	5 U	0.5 UJ	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Vinyl Chloride	5	5 U	5 U	0.5 UJ	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
HERBICIDES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19 U	NA	ND	NA	0.052 U	0.027 U	6.3 U
PESTICIDES	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Dieldrin	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.54**	**0.74**	**0.66**	**0.39**	NA	**0.65**

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-CW33																				
Sample Date:	Goals for Groundwater	10-May	10-Dec	3/19/2012	9/24/2012	12/17/2012	3/19/2013	6/12/2013	1/27/2014	4/29/2014	6/30/2014	12/30/2014	4/20/2015	7/1/2015	3/21/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	3/19/2018	3/18/2019
INORGANICS	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Aluminum	200	NA	NA	117 J	NA	NA	200 U	NA	NA	89 U	NA	NA	89 U	NA	NA	89 U	NA	ND	NA	NA	21.5 U	53 J
Arsenic	10	NA	NA	10 U	NA	NA	10 U	NA	NA	3 U	NA	NA	3 U	NA	NA	3 U	NA	ND	NA	NA	0.72 U	3.3 U
Barium	2000	NA	NA	125 J	NA	NA	200 UJ	NA	NA	140	NA	NA	NA	NA	NA	150	NA	167	NA	NA	159	150
Iron	300	NA	NA	188	NA	NA	100 UJ	NA	NA	25	NA	NA	34 J	NA	NA	19 J	NA	68.9 J	NA	NA	37.4 U	100
Manganese	50	NA	NA	16.8	NA	NA	15 U	NA	NA	6.1	NA	NA	7.2	NA	NA	4 J	NA	3.9	NA	NA	6.4	6
Vanadium	3.1	NA	NA	50 U	NA	NA	50 U	NA	NA	2.2 U	NA	NA	NA	NA	NA	0.99 J	NA	0.43 J	NA	NA	0.21 U	2.2 U
SEMIVOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
2-Methyl-4,6-dinitrophenol	1.7	10 U	10 U	9.9 U	10 U	10 U	10 U	10 U	7.5 U	7.5 U	7.6 U	8.9 U	7.9 U	7.6 U	5.8 U	5.7 U	NA	ND	NA	16 U	5 U	6.1 U
2-Methylnaphthalene	2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.9 U	1.4 U	1.4 U	1.7 U	1.5 U	1.4 U	1.4 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U
Benzo(a)pyrene	0.2	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.7 U	1.5 U	1.4 U	1.4 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U
Bis(2-ethylhexyl)phthalate	6	5 U	5 B	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.9 U	3.3 U	3 U	2.8 U	2.9 U	2.9 U	NA	ND	NA	5 U	2 U	3.1 U
Dibenzofuran	4	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.8 U	2.8 U	2.9 U	3.3 U	3 U	2.8 U	2.9 U	2.9 U	NA	ND	NA	1 U	0.5 U	3.1 U
Naphthalene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.7 U	1.5 U	1.4 U	1.4 U	0.4 J	NA	ND	NA	0.5 U	0.1 U	1.5 U
Pentachlorophenol	1	10 U	0 J	9.9 UJ	10 U	10 U	10 U	10 U	15.1 U	15 U	15.2 U	17.8 U	15.8 U	0.19 U	5.8 U	5.7 U	NA	ND	NA	5 U	1 U	6.1 U
Phenanthrene	41	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1.4 U	1.4 U	1.4 U	1.7 U	1.5 U	1.4 U	1.4 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U
VOLATILES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Ethylbenzene	700	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Toluene	1000	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Trichloroethene	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
Vinyl Chloride	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U
HERBICIDES	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19 U	NA	ND	NA	0.052 U	0.026 U	6.1 U
PESTICIDES	**µg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Dieldrin	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.45**	**0.66**	**0.47**	**0.41**	NA	**0.58**

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

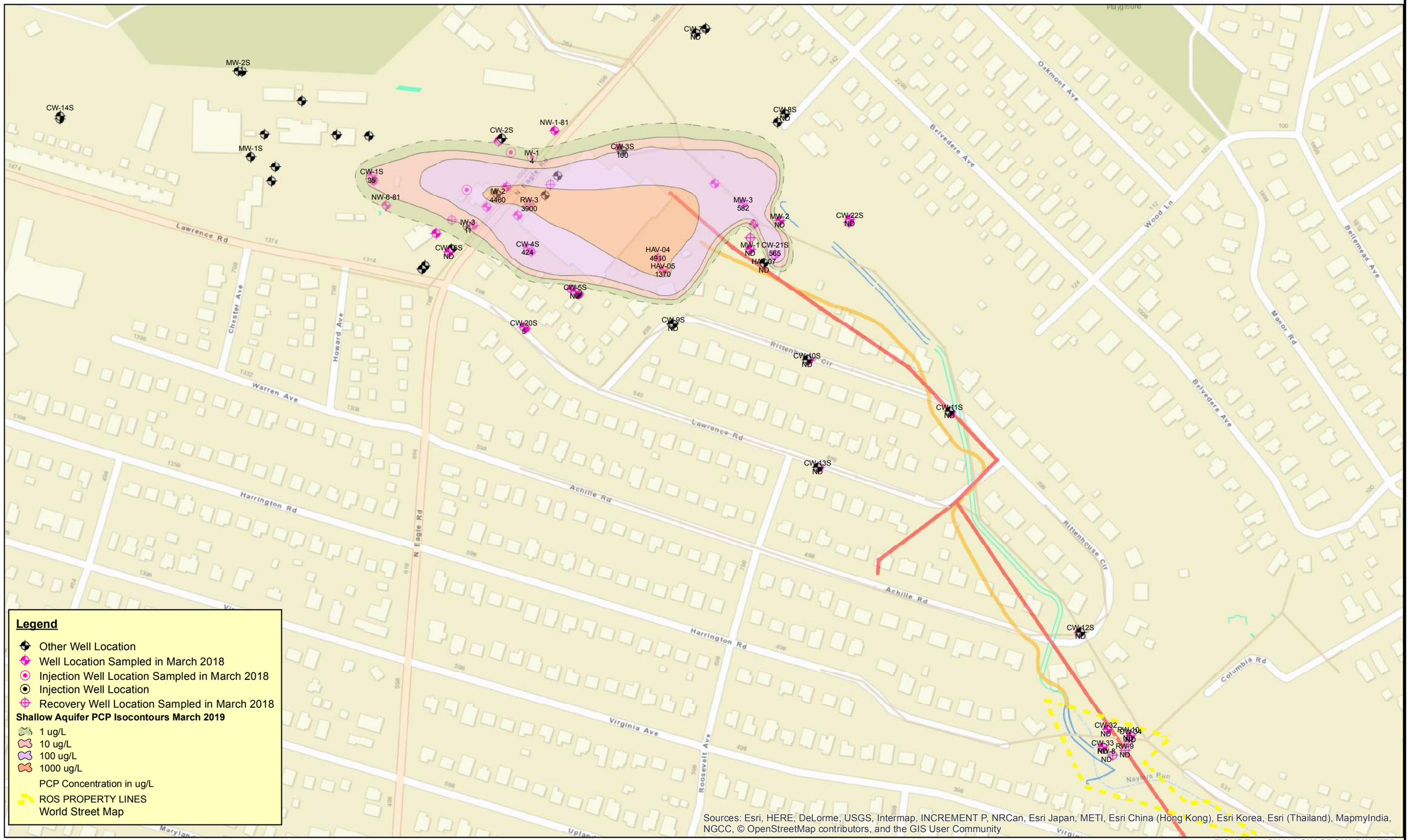
TABLE 6
COMPARISON OF GROUNDWATER REMEDIATION GOALS TO SAMPLING RESULTS OF ROS WELLS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	Remediation	HAV-LTR-CW34																						HAV-LTR-MW1I	HAV-LTR-MW1S	HAV-LTR-MW2I	HAV-LTR-MW2S
Sample Date:	Goals for	10-May	10-Dec	3/19/2012	9/24/2012	12/17/2012	3/19/2013	6/12/2013	1/27/2014	4/29/2014	6/30/2014	12/30/2014	4/20/2015	7/1/2015	3/21/2016	9/14/2016	12/21/2016	3/20/2017	6/14/2017	9/11/2017	3/19/2018	3/18/2019	9/14/2016	9/14/2016	9/14/2016	9/14/2016
	Groundwater																										
INORGANICS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aluminum	200	NA	NA	156 J	NA	NA	200 U	NA	NA	34	NA	NA	31 J	NA	NA	55 J	NA	682	NA	NA	2,130	190	1700	2700	89 U	89 U
Arsenic	10	NA	NA	10 U	NA	NA	10 U	NA	NA	3 U	NA	NA	3 U	NA	NA	3 U	NA	ND	NA	NA	0.72 U	3.3 U	4.5	1.6 J	3 U	8.9
Barium	2000	NA	NA	108 J	NA	NA	200 UJ	NA	NA	94	NA	NA	NA	NA	NA	110	NA	122	NA	NA	155	140	28	69	37	140
Iron	300	NA	NA	248	NA	NA	115 J	NA	NA	94	NA	NA	45 J	NA	NA	77	NA	1020	NA	NA	2,520	310	360	260	56 J	20400
Manganese	50	NA	NA	526	NA	NA	217	NA	NA	58	NA	NA	45	NA	NA	110	NA	368	NA	NA	885	150	950	880	210	660
Vanadium	3.1	NA	NA	50 U	NA	NA	50 U	NA	NA	0.75	NA	NA	NA	NA	NA	1.3 J	NA	1.9	NA	NA	5.3	2.2 U	1.4 J	1.3 J	0.83 J	1 J
SEMIVOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
2-Methyl-4,6-dinitrophenol	1.7	10 U	10 U	9.8 U	10 U	10 U	10 U	10 U	7.8 U	7.5 U	7.4 U	8.1 U	7.9 U	7.7 U	6.4 U	5.7 U	NA	ND	NA	15 U	5 U	6.1 U	NA	NA	NA	NA
2-Methylnaphthalene	2	5 U	5 U	4.9 U	5 U	5 U	5 U	5 U	1.9 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.6 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U	NA	NA	NA	NA
Benzo(a)pyrene	0.2	5 U	5 U	4.9 U	5 U	5 U	5 U	5 U	1.5 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.6 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	6	5 U	5 B	4.9 U	5 U	5 U	5 U	5 U	2.9 U	2.8 U	2.8 U	3 U	3 U	2.9 U	0.53 J	2.8 U	NA	ND	NA	5 U	2 U	0.91 J	NA	NA	NA	NA
Dibenzofuran	4	5 U	5 U	4.9 U	5 U	5 U	5 U	5 U	2.9 U	2.8 U	2.8 U	3 U	3 U	2.9 U	3.2 U	2.8 U	NA	ND	NA	1 U	0.5 U	3 U	NA	NA	NA	NA
Naphthalene	3	5 U	5 U	4.9 U	5 U	5 U	5 U	5 U	1.5 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.6 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U	NA	NA	NA	NA
Pentachlorophenol	1	10 U	3 J	9.8 UJ	10 U	10 U	10 U	10 U	15.5 U	15 U	14.8 U	16.2 U	15.8 U	15.5 U	6.4 U	5.7 U	NA	ND	NA	5 U	1 U	6.1 U	NA	NA	NA	NA
Phenanthrene	41	5 U	5 U	4.9 U	5 U	5 U	5 U	5 U	1.5 U	1.4 U	1.4 U	1.5 U	1.5 U	1.4 U	1.6 U	1.4 U	NA	ND	NA	0.5 U	0.1 U	1.5 U	NA	NA	NA	NA
VOLATILES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Benzene	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U	NA	NA	NA	NA
Ethylbenzene	700	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U	NA	NA	NA	NA
Toluene	1000	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.2 J	1 U	NA	NA	NA	NA
Trichloroethene	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U	NA	NA	NA	NA
Vinyl Chloride	5	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	ND	NA	0.5 U	0.1 U	1 U	NA	NA	NA	NA
HERBICIDES	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Pentachlorophenol	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.098 J	NA	0.088	NA	0.11	0.084	6.1 U	NA	NA	NA	NA
PESTICIDES	µg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dieldrin	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.32	0.25	0.24	NA	0.37	NA	NA	NA	NA

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
B - Detection in the Blank
U - Not Detected Above Laboratory Quantitation L
5.5 - Exceeds Remediation Goal for GW

FIGURES

1 Site Location Map
2 Wells Sampled in March 2018
3 Shallow Groundwater Contours, June 2018
4 Deep Groundwater Contours, June 2018
5 Shallow Overburden PCP Plume Map, March 2018
6 Deep Bedrock PCP Plume Map, March 2018
7 Source Area PCP Concentration Graph - Injection Wells and Surrounding Wells (2011 - 2018)
8 Source Area PCP Concentration Graph - Recovery Wells and PCG/YMCA Wells (2011 - 2018)
9 PCP Concentration Graph - Collection Trench Area Wells (2011 - 2018)
10 PCP Concentration Graph - Plume Perimeter Wells (2011 - 2018)
11 PCP Concentration Graph - Injection Wells (2011 - 2018)
12 Site conceptual model- site plan 2018
13 Cross-section A-A’
14 Cross-section B-B’
15 Cross-section C-C



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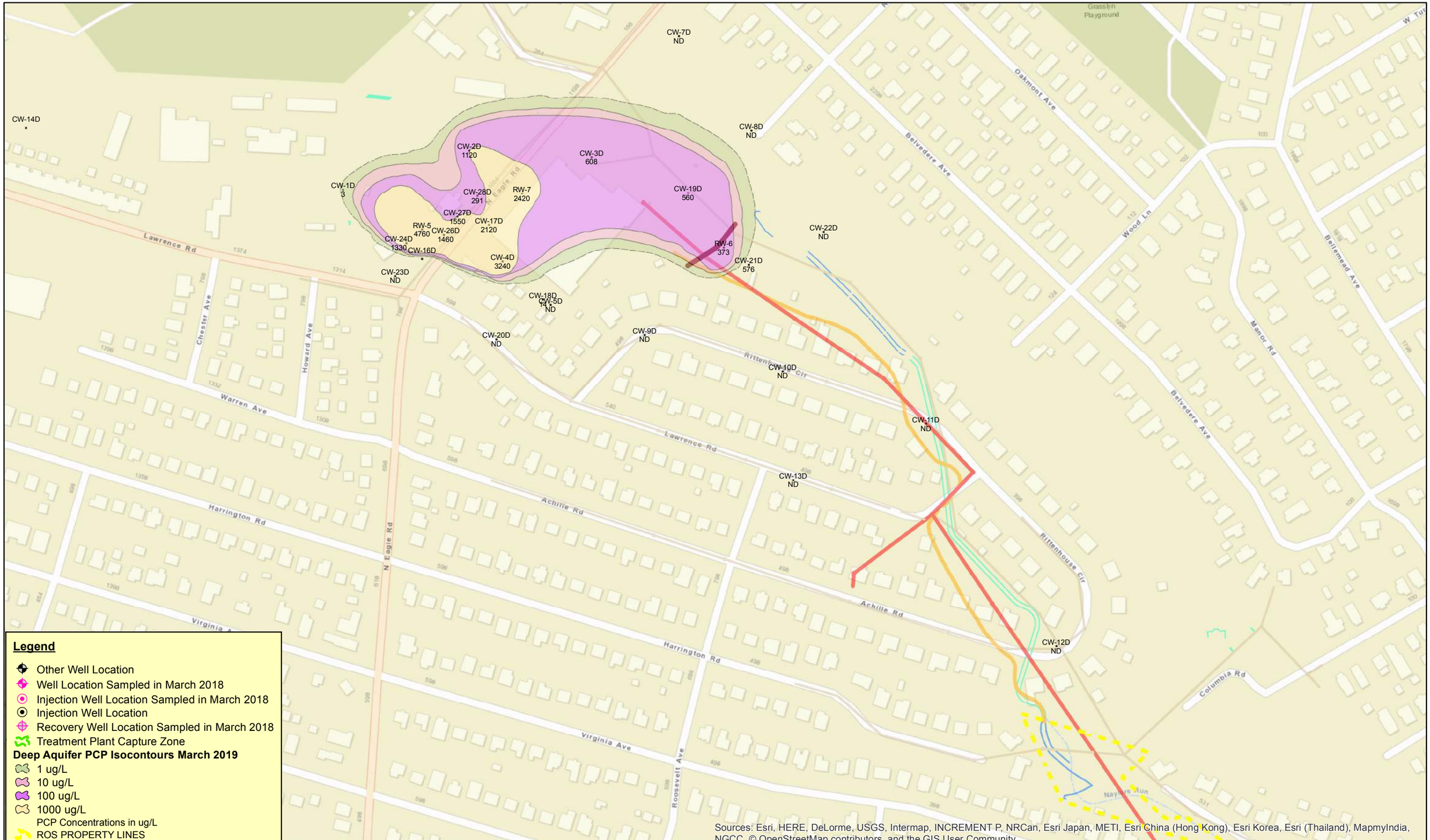
0 55 110 220 330 440 Feet

N W E S

FIGURE 5 - SHALLOW GROUNDWATER PCP ISOCONTOURS MARCH 2019
HAVERTWON PCP SUPERFUND SITE
DELAWARE COUNTY
HAVERTOWN, PENNSYLVANIA

S:\03-Projects\Federal\EPA R3 RAC Assignments\Havertown\103\S3930- PADEP thru IRRSC-7\Deliverables\Annual GW Monitoring Report 2018-2019\Figures\Figure 5 - Shallow Overburden PCP Plume Map March 2019.mxd



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0 55 110 220 330 440 Feet

N W E S

FIGURE 6 - DEEP GROUNDWATER PCP ISOCONTOURS MARCH 2019
HAVERTWON PCP SUPERFUND SITE
DELAWARE COUNTY
HAVERTOWN, PENNSYLVANIA

S:\03-Projects\Federal\EPA R3 RAC Assignments\Havertown\103\S3930- PADEP thru IRRSC-7\Deliverables\Annual GW Monitoring Report 2018-2019\Figures\Figure 6 - Deep Bedrock PCP Plume Map March 2019.mxd

Figure 7
Source Area PCP Concentration Graph - Injection and Surrounding Wells
2011 - 2019

