SITE CHARACTERIZATION/REMEDIAL INVESTIGATION REPORT AREA OF INTEREST 6

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September 3, 2013
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1.0 INTRODUCTION

This Site Characterization Report/Remedial Investigation Report (SCR/RIR) has been prepared for Area of Interest (AOI) 6 at the Philadelphia Energy Solutions Refining and Marketing LLC (PES) refinery (facility). Sunoco Inc. (R&M) (Sunoco) sold the site, with the exception of Belmont Terminal, to PES under a Buyer Seller Agreement signed by Sunoco, PES and the Pennsylvania Department of Environmental Protection (PADEP) in September 2012. Sunoco Logistics is the current owner of Belmont Terminal.

Site remediation at the facility is ongoing as part of previously-established programs and the 2012 Buyer Seller Agreement as described below. The facility has operated and is planned to continue operating as a refinery.

Regulatory Overview

Sunoco and the PADEP entered into a Consent Order & Agreement (CO&A) in December 2003 with respect to the facility. Sunoco's Phase I Remedial Plan (Phase I Plan), dated November 2003, was included as an attachment to the CO&A. In accordance with the CO&A and Phase I Plan, a Current Conditions Report and Comprehensive Remedial Plan (CCR) was prepared by Sunoco in June 2004. The Phase I Plan and the CCR divided the facility into 11 AOIs, and presented a prioritization of the AOIs based on specific risk factors. The CCR also presented the Phase II remedial approach and schedule to characterize each of the 11 AOIs, and to conduct Phase I and II corrective action activities in accordance with the 2003 CO&A and the Phase I Plan. Since 2003, Sunoco has completed site characterization activities at all eleven AOIs in accordance with the 2003 CO&A. For each AOI that has been characterized, Sunoco prepared and submitted a corresponding SCR in accordance with the Revised Phase II Corrective Action Activities schedule (as amended) that was included in the CCR.

With regard to AOI 6, Sunoco submitted a Site Characterization Work Plan (Work Plan) for AOI 6 in February 2006 to the PADEP and the Environmental Protection Agency (EPA). This Work Plan summarized proposed activities to be completed to characterize AOI 6 in accordance with the objectives of the CCR. The Work Plan also included proposed activities to characterize the two leaded tank bottom Solid Waste Management Units (SWMUs) subject to EPA's Resource, Conservation and Recovery Act (RCRA) Corrective Action Program in AOI 6. The Work Plan was implemented between March and June 2006 and the results were summarized in the SCR that was submitted to PADEP and EPA on September 28, 2006 (Sunoco, 2006).

In October 2006, Sunoco submitted a notice of intent to remediate (NIR) to the PADEP for the facility entering the facility into the Act 2 program. On November 2011, the facility was formally entered into the PA One Cleanup Program between the EPA – Region III and PADEP. Sunoco submitted a revised *Work Plan for Sitewide Approach Under the One Cleanup Program* (Work Plan for Sitewide Approach) to document the Sitewide remedial approach extending beyond the requirements of the 2003 CO&A. In accordance with the Work Plan for Sitewide Approach, Sunoco is preparing "repackaged" SCR/RIRs to formerly satisfy the requirements Act 2. This report is the repackaged SCR/RIR for AOI 6 and describes site characterization work included in the 2006 AOI 6 SCR, as well site characterization work completed in 2012 to supplement the 2006 work. The supplemental work was completed to characterize deeper soils (2-15 feet interval) and to address regulated storage tank compliance issues for certain tanks in AOI 6. To further evaluate groundwater conditions, a comprehensive round of groundwater gauging and sampling was also conducted from the network of monitoring wells in AOI 6.

In accordance with Act 2, Langan Engineering and Environmental Services, Inc. (Langan), on behalf of Sunoco, has prepared the required public and municipal notices as part of this report submittal. Appendix A includes a copy of the facility NIR, as well as the Act 2 report notices and their proof of receipt/publication for this report.

1.1 Facility Description

The facility is located in southwest Philadelphia. AOI 6, also known as the Girard Point Fuels Processing Area, is located on the east side of the Schuylkill River (Figures 1 and 2). AOI 6 is comprised of a wedge-shaped section from Lanier Avenue to the Schuylkill River and encompasses approximately 100 acres. A sheet pile bulkhead, which is keyed into the Middle Clay Unit, extends along the entire western boundary of the AOI, between the AOI and the Schuylkill River. The extent of the wall is shown in Figure 2.

There are two leaded tank bottom SWMUs (SWMU Nos. 92 and 95) located in AOI 6 (Figure 3) that were addressed in several previous RCRA investigations as part of the EPA Corrective Action Process (CAP). The history and locations of the two SWMUs are discussed in detail in Section 3.1 of this report.

1.2 Facility Operational History and Current Use

The facility is located in southwest Philadelphia and has a long history of petroleum transportation, storage, and processing. The oldest portion of the facility started petroleum-related activities in the 1860s when the Atlantic Refining Company established an oil distribution center. In the 1900s, crude oil processing began and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals such as acids and ammonia were also produced at the facility.

Historically, AOI 6 consisted of numerous above ground storage tanks (ASTs) containing benzene, toluene, naphtha and other fuel stocks. A sulfuric acid plant was located along the northern boundary of the AOI. A gasoline treating unit, two reformer units, a BDDA (soap) unit, and a thermal hydro-dealkylation unit were also located in this area.

Currently, AOI 6 consists of Udex and cumene units, reformer, tankage, boiler-houses and associated feed water treatment, maintenance buildings, lay-down yards, office buildings, the # 2 oil-water separator and remote Laboratory. Many ASTs have been removed in recent years. The status of regulated tanks in AOI 6 is discussed in Section 3.10 of this report. A sheet pile wall, which is keyed into the Middle Clay, extends along the entire western boundary of the AOI 6 between the Schuylkill River and AOI 6. The extent of the wall is shown in Figure 2.

The existing monitoring well network in AOI 6 includes a total of 64 accessible shallow monitoring points: 51 existing monitoring wells, two piezometers, and 11 recovery wells. Fourteen of the 51 monitoring wells were installed in 2006 as part of the site characterization activities and an additional six of the 51 monitoring wells were installed in 2012 to investigate light non-aqueous phase liquids (LNAPL) occurrence and evaluate groundwater conditions. Groundwater gauging of select monitoring wells in AOI 6 occurs on an annual basis during the second quarter of each year by Stantec Consulting Corporation (Stantec). Annual gauging activities and results are reported to the PADEP and EPA in Quarterly Reports prepared by Sunoco. The Quarterly Reports also include the results of Sunoco's annual perimeter monitoring well sampling program.

The 27 Pump House Total Fluids Recovery System is the only remediation system located in AOI-6. Installed in November 2001, the system included 12 total fluid recovery wells in the vicinity of the former 27 Pump House. The 27 Pump House is

displayed in Figure 3. This system has the capability of pumping total fluids from wells B-124, B-133, B-134, B-136, B-137, B-138, B-139, B 140, B-142, B-143, B-147 and SUMP-1. This system was taken off line on September 20, 2010 due to the absence of recoverable product. Absorbent socks were placed in B-124, B-137, B-139, B-142, B-143, B-132, and B-147 on October 10, 2010. These wells are gauged on a quarterly basis and any detected LNAPL is passively recovered and transferred to the system holding tank.

1.3 Selection of Constituents of Concern and Applicable Standards

The constituents of concern (COCs) for soil and groundwater in AOI 6 are listed in Table 1 of this report. The COCs for the completed activities include all current constituents from the Pennsylvania CAP Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E of PADEP's Closure Requirements for Underground Storage Tank Systems, with the exception of the waste oil parameters since waste oil is only stored in small tanks within the facility maintenance garages. In May 2009, two additional COCs, 1,2,4-trimethylbenze (1,2,4-TMB) and 1,3,5-trimethylbenzene (1,3,5-TMB), were added to the list of COCs by Sunoco based on the PADEP's revisions to the petroleum short list of compounds and at the request of the PADEP.

Media of Concern

The media of concern for AOI 6 include groundwater and soil. The potential vapor intrusion into indoor air exposure pathway was evaluated by completing a site-specific indoor air evaluation. Surface water was evaluated as a potential ecological receptor in relation to facility activities.

Act 2 Remediation Standards

The approach for attaining Act 2 remediation standards for the media of concern is described below by media.

Groundwater

Groundwater sample results were screened against the PADEP non-residential, used-aquifer (TDS<2,500) statewide health groundwater medium-specific concentrations (MSCs). As summarized in the CCR, where constituent concentrations are above these

statewide health MSCs, Sunoco evaluated application of the site-specific remediation standard using either the pathway elimination or calculated risk-based standard options.

Shallow Soil – 0 to 2 Feet Interval

Shallow (0-2 feet) soil samples were collected at each soil boring/monitoring well location that represents a potential complete direct contact exposure pathway to facility workers (at unpaved areas). These shallow soil results were screened against the PADEP non-residential soil MSCs. Where constituent concentrations are above the PADEP non-residential soil MSCs, Sunoco evaluated application of the site-specific remediation standard using either the pathway elimination or calculated risk-based standard options.

Soil – 2 to 15 Feet Interval

Deep (2-15 feet) soil samples were collected at several locations to either vertically delineate shallow soil exceedances or to characterize deep soils where only a shallow sample was previously collected. These deep soil results were screened against the PADEP non-residential soil MSCs. Where constituent concentrations are above the PADEP non-residential soil MSCs, Sunoco evaluated application of the site-specific remediation standard using either the pathway elimination or calculated risk-based standard options.

Vapor Intrusion into Indoor Air

In October 2012, Stantec completed an indoor air assessment at the facility that included sampling indoor air in occupied buildings at the facility that are not under positive pressure. To evaluate the potential vapor intrusion into indoor air exposure pathway, the results of this assessment were screened against the Occupational Safety and Health Association (OSHA) Permissible Exposure Limits (PELs) since PES considers these buildings regulated by OSHA.

2.0 ENVIRONMENTAL SETTING

AOI 6 is located in the southern portion of the facility and is also known as part of the Girard Point Chemicals Processing Area. AOI 6 is located north of the Penrose Avenue Bridge and south of Pennypacker Avenue. It extends in a wedge-shaped section from Lanier Avenue to

the Schuylkill River and encompasses approximately 100 acres. The boundary of AOI 6 is shown in Figures 1 and 2.

2.1 Geology

The geology at AOI 6 has been extensively studied and described in the 2003 CCR and the 2006 AOI 6 SCR. To illustrate the geology at AOI 6, geologic cross section Q-Q,' trending southwest to northeast, was prepared using historic and recent subsurface information. The cross section location is shown in Figure 4 and the cross section is Figure 5.

The following paragraphs describe the geologic units beneath AOI 6 beginning with the deepest units to the shallowest units.

Wissahickon Formation – Bedrock beneath the facility and AOI 6 is identified as the Wissahickon Schist. This formation is a metamorphosed greenish-gray micaceous schist and quartzite. The competent bedrock of the Wissahickon Formation is overlain by weathered bedrock consisting of micaceous clay, which becomes increasingly sandy as the degree of weathering lessens and competent bedrock is encountered. Historic deep well borings in AOI 6 were completed in the Lower Sand and did not reach bedrock, however, based on interpolation from the numerous geologic cross sections presented in Appendix C of the CCR and the cross section provided as Figure 5, the Wissahickon Schist is expected to be approximately 80-90 feet beneath the ground surface in AOI 6.

Lower Sand Unit of the PRM – Throughout the majority of the facility, the Wissahickon Formation is overlain by the Lower Sand, which is the lowest member of the Potomac-Raritan Magothy (PRM) Aquifer System. As shown in Figure 5 the Lower Sand overlies bedrock throughout AOI 6.

The Lower Sand beneath AOI 6 is a green, brown, orange and/or red, fine gravel and course sand that grades upward into medium-to-fine sands and may contain layers of silts and clay. Throughout AOI 6, the Lower Sand is overlain by the Middle/Lower Clay, as indicated by soil borings B-48D, B-133D, B134D. The boring logs for these wells are included in Appendix B. No Lower Sand wells were installed in AOI 6 as part of the site characterization activities in 2006 or 2012. Using available geologic cross sections, the

Lower Sand is estimated to be approximately 15 to 47 feet thick at AOI 6 as shown in Figure 5. Sunoco submitted an Act 2 Final Report for AOI 11, which is the Lower Sand Unit beneath the facility, in June 2013.

Middle/Lower Clay – The Lower Sand is overlain by the Middle/Lower Clay unit in AOI 6. The Middle/Lower Clay is characterized by very low permeability reddish-brown, brown or gray clays and sandy clays. Shelby Tube samples were collected in the Middle/Lower Clay in AOI 6 in 1986 by Dames and Moore and in 2001 by URS. The results of the Atterburg limits for both samples classified the Middle/Lower Clay as high plasticity clay. The Middle/Lower Clay is present beneath AOI 6 as a wedge which thickens towards the west and the Schuylkill River. As shown in Figure 5, the clay is approximately 17 feet thick on the east side of AOI 6 and 50 feet thick along its boundary with the River. The western boundary of AOI 6 is bound by a sheet pile wall which is keyed into the clay as shown in Figure 5.

Trenton Gravel – Throughout most of the facility, the Trenton Gravel typically overlies the Middle/Lower Clay and Lower Sand with thicknesses up to 80 feet and a typical thickness of 40 feet. The Trenton Gravel is of Pleistocene Age (Ice Age; less than 2 million years) and is a very heterogeneous unit comprised of a predominant brown to gray sand, gravel and minor amounts of clay (Owens and Minard, 1979). Along the Schuylkill River, most of the Pleistocene formations have been eroded away, and based on all deep borings performed to date in AOI 6, the Trenton Gravel is not present throughout AOI 6.

Recent Fill/Alluvium - Overlying the Middle Clay in AOI 6 is recent fill/alluvium. The alluvium deposits generally consist of dark gray organic clayey mud or silt and fine sand. Fill type varies across AOI 6 and includes various sands and gravels, brick and wood fragments, and cinder ash.

In addition to the above descriptions, the following general observations can be made concerning the geology in AOI 6:

- The Fill/Alluvium, Middle/Lower Clay, and the Lower Sand units all exist beneath AOI 6; the Trenton Gravel is not present;

- The thickness of the Fill/Alluvium materials beneath AOI 6 ranges between 18 to 39 feet;
- The thickness of the Middle/Lower Clay beneath AOI 6 ranges from 17 to 50 feet, and the thickness increases towards the west and the Schuylkill River; and
- The thickness of the Lower Sand beneath AOI 6 is approximately 15 to 47 feet.

2.2 Hydrogeology

2.2.1 Shallow/Intermediate Groundwater Occurrence and Flow

Groundwater gauging data collected by Aquaterra Technologies, Inc. (Aquaterra) in December 2012 was used to generate a groundwater flow figure for the shallow zone in AOI 6 (Figure 6). The groundwater elevation data from this gauging event is provided in Table 3. Monitoring well construction details for the monitoring wells are provided in Table 2 and boring/well construction logs for the newly-installed monitoring wells are provided in Appendix B of this report. Historic boring/well logs for monitoring wells installed prior to the site characterization activities were provided in Appendix D of the CCR. Based on the groundwater elevations as shown in Figure 6, the following observations can be made:

- Groundwater in the shallow monitoring wells occurs at depths ranging between approximately -1.07 and 7.23 feet above mean sea level (ft amsl);
- Based on the December 2012 groundwater gauging event, the hydraulic gradient in the shallow/intermediate monitoring wells ranged from 0.003 near B-135 in the central portion of AOI 6 to 0.062 near B-169 in the western part of AOI 6 near the sheet pile wall;
- The groundwater gradient in the central portion of AOI 6 is relatively flat;
- A divide in groundwater flow, trending north-south, exists in the eastern portion of AOI 6; and
- Groundwater flow in the shallow/intermediate zone in AOI 6 west of the divide is towards the west-southwest and east of the divide is defined by a groundwater depression.

2.3 Surface Water

No surface water features are located in AOI 6. The nearest surface water body to AOI 6 is the Schuylkill River which borders the western AOI 6 boundaries. A sheet pile wall, keyed into the Middle Clay, exists between AOI 6 and the Schuylkill River as shown on Figure 2 and in cross-sectional view in Figure 5. Shallow groundwater interaction with the Schuylkill River is limited by the presence of the sheet pile wall.