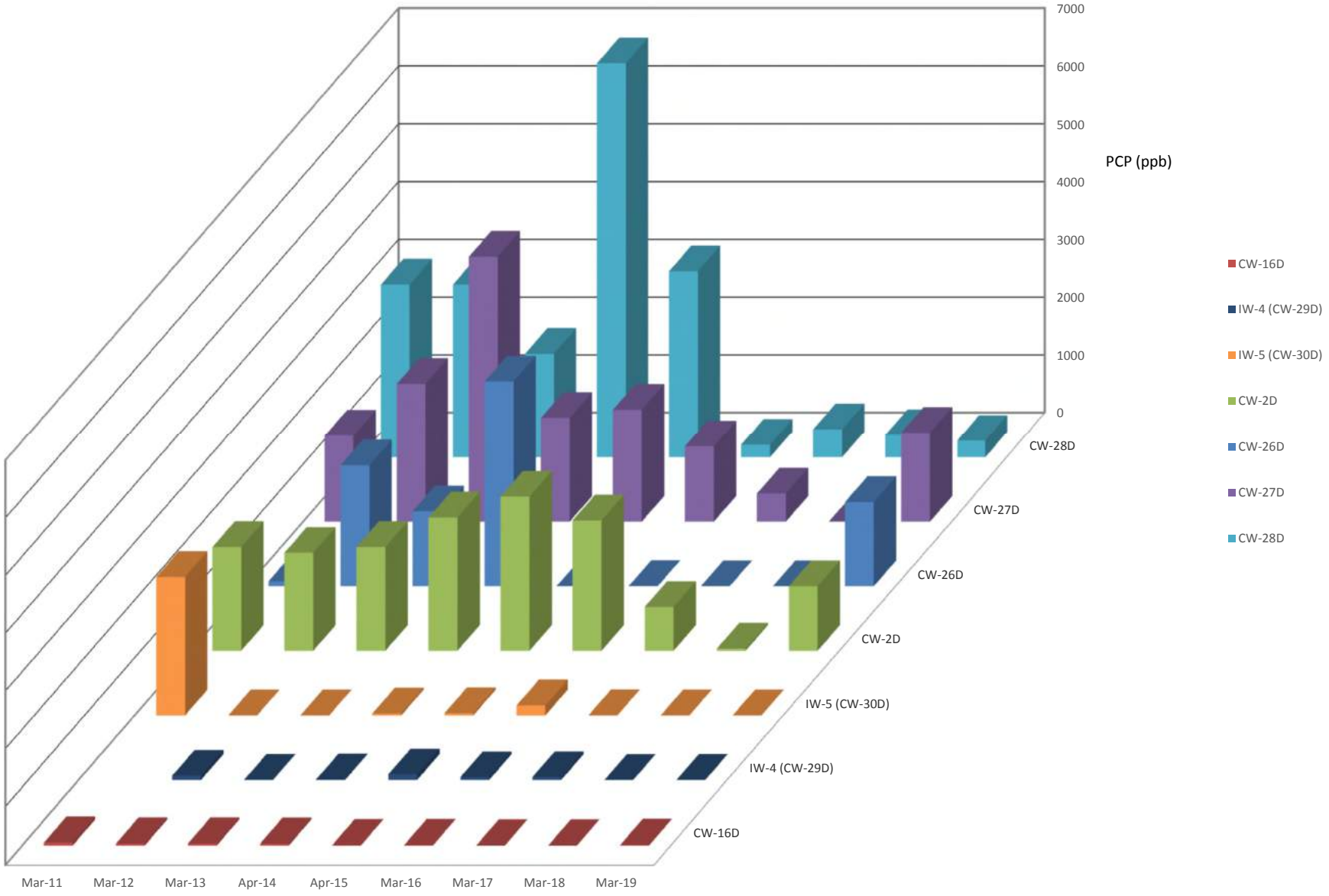


Figure 8

Source Area PCP Concentration - Recovery Wells and YMCA Wells

2011 - 2019

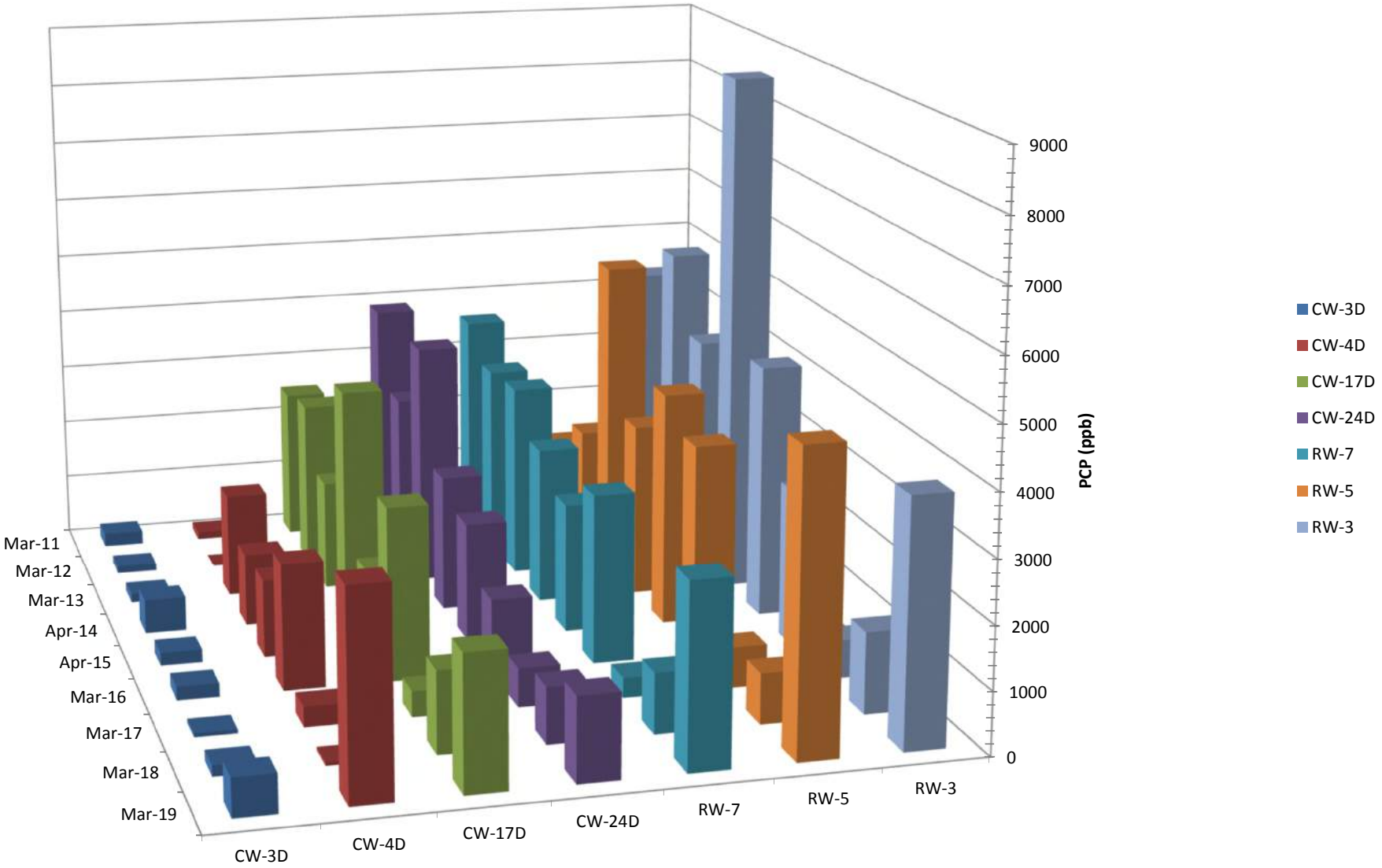


Figure 9
PCP Concentration Graph - Collection Trench Area Wells
2011 - 2019

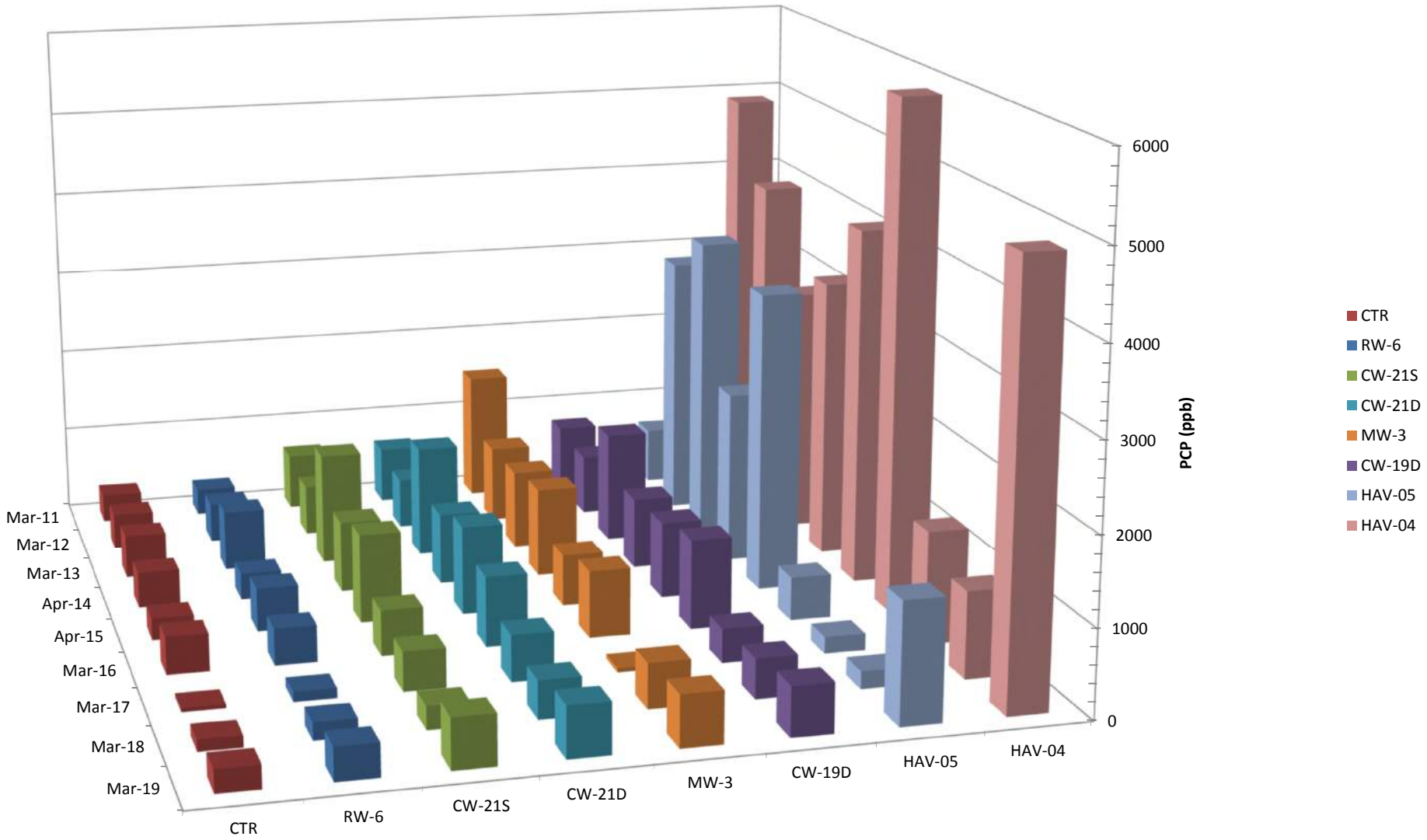


Figure 10
PCP Concentration Graph - Plume Perimeter Wells
2011 - 2019

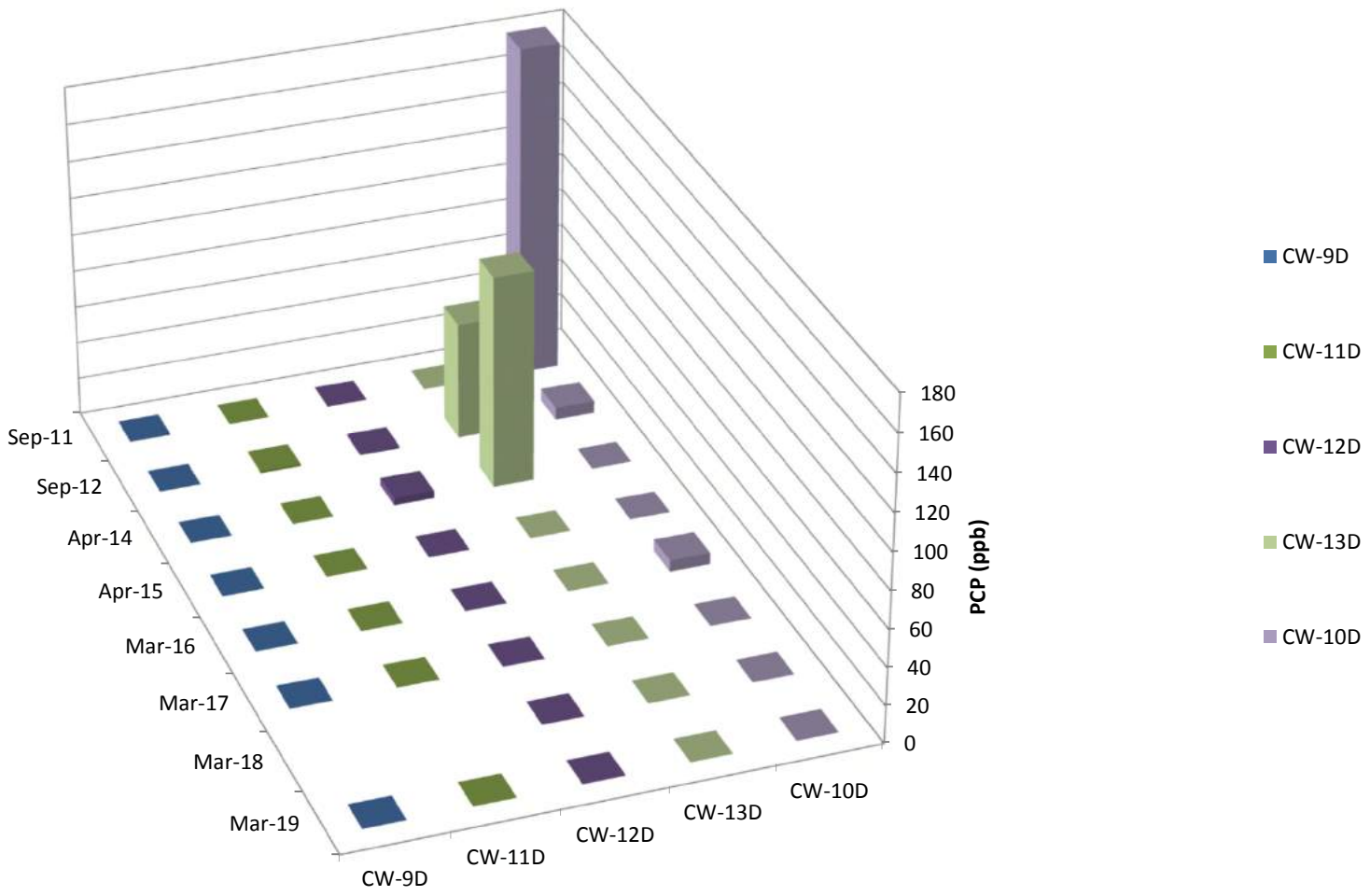
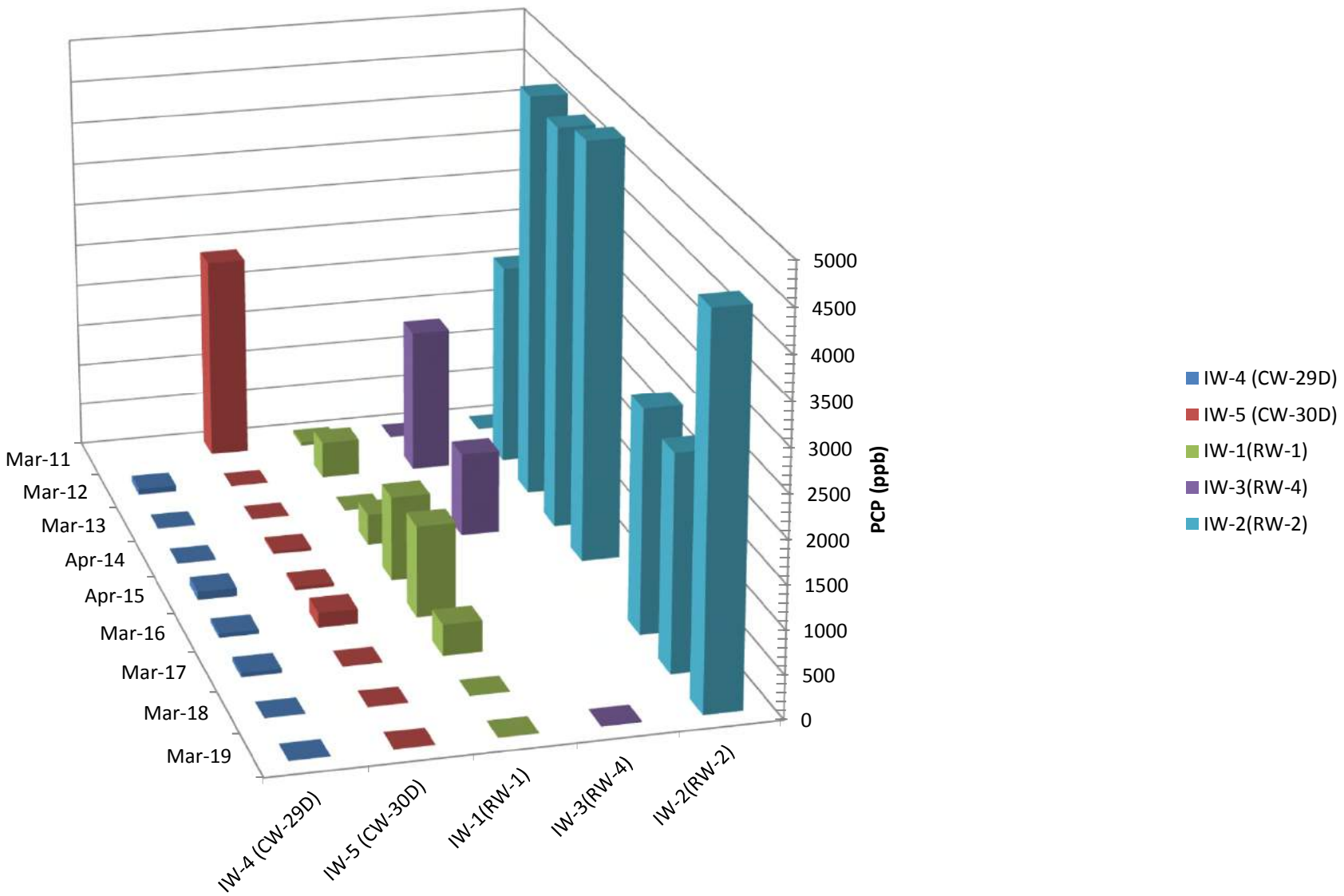
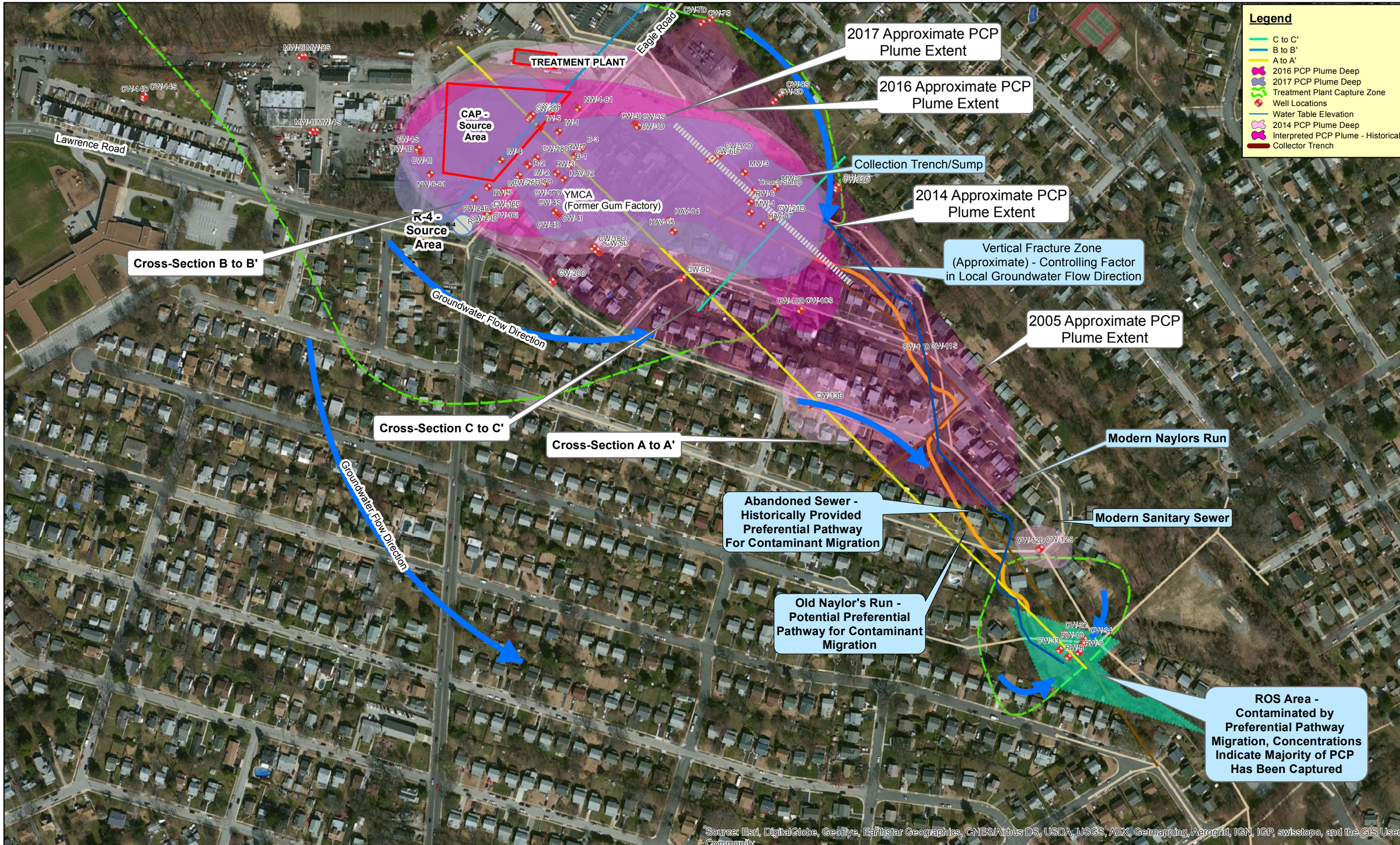


Figure 11
PCP Concentration Graph - Injection Wells
2011 - 2019





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EPA United States Environmental Protection Agency

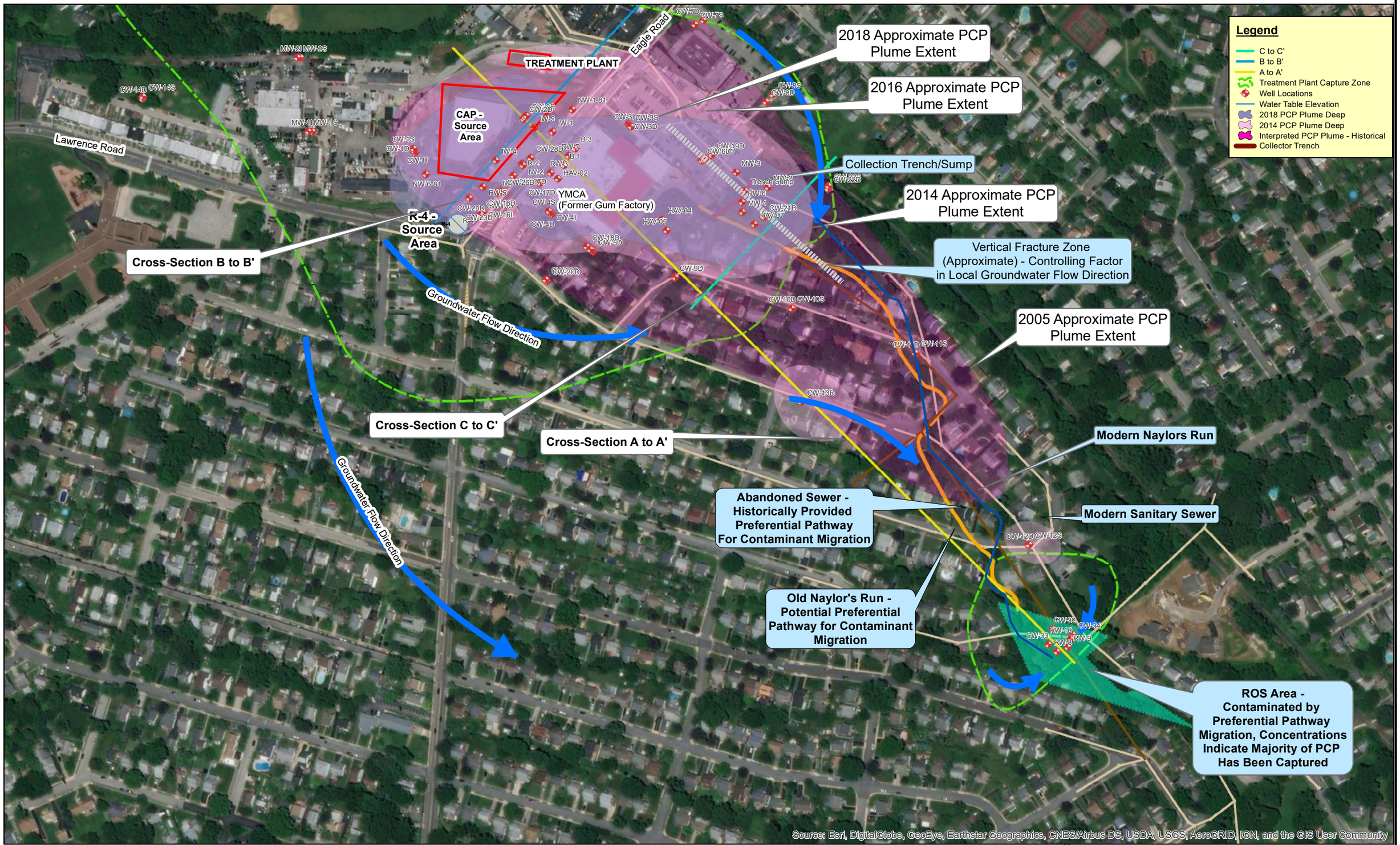
"...to protect human health and to safeguard the natural environment..."

0 70 140 280 420 560 Feet

N W E S

Figure 12 - Conceptual Site Model 2017
Current Site Conditions
Havertown PCP site

S:\03-Projects\Federal\EPA R3 RAC Assignments\Havertown\103\S3930- PADEP thru IRRSC-7\Deliverables\Annual GW Monitoring Report 2016-2017\Figures\Figure 12 CSM Update march 2017.mxd



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0 70 140 280 420 560 Feet

N W E S

Figure 12 - Conceptual Site Model 2018
Current Site Conditions
Havertown PCP site

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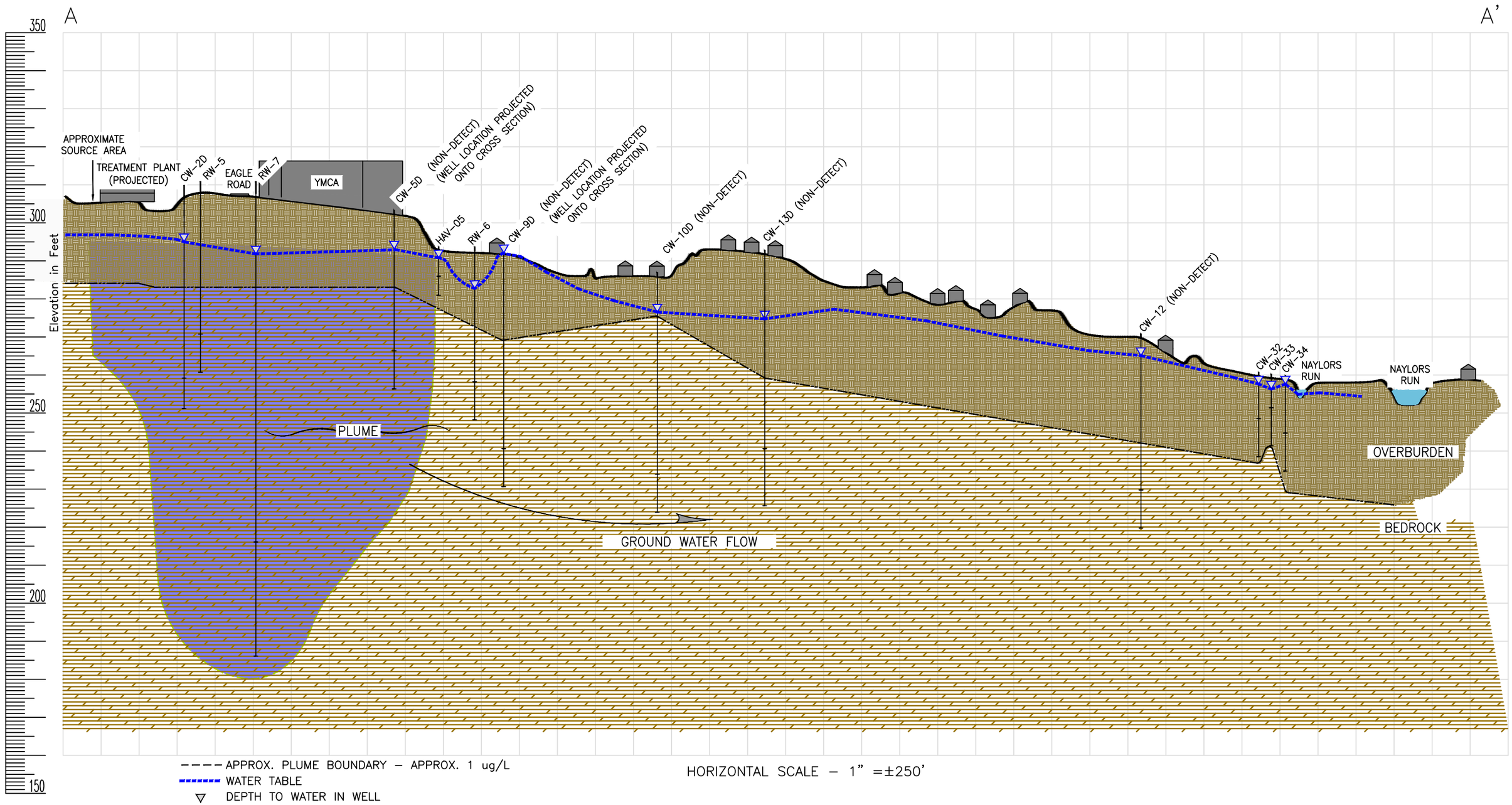
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

FIGURE 13

CONCEPTUAL MODEL CROSS SECTION A–A'

DATA USED – 6/12/18 (SYSTEM OFF)



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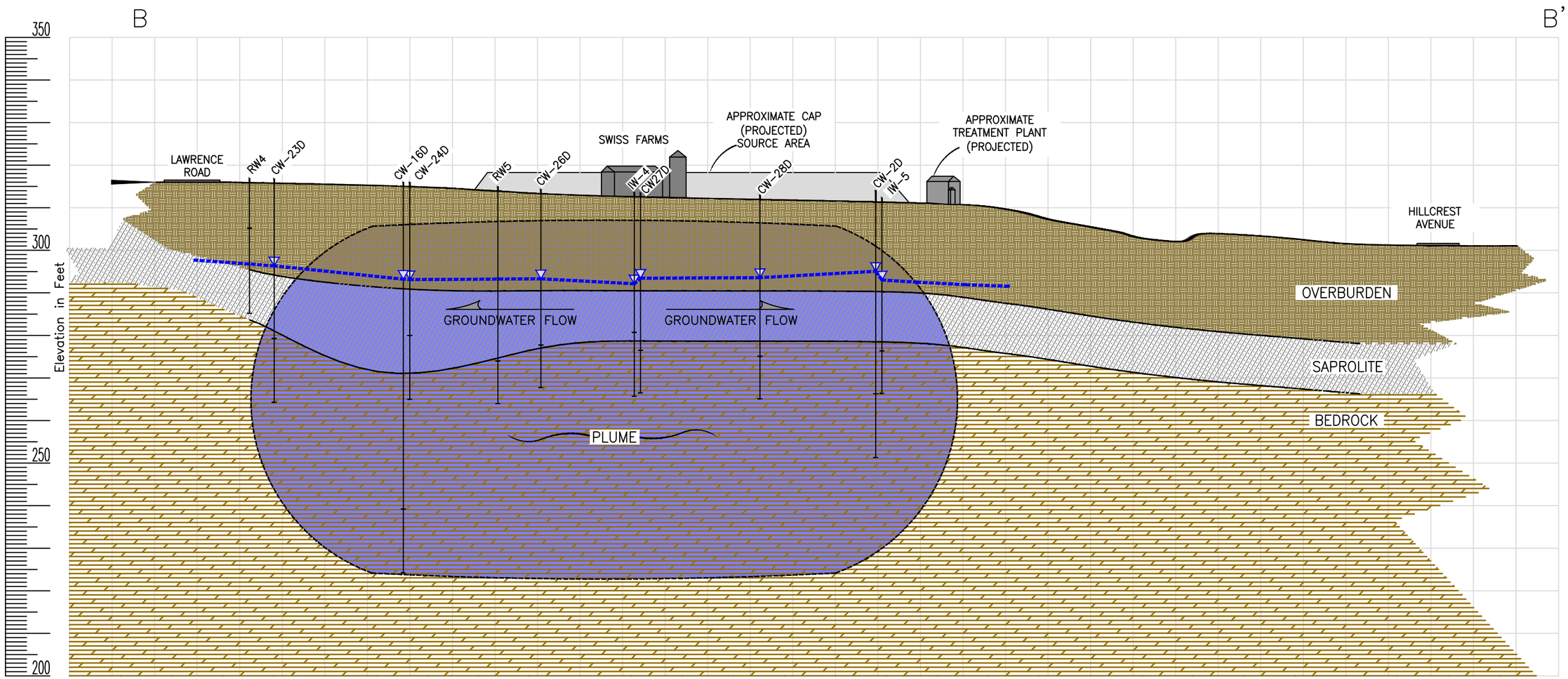
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

FIGURE 14

CONCEPTUAL MODEL CROSS SECTION B–B'

DATA USED – 6/12/18 (SYSTEM OFF)



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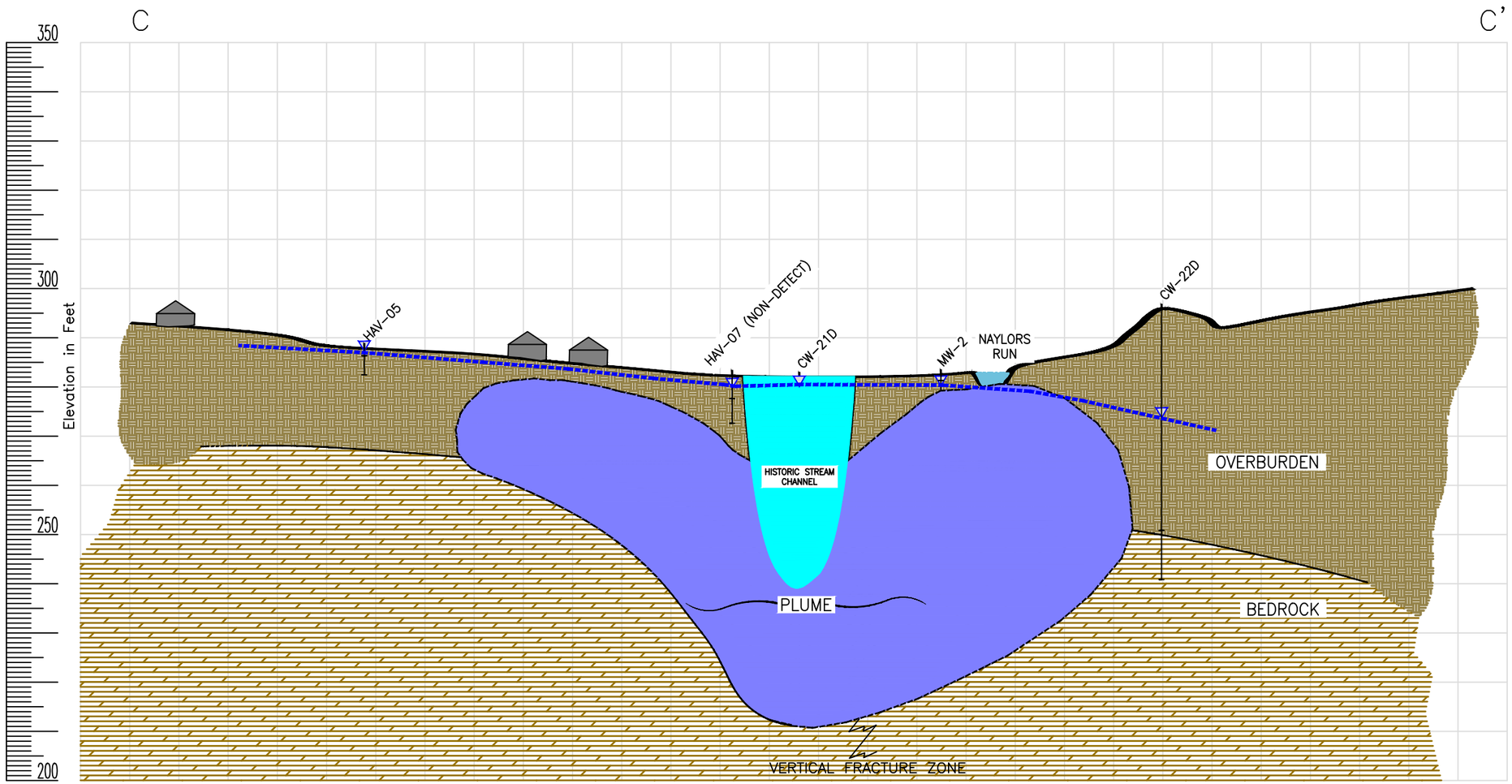
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

FIGURE 15

CONCEPTUAL MODEL CROSS SECTION C–C'

DATA USED – 6/27/18 (SYSTEM ON)



------- APPROX. PLUME BOUNDARY

- - - - - - WATER TABLE

HORIZONTAL SCALE – 1" =±65'

SECONDARY GROUNDWATER FLOW DIRECTION;
PRIMARY GROUNWATER FLOW DIRECTION
PERPENDICULAR TO B–B' CROSS SECTION.

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APPENDIX A

ANALYTICAL DATA

A-1 SEPTEMBER 2017 GROUNDWATER DATA

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CTR**		**HAV-LTR-CW10D**		**HAV-LTR-CW11D**		**HAV-LTR-CW12D**		**HAV-LTR-CW13D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-RW05**	
Sample Date:	**Goals for**	**9/11/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/12/2018**		**9/12/2018**	
Duplicate of:	**Groundwater**																				
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa		7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene		1	U	1	U	0.34	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane		320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone		10	U	7.3	J	3.2	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	5	0.24	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**8.2**	
Bromochloromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide		1	U	0.31	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloromethane		1	U	0.55	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene		0.45	J	3.4		1	U	2.9		6.3		1	U	1	U	1	U	0.38	J	8.4	
cis-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.74	J
Dichlorodifluoromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	11.1	

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CTR**		**HAV-LTR-CW10D**		**HAV-LTR-CW11D**		**HAV-LTR-CW12D**		**HAV-LTR-CW13D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-RW05**	
Sample Date:	**Goals for**	**9/11/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/12/2018**		**9/12/2018**	
Duplicate of:	**Groundwater**																				
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
Freon 113		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	3.3	
Methyl acetate		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.42	J
Methylene Chloride		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene		2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	7.1	
o-Xylene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	15.6	
Styrene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	2.1	
Total Xylenes		3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	22.7	
trans-1,2-Dichloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	2.1		1	U	1	U	4.9		1	U	1	U	1	U	1	U	**6.8**	
Trichlorofluoromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.65	J
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
1,4-Dioxane		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2,3,4,6-Tetrachlorophenol		7.3		3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	2.1	J	133	
2,4,5-Trichlorophenol		1.9	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	15.6	
2,4,6-Trichlorophenol		1.2	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	4.7	
2,4-Dichlorophenol		0.35	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	0.5	J
2,4-Dimethylphenol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2,4-Dinitrophenol		6.1	U	6.1	U	5.9	U	5.8	U	6.3	U	5.7	U	6.3	U	6.3	U	6.3	U	5.8	U
2,4-Dinitrotoluene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2,6-Dinitrotoluene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2-Chloronaphthalene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2-Chlorophenol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	5.9	U	5.8	U	6.3	U	5.7	U	6.3	U	6.3	U	6.3	U	5.8	U
2-Methylnaphthalene	2	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	**10**	
2-Nitroaniline		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
2-Nitrophenol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
3,3-Dichlorobenzidine		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
3-Nitroaniline		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
4-Bromophenyl-phenylether		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CTR**		**HAV-LTR-CW10D**		**HAV-LTR-CW11D**		**HAV-LTR-CW12D**		**HAV-LTR-CW13D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-RW05**	
Sample Date:	**Goals for**	**9/11/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/12/2018**		**9/12/2018**	
Duplicate of:	**Groundwater**																				
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
4-Chloro-3-methylphenol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	0.3	J
4-Chloroaniline		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
4-Chlorophenyl-phenylethe		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
4-Nitroaniline		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
4-Nitrophenol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Acenaphthene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	4.3	
Acenaphthylene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.1	J
Acetophenone		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Anthracene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	
Atrazine		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Benzaldehyde		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Benzo(a)anthracene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Benzo(b)fluoranthene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Benzo(g,h,i)perylene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Benzo(k)fluoranthene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Biphenyl		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	13	
bis(2-Chloroethoxy)methan		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	0.25	J
bis(2-Chloroethyl)ether		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
bis(2-Chloroisopropyl)eth		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
bis(2-Ethylhexyl)phthalat	6	3.1	U	3	U	0.63	J	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	0.63	J	2.9	U
Butylbenzylphthalate		1.3	J	3	U	2.9	U	1.3	J	1.4	J	2.9	U	1.4	J	3.1	U	1.4	J	2.9	U
Caprolactam		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Carbazole		0.12	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Chrysene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Dibenzo(a,h)anthracene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Dibenzofuran	4	0.4	J	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	4	
Diethylphthalate		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Dimethylphthalate		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Di-n-Butylphthalate		3.1	U	0.18	J	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	0.18	J	0.26	J	2.9	U
Di-n-Octylphthalate		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Fluoranthene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U
Fluorene		0.96	J	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	9.2	
Hexachlorobenzene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Hexachlorobutadiene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Hexachlorocyclopentadiene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Hexachloroethane		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
Indeno(1,2,3-cd)pyrene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	1.5	U

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CTR**		**HAV-LTR-CW10D**		**HAV-LTR-CW11D**		**HAV-LTR-CW12D**		**HAV-LTR-CW13D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-RW05**	
Sample Date:	**Goals for**	**9/11/2018**		**9/12/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/11/2018**		**9/12/2018**		**9/12/2018**	
Duplicate of:	**Groundwater**																				
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
Isophorone		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
mp-Cresol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	0.75	J
Naphthalene	3	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	**50.1**	
Nitrobenzene		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
N-Nitroso-di-n-propylamin		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
N-Nitrosodiphenylamine		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	2.9	U
o-Cresol		3.1	U	3	U	2.9	U	2.9	U	3.2	U	2.9	U	3.2	U	3.1	U	3.1	U	0.43	J
Pentachlorophenol	1	**194**		6.1	U	5.9	U	5.8	U	6.3	U	5.7	U	6.3	U	**4.4**	J	**27.8**		**3070**	
Phenanthrene	41	1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	9.8	
Phenol		8.2	U	8.1	U	7.8	U	7.8	U	8.4	U	7.6	U	8.4	U	8.3	U	8.3	U	7.8	U
Pyrene		1.5	U	1.5	U	1.5	U	1.5	U	1.6	U	1.4	U	1.6	U	1.6	U	1.6	U	0.42	J

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-DUP01**		**HAV-LTR-RW06**		**HAV-LTR-RW07**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**9/12/2018**		**9/11/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**	**HAV-LTR-RW05**									
		Result		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane		1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane		1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane		1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane		1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene		1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa		7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane		1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane		1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane		1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U
1,4-Dioxane		320	U	320	U	320	U	320	U	320	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK		5	U	5	U	5	U	5	U	5	U
Acetone		10	U	10	U	7.3	J	3.2	J	10	U
Benzene	5	**8.4**		0.84	J	0.55	J	1	U	1	U
Bromochloromethane		1	U	1	U	1	U	1	U	1	U
Bromodichloromethane		1	U	1	U	1	U	1	U	1	U
Bromoform		1	U	1	U	1	U	1	U	1	U
Bromomethane		1	U	1	U	1	U	1	U	1	U
Carbon Disulfide		1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride		1	U	1	U	1	U	1	U	1	U
Chlorobenzene		1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane		1	U	1	U	1	U	1	U	1	U
Chloroethane		1	U	1	U	1	U	1	U	1	U
Chloroform		1	U	1	U	1	U	1	U	1	U
Chloromethane		1	U	1	U	0.36	J	1	U	1	U
cis-1,2-Dichloroethene		8.8		2.6		2.2		1	U	1	U
cis-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U
Cyclohexane		0.85	J	1	U	1	U	1	U	1	U
Dichlorodifluoromethane		1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	11		1	U	1.6		1	U	1	U

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-DUP01**		**HAV-LTR-RW06**		**HAV-LTR-RW07**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**9/12/2018**		**9/11/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**	**HAV-LTR-RW05**									
		Result		**Result**		**Result**		**Result**		**Result**	
Freon 113		1	U	1	U	1	U	1	U	1	U
Isopropylbenzene		3.3		0.71	J	2.3		1	U	1	U
Methyl acetate		2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane		1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether		0.47	J	0.76	J	1	U	1	U	1	U
Methylene Chloride		1	U	1	U	1	U	1	U	1	U
mp-Xylene		6.9		2	U	1.5	J	2	U	2	U
o-Xylene		14.9		1	U	7.7		1	U	1	U
Styrene		1	U	1	U	1	U	1	U	1	U
Tetrachloroethene		1	U	1	U	1	U	1	U	1	U
Toluene	1000	2		1	U	0.54	J	1	U	1	U
Total Xylenes		21.9		3	U	9.1		3	U	3	U
trans-1,2-Dichloroethene		1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	**6.6**		0.91	J	1.4		1	U	1	U
Trichlorofluoromethane		1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	0.71	J	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**NA**	
1,2,4,5-Tetrachlorobenzen		2.9	U	3	U	2.9	U	3	U		
1,4-Dioxane		2.9	U	3	U	2.9	U	3	U		
2,3,4,6-Tetrachlorophenol		120		8.4		57.9		3	U		
2,4,5-Trichlorophenol		13.8		2.1	J	33.1		3	U		
2,4,6-Trichlorophenol		4.2		2.3	J	3.9		3	U		
2,4-Dichlorophenol		0.56	J	4.7		0.53	J	3	U		
2,4-Dimethylphenol		2.9	U	3	U	2.9	U	3	U		
2,4-Dinitrophenol		5.9	U	6.1	U	5.9	U	6.1	U		
2,4-Dinitrotoluene		2.9	U	3	U	2.9	U	3	U		
2,6-Dinitrotoluene		2.9	U	3	U	2.9	U	3	U		
2-Chloronaphthalene		2.9	U	3	U	2.9	U	3	U		
2-Chlorophenol		2.9	U	1.4	J	2.9	U	3	U		
2-Methyl-4,6-dinitropheno	1.7	5.9	U	6.1	U	5.9	U	6.1	U	NA	
2-Methylnaphthalene	2	**8.4**		1.5	U	0.41	J	1.5	U	NA	
2-Nitroaniline		2.9	U	3	U	2.9	U	3	U	NA	
2-Nitrophenol		2.9	U	3	U	2.9	U	3	U	NA	
3,3-Dichlorobenzidine		2.9	U	3	U	2.9	U	3	U	NA	
3-Nitroaniline		2.9	U	3	U	2.9	U	3	U	NA	
4-Bromophenyl-phenylether		2.9	U	3	U	2.9	U	3	U	NA	

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-DUP01**		**HAV-LTR-RW06**		**HAV-LTR-RW07**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**9/12/2018**		**9/11/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**	**HAV-LTR-RW05**									
		Result		**Result**		**Result**		**Result**		**Result**	
4-Chloro-3-methylphenol		2.9	U	3	U	2.9	U	3	U	NA	
4-Chloroaniline		2.9	U	3	U	2.9	U	3	U	NA	
4-Chlorophenyl-phenylethe		2.9	U	3	U	2.9	U	3	U	NA	
4-Nitroaniline		2.9	U	3	U	2.9	U	3	U	NA	
4-Nitrophenol		2.9	U	3	U	2.9	U	3	U	NA	
Acenaphthene		3.8		1.5	U	2		1.5	U	NA	
Acenaphthylene		0.93	J	1.5	U	0.53	J	1.5	U	NA	
Acetophenone		2.9	U	3	U	2.9	U	3	U	NA	
Anthracene		1.3	J	1.5	U	0.86	J	1.5	U	NA	
Atrazine		2.9	U	3	U	2.9	U	3	U	NA	
Benzaldehyde		2.9	U	3	U	2.9	U	3	U	NA	
Benzo(a)anthracene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.5	U	NA	
Benzo(b)fluoranthene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Benzo(g,h,i)perylene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Benzo(k)fluoranthene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Biphenyl		11.4		1.3	J	6.4		3	U	NA	
bis(2-Chloroethoxy)methan		2.9	U	3	U	2.9	U	3	U	NA	
bis(2-Chloroethyl)ether		2.9	U	3	U	2.9	U	3	U	NA	
bis(2-Chloroisopropyl)eth		2.9	U	3	U	2.9	U	3	U	NA	
bis(2-Ethylhexyl)phthalat	6	2.9	U	3	U	2.9	U	3	U	NA	
Butylbenzylphthalate		2.9	U	1.3	J	1.3	J	1.4	J	NA	
Caprolactam		2.9	U	3	U	2.9	U	3	U	NA	
Carbazole		0.56	J	0.28	J	0.61	J	3	U	NA	
Chrysene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Dibenzo(a,h)anthracene		1.5	U	1.5	U	1.5	U	1.5	U	NA	
Dibenzofuran	4	3.7		0.84	J	3.2		3	U	NA	
Diethylphthalate		2.9	U	3	U	2.9	U	3	U	NA	
Dimethylphthalate		2.9	U	3	U	2.9	U	3	U	NA	
Di-n-Butylphthalate		2.9	U	0.2	J	2.9	U	0.14	J	NA	
Di-n-Octylphthalate		2.9	U	3	U	2.9	U	3	U	NA	
Fluoranthene		0.34	J	1.5	U	1.5	U	1.5	U	NA	
Fluorene		8.2		2.1		9.3		1.5	U	NA	
Hexachlorobenzene		2.9	U	3	U	2.9	U	3	U	NA	
Hexachlorobutadiene		2.9	U	3	U	2.9	U	3	U	NA	
Hexachlorocyclopentadiene		2.9	U	3	U	2.9	U	3	U	NA	
Hexachloroethane		2.9	U	3	U	2.9	U	3	U	NA	
Indeno(1,2,3-cd)pyrene		1.5	U	1.5	U	1.5	U	1.5	U	NA	

SUMMARY OF SEPTEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-DUP01**		**HAV-LTR-RW06**		**HAV-LTR-RW07**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**9/12/2018**		**9/11/2018**		**9/12/2018**		**9/11/2018**		**9/11/2018**	
Duplicate of:	**Groundwater**	**HAV-LTR-RW05**									
		Result		**Result**		**Result**		**Result**		**Result**	
Isophorone		2.9	U	3	U	2.9	U	3	U	NA	
mp-Cresol		0.68	J	3	U	0.31	J	0.5	J	NA	
Naphthalene	3	**42.3**		1.5	U	**8.2**		1.5	U	NA	
Nitrobenzene		2.9	U	3	U	2.9	U	3	U	NA	
N-Nitroso-di-n-propylamin		2.9	U	3	U	2.9	U	3	U	NA	
N-Nitrosodiphenylamine		2.9	U	3	U	2.9	U	3	U	NA	
o-Cresol		0.39	J	3	U	2.9	U	3	U	NA	
Pentachlorophenol	1	**2350**		**572**		**2900**		6.1	U	NA	
Phenanthrene	41	8.7		1.5	U	6.4		1.5	U	NA	
Phenol		7.8	U	8.1	U	7.8	U	8.1	U		
Pyrene		0.41	J	1.5	U	0.36	J	1.5	U		

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Li
5.5 - Exceeds Remediation Goal for GW

A-2 DECEMBER 2017 GROUNDWATER DATA

SUMMARY OF DECEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-DUP01**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**		**12/13/2018**	
Duplicate of:	**Groundwater**									**HAV-LTR-MW02**					
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene		2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa		7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane		320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone		10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone		5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK		5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone		10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform		0.56	J	0.37	J	0.24	J	1	U	1	U	1	U	1	U
Chloromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF DECEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Cyclohexane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Freon 113		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl acetate		2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride		1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene		2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Xylenes		3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	1.2		1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane		1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**NA**	
1,2,4,5-Tetrachlorobenzen		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
1,4-Dioxane		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,3,4,6-Tetrachlorophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,4,5-Trichlorophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,4,6-Trichlorophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,4-Dichlorophenol		3.1	U	3	U	3	U	0.36	J	0.35	J	2.8	U	NA	
2,4-Dimethylphenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,4-Dinitrophenol		6.1	U	6.1	U	6.1	U	5.6	U	6.1	U	5.6	U	NA	
2,4-Dinitrotoluene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2,6-Dinitrotoluene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2-Chloronaphthalene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2-Chlorophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	6.1	U	5.6	U	6.1	U	5.6	U	NA	
2-Methylnaphthalene	2	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
2-Nitroaniline		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
2-Nitrophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
3,3-Dichlorobenzidine		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	

SUMMARY OF DECEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

3-Nitroaniline		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Bromophenyl-phenylether		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Chloro-3-methylphenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Chloroaniline		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Chlorophenyl-phenylethe		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Nitroaniline		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
4-Nitrophenol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Acenaphthene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Acenaphthylene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Acetophenone		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Anthracene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Atrazine		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Benzaldehyde		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Benzo(a)anthracene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Benzo(b)fluoranthene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Benzo(g,h,i)perylene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Benzo(k)fluoranthene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Biphenyl		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
bis(2-Chloroethoxy)methan		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
bis(2-Chloroethyl)ether		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
bis(2-Chloroisopropyl)eth		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
bis(2-Ethylhexyl)phthalat	6	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Butylbenzylphthalate		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Caprolactam		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Carbazole		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Chrysene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Dibenzo(a,h)anthracene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Dibenzofuran	4	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Diethylphthalate		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Dimethylphthalate		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Di-n-Butylphthalate		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Di-n-Octylphthalate		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Fluoranthene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Fluorene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Hexachlorobenzene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Hexachlorobutadiene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Hexachlorocyclopentadiene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Hexachloroethane		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	

SUMMARY OF DECEMBER 2018 QUARTERLY SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Indeno(1,2,3-cd)pyrene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Isophorone		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
mp-Cresol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Naphthalene	3	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Nitrobenzene		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
N-Nitroso-di-n-propylamin		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
N-Nitrosodiphenylamine		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
o-Cresol		3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	NA	
Pentachlorophenol	1	6.1	U	6.1	U	**1.8**	J	5.6	U	6.1	U	5.6	U	NA	
Phenanthrene	41	1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	
Phenol		8.2	U	8.1	U	8.1	U	7.5	U	8.1	U	7.5	U	NA	
Pyrene		1.5	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

A-3 MARCH 2018 GROUNDWATER DATA

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		ROS AREA WELLS															
Sample ID:	**Remediation**	**HAV-LTR-CW32**		**HAV-LTR-CW33**		**HAV-LTR-CW34**		**HAV-LTR-RW8**		**HAV-LTR-RW8X**		**HAV-LTR-RW9**		**HAV-LTR-RW10**		**HAV-LTR-CTR**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW8**							
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.07	J	0.053	J	0.19		0.089	U	0.089	U	0.032	J	0.089	U	0.089	U
Antimony, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U
Barium, Total	2	0.21		0.15		0.14		0.12		0.12		0.057		0.099		0.13	
Beryllium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	16		16.6		30.9		77.5		76.4		79.2		70.2		50.4	
Chromium, Total	-	0.0017	J	0.0022		0.0018	J	0.0012	J	0.0011	J	0.0017	J	0.0023		0.0016	J
Cobalt, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.046	
Copper, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0019	J	0.0056	U	0.0026	J	0.0041	J	0.002	J
Iron, Total	0.3	0.042	J	0.1		**0.31**		0.04	J	0.088		0.23		**0.56**		**3.9**	
Lead, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Magnesium, Total	-	10.7		11.4		15.2		19		18.6		18		16.9		21.3	
Manganese, Total	0.05	0.039		0.006		**0.15**		0.0044	J	0.004	J	**0.059**		**0.67**		**9**	
Nickel, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0057	
Potassium, Total	-	3.5		3.5		2.9		5.4		5.3		4.9		3.8		7	
Selenium, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	34		30.6		20.1		27		26.5		19.8		19.7		49.4	
Thallium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Vanadium, Total	0.0031	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Zinc, Total	-	0.0051	J	0.0063		0.0048	J	0.009		0.0084		0.036		0.0079		0.0079	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	**0.65**		**0.58**		**0.37**		**0.28**		**0.29**		**0.12**		**0.25**		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		ROS AREA WELLS															
Sample ID:	**Remediation**	**HAV-LTR-CW32**		**HAV-LTR-CW33**		**HAV-LTR-CW34**		**HAV-LTR-RW8**		**HAV-LTR-RW8X**		**HAV-LTR-RW9**		**HAV-LTR-RW10**		**HAV-LTR-CTR**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW8**							
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.82	J
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	0.41	J	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	1	U	1	U	0.39	J	1	U	1	U	1	U	1	U	1	U
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.58	J
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.8	J
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Xylenes	-	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		ROS AREA WELLS																	
Sample ID:	**Remediation**	**HAV-LTR-CW32**		**HAV-LTR-CW33**		**HAV-LTR-CW34**		**HAV-LTR-RW8**		**HAV-LTR-RW8X**		**HAV-LTR-RW9**		**HAV-LTR-RW10**		**HAV-LTR-CTR**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW8**							
Trichloroethene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
1,4-Dioxane	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2,3,4,6-Tetrachlorophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	12	
2,4,5-Trichlorophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	4.4	
2,4,6-Trichlorophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	1.4	J
2,4-Dichlorophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	0.49	J
2,4-Dimethylphenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2,4-Dinitrophenol	-	6.3	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
2,4-Dinitrotoluene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2,6-Dinitrotoluene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2-Chloronaphthalene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2-Chlorophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2-Methyl-4,6-dinitropheno	1.7	6.3	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
2-Methylnaphthalene	2	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
2-Nitroaniline	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
2-Nitrophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
3,3-Dichlorobenzidine	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
3-Nitroaniline	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Bromophenyl-phenylether	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Chloro-3-methylphenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Chloroaniline	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Chlorophenyl-phenylethe	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Nitroaniline	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
4-Nitrophenol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Acenaphthene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acenaphthylene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetophenone	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Anthracene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Atrazine	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Benzaldehyde	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Benzo(a)anthracene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	0.2	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(g,h,i)perylene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Biphenyl	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		ROS AREA WELLS															
Sample ID:	**Remediation**	**HAV-LTR-CW32**		**HAV-LTR-CW33**		**HAV-LTR-CW34**		**HAV-LTR-RW8**		**HAV-LTR-RW8X**		**HAV-LTR-RW9**		**HAV-LTR-RW10**		**HAV-LTR-CTR**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW8**							
bis(2-Chloroethoxy)methan	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
bis(2-Chloroethyl)ether	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
bis(2-Chloroisopropyl)eth	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
bis(2-Ethylhexyl)phthalat	6	3.2	U	3.1	U	0.91	J	3.1	U	3	U	3.1	U	3	U	3.1	U
Butylbenzylphthalate	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Caprolactam	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Carbazole	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	0.13	J
Chrysene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzofuran	4	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	0.64	J
Diethylphthalate	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Dimethylphthalate	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Di-n-Butylphthalate	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Di-n-Octylphthalate	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Fluoranthene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Fluorene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.3	J
Hexachlorobenzene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Hexachlorobutadiene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Hexachlorocyclopentadiene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Hexachloroethane	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Indeno(1,2,3-cd)pyrene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Isophorone	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
mp-Cresol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Naphthalene	3	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Nitrobenzene	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
N-Nitroso-di-n-propylamin	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
N-Nitrosodiphenylamine	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
o-Cresol	-	3.2	U	3.1	U	3	U	3.1	U	3	U	3.1	U	3	U	3.1	U
Pentachlorophenol	1	6.3	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	**260**	
Phenanthrene	41	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Phenol	-	8.4	U	8.2	U	8.1	U	8.2	U	8.1	U	8.2	U	8.1	U	8.2	U
Pyrene	-	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW10D**		**HAV-LTR-CW10S**		**HAV-LTR-CW11D**		**HAV-LTR-CW11S**		**HAV-LTR-CW12D**		**HAV-LTR-CW12S**		**HAV-LTR-CW13D**		**HAV-LTR-CW13S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**																
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	**1.6**		0.071	J	**0.54**		0.11		**0.38**		**0.38**		**1.2**		0.15	
Antimony, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.00098	J	0.00095	J	0.0022	U
Arsenic, Total	0.01	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0033	U
Barium, Total	2	0.14		0.17		0.11		0.23		0.094		0.23		0.095		0.22	
Beryllium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.00045	J	0.0011	U	0.00045	J	0.0016		0.00062	J	0.0072		0.0016		0.0017	
Calcium, Total	-	23.7		18.8		25.1		22.3		21.1		70.1		18.2		24	
Chromium, Total	-	0.0017	J	0.0013	J	0.0012	J	0.0012	J	0.0013	J	0.0017	J	0.004		0.0017	J
Cobalt, Total	-	0.0065		0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.005	J	0.0056	U	0.0056	U
Copper, Total	-	0.014		0.0056	U	0.016		0.0077		0.0048	J	0.02		0.024		0.0079	
Iron, Total	0.3	0.22		0.088		0.15		0.17		**0.62**		**0.36**		**0.57**		0.14	
Lead, Total	-	0.0008	J	0.0022	U	0.0014	J	0.0022	U	0.0022	U	0.0091		0.0013	J	0.0022	U
Magnesium, Total	-	12.3		10.2		12.2		12.3		7.3		15.9		12		11.2	
Manganese, Total	0.05	**0.13**		0.0043	J	0.023		**0.49**		0.05		**0.36**		0.033		0.015	
Nickel, Total	-	0.0051	J	0.0056	U	0.02		0.0056	U	0.0021	J	0.0059		0.011		0.0039	J
Potassium, Total	-	5.3		4.3		4.7		4.7		4.8		14.2		6		5.4	
Selenium, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	24.2		28.6		24.9		46.3		29.9		923		25		65.8	
Thallium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0022		0.0019		0.0011	U
Vanadium, Total	0.0031	0.0008	J	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0017	J	0.0012	J	0.0022	U
Zinc, Total	-	0.024		0.0039	J	0.18		0.019		0.027		0.05		0.026		0.12	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW10D**		**HAV-LTR-CW10S**		**HAV-LTR-CW11D**		**HAV-LTR-CW11S**		**HAV-LTR-CW12D**		**HAV-LTR-CW12S**		**HAV-LTR-CW13D**		**HAV-LTR-CW13S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**																
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	-	1	U	1	U	0.29	J	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	0.42	J	0.41	J	0.39	J	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	0.24	J	0.36	J	1	U	1	U	1	U	1	U	0.44	J	1	U
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	0.96	J	1	U	1.4		1	U	3.7		1	U	4.5		1	U
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	3.4		1	U	1	U	1	U	1	U
Total Xylenes	-	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW10D**		**HAV-LTR-CW10S**		**HAV-LTR-CW11D**		**HAV-LTR-CW11S**		**HAV-LTR-CW12D**		**HAV-LTR-CW12S**		**HAV-LTR-CW13D**		**HAV-LTR-CW13S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**																		
Trichloroethene	5	0.48	J	1	U	0.77	J	1	U	1	U	1	U	4.1		1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
1,4-Dioxane	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,3,4,6-Tetrachlorophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,4,5-Trichlorophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,4,6-Trichlorophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,4-Dichlorophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,4-Dimethylphenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,4-Dinitrophenol	-	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
2,4-Dinitrotoluene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2,6-Dinitrotoluene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2-Chloronaphthalene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2-Chlorophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2-Methyl-4,6-dinitropheno	1.7	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
2-Methylnaphthalene	2	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
2-Nitroaniline	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
2-Nitrophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
3,3-Dichlorobenzidine	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
3-Nitroaniline	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Bromophenyl-phenylether	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Chloro-3-methylphenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Chloroaniline	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Chlorophenyl-phenylethe	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Nitroaniline	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
4-Nitrophenol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Acenaphthene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acenaphthylene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetophenone	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Anthracene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Atrazine	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Benzaldehyde	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Benzo(a)anthracene	-	1.5	U	1.5	U	1.5	U	0.33	J	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	**0.47**	J	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	1.5	U	1.5	U	1.5	U	0.57	J	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(g,h,i)perylene	-	1.5	U	1.5	U	1.5	U	0.38	J	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	1.5	U	1.5	U	1.5	U	0.47	J	1.5	U	1.5	U	1.5	U	1.5	U
Biphenyl	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW10D**		**HAV-LTR-CW10S**		**HAV-LTR-CW11D**		**HAV-LTR-CW11S**		**HAV-LTR-CW12D**		**HAV-LTR-CW12S**		**HAV-LTR-CW13D**		**HAV-LTR-CW13S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**																
bis(2-Chloroethoxy)methan	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
bis(2-Chloroethyl)ether	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
bis(2-Chloroisopropyl)eth	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
bis(2-Ethylhexyl)phthalat	6	1.9	J	0.23	J	3.1	U	0.62	J	3.1	U	3.1	U	0.37	J	3	U
Butylbenzylphthalate	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Caprolactam	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Carbazole	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Chrysene	-	1.5	U	1.5	U	1.5	U	0.66	J	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzofuran	4	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Diethylphthalate	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Dimethylphthalate	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Di-n-Butylphthalate	-	3.1	U	0.15	J	3.1	U	3	U	3.1	U	0.15	J	3	U	3	U
Di-n-Octylphthalate	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Fluoranthene	-	1.5	U	1.5	U	1.5	U	1.1	J	1.5	U	1.5	U	1.5	U	1.5	U
Fluorene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Hexachlorobenzene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Hexachlorobutadiene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Hexachlorocyclopentadiene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Hexachloroethane	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.5	U	1.5	U	0.4	J	1.5	U	1.5	U	1.5	U	1.5	U
Isophorone	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
mp-Cresol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Naphthalene	3	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Nitrobenzene	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
N-Nitroso-di-n-propylamin	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
N-Nitrosodiphenylamine	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
o-Cresol	-	3.1	U	3.1	U	3.1	U	3	U	3.1	U	3.1	U	3	U	3	U
Pentachlorophenol	1	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Phenanthrene	41	1.5	U	1.5	U	1.5	U	0.48	J	1.5	U	1.5	U	1.5	U	1.5	U
Phenol	-	8.2	U	8.2	U	8.2	U	8.1	U	8.2	U	8.2	U	8.1	U	8.1	U
Pyrene	-	1.5	U	1.5	U	1.5	U	0.88	J	1.5	U	1.5	U	1.5	U	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