3.0 SITE CHARACTERIZATION ACTIVITIES

The following sections summarize the site characterization activities that were completed in AOI 6 in support of this report. Site characterization activities were performed between 2006 and 2013 by Aquaterra and Langan in coordination with Sunoco.

3.1 Leaded Tank Bottoms - SWMUs 92 and 95

The 1993 Dames & Moore RCRA Facility Investigation (RFI) identified two SWMUs, currently in AOI 6, that required further characterization: SWMU 92 (Storage Tank Areas: Buried Lead Sludge Area 6) and SWMU 95 (Storage Tank Areas: Buried Lead Sludge Area 9). These SWMU areas were characterized during the 2006 effort following the investigative approach outlined in Section 1.2.2 of the Work Plan. This technical approach is summarized below:

- If materials were encountered within the leaded tank bottom areas matching the physical description of the leaded tank bottoms, then Sunoco collected samples for lead;
- If the lead results were above 450 parts per million (ppm) (PADEP's non-residential soil MSC for lead), then samples were analyzed for lead via Toxicity Characteristic Leaching Procedure (TCLP), EPA Test Method 1311; and
- Delineated areas that had soils that physically resemble leaded tank bottoms, had lead concentrations greater than 450 ppm and failed the TCLP test for lead would retain the leaded tank bottom designation. If no soils were encountered that meet all three of the above mentioned criteria, then the area would no longer be classified as a leaded tank bottom area.

In March 2006, a total of five borings were completed in SWMU 95 and 16 borings were completed in SWMU 92. The locations of the borings are shown on Figure 3. Utilizing a stainless steel hand auger, soil borings were advanced to a maximum depth of two feet below grade at each location. The soils were evaluated to determine if leaded tank bottom materials were present. Soil samples were collected at each soil boring location utilizing TerraCore samplers. No soil boring locations in SWMU 95 exhibited leaded tank bottom materials. In SWMU 92, four soil boring locations (BH-02-06, BH-03-06, BH-13-06 and BH-14-06) exhibited characteristics resembling the physical description of leaded tank bottoms and were sampled accordingly. Boring logs are provided in Appendix B.

3.2 General Soil Characterization In SWMU Areas

In December 2012, 14 soil borings were completed to horizontally and vertically delineate shallow soil exceedances within SWMU areas (Figure 3). Since it was confirmed by the 2006 investigation that leaded tank bottoms do not exist in these areas, the purpose of this investigation was only to delineate lead exceedances within SWMU areas. In areas where shallow soil samples were previously collected as part of the 2006 investigation, a deep soil boring was attempted to collect deeper soil samples. In all attempts, groundwater was encountered at a depth of less than two feet. Within SWMU 92, 13 soil borings were conducted and seven shallow samples were able to be collected. Within SWMU 95, one soil boring was conducted and one shallow sample was collected. The borings were advanced with a decontaminated hand auger and samples were collected in laboratory provided bottleware before being submitted to the laboratory for analysis of site COCs. Boring logs from each soil boring are presented in Appendix B. Below is a summary of the total number of soil borings completed in the SWMU areas between 2006 and 2012:

- SWMU 92 – 20 shallow soil borings; and
- SWMU 95 – 6 shallow soil borings.

Soil samples collected prior to October 2012 were submitted to Lancaster Laboratories, Inc. (LLI) of Lancaster, Pennsylvania and after October 2012 samples were submitted to Accutest Laboratories (Accutest) of Dayton, NJ for analysis of site COCs. A summary of the soil analytical results screened against the PADEP non-residential soil MSCs is

further discussed in Section 5.0 below. The laboratory analytical reports are provided as Appendix C.

3.3 Soil Borings and Sampling Outside of-SWMU Areas

A total of 31 soil borings were advanced outside of the SWMU areas at unpaved locations between 2006 and 2012. The locations of soil and monitoring well borings are shown on Figure 3. Soil borings were advanced utilizing a decontaminated stainless steel hand auger as well as split-spoon sampling techniques. Soil borings were advanced until groundwater was encountered at each unpaved location. Shallow soil samples were collected at each soil boring location and where groundwater was not encountered above two feet, a deep soil sample was also collected. All samples were collected with a TerraCore sampler. Soil sampling also occurred during the installation of nine monitoring wells in 2006 and six monitoring wells in 2012.

Soil samples were submitted to LLI prior to October 2012 and Accutest after October 2012 for analysis of site COCs. The laboratory analytical reports are provided as Appendix C.

3.4 Installation of Groundwater Monitoring Wells

Well installation activities performed in 2006 and 2012 were completed by Total Quality Drilling, LLC of Mulica Hills, New Jersey under the direct supervision of Aquaterra and Langan in coordination with Sunoco. The locations of monitoring wells installed are shown on Figure 3. Monitoring wells were installed to monitor the shallow and deep groundwater zones. The well installation activities are discussed in the following sections.

3.4.1 Fill/Alluvium (Shallow) Groundwater Monitoring Wells

Between February and April 2006 Total Quality Drilling installed 14 shallow monitoring wells within the fill/alluvium under the direct supervision of Aquaterra. All wells were installed and constructed in accordance with the Work Plan. Locations of these wells are shown on Figure 3. The fill/alluvium wells were advanced utilizing 8.25-inch inside diameter hollow stem augers and split spoon samplers to record lithology. Split spoon samples were collected at various intervals throughout the borings starting at 8 feet below grade.

Monitoring wells were constructed to a maximum depth of 15 feet below grade with the screen intervals ranging from 8 to 13 feet set within the fill/alluvium. Boring logs depicting monitoring well construction details and lithology are provided as Appendix B. Monitoring wells were constructed with a flush mount manhole cover or with three feet of stickup steel casing for protection. Well construction details are provided in Table 2.

Aquaterra and Langan provided direction and oversight to install six shallow (fill/alluvium) groundwater monitoring wells in AOI 6 in 2012. These wells were installed by Total Quality Drilling.

Prior to the installation of monitoring wells, each well location was cleared for subsurface utilities between 8 to 10 ft below ground surface (bgs) with a hydrovac excavator. After each location was cleared to depth, soil samples were collected from the sidewall of the boring with a decontaminated sampling device. Samples were then screened with a photoionization detector (PID) and were collected in accordance with the sampling procedure outlined in Appendix K. Shallow monitoring wells advanced by the drilling subcontractors utilized hollow stem augers and split spoon samplers to record lithology. Split spoon samples were collected at various intervals throughout the borings typically starting at 8 to 10 ft bgs if groundwater had not yet been encountered above 10 ft bgs. Monitoring wells were constructed to a maximum depth of 25 ft bgs with screen interval lengths of 10 to 15 ft screened across the water table interface. Monitoring wells were constructed with a flush mount manhole cover or with a stickup steel protective casing. Following construction, the monitoring wells were developed. Well construction details are provided in Table 2. Boring logs, lithology, and monitoring well construction details are provided in Appendix B.

3.5 Groundwater Monitoring

On May 24, 2006, Secor performed monitoring well gauging activities to collect liquid levels from monitoring wells within AOI 6 as part of the semi-annual facility well gauging program. Monitoring wells were gauged for depth-to-water, and if applicable, depth-to-product in accordance with the Work Plan. All well gauging readings from this event were summarized in the 2006 SCR.

In December 2012, Aquaterra performed monitoring well gauging activities from all 38 accessible monitoring points in AOI 6. Monitoring points were gauged for depth-to-water, and if applicable, depth-to-LNAPL. The monitoring point gauging readings are summarized in Table 3.

The groundwater monitoring data from Table 3 was used to generate a shallow groundwater elevation contour map provided as Figure 6. Based on the flow contours in Figure 6, the following observations can be made with regard to shallow groundwater flow in AOI 6:

- The groundwater gradient in the central portion of AOI 6 is relatively flat;
- A divide in groundwater flow, trending north-south, exists in the eastern portion of AOI 6; and
- Groundwater flow in the shallow/intermediate zone in AOI 6 west of the divide is towards the west-southwest and east of the divide is defined by a groundwater depression.

3.6 Groundwater Sampling

Aquaterra performed a round of groundwater sampling from all accessible wells in AOI 6 between June 6 and June 9, 2006. Wells B-116 and B-162 were sampled on August 10, 2006. All groundwater sampling activities were completed in accordance with the Work Plan.

In January 2013, Aquaterra performed a complete round of groundwater sampling from 38 monitoring wells in AOI 6 which were sampled for the COCs on Table 1. Prior to this sampling the monitoring well network was gauged for depth to water and product with an oil/water interface probe. Of the wells gauged, 19 monitoring wells had measureable (>0.01 ft.) LNAPL. The monitoring well sampling summary data report is provided as Appendix D.

During both sampling events, to remove stagnant water from the well and obtain a representative sample, Aquaterra purged three well volumes prior to sampling. Following well purging activities, groundwater samples were collected by lowering a

disposable bailer slowly into the monitoring well to minimize excess agitation. The bailer was filled with water from the top of the water table and retrieved. Samples were then collected in laboratory-prepared bottleware and immediately placed on ice. Samples were submitted to LLI in 2006 and Accutest in 2013 for analysis of site COCs. Once the sample was collected, the bailer, bailer cord, and nitrile gloves used to obtain the sample were discarded. Sample date, time, number, and site name were recorded on the chain-of-custody and in field books. For groundwater samples analyzed for lead, LLI and Accutest filtered the samples to analyze for dissolved lead concentrations.

The laboratory analytical reports are included as Appendix C.

3.7 LNAPL Sampling

LNAPL samples for select wells in AOI 6 were previously characterized as described in the CCR. As part of the recent characterization activities, Aquaterra collected LNAPL samples from two additional monitoring wells in AOI 6: B-47 and B-150. LNAPL samples were collected using a direct sampling or swabbing method in accordance with the Work Plan. Samples were packaged in certified hazardous material shipping boxes and sent via FedEx priority overnight to Torkelson Laboratories of Tulsa, Oklahoma for characterization. LNAPL characterization data included product types, density, proportions of product, degree of weathering, and similarities to other samples. Appendix H summarizes the LNAPL characterization results for all samples collected in AOI 6 and previous results from wells in AOI 6.

During the AOI 6 December 2012 groundwater gauging event, 19 monitoring wells (B-117, B-124, B-129, B-130, B-132, B-136, B-137, B-138, B-139, B-141, B-142, B-143, B-147, B-148, B-150, B-161, B-43, B-47, and U-3) had measurable LNAPL. LNAPL samples from monitoring wells B-129, WP9-2, B-130, B-144, and B-43, B-39, B-47, and B-150 were previously collected and characterized as part of the 2004 CCR and the 2006 SCR. During the 2012 gauging events, no new LNAPL was observed, so it was not necessary to collect samples for fingerprint analysis.

3.8 Indoor Air Sampling

There are 19 occupied buildings located in AOI 6 and three of these buildings are not under positive pressure (potential indoor air receptors). The three buildings not under positive pressure are: 24 Gate Building, the GP Training Center and the GP Office Building. The occupied buildings are shown on Figure 7 and are operated by PES and regulated by OSHA. In October 2012, Stantec conducted site wide indoor air sampling, as well as ambient air sampling, in and around the three buildings that are not under positive pressure. Stantec collected 13 indoor air samples and one outdoor ambient air sample related to the three buildings. Information about the sample locations is included in Figure 7. Indoor air samples were collected as follows:

- One sample from each of the 1st and 2nd floors of S24 Gate;
- Two samples from the 1st floor, one sample from the 3rd floor, and one sample from the basement of the Training Center; and
- Two samples from the 1st floor, two samples from the 2nd floor, three samples from the basement, and one outdoor ambient sample near the Main Office Building.

The Stantec 2013 report is attached in Appendix I, and the results of the sampling in AOI 6 are discussed further in Section 5.5.

3.9 Surveying Activities

Following completion of well installation and soil boring activities, the newly-installed monitoring wells and soil boring locations were surveyed by Langan to establish the location and elevation of the inner and outer casing and ground surface at each point. Well elevations were determined to the nearest 0.01 foot relative to mean sea level. Survey activities were performed by a Pennsylvania-licensed surveyor and tied to the NAVD 88 datum. The new survey data for the monitoring wells is presented in Table 3. This new survey data was used to update the Geographic Information System (GIS) and site wide database for the facility.

3.10 Regulated Storage Tank Activities

Previously-existing and existing regulated ASTs in AOI 6 that have been closed-in-place or have a documented release are illustrated in Figure 8. Numerous ASTs were removed from AOI 6 prior to August 5, 1989. Conditions in tank areas where tanks were removed prior to August 5, 1989 are being characterized under the PA One Cleanup Program investigation and are discussed in this SCR/RIR. Tanks in AOI 6 that have been closed-in-place or have had a documented release since August 5, 1989 are summarized in the table below.

Summary of Regulated Storage Tanks in AOI 6
With Documented Releases or Closed-In-Place Since August 5, 1989
PES Facility, Philadelphia, PA

Tank No.	Closure Type	Documented Release (Yes or No)	Additional Comments
GP 250	NA	Yes	2007 SCR Issued
GP 201	NA	Yes	2008 SCR Issued
GP U 677	Closed in Place	No	2011 Closure Report Issued
GP 797	Closed in Place	No	2002 Closure Report and 2002/2003 SCR Issued
GP U 1088	NA	Yes	2008 SCR Issued

Notes:
NA = Not Applicable

Based on the summary table above, two tanks in AOI 6 (GP U 677 and GP 797) have been closed-in-place. Closure and corrective action documentation for these tanks, consistent with requirements of 25 Pa Code §245.561, was prepared by others and previously submitted to the PADEP. Closure and corrective action documentation for GP U 677 was prepared by Secor International Incorporated (SECOR) in July 2002 and for GP 797 by Stantec in August 2011.

Three existing tanks (GP 201, GP 250 and GP U 1088) have had previous releases. Corrective action reports, consistent with requirements of 25 Pa Code §245.301-314, were prepared by others and previously submitted to the PADEP. Corrective action documentation for GP 201, GP 250, and GP 1088 was prepared by SECOR in June 2008, July 2007, and June 2008, respectively.

This SCR/RIR includes a Supplemental SCR (Appendix E of this report) for tanks GP 201, GP 250, GP U 677, GP 797 and GP U 1088. The purpose of the Supplemental SCR is to document the status of each tank and to summarize the previous and more-recent supplemental closure and/or corrective action work completed by Sunoco in these tank areas.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

The following sections outline the field and laboratory quality assurance/quality control measures that were incorporated into the site characterization activities. Groundwater gauging and sampling activities were completed in accordance with the field sampling procedures presented in Appendix K. The complete laboratory analytical data packages for the soil and groundwater sampling events are included in Appendix C.

4.1 Equipment Decontamination and Calibration

Sampling equipment was decontaminated in accordance with the field sampling procedures to prevent cross-contamination. Prior to sampling, the equipment was decontaminated with successive rinses of detergent and potable water and distilled deionized water. Down-hole equipment used in monitoring well purging, such as submersible pumps, was cleaned with an external non-phosphate detergent wash and tap water rinse. This cleaning process was followed by a flush of potable water. Prior to the use of sampling equipment (i.e. Horiba, PID, and electronic interface probe), the equipment was properly calibrated per the operating manual for that piece of equipment.

4.2 Sample Preservation

Samples were preserved, where necessary, with the addition of chemical preservatives, and by cooling the samples at 4°C before and during shipment to the laboratory. Chemical additives necessary for sample preservation were added to the sample containers by the analytical laboratory prior to releasing them to sampling personnel.

4.3 Laboratory Quality Assurance/Quality Control

Sample results summarized in 20 sample delivery groups from the 2006 and 2012 investigations provided by LLI, Accutest, The Washington Group, and Pace Analytical were evaluated for usability. Copies of the laboratory reports are provided in Appendix C. Langan investigations used LLI and Accutest for sample analysis. Pace Analytical, The Washington Group and LLI were used for the tank investigations completed by SECOR and Stantec (refer to Appendix E).

The laboratory performed quality assurance and quality control (QA/QC) analyses, including laboratory control spikes and laboratory control spike duplicates, matrix spikes and matrix spike duplicates, surrogate spikes, method blanks and QA/QC checks such as GC/MS instrument tuning and mass calibration, as appropriate. Laboratory QA/QC summaries were completed by each laboratory and provided in the attached data packages. The analytical data, data qualifiers, and QC results provided in these reports were evaluated to determine the confidence with which the groundwater and soil data could be used in the Act 2 decision-making process.