																OTHER SITE WELLS			
Sample ID:	**Remediation**	**HAV-LTR-CW13X**		**HAV-LTR-CW16D**		**HAV-LTR-CW16S**		**HAV-LTR-CW17D**		**HAV-LTR-CW18D**		**HAV-LTR-CW19D**		**HAV-LTR-CW1D**		**HAV-LTR-CW1S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/20/2019**		**3/20/2019**		**3/22/2019**		**3/20/2019**		**3/22/2019**		**3/22/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**	**HAV-LTR-CW13D**															
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	**1**		0.11		0.044	J	0.089	U	0.14		0.089	U	0.065	J	0.057	J
Antimony, Total	-	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	0.0059	U	0.0033	U	0.0033	U	0.0023	J	0.0019	J	0.0033	U	0.0033	U	0.0033	U
Barium, Total	2	0.091		0.18		0.008		0.094		0.18		0.076		0.13		0.035	
Beryllium, Total	-	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0018	J	0.00056	J	0.0011	U	0.011		0.0011	U	0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	16.8		28.7		8.3		41.2		36.4		62.4		30.3		45	
Chromium, Total	-	0.0037	J	0.0038		0.0016	J	0.0012	J	0.0014	J	0.00075	J	0.0017	J	0.0012	J
Cobalt, Total	-	0.01	U	0.0065		0.0056	U	0.053		0.0029	J	0.0056	U	0.031		0.055	
Copper, Total	-	0.02		0.0025	J	0.0023	J	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Iron, Total	0.3	**0.5**		**8.9**		**1.7**		**2.1**		**21.7**		**26.1**		**57.6**		**15.7**	
Lead, Total	-	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0008	J	0.0022	U	0.0022	U	0.0022	U
Magnesium, Total	-	10.8		13.2		1.4		18.1		19.8		15.7		12.8		13.5	
Manganese, Total	0.05	0.031		**0.62**		**0.058**		**5.9**		**2.8**		**2.1**		**4.9**		**4.2**	
Nickel, Total	-	0.01		0.031		0.0056	U	0.042		0.0056	U	0.0056	U	0.0056	U	0.0056	U
Potassium, Total	-	5.8		6		1.3		8		10		8		5.2		4.7	
Selenium, Total	-	0.01	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	24.1		29.4		238		82.4		33.8		60		26.6		20.5	
Thallium, Total	-	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0012		0.0011	U
Vanadium, Total	0.0031	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.001	J	0.0022	U	0.0022	U	0.0022	U
Zinc, Total	-	0.026		0.023		0.0049	J	0.019		0.0086		0.0053	J	0.0096		0.011	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	0.66	J	2.4	
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

														OTHER SITE WELLS			
Sample ID:	**Remediation**	**HAV-LTR-CW13X**		**HAV-LTR-CW16D**		**HAV-LTR-CW16S**		**HAV-LTR-CW17D**		**HAV-LTR-CW18D**		**HAV-LTR-CW19D**		**HAV-LTR-CW1D**		**HAV-LTR-CW1S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/20/2019**		**3/20/2019**		**3/22/2019**		**3/20/2019**		**3/22/2019**		**3/22/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**	**HAV-LTR-CW13D**															
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	4.7	J	10	U	10	U	5.3	J	10	U	10	U	3.1	J	5.3	J
Benzene	5	1	U	1	U	0.23	J	**6.7**		1	U	0.66	J	1	U	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	0.41	J	0.24	J	1	U	0.43	J	1	U	1	U	1	U	1	U
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	4.1		0.41	J	1	U	3.2		0.51	J	4.6		16.7		256	
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	0.59	J	1	U	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	1	U	1	U	1.7		1	U	0.77	J	1	U	1	U
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	1	U	1.2		1	U	0.77	J
Methylene Chloride	-	1	U	1	U	1	U	1.3		1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	1	U	1	U	1	U	1	U	0.45	J	1	U	1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	0.39	J	1	U	1	U
Total Xylenes	-	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	5	
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

																OTHER SITE WELLS			
Sample ID:	**Remediation**	**HAV-LTR-CW13X**		**HAV-LTR-CW16D**		**HAV-LTR-CW16S**		**HAV-LTR-CW17D**		**HAV-LTR-CW18D**		**HAV-LTR-CW19D**		**HAV-LTR-CW1D**		**HAV-LTR-CW1S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/20/2019**		**3/20/2019**		**3/22/2019**		**3/20/2019**		**3/22/2019**		**3/22/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**	**HAV-LTR-CW13D**															
Trichloroethene	5	4.1		1	U	1	U	2.2		1	U	1	J	2		**233**	
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	2.7		**21.2**	
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
1,4-Dioxane	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2,3,4,6-Tetrachlorophenol	-	3	U	0.5	J	3	U	92.2		1.5	J	11.6		8.4		1.2	J
2,4,5-Trichlorophenol	-	3	U	3.1	U	3	U	8.9		3	U	4.2		3	U	3	U
2,4,6-Trichlorophenol	-	3	U	3.1	U	3	U	3.1	J	3	U	4		10.9		3	U
2,4-Dichlorophenol	-	3	U	3.1	U	3	U	0.61	J	3	U	0.7	J	1.9	J	3	U
2,4-Dimethylphenol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2,4-Dinitrophenol	-	6.1	U	6.1	U	6.1	U	6.6	U	6.1	U	6.2	U	6	U	6	U
2,4-Dinitrotoluene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2,6-Dinitrotoluene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2-Chloronaphthalene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2-Chlorophenol	-	3	U	3.1	U	3	U	0.5	J	3	U	3.1	U	3	U	3	U
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	6.1	U	6.6	U	6.1	U	6.2	U	6	U	6	U
2-Methylnaphthalene	2	1.5	U	1.5	U	**2.4**		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
2-Nitroaniline	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
2-Nitrophenol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
3,3-Dichlorobenzidine	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
3-Nitroaniline	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Bromophenyl-phenylether	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Chloro-3-methylphenol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Chloroaniline	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Chlorophenyl-phenylethe	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Nitroaniline	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
4-Nitrophenol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Acenaphthene	-	1.5	U	1.5	U	2		0.23	J	1.5	U	0.28	J	1.5	U	1.5	U
Acenaphthylene	-	1.5	U	1.5	U	0.36	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetophenone	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Anthracene	-	1.5	U	1.5	U	0.28	J	0.26	J	1.5	U	0.23	J	1.5	U	1.5	U
Atrazine	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Benzaldehyde	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Benzo(a)anthracene	-	1.5	U	1.5	U	0.29	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	**0.62**	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	1.5	U	1.5	U	2		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(g,h,i)perylene	-	1.5	U	1.5	U	0.79	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	1.5	U	1.5	U	0.53	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Biphenyl	-	3	U	3.1	U	0.6	J	8		3	U	2.4	J	3	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

																OTHER SITE WELLS			
Sample ID:	**Remediation**	**HAV-LTR-CW13X**		**HAV-LTR-CW16D**		**HAV-LTR-CW16S**		**HAV-LTR-CW17D**		**HAV-LTR-CW18D**		**HAV-LTR-CW19D**		**HAV-LTR-CW1D**		**HAV-LTR-CW1S**	
Sample Date:	**Goals for**	**3/18/2019**		**3/20/2019**		**3/20/2019**		**3/22/2019**		**3/20/2019**		**3/22/2019**		**3/22/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**	**HAV-LTR-CW13D**															
bis(2-Chloroethoxy)methan	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
bis(2-Chloroethyl)ether	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
bis(2-Chloroisopropyl)eth	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
bis(2-Ethylhexyl)phthalat	6	0.4	J	0.31	J	0.29	J	3.3	U	0.85	J	3.1	U	3	U	3	U
Butylbenzylphthalate	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Caprolactam	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Carbazole	-	3	U	3.1	U	0.18	J	1.1	J	3	U	0.23	J	3	U	3	U
Chrysene	-	1.5	U	1.5	U	1	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	1.5	U	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzofuran	4	3	U	3.1	U	0.74	J	2.9	J	3	U	1.2	J	0.17	J	0.17	J
Diethylphthalate	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Dimethylphthalate	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Di-n-Butylphthalate	-	3	U	3.1	U	3	U	0.22	J	3	U	0.15	J	3	U	3	U
Di-n-Octylphthalate	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Fluoranthene	-	1.5	U	1.5	U	2.4		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Fluorene	-	1.5	U	1.5	U	0.8	J	2.7		0.4	J	3.9		0.26	J	1.5	U
Hexachlorobenzene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Hexachlorobutadiene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Hexachlorocyclopentadiene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Hexachloroethane	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.5	U	0.86	J	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U
Isophorone	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
mp-Cresol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Naphthalene	3	1.5	U	1.5	U	**3.1**		0.2	J	1.5	U	1.5	U	1.5	U	1.5	U
Nitrobenzene	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
N-Nitroso-di-n-propylamin	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
N-Nitrosodiphenylamine	-	3	U	3.1	U	0.61	J	3.3	U	3	U	3.1	U	3	U	3	U
o-Cresol	-	3	U	3.1	U	3	U	3.3	U	3	U	3.1	U	3	U	3	U
Pentachlorophenol	1	6.1	U	**10.7**		6.1	U	**2120**		**14.2**		**560**		**3.1**	J	**35.4**	
Phenanthrene	41	1.5	U	1.5	U	0.65	J	6.1		0.2	J	1.5	U	1.5	U	1.5	U
Phenol	-	8.1	U	8.2	U	8.1	U	8.8	U	8.1	U	8.2	U	8	U	8	U
Pyrene	-	1.5	U	1.5	U	2.3		1.6	U	1.5	U	1.5	U	1.5	U	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW20D**		**HAV-LTR-CW20S**		**HAV-LTR-CW21D**		**HAV-LTR-CW21S**		**HAV-LTR-CW21X**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW23D**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/20/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-CW21D**							
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.19		0.098		0.13		**0.64**		0.098		**0.66**		0.097		**0.65**	
Antimony, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	0.0033	U	0.0019	J	0.0033	U	0.0033	U	0.0033	U	0.0033	U	0.0014	J	0.0017	J
Barium, Total	2	0.26		0.23		0.085		0.098		0.08		0.48		0.28		0.17	
Beryllium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.00065	J	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	21.3		18.8		46.8		46.3		48.8		29.8		20		61.5	
Chromium, Total	-	0.0014	J	0.0022	U	0.0013	J	0.003		0.0014	J	0.0058		0.0015	J	0.0038	
Cobalt, Total	-	0.0056	U	0.04		0.0056	U	0.0027	J	0.0056	U	0.0056	U	0.012		0.0056	U
Copper, Total	-	0.0056	U	0.002	J	0.0022	J	0.052		0.0041	J	0.004	J	0.0024	J	0.0094	
Iron, Total	0.3	**0.99**		**24.3**		**20.5**		**34.3**		**19.4**		**8.8**		**3**		**0.65**	
Lead, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0025		0.0022	U	0.00089	J	0.0022	U	0.0029	
Magnesium, Total	-	12		14.7		10.6		11		9.7		14.8		11.3		10.7	
Manganese, Total	0.05	0.0095		**5**		**1.3**		**1.5**		**1.1**		**0.063**		**0.51**		0.024	
Nickel, Total	-	0.012		0.0027	J	0.0029	J	0.0031	J	0.0056	U	0.0083		0.0056	J	0.0065	
Potassium, Total	-	5.7		5.8		7.5		7.9		6.8		5.1		3.9		6.4	
Selenium, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	21.3		72.7		32.3		32.5		31.4		60		48.3		405	
Thallium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Vanadium, Total	0.0031	0.00082	J	0.0022	U	0.0022	U	0.0021	J	0.0022	U	0.0017	J	0.0022	U	**0.0034**	
Zinc, Total	-	0.03		0.0096		0.006		0.017		0.015		0.035		0.012		0.6	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW20D**		**HAV-LTR-CW20S**		**HAV-LTR-CW21D**		**HAV-LTR-CW21S**		**HAV-LTR-CW21X**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW23D**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/20/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-CW21D**							
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	5.7	J
Benzene	5	1	U	1	U	2.3		2		2.4		1	U	1	U	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	1.2		1	U	1	U	1	U	1	U	0.49	J	0.27	J	1.7	
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1	U	1	U	2.3		1.8		2.3		1	U	1	U	1	U
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	0.6	J	1	U	0.61	J	1	U	1	U	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	0.51	J	2.8		2.7		2.7		1	U	1	U	1	U
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Xylenes	-	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW20D**		**HAV-LTR-CW20S**		**HAV-LTR-CW21D**		**HAV-LTR-CW21S**		**HAV-LTR-CW21X**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW23D**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/20/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-CW21D**							
Trichloroethene	5	1	U	1	U	1		0.82	J	1.1		1	U	1	U	1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
1,4-Dioxane	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2,3,4,6-Tetrachlorophenol	-	3.1	U	0.68	J	12.3		12.6		14.1		2.8	U	3	U	3	U
2,4,5-Trichlorophenol	-	3.1	U	3	U	4.6		4.4		4.1		2.8	U	3	U	3	U
2,4,6-Trichlorophenol	-	3.1	U	3	U	2.9	J	2.6	J	2.6	J	2.8	U	3	U	3	U
2,4-Dichlorophenol	-	3.1	U	3	U	0.62	J	0.58	J	0.63	J	2.8	U	3	U	3	U
2,4-Dimethylphenol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2,4-Dinitrophenol	-	6.2	U	6.1	U	6.1	U	5.6	U	6.1	U	5.7	U	6.1	U	6.1	U
2,4-Dinitrotoluene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2,6-Dinitrotoluene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2-Chloronaphthalene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2-Chlorophenol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2-Methyl-4,6-dinitropheno	1.7	6.2	U	6.1	U	6.1	U	5.6	U	6.1	U	5.7	U	6.1	U	6.1	U
2-Methylnaphthalene	2	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	1.5	U
2-Nitroaniline	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
2-Nitrophenol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
3,3-Dichlorobenzidine	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
3-Nitroaniline	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
4-Bromophenyl-phenylether	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
4-Chloro-3-methylphenol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
4-Chloroaniline	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
4-Chlorophenyl-phenylethe	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
4-Nitroaniline	-	3.1	U	3	U	0.51	J	2.8	U	3	U	2.8	U	3	U	3	U
4-Nitrophenol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Acenaphthene	-	1.6	U	0.97	J	0.51	J	0.19	J	0.48	J	1.4	U	1.5	U	1.5	U
Acenaphthylene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	1.5	U
Acetophenone	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Anthracene	-	1.6	U	0.92	J	0.3	J	0.31	J	0.29	J	1.4	U	1.5	U	0.16	J
Atrazine	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Benzaldehyde	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Benzo(a)anthracene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	0.77	J
Benzo(a)pyrene	0.2	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	**2.1**	
Benzo(b)fluoranthene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	5.4	
Benzo(g,h,i)perylene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	2.6	
Benzo(k)fluoranthene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	1.8	
Biphenyl	-	3.1	U	1.1	J	3.2		3		3.2		2.8	U	3	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW20D**		**HAV-LTR-CW20S**		**HAV-LTR-CW21D**		**HAV-LTR-CW21S**		**HAV-LTR-CW21X**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW23D**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/20/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-CW21D**							
bis(2-Chloroethoxy)methan	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
bis(2-Chloroethyl)ether	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
bis(2-Chloroisopropyl)eth	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
bis(2-Ethylhexyl)phthalat	6	2	J	3	U	3	U	2.8	U	3	U	2.8	U	3	U	0.31	J
Butylbenzylphthalate	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Caprolactam	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	0.35	J
Carbazole	-	3.1	U	3	U	0.3	J	0.31	J	0.34	J	2.8	U	3	U	1.3	J
Chrysene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	3.6	
Dibenzo(a,h)anthracene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	0.41	J
Dibenzofuran	4	3.1	U	0.91	J	1.4	J	1.5	J	1.4	J	2.8	U	3	U	0.25	J
Diethylphthalate	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Dimethylphthalate	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Di-n-Butylphthalate	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Di-n-Octylphthalate	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Fluoranthene	-	1.6	U	0.54	J	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	7.6	
Fluorene	-	1.6	U	2.8		4		4.1		4.1		1.4	U	1.5	U	0.25	J
Hexachlorobenzene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Hexachlorobutadiene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Hexachlorocyclopentadiene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Hexachloroethane	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Indeno(1,2,3-cd)pyrene	-	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	2.6	
Isophorone	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
mp-Cresol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	0.2	J
Naphthalene	3	1.6	U	0.22	J	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	1.5	U
Nitrobenzene	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
N-Nitroso-di-n-propylamin	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
N-Nitrosodiphenylamine	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
o-Cresol	-	3.1	U	3	U	3	U	2.8	U	3	U	2.8	U	3	U	3	U
Pentachlorophenol	1	6.2	U	**5**	J	**576**		**565**		**486**		5.7	U	6.1	U	6.1	U
Phenanthrene	41	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	4.2	
Phenol	-	8.3	U	8.1	U	8.1	U	7.5	U	8.1	U	7.5	U	8.1	U	4.9	J
Pyrene	-	1.6	U	0.77	J	1.5	U	1.4	U	1.5	U	1.4	U	1.5	U	5	