Data quality indicators (DQIs) are qualitative and quantitative measures of data quality "attributes," which are descriptors used to express various properties of analytical data. Thus, DQIs are the various measures of the individual data characteristics that collectively comprise the general, all-encompassing term "data quality." Quality attributes used to assess the data usability include:

- Method selectivity/specificity;
- Method sensitivity
- Accuracy (bias);
- Precision;
- Representativeness;
- Comparability; and
- Completeness.

Based on evaluation of the above-mentioned indicators, the groundwater and soil data collected during this investigation are considered usable for characterizing the site, identifying compounds of concern, and delineating potential impacts, with the exceptions described in Appendix L (Data Usability Assessment). The number of

samples collected is expected to provide sufficient data to satisfy the objective defined in the AOI 6 Work Plan.

4.4 Documentation

Chain-of-custody forms were maintained throughout the sampling program to document sample acquisition, possession and analysis. Chain-of-custody documentation accompanied samples from the field to the laboratory. Each sample was assigned a unique number that was recorded on permanent field sheet.

5.0 SITE CHARACTERIZATION ANALYTICAL RESULTS

The following sections discuss the analytical results of the site characterization activities performed in AOI 6.

5.1 2006 Leaded Tank Bottoms Investigation at SWMUs 92 and 95

As stated in Section 3.1 above, if materials were encountered within the leaded tank bottom areas during site characterization activities matching the physical description of the leaded tank bottom materials, then samples were collected for total lead. If the total lead results exceeded 450 ppm (the PADEP non-residential MSC for lead), then the samples were analyzed for lead via TCLP, EPA Test Method 1311.

In 2006, no soil boring locations in SWMU 95 exhibited leaded tank bottom materials; therefore no samples were collected for further analysis. The logs for these soil borings are presented in Appendix B. Areas of SWMU 92 had material similar in appearance to leaded tank bottoms, however testing in accordance with the above criteria demonstrated no detections of leaded tank bottoms, indicating leaded tank bottoms were unlikely to have been disposed of in this area. In SWMU 92, four sample locations (BH-02-06, BH-03-06, BH-13-06, and BH-14-06) exhibited characteristics resembling the physical description of leaded tank bottoms and were sampled accordingly. The results of the sample analyses are summarized in Table 4, illustrated in Figure 9, and the logs for these borings are provided in Appendix B.

A summary of the sample results from these four borings is presented below:

- The sample collected from boring BH-13-06 exhibited a total lead concentration below the PADEP non-residential MSC (450 ppm) and was not submitted for further analysis; and
- The samples collected from borings BH-02-06, BH-03-06, and BH-14-06 exceeded the PADEP MSC for total lead. These samples were submitted for analysis of TCLP lead using EPA Method 1311. The lead concentrations for all three samples were below the EPA maximum concentration of lead for toxicity concentration of 5 milligrams per liter (mg/L).

5.1.1 2012 Supplemental Soil Investigation in SWMU Areas

To delineate lead exceedances within the SWMU areas that were not related to leaded tank bottoms, a supplemental investigation was conducted in late 2012. A total of seven supplemental shallow soil samples were collected within the two SWMUs and analyzed for site COCs to further characterize the SWMUs. The analytical results of the soil samples collected from within the SWMUs are provided in Tables 4 and 5. Shallow soil samples were collected between the ground surface and 2 ft bgs and deep soil samples were attempted between 2 and 15 ft bgs. Due to shallow groundwater conditions encountered, no deep soil samples were able to be collected within both SWMUs. The soil sample results were screened against the PADEP non-residential soil MSCs. Soil sample locations with results above their respective PADEP non-residential soil MSCs are shown in Figure 10. Below is a general summary of the screening results for samples collected.

A total of seven supplemental shallow soil samples were collected in SWMU 92 in late 2012. A summary of all the screening results from both investigations within SWMU 92 is as follows:

- There were no soil samples with concentrations above the PADEP non-residential soil MSCs for site COCs in BH-12-137, BH-12-144, and BH-12-147; and
- Lead was the only site COC detected in soil above its respective PADEP non-residential soil MSC in BH-12-136 (853 milligrams per kilogram

[mg/kg]), BH-12-139 (1,120 mg/kg), BH-12-140 (766 mg/kg), and BH-12-148 (745 mg/kg).

One shallow soil sample was collected in SWMU 95. A summary of the screening results is as follows:

- There were no concentrations reported above the PADEP non-residential soil MSCs for site COCs in soil sample BH-12-120.

5.2 2006 Soil Analytical Results for Samples Outside SWMU Areas

The results of the soil samples collected outside of the RCRA SWMU areas are provided in Tables 4 and 5. All of the soil samples were collected between 0.5 ft bgs and 2 ft bgs and no saturated soils were observed at these depths in any borings. The soil sample results were screened against the PADEP non-residential MSCs for soil. Sample locations and exceedances of the MSCs are shown in Figure 10. Below is a general summary of the screening results:

- COCs which were detected in soil, exceed their respective non-residential MSCs, and were detected in groundwater include: benzene, toluene, benzo(a)pyrene and total lead; and
- Ethylbenzene, ethylene dibromide, 1,2-dichloroethane, total xylenes, MTBE, cumene, anthracene, pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, chrysene, benzo(a)anthracene, phenanthrene, flourene and naphthalene were not detected in AOI 6 soil at concentrations exceeding their respective non-residential MSCs.

5.2.1 2012 Supplemental Soil Investigation – Outside SWMU Areas

In late 2012, supplemental soil data was collected outside of SWMU areas to both vertically and horizontally delineate 2006 sample exceedances of the PADEP Non-Residential MSC. In addition, at locations where shallow soil samples were previously collected, a deep soil sample was attempted in an effort to characterize deep soil. The results of the soil samples collected outside of the RCRA SWMU areas are provided in Tables 4 and 5. The soil sample results were screened against the PADEP non-residential MSCs for soil. Sample

locations and exceedances of the MSCs are shown in Figure 10. Below is a general summary of the screening results:

Below is a general summary of the screening results:

- COCs which were detected in soil, exceed their respective non-residential MSCs include: benzene, benzo(a)pyrene, 1,2,4-TMB, 1,3,5-TMB, naphthalene, ethylbenzene, 1,2 dibromoethane, and total lead; and
- 1,2-dichloroethane, total xylenes, MTBE, cumene, anthracene, pyrene, benzo(g,h,i)perylene, benzo(b)fluoranthene, toluene, chrysene, benzo(a)anthracene, phenanthrene, and flourene were not detected in AOI 6 soil at concentrations exceeding their respective non-residential MSCs.

5.3 Groundwater Results

The results of the groundwater samples collected from monitoring wells in AOI 6 during 2006 and 2012 sampling events are provided in Table 6. The results were screened against the PADEP non-residential used aquifer (TDS<2,500) groundwater MSCs. Locations with concentrations above the groundwater MSCs are illustrated in Figure 11. A summary of the 2006 COC concentrations that exceeded the PADEP non-residential groundwater MSCs are presented below.

- COCs detected in shallow groundwater at concentrations exceeding their respective non-residential MSCs include: benzene, toluene, MTBE, 1,2-dichoroethane, chrysene, naphthalene, and pyrene; and
- Cumene, ethylbenzene, ethylene dibromide, xylenes, fluorene, phenanthrene and lead were not detected in AOI 6 groundwater at concentrations exceeding their respective non-residential MSCs.

As part of the 2012 investigation, a supplemental round of groundwater sampling was completed in January 2013 to assess current AOI 6 groundwater conditions. The COC listing for groundwater was also revised for the 2012 investigation to include the following compounds from the soil COC listing: anthracene; benzo(a)anthracene; benzo(g,h,i)perylene; benzo(a)pyrene; and benzo(b)fluoranthene. A summary of the

2013 COC concentrations that exceeded the PADEP non-residential groundwater MSCs is below:

- COCs detected in shallow groundwater at concentrations exceeding their respective non-residential MSCs include: benzene, toluene, chrysene, lead, benzo(g,h,i)perylene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(a)anthracene, 1,2,4-TMB, and 1,3,5-TMB; and
- Cumene, ethylbenzene, naphthalene, anthracene, MTBE, 1,2-dichloroethane, ethylene dibromide, xylenes, fluorene, phenanthrene, and pyrene were not detected in AOI 6 groundwater at concentrations exceeding their respective non-residential MSCs.

5.4 LNAPL Characterization Results

The results of the 2006 and 2012 LNAPL characterization analysis were used to separate the apparent LNAPL plumes by LNAPL types and to also assist in the calculations of LNAPL specific volume and mobility using the American Petroleum Institute (API) LNAPL model, as summarized in Appendix H. The extent of LNAPL in AOI 6, based on the apparent LNAPL thickness measured during the December 2012 gauging event, is illustrated in Figure 12. LNAPL thicknesses measured in December 2012 in AOI 6 ranged from a sheen (0.01 feet) to 5.19 feet. LNAPL type was determined during the 2004 and 2006 site characterization activities and was applied to the December 2012 gauging data to generate the product plumes illustrated in Figure 12. The December 2012 gauging data was used to update the API LNAPL modeling in Appendix H. No additional wells were observed to have apparent LNAPL between 2006 and 2012.

Other conclusions regarding the results of the LNAPL characterization and modeling are discussed below:

- Four different types or mixtures of LNAPL were identified in AOI 6. These include gasoline, middle distillate, middle distillate/residual oil mixture, and residual oil;
- The presence of LNAPL within AOI 6 correlates with the COC concentrations in exceedance of the MSC in the majority of the wells in AOI 6; and
- Apparent LNAPL thickness in wells in the 27 Pump House area has reduced significantly since 2004. Based on the quarterly recovery well gauging, as part of

the recovery system performance monitoring program, the 27 Pump House Remedial System was taken off-line in September of 2010 due to the absence of recoverable LNAPL. Absorbent socks were placed in B-124, B-137, B-139, B-142, B-143, B-132, and B-147 on October of 2010. These wells are gauged on a quarterly basis and any detected LNAPL is now passively recovered and transferred to the system holding tank.

- Apparent LNAPL thickness in wells in AOI 6 has generally either remained the same or decreased, with the exception of a slight increase in thickness in well B-129. The API model for well B-129 was updated by inputting the December 2012 apparent LNAPL thickness of 5.19 feet. A seepage velocity of 9.85 x 10-8 cm/sec was calculated for B-129, which is below the mobility threshold of 1 x 10-7 cm/sec referenced in the CCR; therefore the LNAPL in this well is not considered mobile.

5.5 Indoor Air Characterization Results

Stantec collected 13 indoor air samples and one outdoor ambient air sample from the three occupied buildings within AOI 6 that are not under positive pressure: 24 Gate Building, the GP Training Center and the GP Office Building. The results of the indoor air samples were compared to the OSHA PELs because the facility and these buildings are regulated by OSHA. The results are as follows:

- The 24 Gate Building 1st floor sample exhibited concentrations of benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB above the reporting limit but below the corresponding OSHA PELs;
- The 24 Gate Building 2nd floor sample exhibited concentrations of benzene, toluene, ethylbenzene, total xylene, and 1,2,4-TMB below the associated OSHA PELs;
- The GP Training Building 1st floor samples exhibited concentrations of benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB below the associated OSHA PELs;
- The GP Training Building 3rd floor and basement samples exhibited concentrations of benzene, toluene, ethylbenzene, total xylene, cumene, 1,3,5-TMB and 1,2,4-TMB below the associated OSHA PEL;

- The GP Office Building samples exhibited concentrations of benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB above the reporting limit but below the corresponding OSHA PEL; and
- The outdoor ambient air GP Office Building sample exhibited concentrations that were very similar to the indoor air samples where benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB were detected above the reporting limit but below the corresponding OSHA PEL.

Given the above results, all air samples collected from inside the three buildings that are not under positive pressure are below OSHA PELs for the protection of worker health. The air sampling results are provided in Table 7 and building sample locations are displayed in Figure 7. The Stantec 2013 report is attached in Appendix I and the potential vapor intrusion pathway is evaluated further in Section 7.5.

6.0 REMEDIAL SYSTEM UPDATE

There are no active remediation systems currently operating in AOI 6. As previously mentioned, the 27 Pump House Remedial System was taken off-line in September of 2010 due to the absence of recoverable LNAPL.

7.0 FATE AND TRANSPORT ANALYSIS

The following sections describe fate and transport modeling activities performed as part of AOI 6 site characterization and the results. Details regarding the fate and transport modeling approach and results can be found in Appendix F.

7.1 Soil

No fate and transport modeling was completed for the soil analytical results since the only potential exposure pathway to shallow soil is by direct contact. PES's permit procedures and personal protective equipment (PPE) requirements eliminate the potential direct contact exposure pathway to subsurface soil. Potential exposure pathways for AOI 6 are discussed in detail in Section 9.0.

7.2 Groundwater

Fate and transport calculations were completed for groundwater in AOI 6 to evaluate the potential migration pathway of impacted groundwater to the Schuylkill River. Since AOI-6 is bordered by AOI-7 to the north, AOI-3 to the east and AOI-5 to the south, the Schuylkill River is the only potential off-site receptor. A sheet pile wall exists along the AOI 6 border with the river. This wall significantly reduces the flow of groundwater from AOI 6 to the river; however, fate and transport modeling was completed for select wells as a conservative screening measure to assess the potential groundwater to surface water pathway.

Eleven COCs were detected in groundwater during the January 2013 groundwater sampling event at concentrations above their respective MSCs. These COCs are benzene, toluene, benzo(a)pyrene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(b)fluoranthene, pyrene, chrysene, 1,2,4-TMB, 1,3,5-TMB and lead. To address the potential future migration of these COCs, a fate and transport analysis was performed using three models developed by PADEP. The Quick Domenico Version 2 (QD) model and the SWLOAD model were used for fate and transport in groundwater. PENTOXSD was used when assessing potential impacts of groundwater on surface water. For assessing the potential impact of metals in surface water, the equation for calculating the allowable groundwater concentration (discharge equation), presented in the PA Act 2 Technical Guidance page IV-20, was used. Site-specific data was used to complete the fate and transport calculations, when available. For assessing potential impacts to surface water the flow rate of the Schuylkill River was set to 10% of the reported $Q_{7\text{-}10}$ or harmonic mean flow as recommended by PADEP.

For assessing the potential impact of dissolved metals in groundwater to surface water, the equation for calculating the allowable groundwater concentration (discharge equation), as presented in the PA Act 2 Technical Guidance page IV-20, was used.

The wasteload allocation calculations were performed using the equation;

$$C_{gw} = C_x + \frac{Y_c \times Q_{sw} \times (C_x - C_{bsw})}{Q_{gw}}$$

Where:

- C_{gw} = the allowable groundwater concentration (ug/l)
- C_x = the water quality objective from PA Code Chapter 93 (ug/l)
- Q_{sw} = the quantity of stream flow above the nonpoint source discharge into surface water (cubic ft per second)
- C_{bsw} = the background concentration in surface water of a contaminant of concern above the nonpoint source discharge (ug/l)
- Q_{gw} = the quality of flow in the groundwater plume discharging to the surface water (cubic ft per second)
- Y_c = partial mixing factor is the fractional portion of the stream that mixes with the discharge

QD and SWLOAD Modeling Results

QD and SWLOAD groundwater fate and transport results indicate benzene concentrations at B-154 (238,000 ug/l) and B-155 (77,800 ug/l) located near the center of AOI 6 and URS-4 (46.8 ug/l), located at the southern edge of AOI 6, have the potential to reach the bank of the Schuylkill River at concentrations above the DEP MSC. All other COCs evaluated using the QD and SWLOAD models were predicted to attenuate before reaching the nearest receptor. Modeling files and result summary tables can be found in Appendix F.

A number of factors suggest it is unlikely benzene impacts at B-154 and B-155 could reach the Schuylkill River. These factors include:

- Benzene concentrations in downgradient well B-156 at 301 ug/l, and nearby wells B-151 at 15.2 ug/l, B-163 at 373 ug/l, and non-detect at B-135 are several orders of magnitude less than those at B-154 and B-155;
- Benzene concentrations in these wells have decreased by about 50 percent from those detected during the 2006 sampling event (2006 SCR); and
- The sheet pile wall located along the property line between AOI 6 and the Schuylkill River acts as a barrier between the groundwater and surface water interconnection.

QD and SWLOAD results also indicated that PENTOXSD would be needed for benzene at URS-4, which is located about 10 feet from the sheet pile wall. The QD and SWLOAD models were not used for the fate and transport of lead in groundwater. Instead, potential groundwater to surface water discharge was assessed for lead using the mixing equation outlined in the following section.

PENTOXSD Modeling Results

PENTOXSD results indicate that the benzene groundwater concentration at B-154 (238,000 ug/l) would exceed its wasteload allocations (WLAs) for acute fish criterion (AFC), chronic fisher criterion (CFC) and cancer risk level (CRL). PENTOXSD results indicate that the benzene groundwater concentration at B-155 (77,800 ug/l) exceeds its WLAs for AFC, CFC and CRL. The B-155 SWLOAD predicted benzene groundwater concentration at the receptor (1,146.4 ug/l) exceeds the CRL but not the AFC or CFC. However, several factors are present that act to reduce the potential for benzene groundwater impacts to migrate from the B-154/B-155 area to nearby surface water receptors, strongly suggesting that the QD, SWLOAD, and PENTOXSD simulation results are very conservative, and overestimate the mass transport of benzene from these wells.

The current conceptual model of the fate and transport occurring at the B-154/B-155 area is too complex to be assessed using a simple analytical model. For that reason, the fate and transport of benzene was qualitatively assessed by presenting the factors that appear to be reducing the migration of benzene from the B-154/B-155 area. The first factor is the significant attenuation of benzene which has occurred since the last sampling round in 2006. Natural attenuation resulted in a decrease in benzene concentration by 47% at B-154 and 72% at B-155. Observed groundwater concentrations from 2006 to 2013 decreased from 450,000 ug/l to 238,000 ug/l and 280,000 ug/l to 77,800 ug/l at B-154 and B-155, respectively. The second factor is that downgradient wells from B-154 and B-155 exhibit benzene concentrations that are orders of magnitude lower than the concentrations in B-154 and B-155. The third factor is the sheet pile wall located along the property line between AOI 6 and the Schuylkill River acts as a barrier between the groundwater and surface water interconnection. The presence of the sheet pile wall, while not completely impermeable, but less permeable than surface fill/alluvium, acts as a physical barrier to groundwater discharge

from AOI 6 to the Schuylkill River. The sheet pile wall also reduces the flow of groundwater near the Schuylkill River by reducing the hydraulic gradients in the direction of the river, decreasing groundwater seepage velocity and therefore potential mass transport. Based on these factors, the above qualitative assessment of fate and transport of benzene in groundwater from B-154 and B-155 is considered sufficient to assess risk of potential groundwater to surface water discharge. For URS-4 the groundwater benzene concentration at the well was 46.8 ug/l and, calculated by SWLOAD at the receptor is 31.7 ug/l. Neither of these concentrations exceeds any of the PENTOXSD calculated WLAs.

Discharge Equation Results (For Lead)

Using the DEP's discharge equation, the calculated AFC for lead is 1,298.7 ug/l and the CFC for lead is 33,766.33 ug/l. The observed lead concentration at B-39 is 5.7 ug/l, which is below both wasteload allocations.

Fate & Transport Summary

All COCs (benzene, toluene, benzo(a)pyrene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(b)fluoranthene, pyrene, chrysene, 1,2,4-TMB, 1,3.,5-TMB and lead) evaluated using the QD and SWLOAD models were predicted to attenuate before reaching the nearest receptor, except for benzene at B-154, B-155 and URS-4.

Using the two-step model approach (refer to Appendix F) which accounts for changing hydraulic conditions (i.e., presence of a less permeable sheet pile wall along the river), QD and SWLOAD simulations indicate the benzene concentration in B-155 will attenuate below the groundwater MSC before discharging to the Schuylkill River. Using the same two-step modeling approach, SWLOAD predicts that benzene groundwater concentrations from B-154 decrease to 31.2 ug/l, which is several orders of magnitude less than the WLAs calculated by PENTOSXD.

Calculations using the mixing equation for lead at B-39 indicate that the groundwater lead impact of 5.7 ug/l, is several orders of magnitude lower than the AFC and CFC wasteload allocations.

7.3 Surface Water

Due to the presence of the sheet pile wall along the AOI 6 boundary with the Schuylkill River, the significantly lower benzene detections in wells surrounding B-154 and B-155, the natural attenuation of benzene concentrations at B-154 and B-155 over the past several years, and the conservative assumptions used in the QD, SWLOAD and PENTOXSD modeling, groundwater concentrations above the PADEP non-residential groundwater MSC are not anticipated to cause an exceedance of the 25 Title Pa Code Chapter 93 surface water quality criteria in the Schuylkill River.

7.4 LNAPL

As described in Section 5.4, Sunoco evaluated LNAPL mobility across the site using the API LNAPL model as a guide for assessing LNAPL volume, mobility, and recoverability across the facility. Based on the LNAPL modeling conducted in 2006, LNAPL around the 27 Pump House was considered mobile. As a remedy, Sunoco installed the 27 Pump Remedial System that included 12 active total fluid recovery wells where total recovered fluids were routed to an oil/water separator. LNAPL was then passively skimmed and deposited into two 550-gallon holding tanks where the contents of the holding tanks were pumped out, as necessary, and recycled by the facility. Groundwater passed through the separator and was pumped to the facility's wastewater treatment plant. Based on the quarterly recovery well gauging, as part of the recovery system performance monitoring program, the 27 Pump House Remedial System was taken off-line in September of 2010 due to the absence of recoverable LNAPL.

7.5 Vapor Intrusion to Indoor Air

As referenced in Section 5.5, the Stantec indoor air sampling results for the AOI 6 occupied buildings that are not under positive pressure indicated that all of the samples are below OSHA's PELs for the protection of worker health; therefore, the potential vapor intrusion pathway for existing buildings is not evaluated further. The 2013 Stantec report is attached in Appendix I.

8.0 SITE CONCEPTUAL MODEL

A preliminary site conceptual model (SCM) for the facility, including AOI 6, was presented in the CCR. The SCM for AOI 6 was further refined in the 2006 AOI 6 SCR. Data collected from the 2010 to 2013 site characterization activities performed in AOI 6 were used to further refine the SCM. The current SCM for AOI 6 is described the following sections.

8.1 Description and Site Use

AOI 6 is commonly referred to as the Girard Point Chemicals Processing Area and is comprised of a wedge-shaped section from Lanier Avenue to the Schuylkill River that encompasses approximately 100 acres. Existing usage within AOI 6 consists of Udex and cumene units, reformers, tankage, boilerhouses, maintenance buildings, No. 2 Oil-Water Separator, laydown yards, and office buildings, including the remote Laboratory. Many ASTs have been removed in recent years and several are still in service.

The entire western boundary of AOI 6 is bound by a sheet pile wall that is keyed in the Middle Clay. The current, historic uses/investigations and approximate limits of impervious surfaces are depicted on in the current/historic use figure in Appendix J.

AOI 6 is located within a fenced and secured area to prevent unauthorized access. Prior to any work being completed within AOI 6, appropriate work permits, safety and security measures must be approved by PES Facility personnel. AOI 6 is under the control of the PES health and safety administrative procedures and is regulated by OSHA. Direct contact to site soils (soils greater than two feet beneath the ground surface) is controlled by the PES on-site permit and personal protective equipment (PPE) procedures. The current and future intended use of AOI 6 is to remain non-residential.

8.2 Geology and Hydrogeology

The following summarizes relevant information concerning geology and hydrogeology in AOI 6.

- The Fill/Alluvium, Middle/Lower Clay, and the Lower Sand all exist beneath AOI 6, the Trenton Gravel is absent beneath AOI 6 as shown in Figure 5;

- Unconfined groundwater conditions exist in the fill/alluvium at shallow depths (approximately 1.5 to 16 feet beneath the ground surface);
- The sheet pile wall along the border of AOI 6 and the Schuylkill River is keyed into the Middle/Lower Clay and acts as a boundary for shallow groundwater flow;
- The groundwater gradient in the central portion of AOI 6 is relatively flat. A divide in groundwater flow, trending north-south, exists in the eastern portion of AOI 6. Groundwater flow in the shallow/intermediate zone in AOI 6 west of the divide is towards the west-southwest and east of the divide is defined by a groundwater depression.

8.3 Compounds of Concern

The following summarizes relevant information concerning COCs in AOI 6.

- COCs which were detected in shallow soil at concentrations above their respective PADEP non-residential soil MSCs, included: benzene (14 locations), lead (30 locations), 1,2,4-TMB (one location), 1,3,5-TMB (one location), 1,2-dibromethane (one location); and naphthalene (one location).
- 1,2-dichloroethane, cumene, ethylbenzene, MTBE, toluene, xylenes, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, phenanthrene and pyrene were not detected in AOI 6 shallow soil samples at concentrations above their respective PADEP non-residential soil MSCs.
- COCs which were detected in deep soil at concentrations above their respective PADEP non-residential soil MSCs, included: benzene (11 locations), lead (seven locations), toluene (five locations), 1,2,4-TMB (one location), 1,3,5-TMB (one location), cumene (one location), and naphthalene (one location).
- 1,2-dichloroethane, ethylbenzene, MTBE, xylenes, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, ethylene dibromide, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluorene, phenanthrene and pyrene were not detected in AOI 6 shallow groundwater samples at concentrations above their respective PADEP non-residential soil MSCs.

- COCs detected historically in groundwater in the shallow zone at concentrations above their respective PADEP non-residential groundwater MSCs included benzene (31 locations), benzo(a)pyrene (eight locations), benzo(g,h,i)perylene (five locations), toluene (four locations), chrysene (three locations), MTBE (three locations), pyrene (three locations), benzo(a)anthracene (three locations), benzo(b)fluoranthene (three locations), lead (two locations), 1,2-dichloroethane (one location), naphthalene (one location), 1,3,5-TMB (one location), and 1,2,4-TMB (one location).
- Ethylbenzene, MTBE, xylenes, anthracene, ethylene dibromide, fluorene, and phenanthrene were not detected in AOI 6 shallow groundwater samples at concentrations above their respective PADEP non-residential soil MSCs.

The exposure assessment completed for the COCs above the PADEP non-residential MSCs is discussed in Section 9.0 of this report.

8.4 LNAPL Distribution and LNAPL Mobility

The following summarizes relevant information concerning LNAPL distribution in AOI 6:

- Four different types or mixtures of LNAPL were identified in AOI 6. These include gasoline, middle distillate, middle distillate/residual oil mixture and residual oil; and
- LNAPL in AOI 6 is contained within the boundary of the facility and does not appear to have to the potential to migrate off-site.

8.5 Fate and Transport of COCs

Fate and transport calculations were completed for groundwater in AOI 6 to evaluate potential migration pathways/potential impacts to receptors. Eleven COCs were detected in groundwater during the January 2013 groundwater sampling event at concentrations above their respective MSCs. These COCs are benzene, toluene, benzo(a)pyrene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(b)fluoranthene, pyrene, chrysene, 1,2,4-TMB, 1,3,5-TMB and lead. To address the potential future migration of these COCs, a fate and transport analysis was performed using three models developed by PADEP. The QD model and the SWLOAD model were used for fate and transport in groundwater. PENTOXSD was used when assessing potential

impacts of groundwater on surface water. For assessing the potential impact of metals in surface water, the equation for calculating the allowable groundwater concentration (discharge equation), presented in the PA Act 2 Technical Guidance page IV-20 was used. Results of this analysis can be found in Appendix F.

Based on the results of the modeling, groundwater concentrations above the PADEP non-residential groundwater MSC at AOI 6 are not anticipated to cause an exceedance of the 25 Title Pa Code Chapter 93 surface water quality criteria in the Schuylkill River.

8.6 Potential Migration Pathways and Site Receptors

The following summarizes potential migration pathways and site receptors for AOI 6. Site characterization has been completed to address each of the potential pathways listed below.

- AOI 6 is situated within a fenced, secured area to prevent unauthorized access.
- The potential direct contact pathway to soil between 0-2 two feet is deemed complete.
- The potential direct contact pathway to soil greater than two feet is deemed incomplete based on PES's existing permitting procedures, which protect against exposure to soil encountered in excavations.
- The potential direct contact pathway to groundwater is deemed incomplete based on PES's existing permitting procedures which prevent exposure to groundwater that may be encountered in excavations.
- The indoor air assessment completed in the occupied buildings not under positive pressure demonstrated levels below OSHA PEL's.

The exposure assessment completed for the COCs above the PADEP non-residential MSCs is discussed in Section 9.0 of this report.

9.0 HUMAN HEALTH EXPOSURE ASSESSMENT/RISK ASSESSMENT

Based on the current and future intended non-residential site use, an exposure assessment was conducted for any compounds in shallow soils (0-2 feet bgs) or deep soils (2-15 feet bgs) that exceeded the non-residential statewide health soil MSC. Potential human health exposures for the facility are for an industrial worker scenario.

Direct contact exposure pathways to shallow soil, groundwater, and LNAPL is being evaluated under the industrial use scenario because PES has well-documented standards for PPE and procedures for soil excavation and handling.

The following table serves as a summary of potential human health exposure pathways that can be reasonably expected under the current and intended future non-residential use for AOI 6. The table lists potentially contaminated media, potential receptors for these media, and a summary of whether any potentially complete exposure pathways exist at AOI 6 from the media to these receptors.

Exposure Pathway Evaluation Summary

Contaminated Media	Residents	Workers	Day Care	Construction	Trespassers	Recreation	Food
Groundwater	NA	No(1)	NA	No (2)	No	NA	NA
Air (indoor)	NA	No (3)	NA	No(3)	No	NA	NA
Soil <2 feet bgs.	NA	Yes	NA	Yes	No	NA	NA
Soil >2 feet bgs.	NA	No(4)	NA	No(4)	No	NA	NA
Surface Water	NA	No(5)	NA	No(5)	NA	NA	NA
Sediment	NA	NA	NA	NA	NA	NA	NA
LNAPL	NA	No(1)	NA	No (2)	NA	NA	NA

Notes:

(1) No complete groundwater or LNAPL pathways exist for workers that are not addressed through on-site permitting procedures and PPE.
(2) No complete groundwater or LNAPL pathway exists for construction workers that are not addressed through on-site permitting procedures and PPE.
(3) No current complete pathway to indoor air exists based on the evaluation described in Section 9.0.
(4) No complete pathway exists for site soil >2 feet deep that are not addressed through on-site permitting procedures and PPE.
(5) No complete pathway exists for surface water or sediment that is not addressed through on-site permitting procedures and PPE.

Na - Not applicable
No - No potential complete exposure pathway
Yes – Potential complete exposure pathway

A more detailed evaluation of each of these potential human health exposure pathways is presented in the following sections by media.

9.1 Surface Water

There are no surface water features located within AOI 6. The nearest surface water body to AOI 6 is the Schuylkill River which borders the western site boundary (Figure 2). A sheet pile wall is located along the western boundary of the site. Shallow groundwater interaction with surface water is limited by the sheet pile wall.

Based on the location of the sheet pile wall, groundwater flow, and the results of the groundwater modeling for monitoring wells where groundwater COCs were detected above the PADEP non-residential groundwater MSCs, none of the constituents detected in groundwater are likely to cause an in-stream violation of surface water quality criteria for the Schuylkill River.

9.2 Soils (0-15 Feet Below Grade)

Direct Contact Exposure

Based on the data collected between 2006 and 2012, concentrations of benzene, benzo(a)pyrene, lead, naphthalene, toluene, ethylbenzene, ethylene dibromide, 1,2,4-TMB and 1,3,5-TMB were detected in shallow soils above the non-residential soil MSC and concentrations of benzene, lead, naphthalene, toluene, ethylbenzene, isopropylbenzene, 1,2,4-TMB, and 1,3,5-TMB were detected in deep soils above the non-residential soil MSC. To refine the list of compounds carried forward in the risk assessment, the compounds listed above were further screened against the EPA Region III Risk-Based Concentrations (aka, EPA Regional Screening Levels [RSLs]) in accordance with Section IV of the PADEP's Technical Guidance Manual (TGM) (dated June 8, 2002). Based on this screening, concentrations of 1,3,5-TMB, toluene, ethylene dibromide and isopropylbenzene were below the EPA RSLs for industrial soil and were, therefore, eliminated from the risk assessment. Concentrations of benzene, lead naphthalene, benzo(a)pyrene, ethylbenzene and 1,2,4-TMB were above the EPA RSLs and were, therefore, further evaluated as outlined in the January 2013 Soil Screening Procedure for Philadelphia Energy Solutions memorandum (Sunoco 2013).