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW24D**		**HAV-LTR-CW26D**		**HAV-LTR-CW27D**		**HAV-LTR-CW28D**		**HAV-LTR-CW2D**		**HAV-LTR-CW2I**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**		**3/21/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**												
		Result		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.12		0.089	U	NA		0.089	U	0.084	J	0.037	J
Antimony, Total	-	0.0022	U	0.0022	U	NA		0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	**0.014**		0.0049		NA		0.0033	U	0.0033	U	0.0033	U
Barium, Total	2	0.23		0.038		NA		0.057		0.064		0.057	
Beryllium, Total	-	0.0011	U	0.0011	U	NA		0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0011	U	0.0011	U	NA		0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	38.5		17.8		NA		19		25.6		30	
Chromium, Total	-	0.0066		0.0014	J	NA		0.0014	J	0.0054		0.0022	U
Cobalt, Total	-	0.17		0.012		NA		0.027		0.044		0.0056	U
Copper, Total	-	0.0056	U	0.0056	U	NA		0.0023	J	0.0025	J	0.0056	U
Iron, Total	0.3	**105**		**32.8**		NA		**23.3**		**1.4**		**0.44**	
Lead, Total	-	0.0022	U	0.0022	U	NA		0.0022	U	0.0022	U	0.0022	U
Magnesium, Total	-	25.5		9		NA		13		14.6		16.8	
Manganese, Total	0.05	**10.5**		**2.2**		NA		**1.8**		**1.3**		0.0075	
Nickel, Total	-	0.085		0.0038	J	NA		0.0044	J	0.0028	J	0.0056	U
Potassium, Total	-	7.6		17.6		NA		6.3		6		6.3	
Selenium, Total	-	0.0056	U	0.0056	U	NA		0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	NA		0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	53.7		119		NA		291		209		226	
Thallium, Total	-	0.0011	U	0.0011	U	NA		0.0011	U	0.0011	U	0.0011	U
Vanadium, Total	0.0031	0.0012	J	0.0022	U	NA		0.0017	J	0.0018	J	0.0023	
Zinc, Total	-	0.25		0.063		**NA**		0.015		0.013		0.0028	J
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW24D**		**HAV-LTR-CW26D**		**HAV-LTR-CW27D**		**HAV-LTR-CW28D**		**HAV-LTR-CW2D**		**HAV-LTR-CW2I**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**		**3/21/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**												
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	7.1	J	10	U	10	U	10	U	10	U	10	U
Benzene	5	**9.6**		0.48	J	1	U	1	U	1	U	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	11.9		19.5	
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	0.27	J	1	U	0.26	J	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	1	U	0.26	J	1	U	2		244		364	
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1	U	2.3		0.59	J	0.4	J	1	U	1.2	
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	4		1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	2.2		1.7		2		1	U	0.47	J	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1.6		1.1		0.9	J	1	U	0.44	J	1	U
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	0.68	J	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	0.48	J	0.37	J
Methylene Chloride	-	1	U	1	U	1	U	1	U	1.3		1	
mp-Xylene	-	3.9		1.4	J	0.99	J	2	U	2	U	2	U
o-Xylene	-	9.2		4.5		4.2		0.46	J	2.1		1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1.2		1.2		0.91	J	1	U	0.43	J	1	U
Total Xylenes	-	13		6		5.1		3	U	2.1	J	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW24D**		**HAV-LTR-CW26D**		**HAV-LTR-CW27D**		**HAV-LTR-CW28D**		**HAV-LTR-CW2D**		**HAV-LTR-CW2I**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**		**3/21/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**												
Trichloroethene	5	1	U	3.2		1.6		1	U	1	U	1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3	U	3	U	3	U	3.1	U	3	U	3	U
1,4-Dioxane	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2,3,4,6-Tetrachlorophenol	-	78.9		145		116		26.3		42.9		3	U
2,4,5-Trichlorophenol	-	21.2		16.4		9.4		2.4	J	3.9		3	U
2,4,6-Trichlorophenol	-	0.68	J	13.5		2.4	J	4.8		3	U	3	U
2,4-Dichlorophenol	-	1.1	J	2.4	J	0.51	J	1.1	J	3	U	3	U
2,4-Dimethylphenol	-	0.32	J	0.36	J	0.39	J	3.1	U	3	U	3	U
2,4-Dinitrophenol	-	6.1	U	6	U	6	U	6.2	U	6.1	U	6.1	U
2,4-Dinitrotoluene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2,6-Dinitrotoluene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2-Chloronaphthalene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2-Chlorophenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6	U	6	U	6.2	U	6.1	U	6.1	U
2-Methylnaphthalene	2	**12.4**		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
2-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U
2-Nitrophenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U
3,3-Dichlorobenzidine	-	3	U	3	U	3	U	3.1	U	3	U	3	U
3-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Bromophenyl-phenylether	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Chloro-3-methylphenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Chloroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Chlorophenyl-phenylethe	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U
4-Nitrophenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Acenaphthene	-	15.5		0.67	J	1.1	J	1.5	U	1.5	U	1.5	U
Acenaphthylene	-	2.9		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetophenone	-	3	U	1.1	J	3	U	3.1	U	3	U	3	U
Anthracene	-	4		0.47	J	0.52	J	1.5	U	1.5	U	1.5	U
Atrazine	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Benzaldehyde	-	3	U	3	U	0.28	J	3.1	U	3	U	3	U
Benzo(a)anthracene	-	0.27	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(g,h,i)perylene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Biphenyl	-	19.9		3.6		1.6	J	3.1	U	3	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW24D**		**HAV-LTR-CW26D**		**HAV-LTR-CW27D**		**HAV-LTR-CW28D**		**HAV-LTR-CW2D**		**HAV-LTR-CW2I**	
Sample Date:	**Goals for**	**3/20/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**		**3/21/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**												
bis(2-Chloroethoxy)methan	-	3	U	3	U	3	U	3.1	U	3	U	3	U
bis(2-Chloroethyl)ether	-	3	U	3	U	3	U	3.1	U	3	U	3	U
bis(2-Chloroisopropyl)eth	-	3	U	3	U	3	U	3.1	U	3	U	3	U
bis(2-Ethylhexyl)phthalat	6	0.41	J	3	U	0.22	J	4.6		1.1	J	0.41	J
Butylbenzylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Caprolactam	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Carbazole	-	0.15	J	0.37	J	0.26	J	3.1	U	3	U	3	U
Chrysene	-	0.2	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzofuran	4	**7.5**		1.3	J	0.94	J	3.1	U	3	U	3	U
Diethylphthalate	-	0.21	J	3	U	3	U	3.1	U	3	U	3	U
Dimethylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Di-n-Butylphthalate	-	0.31	J	3	U	3	U	0.16	J	3	U	3	U
Di-n-Octylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Fluoranthene	-	3.3		1.5	U	0.85	J	1.5	U	1.5	U	1.5	U
Fluorene	-	18.1		2.9		2.4		1.5	U	1.5	U	1.5	U
Hexachlorobenzene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Hexachlorobutadiene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Hexachlorocyclopentadiene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Hexachloroethane	-	3	U	3	U	3	U	3.1	U	3	U	3	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Isophorone	-	3	U	3	U	3	U	3.1	U	3	U	3	U
mp-Cresol	-	1	J	1	J	0.8	J	3.1	U	0.26	J	3	U
Naphthalene	3	**53.6**		0.9	J	1.1	J	0.21	J	1.5	U	1.5	U
Nitrobenzene	-	3	U	3	U	3	U	3.1	U	3	U	3	U
N-Nitroso-di-n-propylamin	-	3	U	3	U	3	U	3.1	U	3	U	3	U
N-Nitrosodiphenylamine	-	3	U	3	U	3	U	3.1	U	3	U	3	U
o-Cresol	-	0.49	J	0.55	J	0.6	J	3.1	U	3	U	3	U
Pentachlorophenol	1	**1330**		**1460**		**1550**		**291**		**1120**		**1.4**	J
Phenanthrene	41	33.9		0.54	J	1.5	U	1.5	U	1.5	U	1.5	U
Phenol	-	8.1	U	8	U	8	U	8.2	U	8.1	U	8.1	U
Pyrene	-	5		0.18	J	1.6		1.5	U	1.5	U	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-CW4I**		**HAV-LTR-CW4S**		**HAV-LTR-CW4X**		**HAV-LTR-CW5D**		**HAV-LTR-CW5S**		**HAV-LTR-CW7D**
Sample Date:	**Goals for**	**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**
Duplicate of:	**Groundwater**											**HAV-LTR-CW4I**						
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**
Aluminum, Total	0.2	0.18		**0.42**		0.092		0.14		0.064	J	**0.28**		**0.28**		0.12		0.14
Antimony, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022
Arsenic, Total	0.01	0.0033	U	0.0033	U	**0.011**		**0.016**		0.0059	U	**0.017**		0.0031	J	0.002	J	0.0033
Barium, Total	2	0.17		0.11		0.18		0.14		0.11		0.16		0.019		0.16		0.2
Beryllium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011
Cadmium, Total	-	0.0011	U	0.0024		0.00055	J	0.0011	U	0.00087	J	0.0011	U	0.0011	U	0.0019		0.0011
Calcium, Total	-	37.6		60.1		33.5		32.8		38.6		32.5		8.7		18.8		55.6
Chromium, Total	-	0.0013	J	0.0026		0.0015	J	0.0054		0.004	U	0.0013	J	0.0021	J	0.00096	J	0.002
Cobalt, Total	-	0.024		0.0057		0.019		0.066		0.014		0.066		0.0021	J	0.075		0.0056
Copper, Total	-	0.0056	U	0.0098		0.0056	U	0.002	J	0.01	U	0.0022	J	0.0045	J	0.012		0.019
Iron, Total	0.3	**22.9**		**5.8**		**31.7**		**30.9**		0.097	J	**33.6**		**2.1**		**8.2**		**3.4**
Lead, Total	-	0.0013	J	0.003		0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0031		0.0018	J	0.0028
Magnesium, Total	-	18.2		19.1		20.3		19.5		27.2		22.8		2.3		13.5		15
Manganese, Total	0.05	**7.1**		**1.4**		**11.3**		**12.6**		**8.8**		**12.5**		**0.16**		**7.9**		**0.15**
Nickel, Total	-	0.0066		0.005	J	0.0056	U	0.016		0.0099	J	0.011		0.002	J	0.02		0.0037
Potassium, Total	-	7.9		8.1		6.8		6.9		6.9		7.8		2.6		5.6		24
Selenium, Total	-	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.01	U	0.0056	U	0.0056	U	0.0056	U	0.0056
Silver, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022
Sodium, Total	-	78.4		84.8		67.1		69.8		36.4		79.8		8.3		38.5		39.7
Thallium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011
Vanadium, Total	0.0031	0.0022	U	**0.0037**		0.0022	U	0.00091	J	0.004	U	0.001	J	0.0022	J	0.0022	U	0.0022
Zinc, Total	-	0.02		0.012		0.014		0.013		0.0042	J	0.011		0.066		0.045		0.089
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1
1,2-Dichloroethane	-	1	U	1	U	1.1		0.83	J	1	U	0.84	J	1	U	1	U	1
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-CW4I**		**HAV-LTR-CW4S**		**HAV-LTR-CW4X**		**HAV-LTR-CW5D**		**HAV-LTR-CW5S**		**HAV-LTR-CW7D**	
Sample Date:	**Goals for**	**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**											**HAV-LTR-CW4I**							
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	
Acetone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	
Benzene	5	1	U	1	U	**63.2**		**54**		**5.3**		**52.7**		1	U	1	U	1	
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Chloroform	-	2.1		30		1	U	1	U	1	U	1	U	1	U	1	U	1	
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
cis-1,2-Dichloroethene	-	0.34	J	0.33	J	1.8		1.8		0.57	J	1.8		1	U	1	U	1	
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Cyclohexane	-	1	U	1	U	4.7		2.8		1	U	2.8		1	U	1	U	1	
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Ethylbenzene	700	1	U	1	U	14.6		9.9		1	U	9.8		1	U	1	U	1	
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Isopropylbenzene	-	1	U	1	U	8.1		8.1		1	U	8		1	U	1	U	1	
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	
Methyl cyclohexane	-	1	U	1	U	1	U	0.8	J	1	U	1	U	1	U	1	U	1	
Methyl t-Butyl Ether	-	0.36	J	0.61	J	0.72	J	0.56	J	1	U	0.58	J	1	U	1	U	1	
Methylene Chloride	-	1	U	0.59	J	1	U	1	U	1	U	1	U	1	U	1	U	1	
mp-Xylene	-	2	U	2	U	14.3		10.4		2	U	10.3		2	U	2	U	2	
o-Xylene	-	1	U	1	U	33.9		27.8		1	U	27.9		1	U	1	U	1	
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Toluene	1000	1	U	1	U	4.6		3.5		1	U	3.5		1	U	1	U	1	
Total Xylenes	-	3	U	3	U	48.2		38.2		3	U	38.2		3	U	3	U	3	
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Trichloroethene	5	1	U	0.5	J	1.7		1.6		1	U	1.7		1	U	1	U	1	
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-CW4I**		**HAV-LTR-CW4S**		**HAV-LTR-CW4X**		**HAV-LTR-CW5D**		**HAV-LTR-CW5S**		**HAV-LTR-CW7D**
Sample Date:	**Goals for**	**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**
Duplicate of:	**Groundwater**											**HAV-LTR-CW4I**						
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**
1,2,4,5-Tetrachlorobenzen	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
1,4-Dioxane	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
2,3,4,6-Tetrachlorophenol	-	9.2		2.5	J	202		189		19.1		175		3.1	U	3	U	2.8
2,4,5-Trichlorophenol	-	3.8		3.4	U	19.3		18.8		2	J	16.9		3.1	U	3	U	2.8
2,4,6-Trichlorophenol	-	2.7	J	3.4	U	3.8		4.3		1.9	J	3.9		3.1	U	3	U	2.8
2,4-Dichlorophenol	-	3.5	U	3.4	U	3	U	0.42	J	3	U	3	U	3.1	U	0.36	J	2.8
2,4-Dimethylphenol	-	3.5	U	3.4	U	3	U	1.3	J	3	U	3	U	3.1	U	3	U	2.8
2,4-Dinitrophenol	-	7	U	6.8	U	6.1	U	6.1	U	6	U	6.1	U	6.2	U	6.1	U	5.7
2,4-Dinitrotoluene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
2,6-Dinitrotoluene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
2-Chloronaphthalene	-	0.3	J	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
2-Chlorophenol	-	3.5	U	3.4	U	0.39	J	0.45	J	3	U	0.44	J	3.1	U	3	U	2.8
2-Methyl-4,6-dinitropheno	1.7	**54**		0.42	J	6.1	U	6.1	U	6	U	**185**		6.2	U	6.1	U	5.7
2-Methylnaphthalene	2	1.7	U	1.7	U	**13.6**		**2.2**		1.5	U	**2.1**		1.5	U	1.5	U	1.4
2-Nitroaniline	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
2-Nitrophenol	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
3,3-Dichlorobenzidine	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
3-Nitroaniline	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Bromophenyl-phenylether	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Chloro-3-methylphenol	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Chloroaniline	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Chlorophenyl-phenylethe	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Nitroaniline	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
4-Nitrophenol	-	1.3	J	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Acenaphthene	-	1.7	U	1.7	U	4.6		3.7		1.5	U	3.5		1.5	U	1.5	U	1.4
Acenaphthylene	-	1.7	U	1.7	U	1.1	J	1.5	U	1.5	U	0.78	J	1.5	U	1.5	U	1.4
Acetophenone	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Anthracene	-	1.7	U	1.7	U	1.1	J	0.79	J	1.5	U	0.99	J	1.5	U	1.5	U	1.4
Atrazine	-	83.3		3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Benzaldehyde	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Benzo(a)anthracene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Benzo(a)pyrene	0.2	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Benzo(b)fluoranthene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Benzo(g,h,i)perylene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Benzo(k)fluoranthene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Biphenyl	-	0.99	J	3.4	U	13.5		13.1		3	U	12		3.1	U	3	U	2.8
bis(2-Chloroethoxy)methan	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
bis(2-Chloroethyl)ether	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
bis(2-Chloroisopropyl)eth	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**		**HAV-LTR-CW4I**		**HAV-LTR-CW4S**		**HAV-LTR-CW4X**		**HAV-LTR-CW5D**		**HAV-LTR-CW5S**		**HAV-LTR-CW7D**
Sample Date:	**Goals for**	**3/22/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**
Duplicate of:	**Groundwater**											**HAV-LTR-CW4I**						
bis(2-Ethylhexyl)phthalat	6	3.5	U	3.3	J	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Butylbenzylphthalate	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Caprolactam	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	0.52	J	2.8
Carbazole	-	3.5	U	3.4	U	0.12	J	3	U	0.15	J	3	U	3.1	U	3	U	2.8
Chrysene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Dibenzo(a,h)anthracene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Dibenzofuran	4	0.52	J	3.4	U	3.2		2.8	J	0.88	J	2.9	J	3.1	U	0.26	J	2.8
Diethylphthalate	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Dimethylphthalate	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Di-n-Butylphthalate	-	0.18	J	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Di-n-Octylphthalate	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Fluoranthene	-	1.7	U	1.7	U	0.2	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Fluorene	-	1	J	1.7	U	7.1		6.8		0.61	J	6.4		1.5	U	0.69	J	1.4
Hexachlorobenzene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Hexachlorobutadiene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Hexachlorocyclopentadiene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Hexachloroethane	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
Indeno(1,2,3-cd)pyrene	-	1.7	U	1.7	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4
Isophorone	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
mp-Cresol	-	0.22	J	3.4	U	2.2	J	1.8	J	3	U	1.5	J	3.1	U	3	U	2.8
Naphthalene	3	0.35	J	1.7	U	**121**		**69.8**		1.5	U	**67.5**		1.5	U	1.5	U	1.4
Nitrobenzene	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
N-Nitroso-di-n-propylamin	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
N-Nitrosodiphenylamine	-	3.5	U	3.4	U	3	U	3	U	3	U	3	U	3.1	U	3	U	2.8
o-Cresol	-	3.5	U	3.4	U	1.3	J	1.2	J	3	U	1	J	3.1	U	3	U	2.8
Pentachlorophenol	1	**608**		**100**		**3240**		**3120**		**424**		**3040**		6.2	U	6.1	U	5.7
Phenanthrene	41	1.7	U	1.7	U	3.3		3.2		0.21	J	3.3		1.5	U	1.5	U	1.4
Phenol	-	9.3	U	9.1	U	0.68	J	8.1	U	0.49	J	8.1	U	8.2	U	8.1	U	7.5
Pyrene	-	1.7	U	1.7	U	0.24	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**		**HAV-LTR-CW7S**		**HAV-LTR-CW8D**		**HAV-LTR-CW8S**		**HAV-LTR-CW9D**		**HAV-LTR-CW9S**		**HAV-LTR-HAV04**		**HAV-LTR-HAV05**		**HAV-LTR-HAV07**	
Sample Date:	**Goals for**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/18/2019**		**3/18/2019**		**3/22/2019**		**3/22/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**																	
			Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2		0.089	U	0.083	J	**4.4**		**1.4**		0.11		0.13		0.13		**0.45**	
Antimony, Total	-	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0015	J	0.0022	U	0.0022	U
Arsenic, Total	0.01	U	0.0033	U	0.0033	U	0.002	J	0.0013	J	0.0033	U	0.0033	U	0.0015	J	0.0033	U
Barium, Total	2		0.43		0.85		0.44		0.076		0.21		0.12		0.2		0.22	
Beryllium, Total	-	U	0.0011	U	0.0011	U	0.0005	J	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	U	0.00043	J	0.00081	J	0.0013		0.0011	U	0.0011	U	0.00088	J	0.0011	U	0.047	
Calcium, Total	-		41.9		31.7		33.3		20.7		17.8		21.4		24.6		25.6	
Chromium, Total	-	J	0.0012	J	0.0015	J	0.01		0.0035		0.0012	J	0.00093	J	0.0013	J	0.002	J
Cobalt, Total	-	U	0.0034	J	0.0056	U	0.0056		0.0056	U	0.0056	U	0.14		0.02		0.0056	U
Copper, Total	-		0.002	J	0.0033	J	0.018		0.0095		0.0056	U	0.0081		0.0056	U	0.049	
Iron, Total	0.3		0.023	J	**0.45**		**5.8**		**7.7**		0.079		**4.2**		**35.4**		**0.79**	
Lead, Total	-		0.0022	U	0.0022	U	0.022		0.015		0.0022	U	0.00092	J	0.0022	U	0.0075	
Magnesium, Total	-		18.3		17.7		17.2		4.4		12.6		14.8		15.8		13.5	
Manganese, Total	0.05		**0.3**		**0.52**		**0.15**		**0.052**		0.014		**20.5**		**12.2**		0.031	
Nickel, Total	-	J	0.0098		0.011		0.015		0.0039	J	0.0034	J	0.023		0.0044	J	0.0079	
Potassium, Total	-		5.6		5.5		5.7		4.8		3.9		4.3		6.1		4.5	
Selenium, Total	-	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-		72.6		68.2		51.7		209		32.7		30.9		49.8		29.4	
Thallium, Total	-	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.00048	J	0.0011	U	0.0011	U
Vanadium, Total	0.0031	U	0.0022	U	0.0022	U	**0.011**		**0.0052**		0.0022	U	0.0015	J	0.0022	U	0.0022	U
Zinc, Total	-		0.0076		0.096		0.053		0.15		0.005	J	0.013		0.0032	J	0.035	
PESTICIDES	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038		NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	U	2	U	2	U	2	U	2	U	1.2	J	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	U	2	U	2	U	2	U	2	U	0.84	J	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**		**HAV-LTR-CW7S**		**HAV-LTR-CW8D**		**HAV-LTR-CW8S**		**HAV-LTR-CW9D**		**HAV-LTR-CW9S**		**HAV-LTR-HAV04**		**HAV-LTR-HAV05**		**HAV-LTR-HAV07**	
Sample Date:	**Goals for**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/18/2019**		**3/18/2019**		**3/22/2019**		**3/22/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**																	
1,3-Dichlorobenzene	-	U	1	U	1	U	1	U	1	U	0.31	J	1	U	1	U	1	U
1,4-Dichlorobenzene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	U	10	U	10	U	10	U	10	U	10	U	13.4		10	U	10	U
Benzene	5	U	1	U	1	U	1	U	1	U	1	U	1.5		**8.2**		1	U
Bromochloromethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	U	1	U	1	U	1	U	0.41	J	0.45	J	1	U	1	U	1	U
Carbon Disulfide	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	U	1	U	0.42	J	0.3	J	0.24	J	1.1		1	U	1	U	0.54	J
Chloromethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	0.38	J	1	U
cis-1,3-Dichloropropene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	U	1	U	1	U	1	U	1	U	1	U	0.37	J	0.71	J	1	U
Dichlorodifluoromethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	U	1	U	1	U	1	U	1	U	1	U	6		23.2		1	U
Freon 113	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	U	1	U	1	U	1	U	1	U	1	U	3		12.9		1	U
Methyl acetate	-	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1.2		1	U
Methyl t-Butyl Ether	-	U	0.77	J	0.62	J	0.39	J	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	U	2	U	2	U	2	U	2	U	2	U	10		4.4		2	U
o-Xylene	-	U	1	U	1	U	1	U	1	U	1	U	63.4		38.8		1	U
Styrene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	U	1	U	1	U	1	U	1	U	1	U	0.37	J	0.66	J	1	U
Total Xylenes	-	U	3	U	3	U	3	U	3	U	3	U	73.4		43.1		3	U
trans-1,2-Dichloroethene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	U	1	U	1	U	1	U	1	U	1	U	1.7		1.3		1	U
Trichlorofluoromethane	-	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**		**HAV-LTR-CW7S**		**HAV-LTR-CW8D**		**HAV-LTR-CW8S**		**HAV-LTR-CW9D**		**HAV-LTR-CW9S**		**HAV-LTR-HAV04**		**HAV-LTR-HAV05**		**HAV-LTR-HAV07**	
Sample Date:	**Goals for**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/18/2019**		**3/18/2019**		**3/22/2019**		**3/22/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**																	
SEMIVOLATILES	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
1,4-Dioxane	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2,3,4,6-Tetrachlorophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	340		61.5		3	U
2,4,5-Trichlorophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	18.5		39		3	U
2,4,6-Trichlorophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	1.7	J	9.2		3	U
2,4-Dichlorophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	1.5	J	2.1	J	3	U
2,4-Dimethylphenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2,4-Dinitrophenol	-	U	5.7	U	5.6	U	5.6	U	6.3	U	6.2	U	5.7	U	6.1	U	6.1	U
2,4-Dinitrotoluene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2,6-Dinitrotoluene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2-Chloronaphthalene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2-Chlorophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2-Methyl-4,6-dinitropheno	1.7	U	5.7	U	5.6	U	5.6	U	6.3	U	6.2	U	5.7	U	6.1	U	6.1	U
2-Methylnaphthalene	2	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	**24.6**		1.5	U	1.5	U
2-Nitroaniline	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
2-Nitrophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
3,3-Dichlorobenzidine	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
3-Nitroaniline	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Bromophenyl-phenylether	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Chloro-3-methylphenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Chloroaniline	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Chlorophenyl-phenylethe	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Nitroaniline	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
4-Nitrophenol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Acenaphthene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	2		6.1		1.5	U
Acenaphthylene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Acetophenone	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Anthracene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	0.71	J	1.3	J	1.5	U
Atrazine	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Benzaldehyde	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Benzo(a)anthracene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Benzo(a)pyrene	0.2	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Benzo(g,h,i)perylene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Biphenyl	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2	J	9.3		3	U
bis(2-Chloroethoxy)methan	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
bis(2-Chloroethyl)ether	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
bis(2-Chloroisopropyl)eth	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**		**HAV-LTR-CW7S**		**HAV-LTR-CW8D**		**HAV-LTR-CW8S**		**HAV-LTR-CW9D**		**HAV-LTR-CW9S**		**HAV-LTR-HAV04**		**HAV-LTR-HAV05**		**HAV-LTR-HAV07**	
Sample Date:	**Goals for**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/18/2019**		**3/18/2019**		**3/22/2019**		**3/22/2019**		**3/19/2019**	
Duplicate of:	**Groundwater**																	
bis(2-Ethylhexyl)phthalat	6	U	2.9	U	2.8	U	2.8	U	0.88	J	3.1	U	2.8	U	3.1	U	3	U
Butylbenzylphthalate	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Caprolactam	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Carbazole	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Chrysene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Dibenzofuran	4	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	1	J	**4.1**		3	U
Diethylphthalate	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Dimethylphthalate	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Di-n-Butylphthalate	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	0.15	J	3	U
Di-n-Octylphthalate	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Fluoranthene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	0.33	J	1.5	U
Fluorene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.6		10.5		1.5	U
Hexachlorobenzene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Hexachlorobutadiene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Hexachlorocyclopentadiene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Hexachloroethane	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
Indeno(1,2,3-cd)pyrene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.4	U	1.5	U	1.5	U
Isophorone	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
mp-Cresol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	1.5	J	0.57	J	3	U
Naphthalene	3	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	**40.7**		**6.4**		1.5	U
Nitrobenzene	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
N-Nitroso-di-n-propylamin	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
N-Nitrosodiphenylamine	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	2.8	U	3.1	U	3	U
o-Cresol	-	U	2.9	U	2.8	U	2.8	U	3.2	U	3.1	U	0.62	J	0.4	J	3	U
Pentachlorophenol	1	U	5.7	U	5.6	U	5.6	U	6.3	U	6.2	U	**4910**		**1370**		6.1	U
Phenanthrene	41	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	3.2		12.9		1.5	U
Phenol	-	U	7.6	U	7.5	U	7.5	U	8.4	U	8.3	U	1.9	J	0.28	J	8.1	U
Pyrene	-	U	1.4	U	1.4	U	1.4	U	1.6	U	1.6	U	1.6		0.6	J	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-IW1**		**HAV-LTR-IW2**		**HAV-LTR-IW3**		**HAV-LTR-IW4**		**HAV-LTR-IW5**		**HAV-LTR-MW1**		**HAV-LTR-MW2**		**HAV-LTR-MW3**		**HAV-LTR-NW01**	
Sample Date:	**Goals for**	**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**																		
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.068	J	0.089	U	0.089	U	0.089	U	0.032	J	0.2	U	0.035	J	0.089	U	0.068	J
Antimony, Total	-	0.0022	U	0.0022	U	0.0013	J	0.0022	U	0.0022	U	0.005	U	0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	0.0011	J	0.0012	J	0.0068		0.0033	U	0.0033	U	0.0074	U	0.0033	U	0.0033	U	0.0033	U
Barium, Total	2	0.056		0.13		0.35		0.014		0.042		0.16		0.13		0.081		0.11	
Beryllium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0025	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0025	U	0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	32.5		21.6		61.8		31.5		32.8		33.2		74		75.3		66.5	
Chromium, Total	-	0.36		0.0022		0.00076	J	0.0016	J	0.0017	J	0.0023	J	0.0014	J	0.0015	J	0.0009	J
Cobalt, Total	-	0.0094		0.0028	J	0.0056	U	0.0056	U	0.0025	J	0.013	U	0.0056	U	0.0056	U	0.015	
Copper, Total	-	0.017		0.0056	U	0.0056	U	0.0032	J	0.011		0.005	J	0.0038	J	0.0023	J	0.0022	J
Iron, Total	0.3	**5**		**14**		**33.4**		**1.1**		**4**		**0.33**		**0.33**		**26.5**		0.27	
Lead, Total	-	0.0022	U	0.0022	U	0.075		0.0022	U	0.0022	U	0.005	U	0.0022	U	0.0022	U	0.0022	U
Magnesium, Total	-	17.7		11.9		24.1		17.1		17		13.9		28.3		14.5		20.4	
Manganese, Total	0.05	**0.26**		**3.4**		**2.1**		**0.078**		**0.97**		**0.087**		**0.31**		**1.5**		**1.2**	
Nickel, Total	-	0.56		0.0023	J	0.0056	U	0.0056	U	0.0039	J	0.013	U	0.002	J	0.0056	U	0.0022	J
Potassium, Total	-	6.7		6.8		10.6		6.7		6.8		7.5		6.7		8.4		5.5	
Selenium, Total	-	0.0056	U	0.0056	U	0.0043	J	0.0056	U	0.0056	U	0.013	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.005	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	219		115		159		221		220		21.7		65		48.3		37.6	
Thallium, Total	-	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0025	U	0.0011	U	0.0011	U	0.0011	U
Vanadium, Total	0.0031	**0.0044**		0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.005	U	0.002	J	0.0022	U	0.0022	U
Zinc, Total	-	0.0052	J	0.0091		0.0053	J	0.0056		0.01		0.019		0.01		0.086		0.0057	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	-	1	U	0.46	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-IW1**		**HAV-LTR-IW2**		**HAV-LTR-IW3**		**HAV-LTR-IW4**		**HAV-LTR-IW5**		**HAV-LTR-MW1**		**HAV-LTR-MW2**		**HAV-LTR-MW3**		**HAV-LTR-NW01**	
Sample Date:	**Goals for**	**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**																		
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.64	J	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	24.6		1	U	1	U	51.8		52.4		1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	0.49	J	1	U	1	U	1.6		1.7		1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	334		2.2		0.67	J	376		351		0.23	J	1	U	1	U	6	
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1.2		1	U	1	U	1.3		1.3		1	U	1	U	9.2		1	U
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.1		1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	4		1	U	1	U	1	U	1	U	1	U	0.88	J	0.27	J
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	0.48	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	0.34	J	1	U	1	U	0.35	J	0.34	J	1	U	1	U	2		0.56	J
Methylene Chloride	-	0.84	J	1.2		1	U	1	U	1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2.3		2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	31.6		1	U	1	U	1	U	1	U	1	U	0.98	J	0.62	J
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1.3		1	U	1	U	0.89	J	1	U	1	U	1.2		1	U
Total Xylenes	-	3	U	33.8		3	U	3	U	3	U	3	U	3	U	0.98	J	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1.9		1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-IW1**		**HAV-LTR-IW2**		**HAV-LTR-IW3**		**HAV-LTR-IW4**		**HAV-LTR-IW5**		**HAV-LTR-MW1**		**HAV-LTR-MW2**		**HAV-LTR-MW3**		**HAV-LTR-NW01**	
Sample Date:	**Goals for**	**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**																		
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
1,4-Dioxane	-	3	U	3	U	0.71	J	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2,3,4,6-Tetrachlorophenol	-	3	U	164		0.67	J	3.1	U	3	U	3	U	3	U	9		53.6	
2,4,5-Trichlorophenol	-	3	U	24.3		3	U	3.1	U	3	U	3	U	3	U	3.3		1.3	J
2,4,6-Trichlorophenol	-	3	U	2.5	J	3	U	3.1	U	3	U	3	U	3	U	1.9	J	3.1	U
2,4-Dichlorophenol	-	3	U	1.5	J	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2,4-Dimethylphenol	-	3	U	0.49	J	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2,4-Dinitrophenol	-	6.1	U	6.1	U	6.1	U	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U	6.2	U
2,4-Dinitrotoluene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2,6-Dinitrotoluene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2-Chloronaphthalene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2-Chlorophenol	-	3	U	1.2	J	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2-Methyl-4,6-dinitropheno	1.7	6.1	U	6.1	U	6.1	U	6.2	U	6.1	U	6.1	U	6.1	U	6.1	U	6.2	U
2-Methylnaphthalene	2	1.5	U	1.7		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
2-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
2-Nitrophenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
3,3-Dichlorobenzidine	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
3-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Bromophenyl-phenylether	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Chloro-3-methylphenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Chloroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Chlorophenyl-phenylethe	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Nitroaniline	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
4-Nitrophenol	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Acenaphthene	-	1.5	U	3.3		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	0.53	J	1.5	U
Acenaphthylene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Acetophenone	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Anthracene	-	1.5	U	0.57	J	0.29	J	1.5	U	1.5	U	1.5	U	1.5	U	0.19	J	0.37	J
Atrazine	-	3	U	3	U	1.5	J	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Benzaldehyde	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Benzo(a)anthracene	-	1.5	U	1.5	U	0.73	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	0.32	J
Benzo(a)pyrene	0.2	1.5	U	1.5	U	**0.69**	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(b)fluoranthene	-	1.5	U	1.5	U	1.1	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	0.15	J
Benzo(g,h,i)perylene	-	1.5	U	1.5	U	0.54	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzo(k)fluoranthene	-	1.5	U	1.5	U	0.37	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Biphenyl	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	2.9	J	3.1	U
bis(2-Chloroethoxy)methan	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
bis(2-Chloroethyl)ether	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
bis(2-Chloroisopropyl)eth	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-IW1**		**HAV-LTR-IW2**		**HAV-LTR-IW3**		**HAV-LTR-IW4**		**HAV-LTR-IW5**		**HAV-LTR-MW1**		**HAV-LTR-MW2**		**HAV-LTR-MW3**		**HAV-LTR-NW01**	
Sample Date:	**Goals for**	**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/21/2019**		**3/19/2019**		**3/19/2019**		**3/19/2019**		**3/21/2019**	
Duplicate of:	**Groundwater**																		
bis(2-Ethylhexyl)phthalat	6	0.35	J	0.77	J	0.9	J	3.1	U	1.9	J	3	U	3	U	0.24	J	0.31	J
Butylbenzylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Caprolactam	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Carbazole	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Chrysene	-	1.5	U	1.5	U	0.5	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzo(a,h)anthracene	-	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Dibenzofuran	4	3	U	0.79	J	3	U	3.1	U	3	U	3	U	3	U	1.1	J	3.1	U
Diethylphthalate	-	3	U	16.7		3	U	3.1	U	3	U	3	U	3	U	0.21	J	3.1	U
Dimethylphthalate	-	3	U	0.6	J	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Di-n-Butylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	0.17	J	3.1	U
Di-n-Octylphthalate	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Fluoranthene	-	1.5	U	0.58	J	1.1	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	0.54	J
Fluorene	-	1.5	U	2.5		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	2.9		1.5	U
Hexachlorobenzene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Hexachlorobutadiene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Hexachlorocyclopentadiene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Hexachloroethane	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.5	U	0.55	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Isophorone	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
mp-Cresol	-	3	U	0.25	J	0.21	J	3.1	U	3	U	3	U	3	U	0.21	J	3.1	U
Naphthalene	3	1.5	U	**48.5**		1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Nitrobenzene	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
N-Nitroso-di-n-propylamin	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
N-Nitrosodiphenylamine	-	3	U	3	U	3	U	3.1	U	3	U	3	U	3	U	3	U	3.1	U
o-Cresol	-	3	U	0.67	J	0.29	J	3.1	U	3	U	3	U	3	U	3	U	3.1	U
Pentachlorophenol	1	**4.3**	J	**4460**		**10.6**		**2**	J	**1.6**	J	6.1	U	6.1	U	**582**		**1230**	
Phenanthrene	41	1.5	U	1.5	U	0.49	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Phenol	-	8.1	U	8.1	U	8.1	U	8.2	U	8.1	U	8.1	U	8.1	U	8.1	U	8.2	U
Pyrene	-	1.5	U	1	J	1	J	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.1	J