As described in the January 2013 memorandum (Sunoco, 2012), the compounds that exceeded both the non-residential statewide health standards and EPA RSLs were compared to the PADEP's Non-Residential Direct Contact MSC. To maintain conservatism, all soil samples (surface and subsurface) were screened against the more

stringent 0-2 feet below grade direct contact criteria regardless of sample depth in the event that soils are re-used elsewhere on the Facility. Based on this screening, concentrations of naphthalene, ethylbenzene, and 1,2,4-TMB were eliminated from the risk assessment. The compounds identified for further risk assessment are benzene, benzo(a)pyrene, and lead. Benzene and benzo(a)pyrene are carcinogenic compounds and will be evaluated together. Since most lead-based human health effects data are based on blood-lead concentrations instead of external dose, the traditional approach for risk assessment is not applied to characterize exposure to lead. Consequently, exposure to lead is evaluated based on the predicted concentration of lead in the blood and is evaluated separately.

The total cumulative excess cancer risk is the combined risk of exposure to the exposure point concentrations (EPCs) of any carcinogenic compounds that fail the initial screening: for AOI-6 these compounds include benzene and benzo(a)pyrene. The EPC is the representative concentration that is expected to be contacted by a receptor and is assumed to be universally present throughout the exposure area. Consistent with the SCM and because soil at the facility may be moved, the exposure area is understood to extend from the surface to 15 feet bgs. There are no receptors at the facility subject to exposure to subsurface soils absent soil re-use; therefore, use of surface and subsurface soils in the derivation of an EPC represents the only reasonable and health-protective scenario. As described in the January 2013 memorandum, the 95% Upper Confidence Limit (95UCL) was used as the EPC except in cases where the 95UCL is higher than the maximum concentrations (USEPA 1989). If the maximum concentration is lower than the calculated 95UCL then the maximum concentration is used as the EPC. The 95UCL for benzene and benzo(a)pyrene in soil samples collected from 0 to 15 feet bgs was derived using USEPA's ProUCL Version 4.1 software. The ProUCL output is provided as Attachment G.

Using the 95UCL, incremental cancer risk attributable to benzene was calculated to be 6E-06 and incremental cancer risk attributable to benzo(a)pyrene was calculated to be 5E-06 (Table H-1). The total cumulative excess cancer risk is the combined risk of exposure to benzene and benzo(a)pyrene and, in accordance with the TGM, should not exceed 10^{-4}. As presented in Table H-1, the total cumulative risk of exposure to the carcinogenic compounds benzene and benzo(a)pyrene is 1E-05 and within the PADEP's acceptable threshold; therefore, no remedies are required to address carcinogenic risks.

The site-specific screening level for lead was calculated based on ingestion as presented in 25 Pa. Code § 250.306(e), Appendix A, Table 7. As described in 25 Pa. Code § 250.306(e), the non-residential soil screening value for lead is based on the method presented in the report 'The Society for Environmental Geochemistry and Health (SEGH) Task Force Approach to the Assessment of Lead in Soil' (Wixson, 1991). The model used by the PADEP and developed by SEGH was also used to calculate the site specific criterion for the facility. Based on the SEGH model and PADEP's default parameters, PADEP's non-residential direct contact MSC default value for lead in surface soil is 1,000 mg/kg. To develop a site-specific criteria for lead, the values used by PADEP for the target blood lead concentration (T) and geometric mean background blood lead concentration (B) were revised in consideration of site-specific conditions and updated lead data collected by the US Center for Disease Control and Prevention (CDC). Revised values for these parameters are discussed in the following paragraphs.

As presented in Appendix G, based on the revised parameters, the derived site-specific standard for lead in soil is 1,708 mg/kg for a facility worker. Two shallow soil samples (BH-29-06 and BH-30-09), two tank samples(GPU677-SR-31-4 and GPU677-SR-31-5) and one deep soil sample (BH-12-110) have concentrations of lead above the site specific criteria and will be delineated and remediated as described in the Clean-up Plan.

9.3 Groundwater

Results of the groundwater sampling indicated COCs at concentrations above their respective PADEP non-residential groundwater MSCs, including: benzene, chrysene, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, 1,2,4-TMB, 1,3,5-TMB, toluene, pyrene, 1,2-dichloroethane, MTBE, naphthalene and lead. Based on the results of the fate and transport analysis, there are no dissolved phase COCs in groundwater that appear to have the potential to extend beyond the facility boundary or cause an unacceptable risk to surface water receptors in the Schuylkill River.

Excavations in AOI 6 are governed by PES's permitting procedures which protect against potential exposures to groundwater that could be encountered in an excavation. Also, there are no complete direct contact exposure pathways for groundwater within AOI 6 because of on-site facility safety procedures and required PPE. Previous

investigations and recent (2013) well searches verified that no monitoring wells located within 1.0 miles of the facility are used for drinking water or agricultural use.

9.4 LNAPL

There are no complete direct contact exposure pathways for LNAPL within AOI 6 because of PES's on-site procedures and required PPE.

9.5 Vapor

In October 2012, Stantec completed an indoor air assessment that included all occupied buildings at the facility that are not under positive pressure (Appendix I). In AOI 6, that evaluation included the 24 Gate Building, the Girard Point Training Building and the Girard Point Office Building.

Congress designated the OSHA as the lead agency to regulate worker exposure in industrial settings in the Occupational Health and Safety Act of 1970. Consequently, the potential vapor intrusion risk to industrial workers at AOI 6 was assessed by comparing results of the indoor air samples to OSHA's PEL (8-hour time weighted average). At the 24 Gate Building, benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB were detected above the reporting limit but below the corresponding PEL by multiple orders of magnitude in samples collected from the first floor. Similarly, benzene, toluene, ethylbenzene, total xylene, and 1,2,4-TMB were detected well below the associated PEL in the sample taken from the second floor.

In the GP Training Building, samples were collected in the first floor vending area, first floor west area, third floor gym and the building's basement. All detections were below the associated OSHA PEL. Further, sample results from the building's basement were lower than those in the third floor gym, indicating that constituent vapors at the GP Training Building are not likely to have originated from soil or groundwater underlying the structure.

Seven indoor air samples were collected from the GP Office Building, including three from the basement, and two from each of the first and second floors. Benzene, toluene, ethylbenzene, total xylene, cumene and 1,2,4-TMB were detected above the reporting limit but well below the corresponding PEL. Given that all samples collected

from buildings located in AOI 6 meet OSHA's exposure limits for the protection of worker health, the potential vapor intrusion pathway for existing buildings is not evaluated further in the risk assessment.

10.0 ECOLOGICAL ASSESSMENT

The majority of AOI 6 is covered with impervious surfaces as shown in Appendix J. Some areas are covered by soil and gravel; however, they are not likely to serve as a breeding area, migratory stopover, or primary habitat for wildlife. In January 2012, a survey of endangered, threatened and special concern wildlife was conducted by submitting a request to the Pennsylvania Natural Diversity Inventory (PNDI) data base. The PNDI search identified potential threatened and endangered species impacts that require further review. In June 2013, Potential PNDI Conflict Letters (Appendix M) were submitted to the PA Fish and Boat Commission as well as the PA Game Commission to request further investigation and clearance based on ecological impact potential. Replies from the agencies related to the June 2013 letters are pending.

No surface water features are located in AOI 6. The nearest surface water body to AOI 6 is the Schuylkill River which comprises the western boundary of AOI 6. A sheet pile wall which is keyed into the Middle Clay exists between AOI 6 and the Schuylkill River. Groundwater interaction with surface water is limited by the above referenced sheet pile wall. Based on the results of the fate and transport analysis, impacted groundwater in AOI 6 is not likely to cause a violation of a 25 Title Pa Code Chapter 93 surface water quality criteria, which are protective of surface water ecological receptors.

11.0 COMMUNITY RELATION ACTIVITIES

A Community Relation Plan (CRP) that includes public involvement with local residents to inform them of the anticipated investigations and remediation activities was completed as part of the NIR submittal in 2006. The purpose of this CRP is to provide a mechanism for the community, government officials, and other interested or affected citizens to be informed of on-site activities related to the investigation activities at the Site. This plan incorporates aspects of public involvement under both PADEP's Act 2 program and EPA's RCRA Corrective

Action program. This report and future Act 2 reports will include the appropriate municipal and public notices in accordance with the provisions of Act 2. Notices will be published in the Pennsylvania Bulletin and a summary of the notice will appear in a local newspaper.

A copy of the NIR and the Act 2 report notifications for this SCR/RIR are included in Appendix A.

12.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the completed activities, the following conclusions and recommendations have been developed for AOI 6:

SOIL

- Concentrations of benzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, benzo(a)pyrene, ethylbenzene, ethylene dibromide, cumene, and lead detected in soil samples collected in AOI 6 were above their respective PADEP non-residential soil MSCs.
- Based on the human health risk assessment completed, the total cumulative risk of exposure to the carcinogenic compounds benzene and benzo(a)pyrene is 1E-05 and within the PADEP's acceptable threshold; therefore, no remedies are required to address carcinogenic risks. Two shallow soil samples (BH-29-06 and BH-30-09), two tank samples(GPU677-SR-31-4 and GPU677-SR-31-5) and one deep soil sample (BH-12-110) have concentrations of lead above the site specific criteria and will be delineated and remediated as described in the Clean-up Plan.
- The soil-to-groundwater pathway, the direct contact pathway to soil greater than 2 feet beneath the ground surface at the facility is incomplete because of PES's on-site procedures and PPE requirements that protect onsite workers from exposure. The soil-to-groundwater pathway was evaluated using shallow groundwater data discussed below.

GROUNDWATER

- Based on the results of the fate and transport analysis, there are no dissolved phase COCs in groundwater that appear to have the potential to extend beyond the facility

boundary or cause an unacceptable risk to surface water receptors in the Schuylkill River.

- There are no complete direct contact exposure pathways for groundwater within AOI 6 because of on-site facility safety procedures and required PPE. Previous investigations and recent (2013) well searches verified that no monitoring wells located within 1.0 miles of the facility are used for drinking water or agricultural use.

LNAPL

- Based on occurrence and mobility of LNAPL in AOI 6, LNAPL does not appear to have migrated off site. In the event that recoverable LNAPL returns in the vicinity of the 27 Pump House, the 27 Pump House Recovery System will be re-activated.

VAPOR INTRUSION

- The majority of occupied buildings in AOI 6 are under positive pressure. Indoor air samples collected from buildings located in AOI 6 that are not under positive pressure were below OSHA's PELs for the protection of worker health. The potential vapor intrusion pathway for existing buildings is not complete.

RCRA SWMUs

- No leaded tank bottom materials were observed in SWMU 92 (Storage Tank Areas: Buried Lead Sludge Area 6). Therefore Sunoco is requesting a Final Agency Determination for SWMU 92 in AOI 6 from US EPA.
- Potential leaded tank bottom materials were observed in three soil borings within SWMU 95 (Storage Tank Areas: Buried Lead Sludge Area 9), however, the TCLP results for these samples were below the US EPA maximum concentration of lead for toxicity concentration of 5 mg/L. Therefore, Sunoco is requesting a Final Agency Determination for SWMU 95 in AOI 6 from US EPA.

13.0 SCHEDULE

The proposed schedule for future Site activities is:

- Submittal of a Cleanup Plan following PADEP approval of the SCR/RIR;
- Submittal of a Final Report; and
- Continue quarterly monitoring activities and reports.

14.0 SIGNATURES

The following parties are participating in the remediation at this time and are seeking relief from liability under Act 2 of 1995:

James Oppenheim
Sunoco Inc. (R&M)

This Act 2 SCR/RIR has been prepared in accordance with the final provisions of Act 2 and the June 8, 2002 Land Recycling Program Technical Guidance Manual.

15.0 REFERENCES

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Tank GP 270 Release – Site Characterization Letter Report, Sunoco Inc., Philadelphia Refinery, Philadelphia, PA, Stantec Consulting Corp., November 23, 2009.

Development of Site-Specific Soil and Groundwater Criteria for Sunoco Marcus Hook and Philadelphia Refineries, Sunoco, Inc. (R&M), November 7, 2012.

TABLES

Table 1
Constituents of Concern
AOI 6
PES Facility
Philadelphia, Pennsylvania

METALS	CAS No.
Lead (dissolved)	7439-92-1

VOCs	CAS No.
1,2-Dichloroethane	107-06-2
1,2,4-Trimethylbenzene	95-63-6
1,3,5-Trimethylbenzene	108-67-8
Benzene	71-43-2
Cumene	98-82-8
Ethylbenzene	100-41-4
Methyl tertiary butyl ether	1634-04-4
Toluene	108-88-3
Xylenes (total)	1330-20-7
Ethylene dibromide	106-93-4

SVOCs/ PAHs	CAS No.
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(g,h,i)perylene	191-24-2
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Chrysene	218-01-9
Fluorene	86-73-7
Naphthalene	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0

Notes:

1. Constituents are from Pennsylvania Corrective Action Process (CAP) Regulation Amendments effective December 1, 2001; provided in Chapter VI, Section E (pgs. 29-30) of PADEP Document, *Closure Requirements for Underground Storage Tank Systems,* effective April 1, 1998 and the March 18, 2008 revised PADEP Petroleum Short List.

Table 2
Existing Well Summary
AOI 6
PES Facility
Philadelphia, Pennsylvania

Well ID	Former Well ID[3]	AOI	Well Type	Well Classification (Shallow, Intermediate, Deep)[4]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction[2]								References
								Well Completion Depth (ft. bgs)	Well Diameter (in)	Casing Elevation (ft. msl) (NAVD88)	Ground Surface Elevation[1] (ft.) (NAVD88)	Top of Screen Elevation (ft) (NAVD88)	Bottom of Screen Elevation (ft) (NAVD88)	Depth to Screen (ft. bgs)	Screen Length (ft.)	
B-115	--	6	Monitoring Well	Shallow	--	--	--	--	--	8.01	5.07	--	--	--	--	Handex, 1996
B-116	--	6	Monitoring Well	Shallow	--	--	--	--	--	6.33	6.33	--	--	--	--	Handex, 1996
B-117	--	6	Monitoring Well	Shallow	--	--	--	--	--	8.32	8.32	--	--	--	--	Handex, 1996
B-123	--	6	Monitoring Well	Shallow	--	--	--	--	--	--	12.10	--	--	--	--	Handex, 1996
B-124	--	6	Recovery Well	Shallow	Y	Y	9/21/92	15	4	11.61	10.56	5.56	-4.44	5	10	Handex, 1996
B-125	--	6	Monitoring Well	Shallow	--	--	--	--	--	--	10.09	--	--	--	--	Handex, 1996
B-126	--	6	Monitoring Well	Shallow	--	--	--	--	--	--	10.15	--	--	--	--	Handex, 1996
B-129	--	6	Monitoring Well	Shallow	Y	Y	8/20/92	15	4	8.04	9.95	4.95	-5.05	5	10	Dames & Moore, 1992
B-130	--	6	Monitoring Well	Shallow	Y	Y	8/20/92	16	4	--	11.48	6.48	-3.52	5	10	Dames & Moore, 1992
B-131	--	6	Monitoring Well	Shallow	Y	Y	8/20/92	14	4	--	10.32	6.32	-3.68	4	10	Dames & Moore, 1992
B-132	--	6	Monitoring Well	Shallow	Y	Y	8/28/01	11	4	--	4.01	3.01	-6.99	1	10	URS, 2002
B-132D	--	6	Monitoring Well	Deep	Y	Y	3/7/01	85	2	10.55	8.12	-66.88	-76.88	75	10	URS, 2002
B-133	--	6	Recovery Well	Shallow	Y	Y	8/28/01	11	--	--	4.58	3.58	-6.42	1	10	URS, 2002
B-133D	--	6	Monitoring Well	Deep	Y	Y	3/5/01	65	2	10.03	--	--	--	55	10	URS, 2002
B-134	--	6	Recovery Well	Shallow	Y	Y	8/28/01	11	--	--	4.71	3.71	-6.29	1	10	URS, 2002
B-134D	--	6	Monitoring Well	Deep	Y	Y	3/5/01	79	2	9.73	--	--	--	69	10	URS, 2002
B-135	--	6	Monitoring Well	Shallow	Y	Y	8/28/01	11	--	--	4.39	3.39	-6.61	1	10	URS, 2002
B-136	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	7.55	5.55	-4.45	2	10	URS, 2002
B-137	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	7.37	5.37	-4.63	2	10	Handex, 1996
B-138	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	7.32	5.32	-4.68	2	10	Handex, 1996
B-139	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	8.01	6.01	-3.99	2	10	Handex, 1996
B-140	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	8.38	6.38	-3.62	2	10	Handex, 1996
B-141	--	6	Monitoring Well	Shallow	Y	Y	8/30/01	12	--	--	11.38	9.38	-0.62	2	10	Handex, 1996
B-142	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	8.04	6.04	-3.96	2	10	Handex, 1996
B-143	--	6	Recovery Well	Shallow	Y	Y	8/29/01	12	--	--	7.56	5.56	-4.44	2	10	Handex, 1996
B-144	--	6	Monitoring Well	Shallow	Y	Y	8/30/01	12	--	--	7.23	5.23	-4.77	2	10	Handex, 1996
B-145	--	6	Monitoring Well	Shallow	Y	Y	8/30/01	12	--	--	8.22	6.22	-3.78	2	10	Handex, 1996
B-146	--	6	Monitoring Well	Shallow	Y	Y	8/30/01	12	--	--	9.19	7.19	-2.81	2	10	Handex, 1996
B-147	--	6	Recovery Well	Shallow	Y	Y	8/30/01	12	--	5.20	7.75	5.75	-4.25	2	10	Handex, 1996
B-148	MW-1	6	Monitoring Well	Shallow	Y	N	9/17/02	11	--	7.23	5.19	4.19	-5.81	1	10	Secor, 2002
B-149	MW-2	6	Monitoring Well	Shallow	Y	Y	9/17/02	11	--	--	0.00	-1	-11	1	10	Secor, 2002
B-150	MW-3	6	Monitoring Well	Shallow	Y	Y	9/16/02	11	--	--	0.00	-1	-11	1	10	Secor, 2002
B-151	--	6	Monitoring Well	Shallow	Y	Y	2/23/06	13	4	7.74	5.77	3.77	-4.23	2	8	Aquaterra, 2006
B-152	--	6	Monitoring Well	Shallow	Y	Y	2/27/06	10	4	5.04	5.50	3.5	-4.5	2	8	Aquaterra, 2006
B-153	--	6	Monitoring Well	Shallow	Y	Y	2/24/06	10	4	6.37	6.67	4.67	-3.33	2	8	Aquaterra, 2006
B-154	--	6	Monitoring Well	Shallow	Y	Y	2/23/06	13	4	8.68	6.43	4.43	-3.57	2	8	Aquaterra, 2006
B-155	--	6	Monitoring Well	Shallow	Y	Y	2/24/06	13	4	8.54	6.54	4.54	-3.46	2	8	Aquaterra, 2006
B-156	--	6	Monitoring Well	Shallow	Y	Y	2/23/06	13	4	8.86	6.66	4.66	-3.34	2	8	Aquaterra, 2006
B-157	--	6	Monitoring Well	Shallow	Y	Y	2/22/06	12	4	4.92	5.26	3.26	-6.74	2	10	Aquaterra, 2006
B-158	--	6	Monitoring Well	Shallow	Y	Y	2/22/06	12	4	8.21	8.66	6.66	-3.34	2	10	Aquaterra, 2006
B-159	--	6	Monitoring Well	Shallow	Y	Y	4/20/06	10	4	8.12	8.51	6.51	-1.49	2	8	Aquaterra, 2006
B-160	--	6	Monitoring Well	Shallow	Y	Y	2/27/06	10	4	8.53	8.95	6.95	-1.05	2	8	Aquaterra, 2006
B-161	--	6	Monitoring Well	Shallow	Y	Y	2/21/06	15	4	10.00	6.98	4.98	-5.02	2	10	Aquaterra, 2006
B-162	--	6	Monitoring Well	Shallow	Y	Y	2/20/06	18	4	7.59	4.93	2.93	-10.07	2	13	Aquaterra, 2006
B-163	--	6	Monitoring Well	Shallow	Y	Y	2/28/06	10	4	7.45	7.68	5.68	-2.32	2	8	Aquaterra, 2006
B-164	--	6	Monitoring Well	Shallow	Y	Y	2/21/06	15	4	8.82	5.86	3.86	-6.14	2	10	Aquaterra, 2006
B-165	--	6	Monitoring Well	Shallow	Y	Y	12/11/12	12	4	5.79	6.07	4.07	-5.93	2	10	Aquaterra, 2012
B-166	--	6	Monitoring Well	Shallow	Y	Y	12/18/12	12	4	7.47	7.89	5.89	-4.11	2	10	Aquaterra, 2012
B-167	--	6	Monitoring Well	Shallow	Y	Y	12/17/12	10	4	6.73	7.21	5.21	-2.79	2	8	Aquaterra, 2012
B-168	--	6	Monitoring Well	Shallow	Y	Y	12/10/12	12	4	6.46	6.77	4.77	-5.23	2	10	Aquaterra, 2012
B-169	--	6	Monitoring Well	Shallow	Y	Y	12/11/12	12	4	6.12	6.47	4.47	-5.53	2	10	Aquaterra, 2012
B-39	--	6	Monitoring Well	Shallow	Y	Y	2/19/86	15	4	0.04	0.15	-2.85	-14.85	3	12	Dames & Moore, 1990
B-40	--	6	Abandoned	Shallow	Y	Y	2/18/86	13	4	7.17	6.12	3.12	-6.88	3	10	Dames & Moore, 1990
B-41	--	6	Abandoned	Shallow	Y	Y	2/21/86	12	4	8.85	7.80	5.8	-4.2	2	10	Dames & Moore, 1990
B-42	--	6	Monitoring Well	Shallow	Y	Y	2/19/86	15	4	8.04	6.99	4.49	-8.01	2.5	12.5	Dames & Moore, 1990
B-43	--	6	Monitoring Well	Shallow	Y	Y	2/19/86	14.5	4	9.36	8.31	5.31	-6.19	3	11.5	Dames & Moore, 1990
B-44	--	6	Abandoned	Shallow	Y	Y	2/20/86	15	4	8.21	7.16	4.16	-5.84	3	10	Dames & Moore, 1990
B-45	--	6	Monitoring Well	Shallow	Y	Y	2/20/86	15	4	7.30	6.25	3.25	-8.75	3	12	Dames & Moore, 1990
B-46	--	6	Monitoring Well	Shallow	Y	Y	2/21/86	12	4	10.56	9.50	7.5	-2.5	2	10	Dames & Moore, 1990
B-47	--	6	Monitoring Well	Shallow	Y	Y	2/21/86	13	4	10.56	9.51	6.51	-3.49	3	10	Dames & Moore, 1990
B-48	--	6	Monitoring Well	Shallow	Y	Y	2/21/86	14	4	8.90	7.85	3.85	-6.15	4	10	Dames & Moore, 1990
B-48D	--	6	Monitoring Well	Deep	Y	Y	11/6/86	55	4	9.82	8.77	-36.23	-46.23	45	10	Dames & Moore, 1990
B-92	--	6	Monitoring Well	Shallow	Y	Y	10/21/86	15.5	4	12.33	11.28	5.78	-4.22	5.5	10	Dames & Moore, 1990
B-93	--	6	Abandoned	Shallow	Y	Y	10/22/86	13.5	4	12.83	11.67	8.17	-1.83	3.5	10	Dames & Moore, 1990
B-94	--	6	Monitoring Well	Shallow	Y	Y	10/22/86	14	4	11.21	8.45	4.45	-5.55	4	10	Dames & Moore, 1990
GP-19	--	6	Abandoned	Shallow	Y	Y	9/11/00	15	--	7.80	--	--	--	5	10	URS, 2002
GP-22	--	6	Abandoned	Shallow	Y	Y	9/11/00	15	--	7.50	--	--	--	10	5	URS, 2002
GP-3	--	6	Abandoned	Shallow	Y	Y	9/8/00	14	--	7.60	--	--	--	4	9	URS, 2002
PH-36	--	6	Abandoned	--	--	--	--	--	--	--	--	--	--	--	--	USGS, 1989
PH-37	--	6	Abandoned	--	--	--	--	--	--	--	--	--	--	--	--	USGS, 1989
PH-39	--	6	Abandoned	--	--	--	--	--	--	--	--	--	--	--	--	USGS, 1989
PH-42	--	6	Abandoned	--	--	--	--	--	--	--	--	--	--	--	--	USGS, 1989

NOTES:

AOI - Area of Interest
ft. - feet
bgs - below ground surface
in. - inches
msl - elevation relative to mean sea level

1. TIC and all other relevant elevation datum for wells within AOI 6 were resurveyed by Langan duirng the completion of the AOI 6 Site Characterization Report. This was done to update all wells to the NAVD 88 datum.
2. Well construction details were taken directly from well boring logs provided by Handex or collected from available historic reports. Where no well boring logs exist, no well construction or lithologic data exists.
3. Former well IDs were derived from handwritten notes on the logs themselves or the referenced report.
4. Well classification was chosen based on the formation in which the well was screened. Wells screened within the Middle Clay or the Farrington Sand were classified as deep wells. Based on their total depth, wells screened above the Middle Clay were classified as either a shallow or intermediate well.

-- Data could not be located or determined based on available reports
Abandoned wells.

Table 2
Existing Well Summary
AOI 6
PES Facility
Philadelphia, Pennsylvania

Well ID	Former Well ID[3]	AOI	Well Type	Well Classification (Shallow, Intermediate, Deep)[4]	Soil Boring Log Available (Y/N)	Construction Detail Available (Y/N)	Date of Well Completion	Well Construction[2]								References
								Well Completion Depth (ft. bgs)	Well Diameter (in)	Casing Elevation (ft. msl) (NAVD88)	Ground Surface Elevation[1] (ft.) (NAVD88)	Top of Screen Elevation (ft) (NAVD88)	Bottom of Screen Elevation (ft) (NAVD88)	Depth to Screen (ft. bgs)	Screen Length (ft.)	
PS-1	--	6	Monitoring Well	--												
PZ-132A	--	6	Piezometer	Shallow	Y	Y	3/8/01	10	1	--	--	--	--	5	5	URS, 2002
PZ-132B	--	6	Abandoned	Shallow	Y	Y	3/8/01	10	1	--	--	--	--	5	5	URS, 2002
PZ-134A	--	6	Abandoned	Shallow	Y	Y	3/8/01	10	1	--	--	--	--	5	5	URS, 2002
PZ-134B	--	6	Abandoned	Shallow	Y	Y	3/8/01	10	1	--	--	--	--	5	5	URS, 2002
PZ-135A	--	6	Piezometer	Shallow	Y	Y	3/8/01	10	1	--	8.22	3.22	-1.78	5	5	URS, 2002
PZ-135B	--	6	Piezometer	Shallow	Y	Y	3/8/01	10	1	--	--	--	--	5	5	URS, 2002
RW16-2	--	6	Abandoned	--												
RW-9	--	6	Recovery Well	--	Y	Y	--	--	--	--	10.29	--	--	--	--	Handex, 1996
SUMP-1	--	6	Recovery Well	Shallow	Y	Y	11/1/01	10	6	--	10.15	10.15	0.15	0	10	Handex, 1996
U-1	--	6	Monitoring Well	-	N	N	--	--	--	--	--	--	--	--	--	
U-2	--	6	Monitoring Well	-	N	N	--	--	--	--	--	--	--	--	--	
U-3	--	6	Monitoring Well	-	N	N	--	--	--	--	--	--	--	--	--	
U-4	--	6	Monitoring Well	-	N	N	--	--	--	--	--	--	--	--	--	
U-5	--	6	Monitoring Well	-	N	N	--	--	--	--	--	--	--	--	--	
URS-1	B-132U	6	Monitoring Well	Shallow	N	N	--		--	--	9.05	--	--	--	--	
URS-2	B-133U	6	Monitoring Well	Shallow	N	N	--		--	--	--	--	--	--	--	
URS-3	B-134U	6	Monitoring Well	Shallow	N	N	--	18	--	--	--	--	--	--	--	
URS-4	B-135U	6	Monitoring Well	Shallow	N	N	--		--	9.94	8.56	--	--	--	--	
URS-5	B-136U	6	Monitoring Well	Shallow	N	N	--	14	--	--	--	--	--	--	--	
WP10-1	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP10-2	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-1	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-10	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-11	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-12	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-2	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-3	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-4	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-5	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-6	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-7	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-8	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP11-9	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP12-1	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP12-2	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP12-3	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP12-4	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP12-5	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP16-1	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP16-2	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	13.59	--	--	0.5	10	Handex, 1996
WP16-3	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP16-4	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP16-5		6	Monitoring Well	Shallow	Y	Y	6/21/93	10.5	2	--	13.71	--	--	0.5	10	Handex, 1996
WP17-1	--	6	Abandoned	--	Y	Y	34131	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP17-2	--	6	Abandoned	--	Y	Y	34131	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP17-3	--	6	Abandoned	--	Y	Y	34131	10.5	--	--	--	--	--	0.5	10	Handex, 1996
WP8-1	--	6	Abandoned	--	Y	Y	34114	10.5	--	--	--	--	--	0.5	10	Dames & Moore Boring Log
WP8-2	--	6	Abandoned	--	Y	Y	34114	10.5	--	--	--	--	--	0.5	10	Dames & Moore Boring Log
WP8-3	--	6	Abandoned	--	Y	Y	34114	10.5	--	--	--	--	--	0.5	10	Dames & Moore Boring Log
WP9-1	--	6	Abandoned	Shallow	Y	Y	34115	9	--	--	7.9	7.40	-2.10	0.5	9.5	Handex, 1996
WP9-2	--	6	Monitoring Well	Shallow	Y	Y	5/26/93	10.5	--	--	8.15	7.65	-2.35	0.5	10	Handex, 1996
WP9-3	--	6	Monitoring Well	Shallow	Y	Y	5/26/93	9	--	--	7.23	6.73	-2.77	0.5	9.5	Handex, 1996
WP9-4	--	6	Monitoring Well	Shallow	Y	Y	6/14/93	9	--	--	10.23	9.73	0.23	0.5	9.5	Handex, 1996
WP9-5	--	6	Abandoned	--	Y	Y	6/14/93	10.5	--	--	-1.05	-1.55	-11.55	0.5	10	Handex, 1996
WP9-6	--	6	Abandoned	--	Y	Y	6/11/93	10.5	--	--	10.02	9.52	-0.48	0.5	10	Handex, 1996
WP9-7	--	6	Abandoned	--	N	N	--	--	--	--	--	--	--	--	--	
WP9-8	--	6	Monitoring Well	--	N	N	--	--	--	8.82	6.35	--	--	--	--	
WPM-1	--	6	Abandoned	--	--	--	--	--	--	--	13.80	--	--	--	--	Handex, 1996
WPM-10	--	6	Abandoned	--	--	--	--	--	--	--	9.99	--	--	--	--	Handex, 1996
WPM-11	--	6	RFI Well Point Loc.	--	--	--	--	--	--	--	13.60	--	--	--	--	Handex, 1996
WPM-2	--	6	Abandoned	--	--	--	--	--	--	--	13.97	--	--	--	--	Handex, 1996
WPM-3	--	6	Abandoned	--	--	--	--	--	--	--	13.76	--	--	--	--	Handex, 1996
WPM-4	--	6	Abandoned	--	--	--	--	--	--	14.06	13.01	--	--	--	--	Dames & Moore, 1993
WPM-5	--	6	Abandoned	--	--	--	--	--	--	14.18	13.13	--	--	--	--	Dames & Moore, 1993
WPM-6	--	6	Abandoned	--	--	--	--	--	--	--	--	--	--	--	--	Dames & Moore, 1993
WPM-6	--	6	Abandoned	--	--	--	--	--	--	14.35	13.30	--	--	--	--	Dames & Moore, 1993
WPM-7	--	6	Abandoned	--	--	--	--	--	--	--	14.68	--	--	--	--	Handex, 1996
WPM-8	RWM-8	6	Monitoring Well	--	--	--	--	--	--	14.99	13.94	--	--	--	--	Dames & Moore, 1993
WPM-9	--	6	Abandoned	--	--	--	--	--	--	16.50	15.45	--	--	--	--	Dames & Moore, 1993

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-- Data could not be located or determined based on available reports
Abandoned wells.