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-NW06**		**HAV-LTR-R2**		**HAV-LTR-RW3**		**HAV-LTR-RW5**		**HAV-LTR-RW5X**		**HAV-LTR-RW6**		**HAV-LTR-RW7**		**HAV-LTR-RW7X**		**HAV-LTR-FB01**	
Sample Date:	**Goals for**	**3/22/2019**		**3/21/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/22/2019**		**3/22/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW5**						**HAV-LTR-RW7**			
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.089	U	0.089	U	0.098	J	0.089	U	0.089	U	0.089	U	0.089	U	0.089	U	0.089	U
Antimony, Total	-	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Arsenic, Total	0.01	0.01		0.0043		0.0059	U	0.0046		0.0046		0.0033	U	0.0018	J	0.0016	J	0.0033	U
Barium, Total	2	0.051		0.2		0.15		0.062		0.062		0.12		0.096		0.097		0.0056	U
Beryllium, Total	-	0.0011	U	0.0011	U	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Cadmium, Total	-	0.0011	U	0.0011	U	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U
Calcium, Total	-	29.4		32.9		26.6		30.5		30		53		27.3		27.9		0.085	J
Chromium, Total	-	0.0017	J	0.0015	J	0.0027	J	0.0013	J	0.0016	J	0.0041		0.00095	J	0.001	J	0.001	J
Cobalt, Total	-	0.012		0.027		0.01	U	0.013		0.013		0.027		0.017		0.017		0.0056	U
Copper, Total	-	0.0056	U	0.0056	U	0.01	U	0.0056	U	0.0056	U	0.0025	J	0.0027	J	0.0025	J	0.0056	U
Iron, Total	0.3	**7.1**		**11.4**		**9.4**		**19.2**		**19.1**		**28.6**		**12.2**		**12.1**		0.023	J
Lead, Total	-	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Magnesium, Total	-	9.2		14.9		15		17		16.8		15.3		14.4		14.2		0.11	U
Manganese, Total	0.05	**2.7**		**7.7**		**5.1**		**8.7**		**8.6**		**3.3**		**6.9**		**7**		0.0056	U
Nickel, Total	-	0.0026	J	0.0034	J	0.01	U	0.0056	U	0.0056	U	0.015		0.0048	J	0.0047	J	0.0056	U
Potassium, Total	-	5.4		7.1		7.5		7.8		7.7		8		7.3		7.3		0.11	U
Selenium, Total	-	0.0056	U	0.0056	U	0.01	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U	0.0056	U
Silver, Total	-	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Sodium, Total	-	24.5		143		193		113		111		44.1		159		158		0.29	
Thallium, Total	-	0.0011	U	0.00077	J	0.002	U	0.0011	U	0.0011	U	0.0011	U	0.0013		0.0011	U	0.0011	U
Vanadium, Total	0.0031	0.0022	U	0.0022	U	0.004	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U	0.0022	U
Zinc, Total	-	0.014		0.0032	J	0.007	J	0.0028	J	0.0056	U	0.013		0.015		0.02		0.0035	J
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA		NA		0.019	U
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	10	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	10	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	35	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	-	1	U	5	U	0.52	J	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-NW06**		**HAV-LTR-R2**		**HAV-LTR-RW3**		**HAV-LTR-RW5**		**HAV-LTR-RW5X**		**HAV-LTR-RW6**		**HAV-LTR-RW7**		**HAV-LTR-RW7X**		**HAV-LTR-FB01**	
Sample Date:	**Goals for**	**3/22/2019**		**3/21/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/22/2019**		**3/22/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW5**						**HAV-LTR-RW7**			
1,3-Dichlorobenzene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	1600	U	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	50	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	-	5	U	25	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	25	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	10	U	50	U	4.3	J	3.7	J	4.3	J	10	U	10	U	10	U	10	U
Benzene	5	1	U	5	U	1	U	3.5		3.5		0.46	J	0.74	J	0.74	J	1	U
Bromochloromethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorodibromomethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	1	U	4.7	J	2.3		1.1		1.1		1	U	0.95	J	0.96	J	0.47	J
Chloromethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1	U	5	U	0.43	J	19.5		19.9		3.3		2.7		2.8		1	U
cis-1,3-Dichloropropene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	5	U	0.33	J	0.61	J	0.66	J	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	13.8		9.3		6.9		7.1		1	U	2.1		2.1		1	U
Freon 113	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	9.3		6.1		3.3		3.6		0.46	J	3		3.2		1	U
Methyl acetate	-	2	U	10	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	5	U	1		1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	5	U	1	U	0.86	J	0.81	J	0.81	J	0.36	J	1	U	1	U
Methylene Chloride	-	1	U	2.5	J	0.79	J	0.48	J	0.46	J	1	U	1	U	0.47	J	1.3	
mp-Xylene	-	2	U	27		9.2		6.6		6.9		2	U	1.7	J	1.8	J	2	U
o-Xylene	-	1	U	63.4		40.5		19.6		19.9		1	U	11		11.2		1	U
Styrene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	4.7	J	2.6		3.4		3.4		0.45	J	0.59	J	0.59	J	1	U
Total Xylenes	-	3	U	90.4		49.7		26.2		26.8		3	U	12.7		13		3	U
trans-1,2-Dichloroethene	-	1	U	5	U	1	U	0.33	J	0.33	J	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	0.68	J	5	U	0.62	J	**15.1**		**15.3**		0.84	J	1.7		1.5		1	U
Trichlorofluoromethane	-	1	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	5	U	1	U	1.3		1.2		1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-NW06**		**HAV-LTR-R2**		**HAV-LTR-RW3**		**HAV-LTR-RW5**		**HAV-LTR-RW5X**		**HAV-LTR-RW6**		**HAV-LTR-RW7**		**HAV-LTR-RW7X**		**HAV-LTR-FB01**	
Sample Date:	**Goals for**	**3/22/2019**		**3/21/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/22/2019**		**3/22/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW5**						**HAV-LTR-RW7**			
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
1,4-Dioxane	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2,3,4,6-Tetrachlorophenol	-	152		344		129		315		292		9.2		92.7		83.4		3	U
2,4,5-Trichlorophenol	-	0.56	J	7.6		42.9		20.4		19.9		1.8	J	38.2		34.4		3	U
2,4,6-Trichlorophenol	-	1.6	J	2	J	3.4		7.9		7.4		1.3	J	4.5		3.9		3	U
2,4-Dichlorophenol	-	0.37	J	1.9	J	2.1	J	1.3	J	1.2	J	3.1	U	1.4	J	1.2	J	3	U
2,4-Dimethylphenol	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2,4-Dinitrophenol	-	6	U	6.2	U	6.2	U	6.1	U	6.1	U	6.2	U	6.2	U	6.7	U	6.1	U
2,4-Dinitrotoluene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2,6-Dinitrotoluene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2-Chloronaphthalene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2-Chlorophenol	-	3	U	1.1	J	0.65	J	0.41	J	0.41	J	3.1	U	3.1	U	3.4	U	3	U
2-Methyl-4,6-dinitropheno	1.7	6	U	6.2	U	6.2	U	6.1	U	6.1	U	6.2	U	6.2	U	6.7	U	6.1	U
2-Methylnaphthalene	2	1.5	U	**198**		**4.2**		**15.3**		**17.2**		1.5	U	0.74	J	0.58	J	1.5	U
2-Nitroaniline	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
2-Nitrophenol	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
3,3-Dichlorobenzidine	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
3-Nitroaniline	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Bromophenyl-phenylether	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Chloro-3-methylphenol	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Chloroaniline	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Chlorophenyl-phenylethe	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Nitroaniline	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
4-Nitrophenol	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Acenaphthene	-	1.5	U	11		7.4		5.6		5.3		1.5	U	3.1		2.8		1.5	U
Acenaphthylene	-	1.5	U	1.5	U	1.4	J	1.5	U	1.5	U	1.5	U	0.58	J	0.55	J	1.5	U
Acetophenone	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Anthracene	-	1.5	U	1.9		1.4	J	1.9		1.9		1.5	U	1	J	1.1	J	1.5	U
Atrazine	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Benzaldehyde	-	3	U	7.9		3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Benzo(a)anthracene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Benzo(a)pyrene	0.2	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Benzo(b)fluoranthene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Benzo(g,h,i)perylene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Benzo(k)fluoranthene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Biphenyl	-	3	U	12		9.4		18.9		18.3		3.1	U	8.1		7.2		3	U
bis(2-Chloroethoxy)methan	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
bis(2-Chloroethyl)ether	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
bis(2-Chloroisopropyl)eth	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

Sample ID:	**Remediation**	**HAV-LTR-NW06**		**HAV-LTR-R2**		**HAV-LTR-RW3**		**HAV-LTR-RW5**		**HAV-LTR-RW5X**		**HAV-LTR-RW6**		**HAV-LTR-RW7**		**HAV-LTR-RW7X**		**HAV-LTR-FB01**	
Sample Date:	**Goals for**	**3/22/2019**		**3/21/2019**		**3/22/2019**		**3/20/2019**		**3/20/2019**		**3/19/2019**		**3/22/2019**		**3/22/2019**		**3/18/2019**	
Duplicate of:	**Groundwater**									**HAV-LTR-RW5**						**HAV-LTR-RW7**			
bis(2-Ethylhexyl)phthalat	6	3	U	0.7	J	3.1	U	3.1	U	3.1	U	3.1	U	0.69	J	3.4	U	3	U
Butylbenzylphthalate	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Caprolactam	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Carbazole	-	3	U	3.1	U	3.1	U	1.3	J	3.1	U	0.2	J	3.1	U	0.15	J	3	U
Chrysene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Dibenzo(a,h)anthracene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Dibenzofuran	4	3	U	**6.1**		**4.3**		**6.3**		**5.9**		0.94	J	**4.1**		3.7		3	U
Diethylphthalate	-	3	U	3.1	U	0.25	J	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Dimethylphthalate	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Di-n-Butylphthalate	-	0.26	J	0.16	J	3.1	U	0.18	J	0.16	J	3.1	U	3.1	U	0.17	J	3	U
Di-n-Octylphthalate	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	0.14	J
Fluoranthene	-	1.5	U	0.71	J	0.28	J	0.53	J	0.48	J	1.5	U	0.28	J	0.3	J	1.5	U
Fluorene	-	1.5	U	13.6		11.4		12.9		12.1		2.4		11.5		10.5		1.5	U
Hexachlorobenzene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Hexachlorobutadiene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Hexachlorocyclopentadiene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Hexachloroethane	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.5	U	1.6	U	1.5	U	1.5	U	1.5	U	1.5	U	1.7	U	1.5	U
Isophorone	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
mp-Cresol	-	3	U	0.88	J	0.55	J	1.9	J	1.9	J	3.1	U	0.44	J	0.41	J	3	U
Naphthalene	3	1.5	U	**620**		**37.5**		**70.1**		**74.8**		1.5	U	**14.1**		**11.8**		1.5	U
Nitrobenzene	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
N-Nitroso-di-n-propylamin	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
N-Nitrosodiphenylamine	-	3	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.4	U	3	U
o-Cresol	-	3	U	0.53	J	0.3	J	0.95	J	0.99	J	3.1	U	0.33	J	3.4	U	3	U
Pentachlorophenol	1	**2230**		**9830**		**3900**		**4760**		**4620**		**373**		**2420**		**2210**		6.1	U
Phenanthrene	41	1.5	U	19.9		12		15.3		14.4		1.5	U	8.4		8		1.5	U
Phenol	-	8	U	0.33	J	8.3	U	8.2	U	8.2	U	8.2	U	8.2	U	9	U	8.1	U
Pyrene	-	1.5	U	1.1	J	0.47	J	0.64	J	0.56	J	1.5	U	0.4	J	0.38	J	1.5	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		FIELD QC													
Sample ID:	**Remediation**	**HAV-LTR-FB02**		**HAV-LTR-FB03**		**HAV-LTR-TB01**		**HAV-LTR-TB02**		**HAV-LTR-TB03**		**HAV-LTR-TB04**		**HAV-LTR-TB05**	
Sample Date:	**Goals for**	**3/19/2019**		**3/22/2019**		**3/18/2019**		**3/19/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**														
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
INORGANICS	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**	
Aluminum, Total	0.2	0.089	U	0.089	U	NA		NA		NA		NA		NA	
Antimony, Total	-	0.0022	U	0.0022	U	NA		NA		NA		NA		NA	
Arsenic, Total	0.01	0.0033	U	0.0033	U	NA		NA		NA		NA		NA	
Barium, Total	2	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Beryllium, Total	-	0.0011	U	0.0011	U	NA		NA		NA		NA		NA	
Cadmium, Total	-	0.0011	U	0.0011	U	NA		NA		NA		NA		NA	
Calcium, Total	-	0.087	J	0.14		NA		NA		NA		NA		NA	
Chromium, Total	-	0.0016	J	0.00096	J	NA		NA		NA		NA		NA	
Cobalt, Total	-	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Copper, Total	-	0.002	J	0.0056	U	NA		NA		NA		NA		NA	
Iron, Total	0.3	0.027	J	0.15		NA		NA		NA		NA		NA	
Lead, Total	-	0.0022	U	0.0022	U	NA		NA		NA		NA		NA	
Magnesium, Total	-	0.11	U	0.11	U	NA		NA		NA		NA		NA	
Manganese, Total	0.05	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Nickel, Total	-	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Potassium, Total	-	0.11	U	0.11	U	NA		NA		NA		NA		NA	
Selenium, Total	-	0.0056	U	0.0056	U	NA		NA		NA		NA		NA	
Silver, Total	-	0.0022	U	0.0022	U	NA		NA		NA		NA		NA	
Sodium, Total	-	0.29		0.32		NA		NA		NA		NA		NA	
Thallium, Total	-	0.0011	U	0.0011	U	NA		NA		NA		NA		NA	
Vanadium, Total	0.0031	0.0022	U	0.0022	U	NA		NA		NA		NA		NA	
Zinc, Total	-	0.0047	J	0.004	J	NA		NA		NA		NA		NA	
PESTICIDES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
Dieldrin	0.038	NA		NA		NA		NA		NA		NA		NA	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2,4-Trichlorobenzene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromo-3-chloropropa	-	7	U	7	U	7	U	7	U	7	U	7	U	7	U
1,2-Dibromoethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		FIELD QC													
Sample ID:	**Remediation**	**HAV-LTR-FB02**		**HAV-LTR-FB03**		**HAV-LTR-TB01**		**HAV-LTR-TB02**		**HAV-LTR-TB03**		**HAV-LTR-TB04**		**HAV-LTR-TB05**	
Sample Date:	**Goals for**	**3/19/2019**		**3/22/2019**		**3/18/2019**		**3/19/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**														
1,3-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dichlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-Dioxane	-	320	U	320	U	320	U	320	U	320	U	320	U	320	U
2-Butanone	-	10	U	10	U	10	U	10	U	10	U	10	U	2.3	J
2-Hexanone	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-Pentanone(MIBK	-	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	-	4.4	J	4.8	J	10	U	10	U	10	U	10	U	6.1	J
Benzene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromochloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromodichloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromoform	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Bromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	0.24	J
Chlorodibromomethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Chloroform	-	0.52	J	0.5	J	1	U	1	U	1	U	1	U	1	U
Chloromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dichlorodifluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Freon 113	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Isopropylbenzene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl acetate	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Methyl cyclohexane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl t-Butyl Ether	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methylene Chloride	-	1.1		1		1	U	1	U	1	U	1	U	1	U
mp-Xylene	-	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-Xylene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Styrene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Toluene	1000	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Total Xylenes	-	3	U	3	U	3	U	3	U	3	U	3	U	3	U
trans-1,2-Dichloroethene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-Dichloropropene	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichloroethene	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Trichlorofluoromethane	-	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	5	1	U	1	U	1	U	1	U	1	U	1	U	1	U

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		FIELD QC													
Sample ID:	**Remediation**	**HAV-LTR-FB02**		**HAV-LTR-FB03**		**HAV-LTR-TB01**		**HAV-LTR-TB02**		**HAV-LTR-TB03**		**HAV-LTR-TB04**		**HAV-LTR-TB05**	
Sample Date:	**Goals for**	**3/19/2019**		**3/22/2019**		**3/18/2019**		**3/19/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**														
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
1,4-Dioxane	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,3,4,6-Tetrachlorophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,4,6-Trichlorophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,4-Dichlorophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,4-Dimethylphenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,4-Dinitrophenol	-	6.4	U	6.2	U	NA		NA		NA		NA		NA	
2,4-Dinitrotoluene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2-Chloronaphthalene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2-Chlorophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2-Methyl-4,6-dinitropheno	1.7	6.4	U	6.2	U	NA		NA		NA		NA		NA	
2-Methylnaphthalene	2	1.6	U	1.5	U	NA		NA		NA		NA		NA	
2-Nitroaniline	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
2-Nitrophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
3,3-Dichlorobenzidine	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
3-Nitroaniline	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Chloro-3-methylphenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Chloroaniline	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Chlorophenyl-phenylethe	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Nitroaniline	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
4-Nitrophenol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Acenaphthene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Acenaphthylene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Acetophenone	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Anthracene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Atrazine	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Benzaldehyde	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Benzo(a)anthracene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Benzo(a)pyrene	0.2	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Benzo(b)fluoranthene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Benzo(g,h,i)perylene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Benzo(k)fluoranthene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Biphenyl	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
bis(2-Chloroethoxy)methan	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
bis(2-Chloroethyl)ether	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
bis(2-Chloroisopropyl)eth	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	

SUMMARY OF MARCH 2019 ANNUAL SAMPLING EVENT ANALYTICAL RESULTS
HAVERTOWN PCP SUPERFUND SITE
HAVERTOWN, PENNSYLVANIA

		FIELD QC													
Sample ID:	**Remediation**	**HAV-LTR-FB02**		**HAV-LTR-FB03**		**HAV-LTR-TB01**		**HAV-LTR-TB02**		**HAV-LTR-TB03**		**HAV-LTR-TB04**		**HAV-LTR-TB05**	
Sample Date:	**Goals for**	**3/19/2019**		**3/22/2019**		**3/18/2019**		**3/19/2019**		**3/20/2019**		**3/21/2019**		**3/22/2019**	
Duplicate of:	**Groundwater**														
bis(2-Ethylhexyl)phthalat	6	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Butylbenzylphthalate	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Caprolactam	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Carbazole	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Chrysene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Dibenzo(a,h)anthracene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Dibenzofuran	4	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Diethylphthalate	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Dimethylphthalate	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Di-n-Butylphthalate	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Di-n-Octylphthalate	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Fluoranthene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Fluorene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Hexachlorobenzene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Hexachlorobutadiene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Hexachlorocyclopentadiene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Hexachloroethane	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Isophorone	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
mp-Cresol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Naphthalene	3	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Nitrobenzene	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
N-Nitroso-di-n-propylamin	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
N-Nitrosodiphenylamine	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
o-Cresol	-	3.2	U	3.1	U	NA		NA		NA		NA		NA	
Pentachlorophenol	1	6.4	U	6.2	U	NA		NA		NA		NA		NA	
Phenanthrene	41	1.6	U	1.5	U	NA		NA		NA		NA		NA	
Phenol	-	8.5	U	8.2	U	NA		NA		NA		NA		NA	
Pyrene	-	1.6	U	1.5	U	NA		NA		NA		NA		NA	

NA - Not Analyzed
µg/L - Micrograms per Liter
pg/L - Picograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quanti
5.5 - Exceeds Remediation Goal for GW

A-4 JUNE 2018 GROUNDWATER DATA

ANALYTICAL DATA
JUNE 2019 GROUNDWATER DATA
HAVERTOWN PCP SITE, HAVERTOWN, PENNSYLVANIA

																		SITE WELLS	
Sample ID:	**Remediation**	**HAV-LTR-CW16D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW26D**		**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**	
Sample Date:	**Goals for**	**6/13/2019**		**6/12/2019**		**6/12/2019**		**6/13/2019**		**6/13/2019**		**6/13/2019**		**6/12/2019**	
Duplicate of:	**Groundwater**														
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,1,2,2-Tetrachloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,1,2-Trichloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,1-Dichloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,1-Dichloroethene	-	NA		1	U	1	U	NA		NA		NA		NA	
1,2,3-Trichlorobenzene	-	NA		2	U	2	U	NA		NA		NA		NA	
1,2,4-Trichlorobenzene	-	NA		2	U	2	U	NA		NA		NA		NA	
1,2-Dibromo-3-chloropropa	-	NA		7	U	7	U	NA		NA		NA		NA	
1,2-Dibromoethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,2-Dichlorobenzene	-	NA		1	U	1	U	NA		NA		NA		NA	
1,2-Dichloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,2-Dichloropropane	-	NA		1	U	1	U	NA		NA		NA		NA	
1,3-Dichlorobenzene	-	NA		1	U	1	U	NA		NA		NA		NA	
1,4-Dichlorobenzene	-	NA		1	U	1	U	NA		NA		NA		NA	
2-Butanone	-	NA		10	U	10	U	NA		NA		NA		NA	
2-Hexanone	-	NA		5	U	5	U	NA		NA		NA		NA	
4-Methyl-2-Pentanone(MIBK)	-	NA		5	U	5	U	NA		NA		NA		NA	
Acetone	-	NA		10	U	10	U	NA		NA		NA		NA	
Benzene	5	NA		1	U	1	U	NA		NA		NA		NA	
Bromochloromethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Bromodichloromethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Bromoform	-	NA		1	U	1	U	NA		NA		NA		NA	
Bromomethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Carbon Disulfide	-	NA		1	U	1	U	NA		NA		NA		NA	
Carbon Tetrachloride	-	NA		1	U	1	U	NA		NA		NA		NA	
Chlorobenzene	-	NA		1	U	1	U	NA		NA		NA		NA	
Chlorodibromomethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Chloroethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Chloroform	-	NA		0.48	J	0.31	J	NA		NA		NA		NA	
Chloromethane	-	NA		1	U	1	U	NA		NA		NA		NA	
cis-1,2-Dichloroethene	-	NA		1	U	1	U	NA		NA		NA		NA	
cis-1,3-Dichloropropene	-	NA		1	U	1	U	NA		NA		NA		NA	
Cyclohexane	-	NA		1	U	1	U	NA		NA		NA		NA	
Dichlorodifluoromethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Ethylbenzene	700	NA		1	U	1	U	NA		NA		NA		NA	
Freon 113	-	NA		1	U	1	U	NA		NA		NA		NA	
Isopropylbenzene	-	NA		1	U	1	U	NA		NA		NA		NA	
Methyl acetate	-	NA		2	U	2	U	NA		NA		NA		NA	
Methyl cyclohexane	-	NA		1	U	1	U	NA		NA		NA		NA	
Methyl t-Butyl Ether	-	NA		1	U	1	U	NA		NA		NA		NA	
Methylene Chloride	-	NA		1	U	1	U	NA		NA		NA		NA	
mp-Xylene	-	NA		2	U	2	U	NA		NA		NA		NA	
o-Xylene	-	NA		1	U	1	U	NA		NA		NA		NA	
Styrene	-	NA		1	U	1	U	NA		NA		NA		NA	
Tetrachloroethene	-	NA		1	U	1	U	NA		NA		NA		NA	
Toluene	1000	NA		1	U	1	U	NA		NA		NA		NA	
Total Xylenes	-	NA		3	U	3	U	NA		NA		NA		NA	
trans-1,2-Dichloroethene	-	NA		1	U	1	U	NA		NA		NA		NA	
trans-1,3-Dichloropropene	-	NA		1	U	1	U	NA		NA		NA		NA	
Trichloroethene	5	NA		1	U	1	U	NA		NA		NA		NA	
Trichlorofluoromethane	-	NA		1	U	1	U	NA		NA		NA		NA	
Vinyl Chloride	5	NA		1	U	1	U	NA		NA		NA		NA	
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
1,4-Dioxane	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2,3,4,6-Tetrachlorophenol	-	0.52	J	3.2	U	3.2	U	251		10.9		5.6		25.8	
2,4,5-Trichlorophenol	-	3	U	3.2	U	3.2	U	21.5		0.56	J	3.1	U	1.8	J
2,4,6-Trichlorophenol	-	3	U	3.2	U	3.2	U	20.8		0.68	J	3.1	U	4.7	
2,4-Dichlorophenol	-	3	U	3.2	U	3.2	U	2.4	J	2.9	U	3.1	U	3.2	U
2,4-Dimethylphenol	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2,4-Dinitrophenol	-	6	U	6.4	U	6.5	U	5.7	U	5.7	U	6.1	U	6.4	U
2,4-Dinitrotoluene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2,6-Dinitrotoluene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2-Chloronaphthalene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U

														SITE WELLS	
Sample ID:	**Remediation**	**HAV-LTR-CW16D**		**HAV-LTR-CW22D**		**HAV-LTR-CW22S**		**HAV-LTR-CW26D**		**HAV-LTR-CW3D**		**HAV-LTR-CW3S**		**HAV-LTR-CW4D**	
Sample Date:	**Goals for**	**6/13/2019**		**6/12/2019**		**6/12/2019**		**6/13/2019**		**6/13/2019**		**6/13/2019**		**6/12/2019**	
Duplicate of:	**Groundwater**														
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
2-Chlorophenol	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2-Methyl-4,6-dinitropheno	1.7	6	U	6.4	U	6.5	U	5.7	U	5.7	U	6.1	U	6.4	U
2-Methylnaphthalene	2	1.5	U	1.6	U	1.6	U	**2.8**		1.4	U	1.5	U	1.6	U
2-Nitroaniline	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
2-Nitrophenol	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
3,3-Dichlorobenzidine	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
3-Nitroaniline	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Bromophenyl-phenylether	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Chloro-3-methylphenol	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Chloroaniline	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Chlorophenyl-phenylethe	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Nitroaniline	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
4-Nitrophenol	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Acenaphthene	-	1.5	U	1.6	U	1.6	U	2.3		1.4	U	1.5	U	1	J
Acenaphthylene	-	1.5	U	1.6	U	1.6	U	0.55	J	1.4	U	1.5	U	1.6	U
Acetophenone	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Anthracene	-	1.5	U	1.6	U	1.6	U	0.83	J	1.4	U	1.5	U	0.62	J
Atrazine	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Benzaldehyde	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Benzo(a)anthracene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Benzo(a)pyrene	0.2	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Benzo(b)fluoranthene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Benzo(g,h,i)perylene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Benzo(k)fluoranthene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Biphenyl	-	3	U	3.2	U	3.2	U	9.6		2.9	U	3.1	U	2.3	J
bis(2-Chloroethoxy)methan	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
bis(2-Chloroethyl)ether	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
bis(2-Chloroisopropyl)eth	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
bis(2-Ethylhexyl)phthalat	6	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Butylbenzylphthalate	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Caprolactam	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Carbazole	-	3	U	3.2	U	3.2	U	0.73	J	2.9	U	3.1	U	3.2	U
Chrysene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Dibenzo(a,h)anthracene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Dibenzofuran	4	3	U	3.2	U	3.2	U	2.7	J	2.9	U	3.1	U	1.3	J
Diethylphthalate	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Dimethylphthalate	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Di-n-Butylphthalate	-	0.29	J	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Di-n-Octylphthalate	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Fluoranthene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Fluorene	-	1.5	U	1.6	U	1.6	U	6.2		1.4	U	1.5	U	3.2	
Hexachlorobenzene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Hexachlorobutadiene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Hexachlorocyclopentadiene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Hexachloroethane	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U
Isophorone	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
mp-Cresol	-	3	U	3.2	U	3.2	U	1.5	J	2.9	U	3.1	U	3.2	U
Naphthalene	3	1.5	U	1.6	U	1.6	U	**86**		1.4	U	1.5	U	2.1	
Nitrobenzene	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
N-Nitroso-di-n-propylamin	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
N-Nitrosodiphenylamine	-	3	U	3.2	U	3.2	U	2.9	U	2.9	U	3.1	U	3.2	U
o-Cresol	-	3	U	3.2	U	3.2	U	0.87	J	2.9	U	3.1	U	3.2	U
Pentachlorophenol	1	**25.7**		6.4	U	6.5	U	**3750**		**463**		**269**		**305**	
Phenanthrene	41	1.5	U	1.6	U	1.6	U	2.6		1.4	U	1.5	U	1.3	J
Phenol	-	8	U	8.5	U	8.6	U	7.6	U	7.6	U	8.2	U	8.6	U
Pyrene	-	1.5	U	1.6	U	1.6	U	1.4	U	1.4	U	1.5	U	1.6	U

NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation Limit
5.5 - Exceeds Remediation Goal for GW

ANALYTICAL DATA
JUNE 2019 GROUNDWATER DATA
HAVERTOWN PCP SITE, HAVERTOWN, PENNSYLVANIA

																FIELD QC			
Sample ID:	**Remediation**	**HAV-LTR-HAV5**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-DUP01**		**HAV-LTR-NW1**		**HAV-LTR-NW6**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/13/2019**		**6/13/2019**		**6/12/2019**		**6/14/2019**	
Duplicate of:	**Groundwater**							**HAV-LTR-MW02**									
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
VOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,1,1-Trichloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,1,2,2-Tetrachloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,1,2-Trichloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,1-Dichloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,1-Dichloroethene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,2,3-Trichlorobenzene	-	NA		2	U	2	U	2	U	NA		NA		2	U	2	U
1,2,4-Trichlorobenzene	-	NA		2	U	2	U	2	U	NA		NA		2	U	2	U
1,2-Dibromo-3-chloropropa	-	NA		7	U	7	U	7	U	NA		NA		7	U	7	U
1,2-Dibromoethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,2-Dichlorobenzene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,2-Dichloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,2-Dichloropropane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,3-Dichlorobenzene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
1,4-Dichlorobenzene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
2-Butanone	-	NA		10	U	10	U	10	U	NA		NA		10	U	10	U
2-Hexanone	-	NA		5	U	5	U	5	U	NA		NA		5	U	5	U
4-Methyl-2-Pentanone(MIBK)	-	NA		5	U	5	U	5	U	NA		NA		5	U	5	U
Acetone	-	NA		10	U	10	U	10	U	NA		NA		10	U	10	U
Benzene	5	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Bromochloromethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Bromodichloromethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Bromoform	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Bromomethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Carbon Disulfide	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Carbon Tetrachloride	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Chlorobenzene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Chlorodibromomethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Chloroethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Chloroform	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Chloromethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
cis-1,2-Dichloroethene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
cis-1,3-Dichloropropene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Cyclohexane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Dichlorodifluoromethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Ethylbenzene	700	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Freon 113	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Isopropylbenzene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Methyl acetate	-	NA		2	U	2	U	2	U	NA		NA		2	U	2	U
Methyl cyclohexane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Methyl t-Butyl Ether	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Methylene Chloride	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
mp-Xylene	-	NA		2	U	2	U	2	U	NA		NA		2	U	2	U
o-Xylene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Styrene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Tetrachloroethene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Toluene	1000	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Total Xylenes	-	NA		3	U	3	U	3	U	NA		NA		3	U	3	U
trans-1,2-Dichloroethene	-	NA		1	U	0.32	J	1	U	NA		NA		0.29	J	1	U
trans-1,3-Dichloropropene	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Trichloroethene	5	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Trichlorofluoromethane	-	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
Vinyl Chloride	5	NA		1	U	1	U	1	U	NA		NA		1	U	1	U
SEMIVOLATILES	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**	
1,2,4,5-Tetrachlorobenzen	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
1,4-Dioxane	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2,3,4,6-Tetrachlorophenol	-	317		3.2	U	3.1	U	3.1	U	2.9	U	217		3.1	U	NA	
2,4,5-Trichlorophenol	-	22.4		3.2	U	3.1	U	3.1	U	2.9	U	0.75	J	3.1	U	NA	
2,4,6-Trichlorophenol	-	2	J	3.2	U	3.1	U	3.1	U	2.9	U	2.3	J	3.1	U	NA	
2,4-Dichlorophenol	-	2.7	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2,4-Dimethylphenol	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2,4-Dinitrophenol	-	6.2	U	6.4	U	6.2	U	6.2	U	5.8	U	6.2	U	6.2	U	NA	
2,4-Dinitrotoluene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2,6-Dinitrotoluene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2-Chloronaphthalene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	

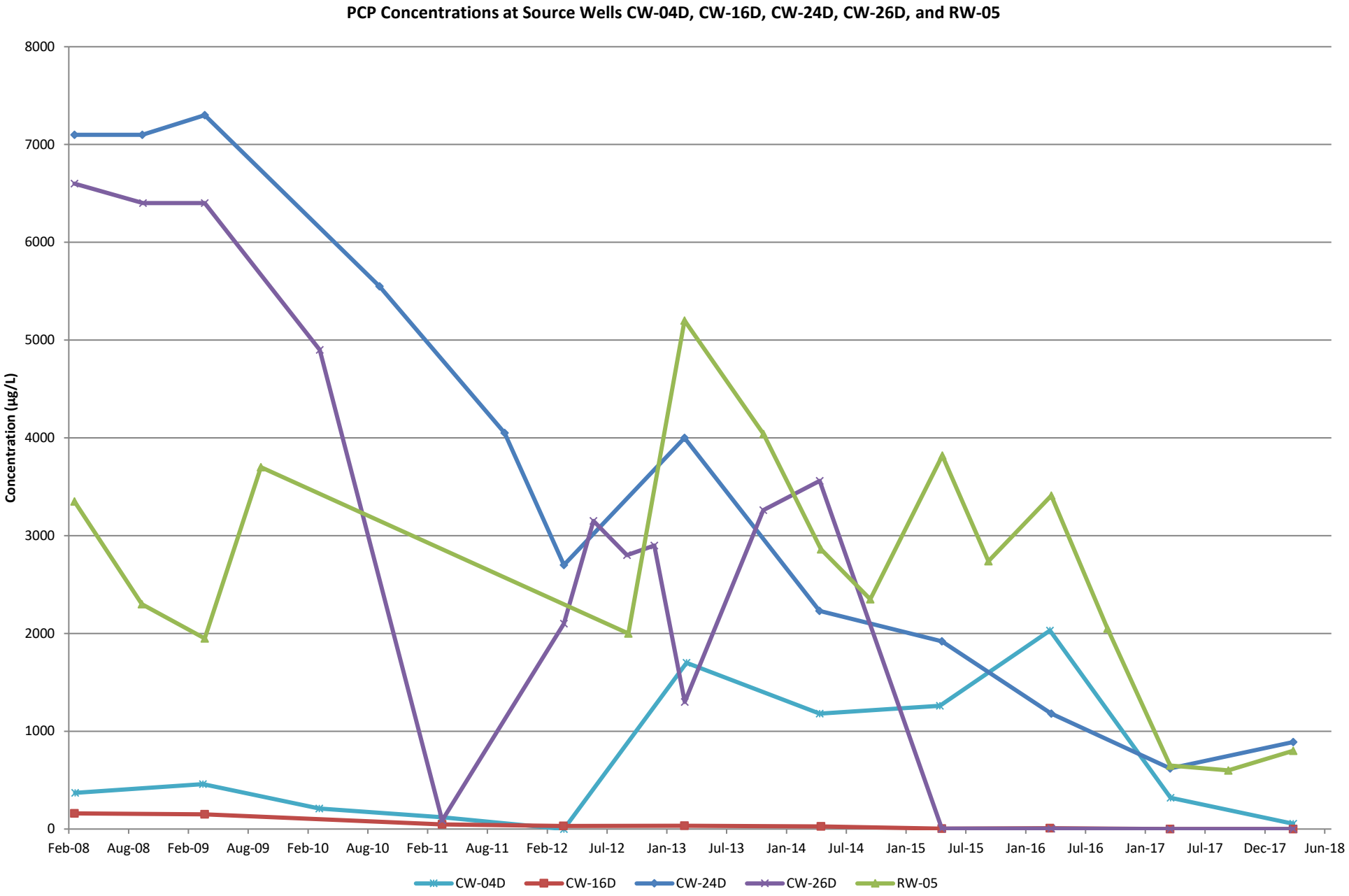
ANALYTICAL DATA
JUNE 2019 GROUNDWATER DATA
HAVERTOWN PCP SITE, HAVERTOWN, PENNSYLVANIA

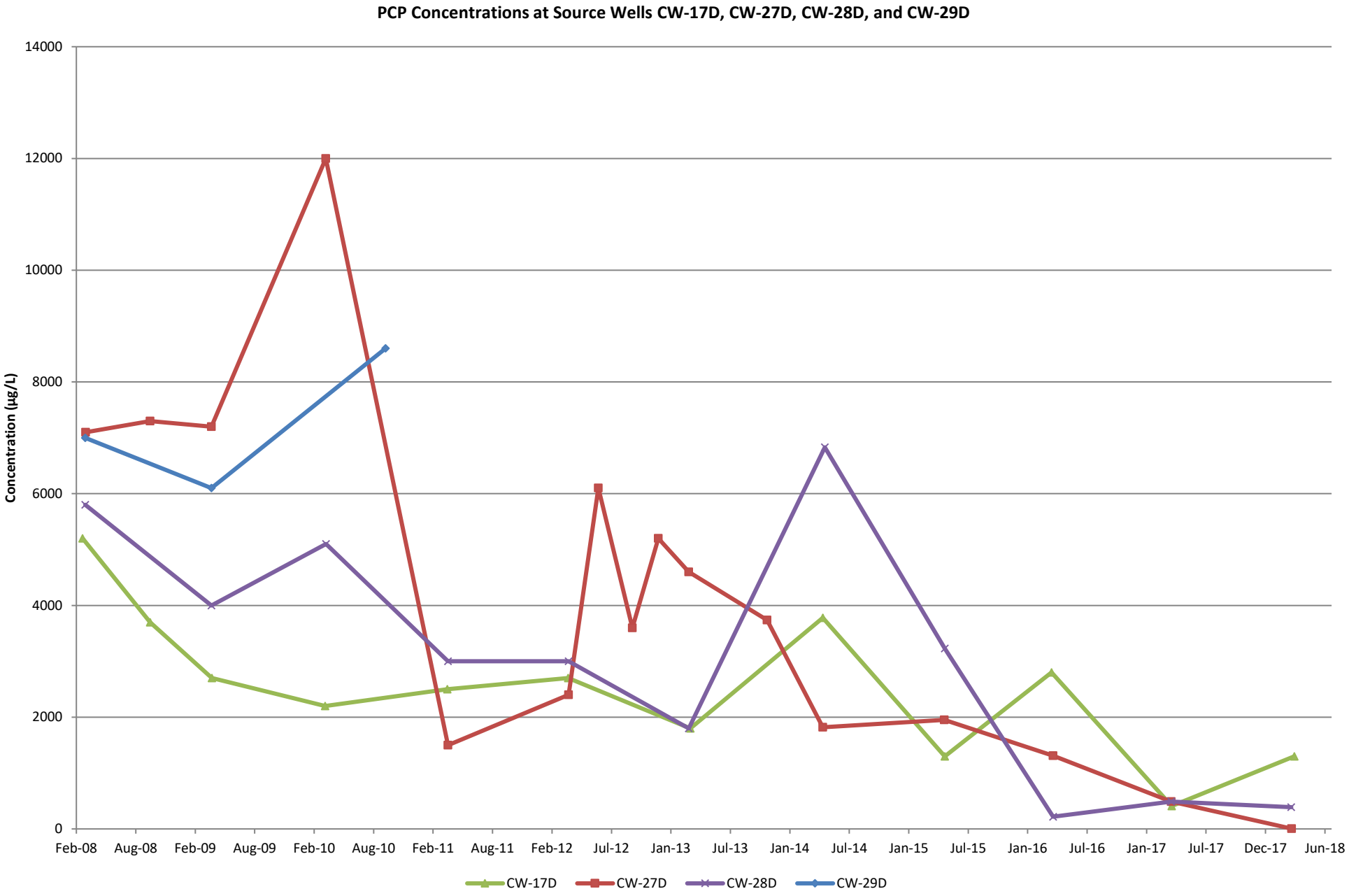
														FIELD QC			
Sample ID:	**Remediation**	**HAV-LTR-HAV5**		**HAV-LTR-MW01**		**HAV-LTR-MW02**		**HAV-LTR-DUP01**		**HAV-LTR-NW1**		**HAV-LTR-NW6**		**HAV-LTR-FB01**		**HAV-LTR-TB01**	
Sample Date:	**Goals for**	**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/12/2019**		**6/13/2019**		**6/13/2019**		**6/12/2019**		**6/14/2019**	
Duplicate of:	**Groundwater**							**HAV-LTR-MW02**									
		Result		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**		**Result**	
2-Chlorophenol	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2-Methyl-4,6-dinitropheno	1.7	6.2	U	6.4	U	6.2	U	6.2	U	5.8	U	6.2	U	6.2	U	NA	
2-Methylnaphthalene	2	**8.8**		1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
2-Nitroaniline	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
2-Nitrophenol	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
3,3-Dichlorobenzidine	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
3-Nitroaniline	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Bromophenyl-phenylether	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Chloro-3-methylphenol	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Chloroaniline	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Chlorophenyl-phenylethe	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Nitroaniline	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
4-Nitrophenol	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Acenaphthene	-	3.6		1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Acenaphthylene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Acetophenone	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Anthracene	-	0.91	J	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Atrazine	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Benzaldehyde	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	0.44	J	NA	
Benzo(a)anthracene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Benzo(a)pyrene	0.2	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Benzo(b)fluoranthene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Benzo(g,h,i)perylene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Benzo(k)fluoranthene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Biphenyl	-	3.6		3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
bis(2-Chloroethoxy)methan	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
bis(2-Chloroethyl)ether	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
bis(2-Chloroisopropyl)eth	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
bis(2-Ethylhexyl)phthalat	6	0.35	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Butylbenzylphthalate	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Caprolactam	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Carbazole	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Chrysene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Dibenzo(a,h)anthracene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Dibenzofuran	4	1.6	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Diethylphthalate	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Dimethylphthalate	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Di-n-Butylphthalate	-	0.37	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Di-n-Octylphthalate	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Fluoranthene	-	0.87	J	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Fluorene	-	2.9		1.6	U	1.5	U	1.5	U	1.4	U	0.28	J	1.5	U	NA	
Hexachlorobenzene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Hexachlorobutadiene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Hexachlorocyclopentadiene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Hexachloroethane	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Indeno(1,2,3-cd)pyrene	-	1.5	U	1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Isophorone	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
mp-Cresol	-	1.9	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Naphthalene	3	**6.7**		1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Nitrobenzene	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
N-Nitroso-di-n-propylamin	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
N-Nitrosodiphenylamine	-	3.1	U	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
o-Cresol	-	1	J	3.2	U	3.1	U	3.1	U	2.9	U	3.1	U	3.1	U	NA	
Pentachlorophenol	1	**5070**		1	J	6.2	U	6.2	U	0.49	J	**5330**		6.2	U	NA	
Phenanthrene	41	5.2		1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	
Phenol	-	8.2	U	8.5	U	8.2	U	8.2	U	7.7	U	8.2	U	8.2	U	NA	
Pyrene	-	3.4		1.6	U	1.5	U	1.5	U	1.4	U	1.5	U	1.5	U	NA	

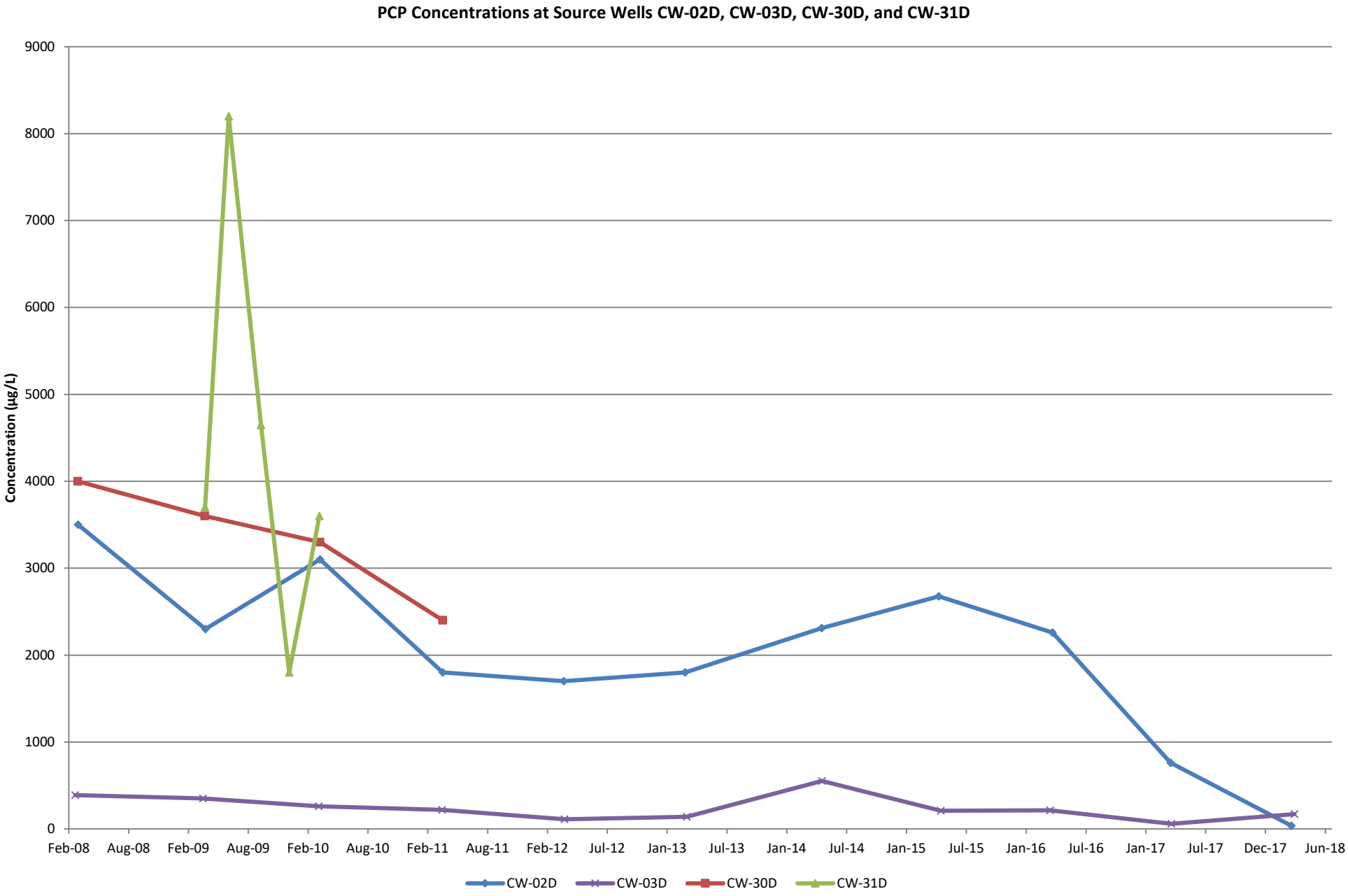
NA - Not Analyzed
µg/L - Micrograms per Liter
J - Estimated Value
U - Not Detected Above Laboratory Quantitation
5.5 - Exceeds Remediation Goal for GW

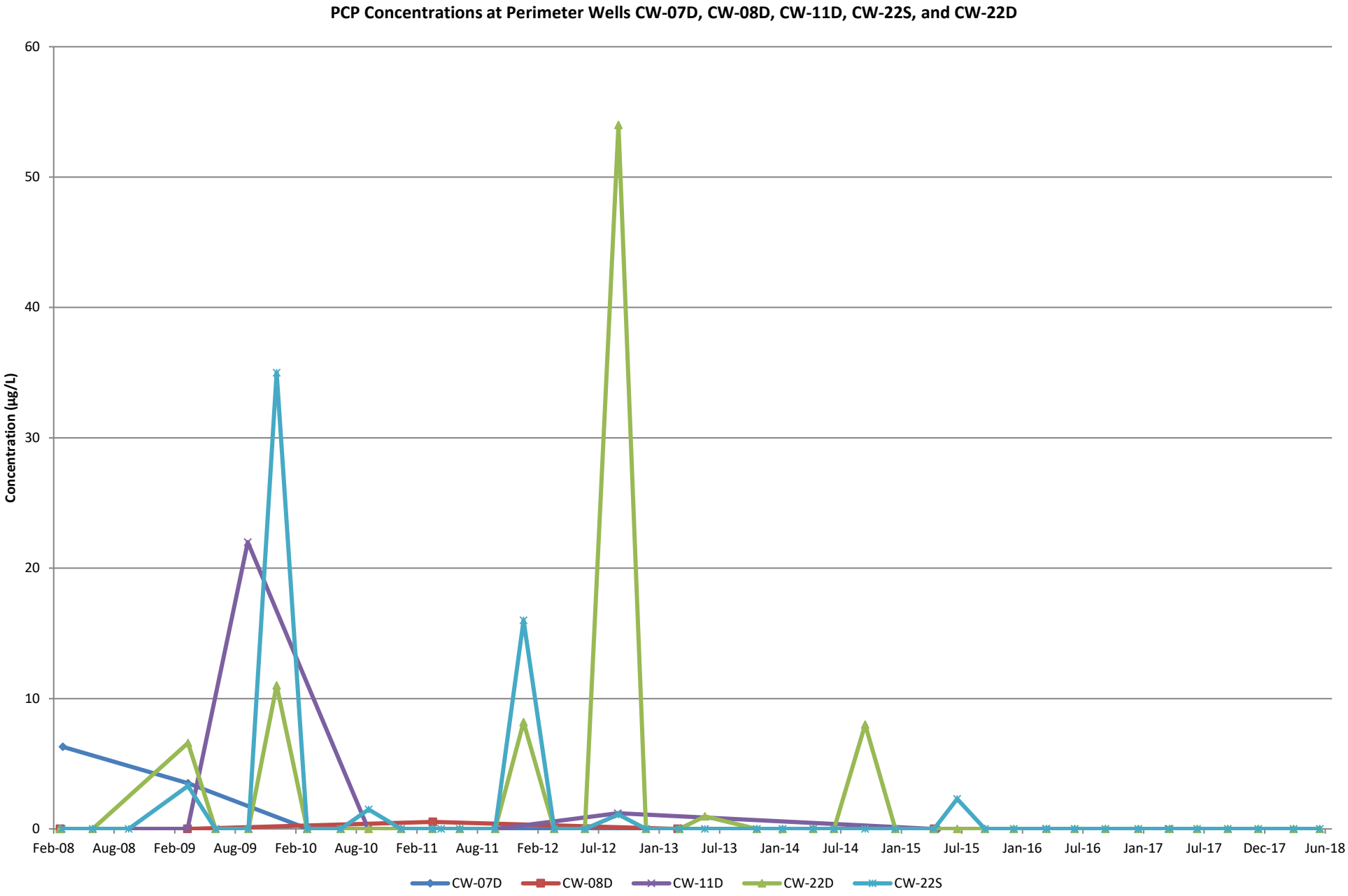
APPENDIX B

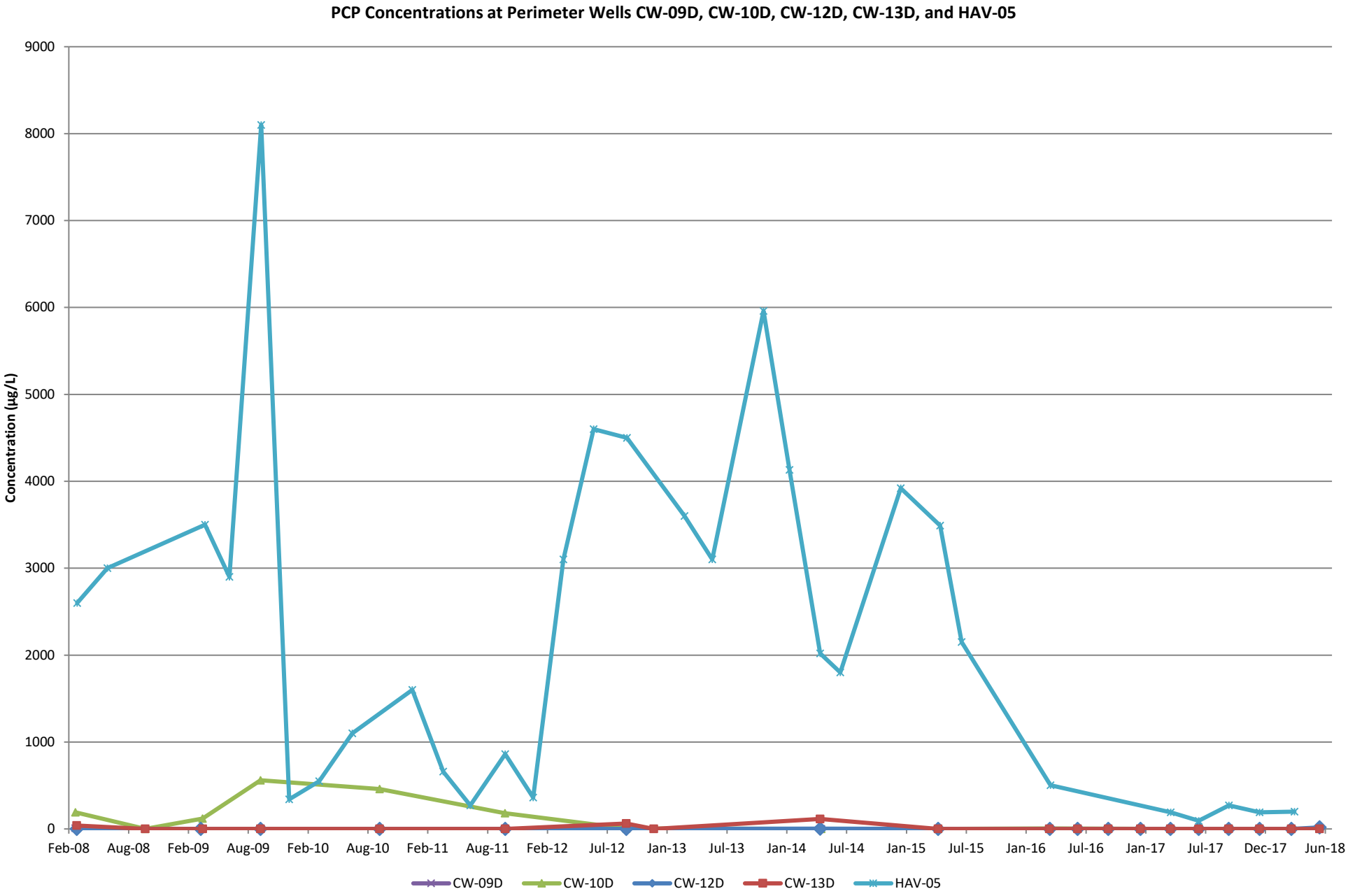
GRAPHS OF HISTORICAL CONTAMINANT CONCENTRATIONS IN MONITORING WELLS

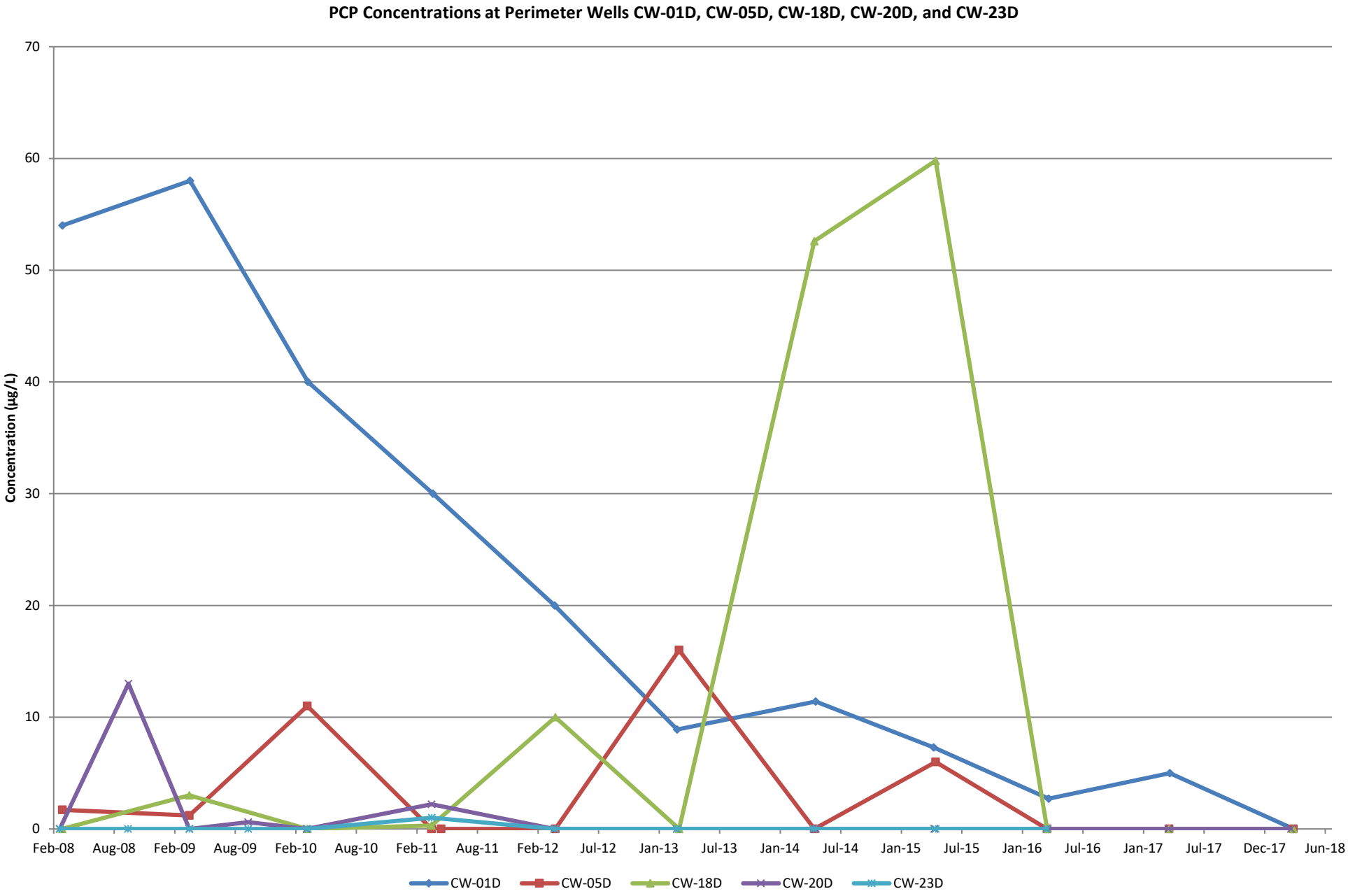

PCP Concentrations at Source Wells CW-04D, CW-16D, CW-24D, CW-26D, and RW-05
Concentration (µg/L)
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-04D
CW-16D
CW-24D
CW-26D
RW-05

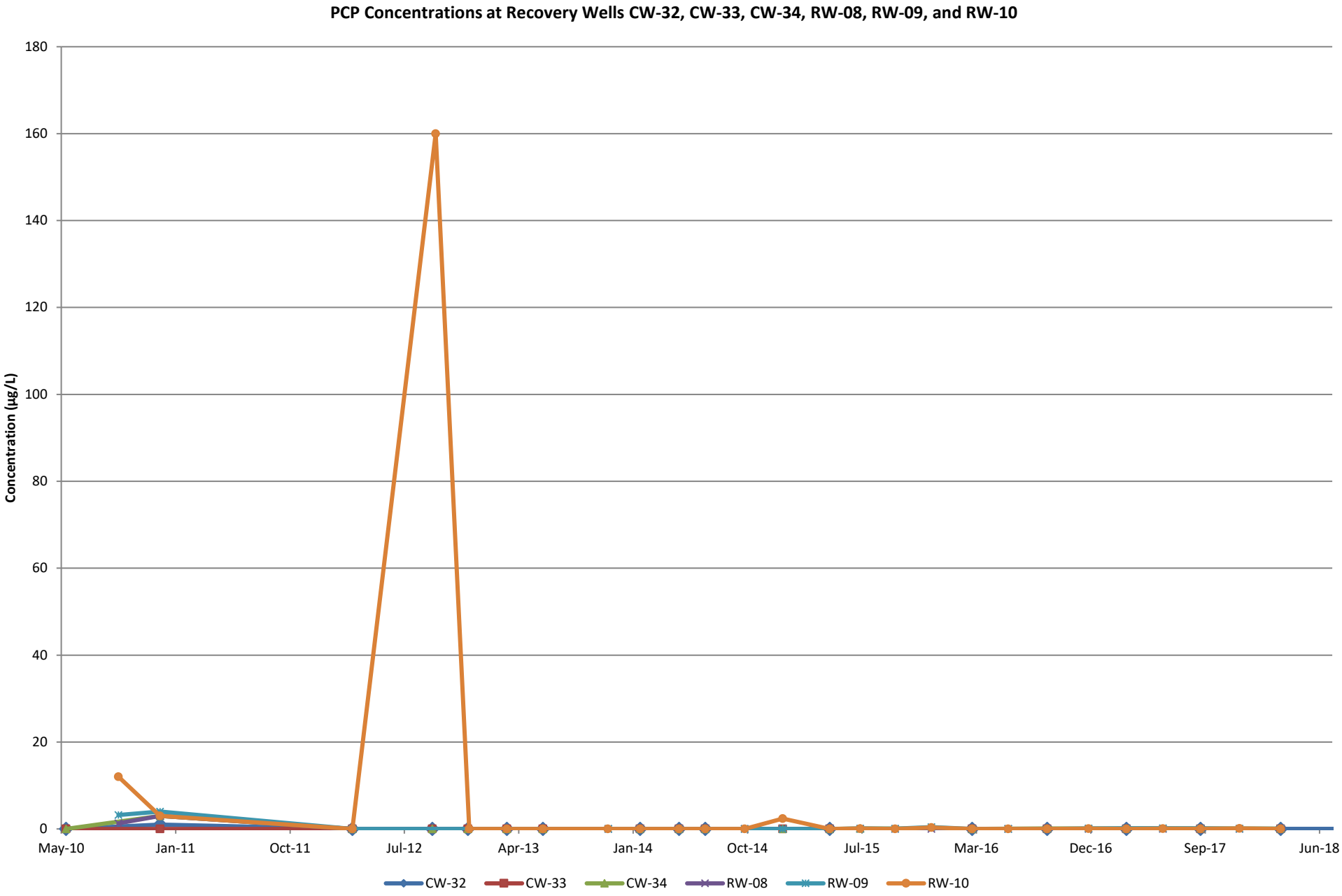

PCP Concentrations at Source Wells CW-17D, CW-27D, CW-28D, and CW-29D
Concentration (µg/L)
14000
12000
10000
8000
6000
4000
2000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-17D
CW-27D
CW-28D
CW-29D

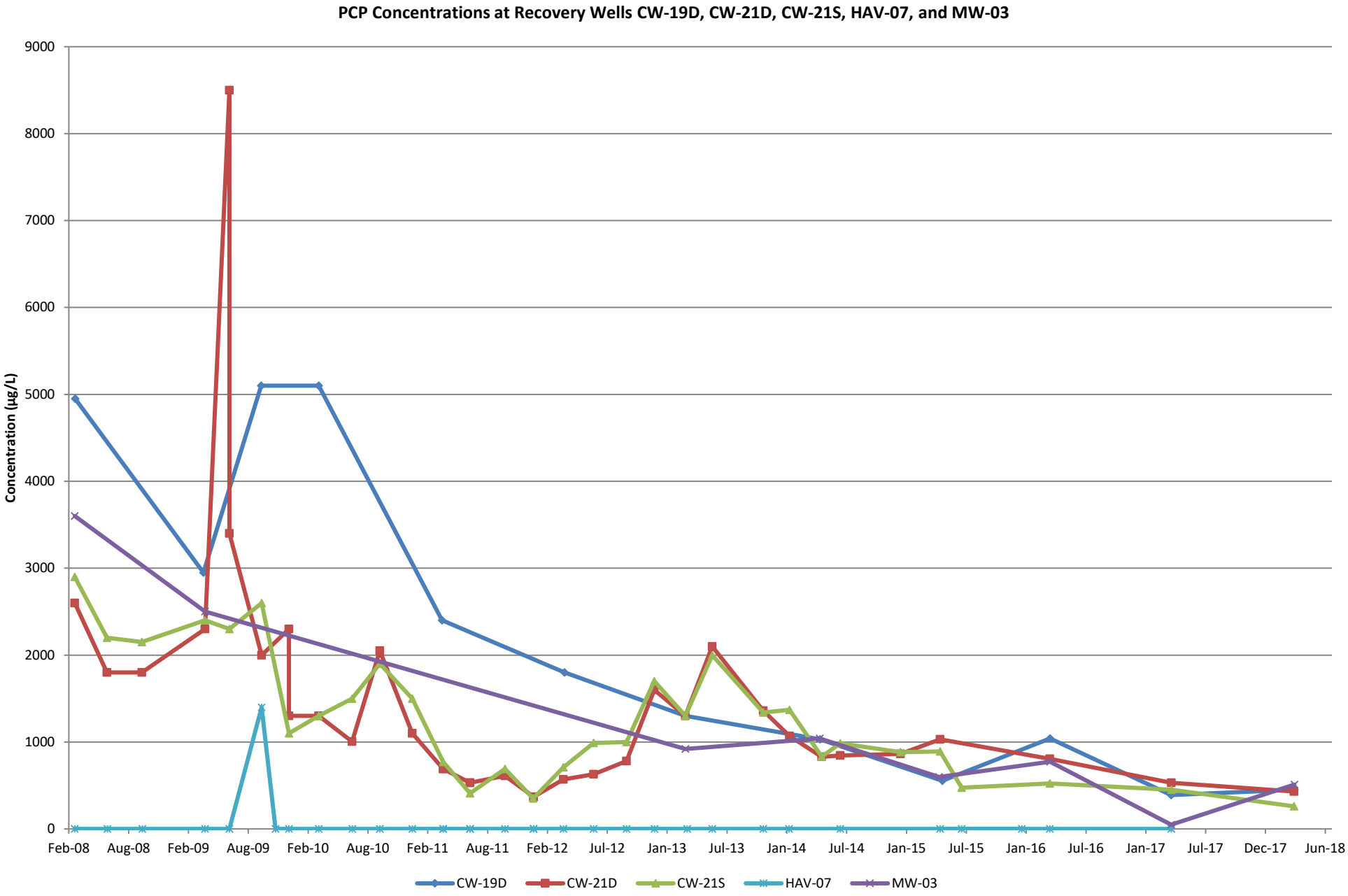

PCP Concentrations at Source Wells CW-02D, CW-03D, CW-30D, and CW-31D
Concentration (µg/L)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-02D
CW-03D
CW-30D
CW-31D

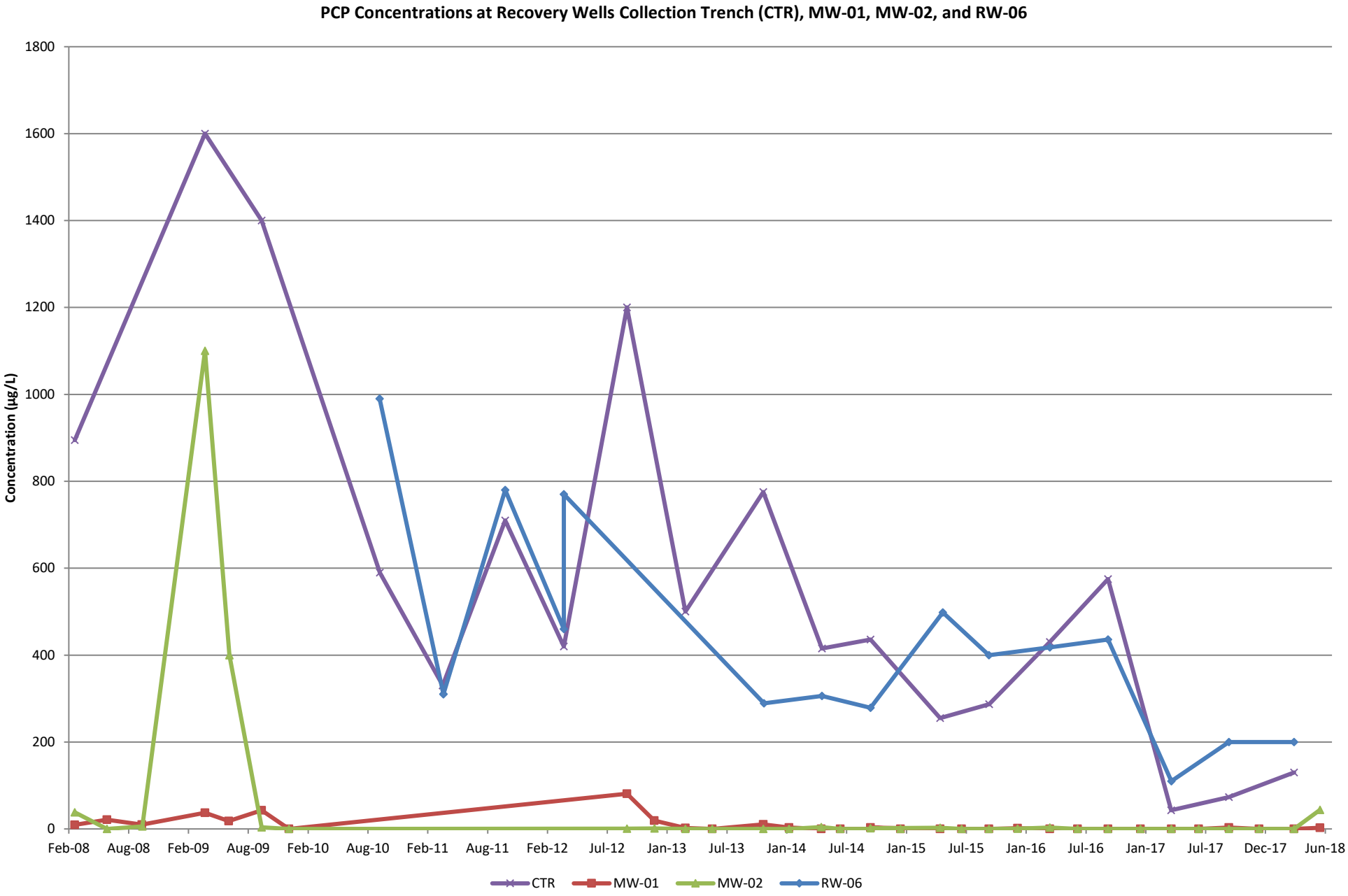

PCP Concentrations at Perimeter Wells CW-07D, CW-08D, CW-11D, CW-22S, and CW-22D
Concentration (µg/L)
60
50
40
30
20
10
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-07D
CW-08D
CW-11D
CW-22D
CW-22S

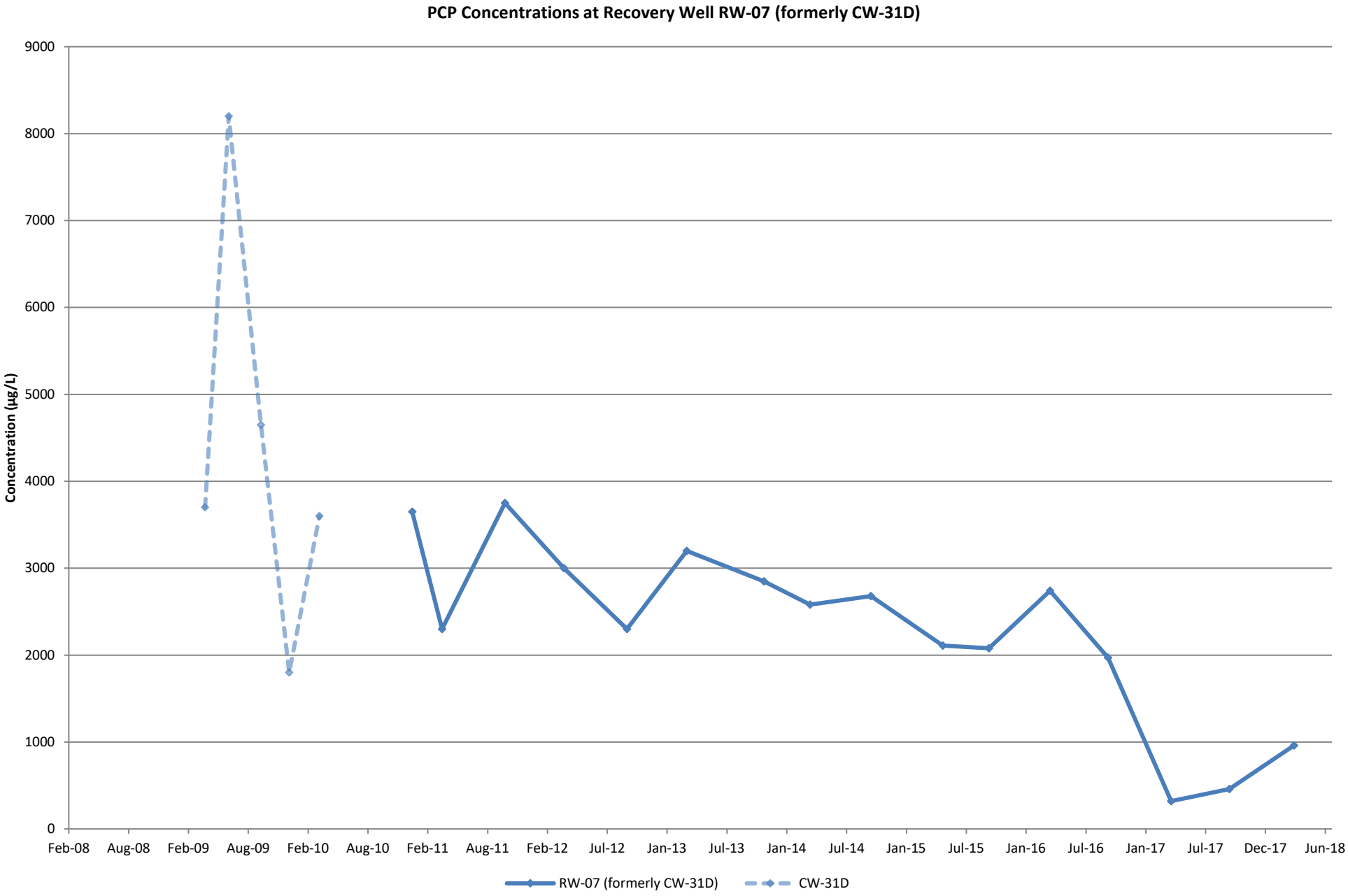

PCP Concentrations at Perimeter Wells CW-09D, CW-10D, CW-12D, CW-13D, and HAV-05
Concentration (µg/L)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-09D
CW-10D
CW-12D
CW-13D
HAV-05

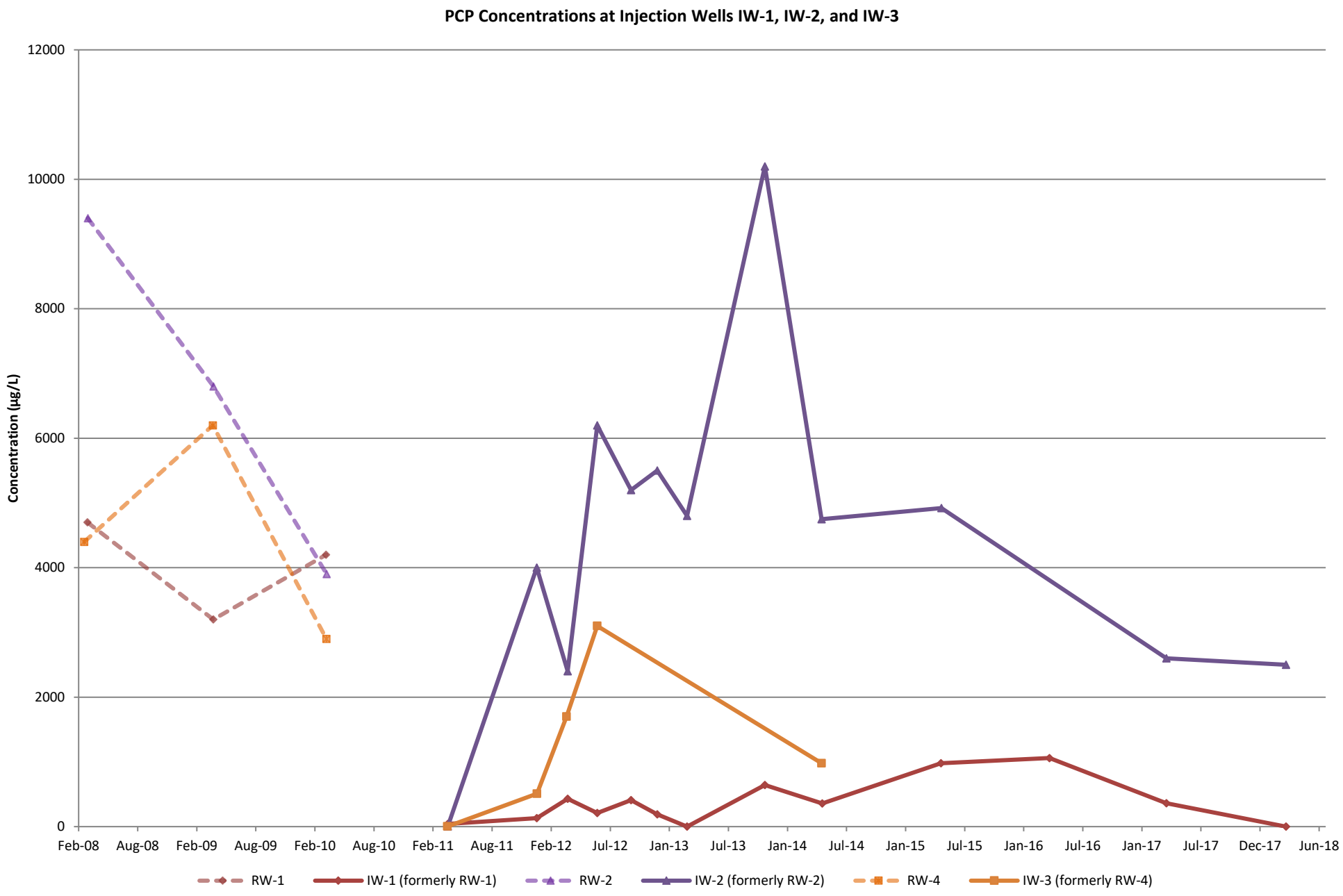

PCP Concentrations at Perimeter Wells CW-01D, CW-05D, CW-18D, CW-20D, and CW-23D
Concentration (µg/L)
70
60
50
40
30
20
10
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-01D
CW-05D
CW-18D
CW-20D
CW-23D

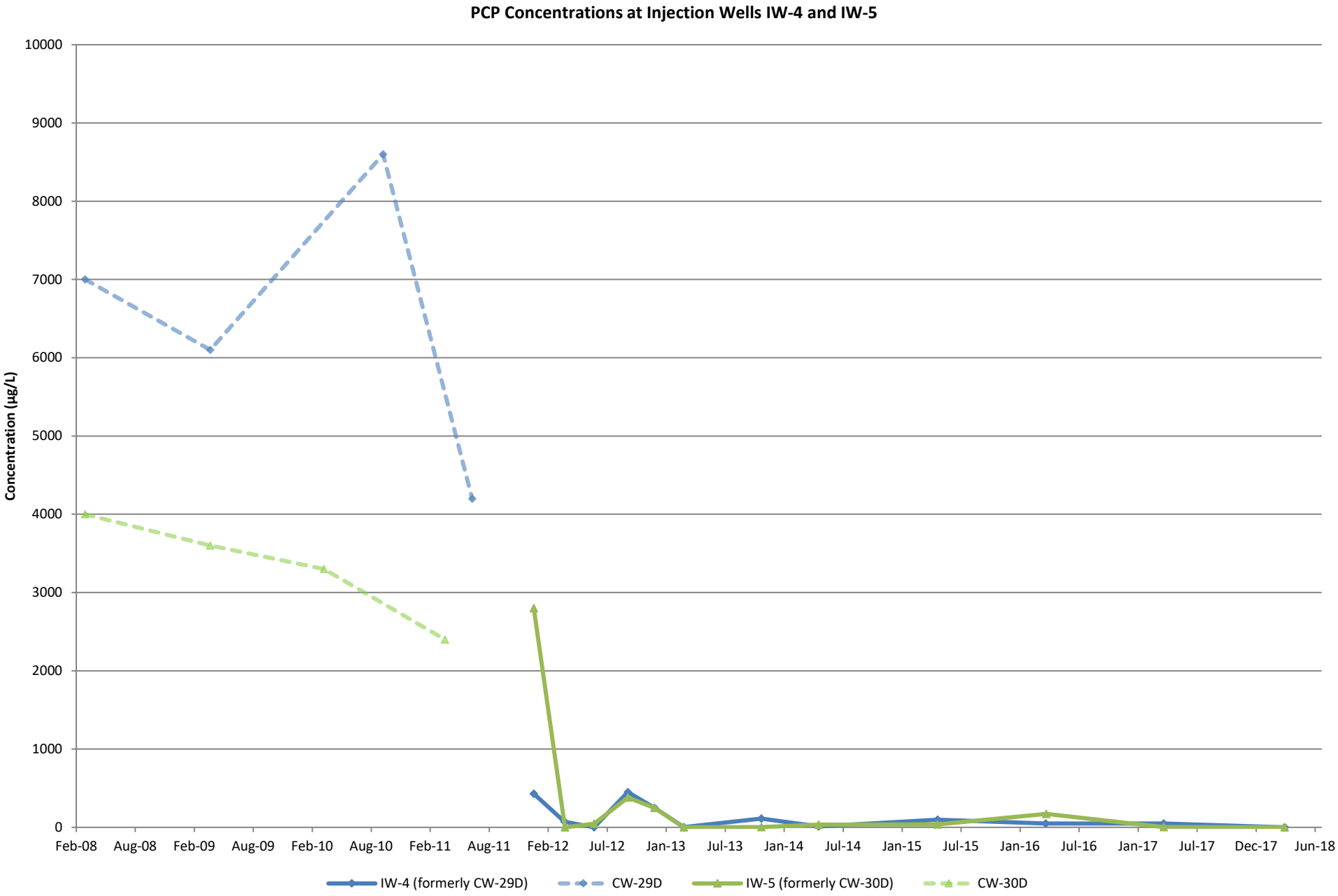

PCP Concentrations at Recovery Wells CW-32, CW-33, CW-34, RW-08, RW-09, and RW-10
Concentration (µg/L)
180
160
140
120
100
80
60
40
20
0
May-10
Jan-11
Oct-11
Jul-12
Apr-13
Jan-14
Oct-14
Jul-15
Mar-16
Dec-16
Sep-17
Jun-18
CW-32
CW-33
CW-34
RW-08
RW-09
RW-10


PCP Concentrations at Recovery Wells CW-19D, CW-21D, CW-21S, HAV-07, and MW-03
Concentration (µg/L)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CW-19D
CW-21D
CW-21S
HAV-07
MW-03


PCP Concentrations at Recovery Wells Collection Trench (CTR), MW-01, MW-02, and RW-06
Concentration (µg/L)
1800
1600
1400
1200
1000
800
600
400
200
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
CTR
MW-01
MW-02
RW-06


PCP Concentrations at Recovery Well RW-07 (formerly CW-31D)
Concentration (µg/L)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
RW-07 (formerly CW-31D)
CW-31D


PCP Concentrations at Injection Wells IW-1, IW-2, and IW-3
Concentration (µg/L)
12000
10000
8000
6000
4000
2000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
RW-1
IW-1 (formerly RW-1)
RW-2
IW-2 (formerly RW-2)
RW-4
IW-3 (formerly RW-4)


PCP Concentrations at Injection Wells IW-4 and IW-5
Concentration (µg/L)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Feb-08
Aug-08
Feb-09
Aug-09
Feb-10
Aug-10
Feb-11
Aug-11
Feb-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Dec-17
Jun-18
IW-4 (formerly CW-29D)
CW-29D
IW-5 (formerly CW-30D)
CW-30D