Table 3
Summary of Groundwater and LNAPL Elevations
AOI 6
December 2012
PES Facility
Philadelphia, Pennsylvania

Monitoring Point ID	Northing	Easting	Well Type	Specific Gravity (g/cc) Used for Correction		Depth to Product (ft btic)	Depth to Groundwater[3] (ft btic)	Apparent LNAPL Thickness (ft)	LNAPL Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Corrected Groundwater Elevation (ft amsl)	TIC Elevation (ft amsl)
				S.G.[1]	Source[2]							
B-165	217152.414	2680186.533	Monitoring Well	-	-	-	2.42	-	-	3.37	-	5.790
B-166	217408.526	2682932.152	Monitoring Well	-	-	-	2.25	-	-	5.22	-	7.470
B-167	217814.189	2683187.850	Monitoring Well	-	-	-	1.91	-	-	4.82	-	6.730
B-168	217494.926	2680069.594	Monitoring Well	-	-	-	2.12	-	-	4.34	-	6.460
B-169	217416.456	2680092.228	Monitoring Well	-	-	-	2.95	-	-	3.17	-	6.120
B-170	217350.272	2680110.597	Monitoring Well	-	-	-	1.11	-	-	-1.07	-	0.040
B-39	216614.006	2680589.935	Monitoring Well	-	-	-	0.27	-	-	5.21	-	5.480
B-115	218058.703	2682824.899	Monitoring Well	-	-	-	2.44	-	-	5.06	-	7.500
B-116	217899.153	2682924.951	Monitoring Well	-	-	-	5.60	-	-	-0.53	-	5.070
B-117	217678.393	2682499.354	Monitoring Well	0.8654	B-129	4.66	5.15	0.49	1.31	0.82	1.24	5.970
B-123	217145.729	2681457.873	Monitoring Well	-	-	-	3.82	-	-	6.94	-	10.760
B-124	216810.937	2681316.383	Recovery Well	0.8114	WP9-2	4.7	4.74	0.04	4.27	4.23	4.26	8.970
B-125	216828.873	2681099.168	Monitoring Well	-	-	-	4.78	-	-	3.73	-	8.510
B-126	217022.175	2680973.621	Monitoring Well	-	-	-	4.86	-	-	3.65	-	8.510
B-129	217874.097	2683017.663	Monitoring Well	0.8654	B-129	5.12	10.31	5.19	2.9	-2.29	2.20	8.020
B-130	217397.337	2680131.192	Monitoring Well	0.9306	B-130	4.98	5.21	0.23	4.71	4.48	4.69	9.690
B-131	216460.204	2680692.635	Monitoring Well	-	-	-	4.60	-	-	4.12	-	8.720
B-132	217350.988	2681170.909	Monitoring Well	0.8668	B-129	4.44	4.46	0.02	2.43	2.41	2.43	6.870
B-133	217307.146	2681206.779	Recovery Well	-	-	-	4.84	-	-	2.49	-	7.330
B-134	217285.225	2681162.937	Recovery Well	-	-	-	4.26	-	-	2.26	-	6.520
B-135	217329.067	2681137.031	Monitoring Well	-	-	-	4.38	-	-	2.00	-	6.380
B-136	217259.319	2681252.614	Recovery Well	0.8654	B-129	4.19	4.34	0.15	4.96	4.81	4.94	9.150
B-137	217187.578	2681298.448	Recovery Well	0.8654	B-129	3.48	3.58	0.10	5.25	5.15	5.24	8.730
B-138	217137.758	2681330.333	Recovery Well	0.8654	WP9-2	3.5	3.56	0.06	5.83	5.77	5.82	9.330
B-139	217339.031	2681270.549	Recovery Well	0.8654	WP9-2	5.05	5.09	0.04	4.35	4.31	4.34	9.400
B-140	217269.283	2681316.383	Recovery Well	-	-	-	NG	-	-	-	-	10.140
B-141	217229.427	2681380.153	Monitoring Well	0.8654	B-129	2.52	2.54	0.02	6.17	6.15	6.17	8.690
B-142	217177.614	2681208.772	Recovery Well	0.8654	B-129	6.56	6.58	0.02	3.18	3.16		9.740
B-143	217207.506	2681158.952	Recovery Well	0.8654	B-129	4.37	4.4	0.03	4.61	4.58	4.61	8.980
B-144	217133.772	2681234.678	Monitoring Well	-	-	-	4.24	-	-	4.78	-	9.020
B-145	217085.945	2681362.218	Monitoring Well	-	-	-	3.68	-	-	6.13	-	9.810
B-147	217145.729	2681125.074	Recovery Well	0.8654	B-144	5.19	5.20	0.01	3.71	3.70	3.71	8.900
B-148	217443.977	2681076.939	Monitoring Well	0.8668	B-144	4.97	5.17	0.20	2.25	2.05	2.22	7.220
B-149	217436.203	2680999.206	Monitoring Well	-	-	-	2.27	-	-	5.47	-	7.740
B-150	217480.252	2680965.522	Monitoring Well	0.8668	B-144	2.88	2.89	0.01	4.92	4.91	4.92	7.800
B-151	217738.379	2680728.909	Monitoring Well	-	-	-	2.54	-	-	5.20	-	7.735
B-152	217848.398	2680602.540	Monitoring Well	-	-	-	0.11	-	-	4.93	-	5.036
B-153	217475.270	2680101.704	Monitoring Well	-	-	-	2.34	-	-	4.03	-	6.367
B-154	217552.437	2680926.805	Monitoring Well	-	-	-	2.21	-	-	6.47	-	8.680
B-155	217399.880	2680974.744	Monitoring Well	-	-	-	3.71	-	-	4.83	-	8.541
B-156	217365.500	2680904.069	Monitoring Well	-	-	-	4.96	-	-	3.90	-	8.856
B-158	217966.981	2679968.858	Monitoring Well	-	-	-	1.61	-	-	6.60	-	8.209
B-159	217268.172	2681614.145	Monitoring Well	-	-	-	NG	-	-	-	-	8.122
B-160	217370.650	2681839.847	Monitoring Well	-	-	-	4.46	-	-	4.07	-	8.532
B-161	216894.044	2681270.427	Monitoring Well	0.8114	WP9-2	3.51	3.52	0.01	4.79	4.78	4.79	8.300
B-162	217903.199	2682803.459	Monitoring Well	-	-	-	NG	-	-	-	-	7.589
B-163	217531.251	2681198.847	Monitoring Well	-	-	-	1.57	-	-	5.88	-	7.452
B-164	216480.287	2680585.188	Monitoring Well	-	-	-	3.76	-	-	5.06	-	8.822

Table 3
Summary of Groundwater and LNAPL Elevations
AOI 6
December 2012
PES Facility
Philadelphia, Pennsylvania

Monitoring Point ID	Northing	Easting	Well Type	Specific Gravity (g/cc) Used for Correction		Depth to Product (ft btic)	Depth to Groundwater[3] (ft btic)	Apparent LNAPL Thickness (ft)	LNAPL Elevation (ft amsl)	Groundwater Elevation (ft amsl)	Corrected Groundwater Elevation (ft amsl)	TIC Elevation (ft amsl)
				S.G.[1]	Source[2]							
B-165	217152.414	2680186.533	Monitoring Well	-	-	-	2.42	-	-	3.37	-	5.790
B-43	217573.531	2680040.504	Monitoring Well	0.9161	B-43	3.14	3.47	0.33	4.07	3.74	4.04	7.210
B-45	218353.448	2680392.892	Monitoring Well	-	-	-	NG	-	-	-	-	5.099
B-46	218130.615	2681908.678	Monitoring Well	-	-	-	0.80	-	-	7.23	-	8.030
B-47	217433.612	2681963.091	Monitoring Well	0.9796	B-144	3.00	3.50	0.50	5.3	4.80	5.29	8.300
B-48	217529.482	2682248.110	Monitoring Well	-	-	-	0.20	-	-	6.30	-	6.500
B-92	216966.376	2681497.729	Monitoring Well	-	-	-	4.72	-	-	5.51	-	10.230
B-94	217609.806	2683136.853	Monitoring Well	-	-	-	6.91	-	-	3.44	-	10.350
RW-9	216561.837	2681445.916	Recovery Well	-	-	-	NG	-	-	-	-	8.760
SUMP-1	217217.470	2681190.837	Recovery Well	-	-	-	2.87	-	-	7.83	-	10.700
U-1	216621.098	2681638.368	Monitoring Well	-	-	-	6.87	-	-	3.83	-	10.700
U-2	216693.553	2681797.949	Monitoring Well	-	-	-	NG	-	-	-	-	9.390
U-3	216811.345	2681940.986	Monitoring Well	0.8114	WP9-2	7.05	8.42	1.37	2.75	1.38	2.49	9.800
U-4	216875.006	2682042.594	Monitoring Well	-	-	-	3.81	-	-	5.41	-	9.220
U-5	216800.942	2681801.462	Monitoring Well	-	-	-	7.81	-	-	1.98	-	9.790
URS-1	216100.512	2680858.739	Monitoring Well	-	-	-	NG	-	-	-	-	10.020
URS-2	216725.578	2681726.699	Monitoring Well	-	-	-	5.17	-	-	2.72	-	7.890
URS-3	216761.463	2681038.769	Monitoring Well	-	-	-	NG	-	-	-	-	7.600
URS-4	216277.495	2680670.556	Monitoring Well	-	-	-	NG	-	-	-		9.941
URS-5	216793.509	2680400.604	Monitoring Well	-	-	-	NG	-	-	-		7.940
WP9-3	216733.218	2681300.441	Temporary Well Point	-	-	-	2.01	-	-	4.15		6.160
WP9-4	216553.866	2681412.038	Temporary Well Point	-	-	-	6.25	-	-	2.62		8.870
WPM-11	217105.984	2682370.847	Temporary Well Point	-	-	-	NG	-	-	-		6.509
WPM-2	217072.188	2682472.106	Temporary Well Point	-	-	-	-	-	-	-		7.470
WPM-3	217085.439	2682433.127	Temporary Well Point	-	-	-	-	-	-	-		8.031

Notes:

1. Specific Gravity (S.G.) values were determined from LNAPL samples taken by Aquaterra on February 27th and March 1st, 2004, April 12, 2006, or from samples collected by SECOR in 1999-2000.
2. For wells with no direct S.G. measurements, the S.G. value in the nearest well with a direct S.G was used.
3. Depth to Water and Depth to LNAPL collected byAquaterra during December 2012.

g/cc - Grams per cubic centimeter
ft btic - Feet below top of inner casing
ft amsl - Feet above mean sea level
TIC - Top of inner casing
LNAPL - Light non aqueous phase liquid
NG - Not gauged

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 B-166				AOI6 B-167				AOI6 B-170				AOI6 BH-12-104				AOI6 BH-12-106				AOI6 BH-12-107			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	B-166_2'				B-167_2'				B-170_2'				BH-12-104_0.5-1'				BH-12-106_1-1.5'				BH-12-107_1-1.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1.5-2				1.5-2				1.5-2				0.5-1				1-1.5				1-1.5			
							Sample Date	12/13/2012				12/13/2012				12/13/2012				12/4/2012				12/3/2012				12/3/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.0074	1	ND	U	0.24	1	ND	U	0.0052	1	ND	U	0.32	1	0.717		0.32	1	ND	U	0.0046	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	0.0015	1	ND	U	**0.048**	1	ND	U	0.001	1	ND	U	**0.063**	1	ND	U	**0.064**	1	ND	U	0.00092	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.0015	1	ND	U	0.048	1	ND	U	0.001	1	ND	U	0.063	1	ND	U	0.064	1	ND	U	0.00092	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.0074	1	ND	U	0.24	1	ND	U	0.0052	1	ND	U	0.32	1	ND	U	0.32	1	ND	U	0.0046	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.0015	1	0.0638		0.048	1	ND	U	0.001	1	ND	U	0.063	1	**88.2**		**0.64**	1	0.0124		0.00092	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.0015	1	0.806		0.048	1	ND	U	0.001	1	ND	U	0.063	1	1.14		0.064	1	0.00094		0.00092	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.0015	1	0.395		0.048	1	ND	U	0.001	1	ND	U	0.063	1	0.452		0.064	1	ND	U	0.00092	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.0074	1	3.15		0.24	1	ND	U	0.0052	1	ND	U	0.32	1	31.2		3.2	1	ND	U	0.0046	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.0015	1	ND	U	0.048	1	ND	U	0.001	1	ND	U	0.063	1	ND	U	0.064	1	ND	U	0.00092	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.0015	1	0.0932		0.048	1	ND	U	0.001	1	ND	U	0.063	1	5.34		0.064	1	0.0017		0.00092	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.0812		0.042	1	ND	U	0.034	1	0.257		0.036	1	ND	U	0.038	1	1.24		0.17	5	0.715		0.069	2
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	0.318		0.042	1	0.113		0.034	1	0.578		0.036	1	0.0863		0.038	1	3.68		0.17	5	2.32		0.069	2
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	0.33		0.042	1	0.13		0.034	1	0.659		0.036	1	0.063		0.038	1	4.06		0.17	5	2.61		0.069	2
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.293		0.042	1	0.15		0.034	1	0.617		0.036	1	0.103		0.038	1	4.41		0.17	5	2.32		0.069	2
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.228		0.042	1	0.121		0.034	1	0.466		0.036	1	0.0866		0.038	1	2.17		0.17	5	1.81		0.069	2
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.334		0.042	1	0.137		0.034	1	0.589		0.036	1	0.0989		0.038	1	3.49		0.17	5	2.37		0.069	2
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	0.042	1	ND	U	0.034	1	0.229		0.036	1	ND	U	0.038	1	1.02		0.17	5	0.439		0.069	2
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.042	1	0.0352		0.034	1	0.114		0.036	1	ND	U	0.038	1	0.994		0.32	1	ND	U	0.0046	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.285		0.042	1	0.108		0.034	1	0.379		0.036	1	ND	U	0.038	1	5.8		0.17	5	3.02		0.069	2
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	0.536		0.042	1	0.275		0.034	1	1.16		0.036	1	0.0825		0.038	1	6.8		0.17	5	5.05		0.069	2
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**744**		2.6	1	253		2	1	66.9		2.3	1	161		2.4	1	**897**		2.3	1	221		2.2	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 BH-12-108				AOI6 BH-12-111				AOI6 BH-12-111				AOI6 BH-12-112				AOI6 BH-12-114				AOI6 BH-12-115			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-108_1'				BH-12-111_0.5-1'				BH-12-111_1-1.5'				BH-12-112_0.5-1'				BH-12-114_1-1.5'				BH-12-115_1-2'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	0.5-1				0.5-1				1-1.5				0.5-1				1-1.5				1-2			
							Sample Date	12/3/2012				12/3/2012				12/3/2012				12/3/2012				12/3/2012				12/3/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	**306**		25	1	ND	U	1.2	1	ND	U	1.2	1	ND	U	0.0048	1	ND	U	0.0047	1	ND	U	0.0047	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.25**	1	ND	U	**0.25**	1	ND	U	**0.23**	1	ND	U	0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.25	1	ND	U	0.25	1	ND	U	0.23	1	ND	U	0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	**119**		**25**	1	ND	U	1.2	1	ND	U	1.2	1	ND	U	0.0048	1	ND	U	0.0047	1	ND	U	0.0047	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	**23.6**		0.25	1	ND	U	0.25	1	0.404		0.23	1	0.0016		0.00095	1	ND	U	0.00094	1	0.0013		0.00094	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	314		5	1	0.638		0.25	1	0.652		0.23	1	ND	U	0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	57.1		5	1	ND	U	0.25	1	ND	U	0.23	1	ND	U	0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	25.2		1.3	1	ND	U	1.2	1	ND	U	1.2	1	ND	U	0.0048	1	ND	U	0.0047	1	ND	U	0.0047	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.25	1	ND	U	0.25	1	ND	U	0.23	1	ND	U	0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	10.3		0.25	1	ND	U	0.25	1	ND	U	0.23	1	0.0022		0.00095	1	ND	U	0.00094	1	ND	U	0.00094	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	1.7		0.032	1	0.472		0.17	1	ND	U	0.16	5	0.151		0.034	1	ND	U	0.035	1	0.224		0.036	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	4.55		0.65	20	1.1		0.17	1	0.171		0.16	5	0.411		0.034	1	0.0569		0.035	1	0.499		0.036	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	4.83		0.65	20	1.43		0.17	1	ND	U	0.16	5	0.484		0.034	1	0.0748		0.035	1	0.783		0.036	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	2.89		0.032	1	0.924		0.17	1	ND	U	0.16	5	0.626		0.034	1	0.0956		0.035	1	0.333		0.036	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	3.54		0.65	20	1.44		0.17	1	ND	U	0.16	5	0.335		0.034	1	0.1		0.035	1	0.766		0.036	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	5.36		0.65	20	2.93		0.17	1	0.258		0.16	5	0.557		0.034	1	0.0876		0.035	1	1.03		0.036	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	15.2		0.65	20	1.23		0.17	1	0.641		0.16	5	0.206		0.034	1	ND	U	0.035	1	0.0803		0.036	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	**25.9**		1.3	1	ND	U	1.2	1	ND	U	1.2	1	ND	U	0.0048	1	ND	U	0.0047	1	ND	U	0.0047	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	14.9		0.65	20	1.74		0.17	1	0.68		0.16	5	0.51		0.034	1	0.055		0.035	1	0.2		0.036	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	7.95		0.65	20	3.64		0.17	1	0.588		0.16	5	0.718		0.034	1	0.103		0.035	1	1.57		0.036	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	380		2.4	1	163		2.2	1	34.6		2	1	427		4.6	2	49.1		4.3	2	126		4.9	2
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 BH-12-119				AOI6 BH-12-120				AOI6 BH-12-122				AOI6 BH-12-123				AOI6 BH-12-129				AOI6 BH-12-130			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-119_0.5-1'				BH-12-120_0-1'				BH-12-122_1-1.5'				BH-12-123_1-1.5'				BH-12-129_1.5-2'				BH-12-130_1-2'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	0.5-1				0-1				1-1.5				1-1.5				1.5-2				1-2			
							Sample Date	12/4/2012				12/4/2012				12/3/2012				12/4/2012				12/4/2012				12/4/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.0051	1	ND	U	0.0063	1	0.0079		0.0044	1	ND	U	0.0052	1	0.705		0.24	1	ND	U	2.5	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	ND	U	0.00088	1	ND	U	0.001	1	ND	U	**0.048**	1	ND	U	**0.5**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	ND	U	0.00088	1	ND	U	0.001	1	ND	U	0.048	1	ND	U	0.5	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.0051	1	ND	U	0.0063	1	0.0049		0.0044	1	ND	U	0.0052	1	0.257		0.24	1	ND	U	2.5	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	0.0034		0.00088	1	ND	U	0.001	1	**91.6**		**4.8**	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	0.008		0.00088	1	ND	U	0.001	1	3.69		0.048	1	ND	U	0.5	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	0.0021		0.00088	1	ND	U	0.001	1	0.837		0.048	1	ND	U	0.5	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.0051	1	ND	U	0.0063	1	0.0082		0.0044	1	ND	U	0.0052	1	311		24	1	32.9		2.5	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	ND	U	0.00088	1	ND	U	0.001	1	ND	U	0.048	1	ND	U	0.5	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.001	1	ND	U	0.0013	1	0.0033		0.00088	1	ND	U	0.001	1	**116**		4.8	1	ND	U	0.5	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.219		0.074	2	0.185		0.043	1	0.21		0.032	1	0.597		0.039	1	ND	U	0.033	1	3.58		0.73	20
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	0.266		0.074	2	0.127		0.043	1	0.589		0.032	1	1.79		0.039	1	0.0699		0.033	1	3.52		0.036	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	0.32		0.074	2	0.118		0.043	1	0.816		0.032	1	2.11		0.039	1	0.0627		0.033	1	6.52		0.73	20
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.395		0.074	2	0.198		0.043	1	0.874		0.032	1	2.15		0.039	1	0.0687		0.033	1	11.3		0.73	20
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.587		0.074	2	0.555		0.043	1	0.915		0.032	1	1.59		0.039	1	0.0498		0.033	1	4.33		0.73	20
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.295		0.074	2	0.236		0.043	1	0.73		0.032	1	1.87		0.039	1	0.0711		0.033	1	9.88		0.73	20
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	0.074	2	ND	U	0.043	1	0.0605		0.032	1	0.307		0.039	1	ND	U	0.033	1	34.6		0.73	20
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.0051	1	ND	U	0.0063	1	0.0051		0.0044	1	ND	U	0.0052	1	ND	U	0.24	1	ND	U	2.5	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.17		0.074	2	0.243		0.043	1	0.456		0.032	1	1.49		0.039	1	0.0395		0.033	1	10		0.73	20
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	0.301		0.074	2	0.3		0.043	1	0.937		0.032	1	2.51		0.039	1	0.121		0.033	1	12.1		0.73	20
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	237		2.5	1	309		2.7	1	75.2		2	1	224		2.4	1	48		2.1	1	84.4		2.2	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
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ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 BH-12-131				AOI6 BH-12-135				AOI6 BH-12-136				AOI6 BH-12-137				AOI6 BH-12-138				AOI6 BH-12-139			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-131_1-2'				BH-12-135_1-1.5'				BH-12-136_1-1.5'				BH-12-137_0-1'				BH-12-138_0-1'				BH-12-139_1-1.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1-2				1-1.5				1-1.5				0-1				0-1				1-1.5			
							Sample Date	12/4/2012				12/5/2012				12/5/2012				12/5/2012				12/5/2012				12/5/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.28	1	ND	U	0.0045	1	ND	U	0.0042	1	ND	U	0.0046	1	ND	U	0.0074	1	ND	U	0.0048	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.057**	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.28	1	ND	U	0.0045	1	ND	U	0.0042	1	ND	U	0.0046	1	ND	U	0.0074	1	ND	U	0.0048	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	0.11		0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.216		0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	0.136		0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.28	1	ND	U	0.0045	1	ND	U	0.0042	1	ND	U	0.0046	1	ND	U	0.0074	1	ND	U	0.0048	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.211		0.057	1	ND	U	0.00091	1	ND	U	0.00084	1	ND	U	0.00091	1	ND	U	0.0015	1	ND	U	0.00097	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.0602		0.036	1	ND	U	0.037	1	0.0941		0.035	1	0.142		0.036	1	0.118		0.041	1	0.0718		0.036	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	0.0983		0.036	1	0.0614		0.037	1	0.267		0.035	1	0.374		0.036	1	0.145		0.041	1	0.214		0.036	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	0.116		0.036	1	0.0757		0.037	1	0.234		0.035	1	0.296		0.036	1	0.168		0.041	1	0.221		0.036	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.0976		0.036	1	0.0894		0.037	1	0.265		0.035	1	0.307		0.036	1	0.215		0.041	1	0.24		0.036	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.178		0.036	1	0.0597		0.037	1	0.122		0.035	1	0.141		0.036	1	0.169		0.041	1	0.144		0.036	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.136		0.036	1	0.0655		0.037	1	0.237		0.035	1	0.332		0.036	1	0.148		0.041	1	0.219		0.036	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	0.122		0.036	1	ND	U	0.037	1	ND	U	0.035	1	ND	U	0.036	1	ND	U	0.041	1	ND	U	0.036	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	0.36		0.28	1	ND	U	0.037	1	ND	U	0.035	1	ND	U	0.036	1	ND	U	0.041	1	ND	U	0.036	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.174		0.036	1	ND	U	0.037	1	0.373		0.035	1	0.556		0.036	1	0.138		0.041	1	0.26		0.036	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	0.14		0.036	1	0.0708		0.037	1	0.415		0.035	1	0.594		0.036	1	0.202		0.041	1	0.34		0.036	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	111		2.4	1	106		2.1	1	**853**		4.5	2	137		4.9	2	**483**		2.3	1	**1120**		2.3	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
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Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 BH-12-140				AOI6 BH-12-144				AOI6 BH-12-146				AOI6 BH-12-147				AOI6 BH-12-148				AOI6 BH-12-149			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-140_0-0.5'				BH-12-144_0-0.5'				BH-12-146_0-1'				BH-12-147_1-1.5'				BH-12-148_0-1'				BH-12-149_1-1.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	0-0.5				0-0.5				0-1				1-1.5				0-1				1-1.5			
							Sample Date	12/5/2012				12/5/2012				12/5/2012				12/5/2012				12/5/2012				12/4/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.0059	1	ND	U	0.0041	1	ND	U	0.0049	1	ND	U	0.0044	1	ND	U	0.0053	1	ND	U	0.35	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	**0.07**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.0059	1	ND	U	0.0041	1	ND	U	0.0049	1	ND	U	0.0044	1	ND	U	0.0053	1	ND	U	0.35	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.0059	1	ND	U	0.0041	1	ND	U	0.0049	1	ND	U	0.0044	1	ND	U	0.0053	1	ND	U	0.35	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.0012	1	ND	U	0.00083	1	ND	U	0.00098	1	ND	U	0.00089	1	ND	U	0.0011	1	ND	U	0.07	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.29		0.036	1	ND	U	0.033	1	0.0787		0.038	1	ND	U	0.034	1	0.155		0.041	1	ND	U	0.037	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	0.0701		0.036	1	0.0373		0.033	1	0.603		0.038	1	0.0519		0.034	1	0.328		0.041	1	0.0518		0.037	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	0.0915		0.036	1	0.0397		0.033	1	1.02		0.038	1	0.065		0.034	1	0.327		0.041	1	0.0576		0.037	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.103		0.036	1	0.056		0.033	1	1.36		0.038	1	0.0787		0.034	1	0.334		0.041	1	0.067		0.037	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.0844		0.036	1	ND	U	0.033	1	0.982		0.038	1	0.0542		0.034	1	0.205		0.041	1	0.0459		0.037	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.0825		0.036	1	0.0422		0.033	1	0.818		0.038	1	0.0608		0.034	1	0.307		0.041	1	0.064		0.037	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	0.036	1	ND	U	0.033	1	ND	U	0.038	1	ND	U	0.034	1	ND	U	0.041	1	ND	U	0.037	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.036	1	ND	U	0.033	1	ND	U	0.038	1	ND	U	0.034	1	ND	U	0.041	1	ND	U	0.35	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.0474		0.036	1	ND	U	0.033	1	0.329		0.038	1	ND	U	0.034	1	0.425		0.041	1	ND	U	0.037	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	0.108		0.036	1	0.0613		0.033	1	1.36		0.038	1	0.0774		0.034	1	0.469		0.041	1	0.0804		0.037	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**766**		7.7	3	17.1		2.1	1	184		2.4	1	286		2.3	1	**745**		2.3	1	27.9		2.6	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AOI6 C-165				AOI6 C-168				AOI6 C-169				AST-250-SS-1				AST-250-SS-2				AST-250-SS-3			
							Data Type	Langan Data				Langan Data				Langan Data				Historical Tank Data				Historical Tank Data				Historical Tank Data			
							Sample ID	C-165_1.5-2'				C-168_1.5-2'				C-169_1.5-2'				AST-250-SS-1				AST-250-SS-2				AST-250-SS-3			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1.5-2				1.5-2				1.5-2				0-0.5				0-0.5				0-0.5			
							Sample Date	12/5/2012				12/5/2012				12/5/2012				5/15/2007				5/15/2007				5/15/2007			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	1.2	1	ND	U	0.0064	1	ND	U	0.008	1	NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.25**	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	**0.081**	50	ND	UD	**0.097**	50	ND	UD	**0.088**	50
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	0.081	50	ND	UD	0.097	50	ND	UD	0.088	50
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	1.2	1	ND	U	0.0064	1	ND	U	0.008	1	NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	0.081	50	ND	UD	0.097	50	ND	UD	0.088	50
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.445		0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	0.081	50	ND	UD	0.097	50	0.098	D	0.088	50
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	0.081	50	ND	UD	0.097	50	ND	UD	0.088	50
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	1.2	1	ND	U	0.0064	1	ND	U	0.008	1	ND	UD	0.081	50	ND	UD	0.097	50	ND	UD	0.088	50
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	NA				NA				NA			
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.347		0.25	1	ND	U	0.0013	1	ND	U	0.0016	1	ND	UD	0.081	50	ND	UD	0.097	50	ND	UD	0.088	50
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				500	D	0	50	NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	2.64		0.26	1	0.206		0.038	1	0.0691		0.045	1	NA				NA				NA			
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	0.79		0.26	1	0.24		0.038	1	0.0673		0.045	1	NA				NA				NA			
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	0.576		0.26	1	0.223		0.038	1	0.0624		0.045	1	NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.445		0.26	1	0.206		0.038	1	0.067		0.045	1	NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.912		0.26	1	0.612		0.038	1	0.0751		0.045	1	NA				NA				NA			
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	1.05		0.26	1	0.276		0.038	1	0.0565		0.045	1	NA				NA				NA			
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	7.93		0.26	1	ND	U	0.038	1	ND	U	0.045	1	ND	U	0.35	1	ND	U	0.35	1	ND	U	0.37	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.26	1	ND	U	0.038	1	ND	U	0.045	1	0.052	JD	0.081	50	0.067	JD	0.097	50	0.31	D	0.088	50
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	10.6		0.26	1	0.165		0.038	1	ND	U	0.045	1	NA				NA				NA			
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	2.05		0.26	1	0.284		0.038	1	0.0751		0.045	1	NA				NA				NA			
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	286		2.9	1	273		2.6	1	127		3	1	**940**		0.54	1	30		0.53	1	100		0.54	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	AST-250-SS-4				AST-250-SS-5				AST-250-SS-6				AST-250-SS-7				AST-250-SS-8				B-151			
							Data Type	Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data				Langan Data			
							Sample ID	AST-250-SS-4				AST-250-SS-5				AST-250-SS-6				AST-250-SS-7				AST-250-SS-8				BH-B151-030106-0.5-1			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	0-0.5				0-0.5				0-0.5				0-0.5				0-0.5				0.5-1			
							Sample Date	5/15/2007				5/15/2007				5/15/2007				5/15/2007				5/15/2007				3/1/2006			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	UD	**0.1**	50	ND	UD	**0.11**	50	ND	UD	**0.069**	50	ND	UD	**0.078**	50	ND	UD	**0.092**	50	ND	U	**0.2**	35.92
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	UD	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	UD	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.87	D	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	UD	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	0.12	D	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	NA				NA				NA				NA				NA				ND	U	0.2	35.92
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	UD	0.1	50	ND	UD	0.11	50	ND	UD	0.069	50	ND	UD	0.078	50	ND	UD	0.092	50	ND	U	0.2	35.92
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	NA				NA				NA				NA				NA				ND	U	0.92	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	NA				NA				NA				NA				NA				2		0.92	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	NA				NA				NA				NA				NA				1.7		0.92	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	NA				NA				NA				NA				NA				1.6		0.92	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	NA				NA				NA				NA				NA				ND	U	0.92	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	NA				NA				NA				NA				NA				2.4		0.92	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	0.62		0.35	1	ND	U	0.36	1	ND	U	0.35	1	ND	U	0.35	1	ND	U	0.36	1	1.1		0.92	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	4.2	D	0.1	50	0.081	JD	0.11	50	0.065	JD	0.069	50	0.055	JD	0.078	50	0.075	JD	0.092	50	8.6		0.92	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	NA				NA				NA				NA				NA				2.9		0.92	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	NA				NA				NA				NA				NA				5.3		0.92	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	2.8		0.54	1	190		0.56	1	**1500**		0.58	1	140		0.59	1	13		0.54	1	198		10.6	5
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	B-152				B-153				B-154				B-155				B-156				B-157			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-B152-030106-1.5-2				BH-B153-030106-1.5-2				BH-B154-030106-1-1.5				BH-B155-032006-1.5-2				BH-B156-032006-1-1.5				BH-B157-030106-1-1.5			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1.5-2				1.5-2				1-1.5				1.5-2				1-1.5				1-1.5			
							Sample Date	3/1/2006				3/1/2006				3/1/2006				3/20/2006				3/20/2006				3/1/2006			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.2**	33.07	ND	U	**0.42**	49.5	ND	U	**0.16**	26.97	ND	U	**0.22**	31.81	ND	U	0.005	0.72	ND	U	**0.24**	38.28
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.2	33.07	ND	U	0.42	49.5	ND	U	0.16	26.97	ND	U	0.22	31.81	ND	U	0.005	0.72	ND	U	0.24	38.28
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	0.46		0.2	33.07	ND	U	0.42	49.5	**3.6**		0.16	26.97	ND	U	0.22	31.81	0.009		0.005	0.72	ND	U	0.24	38.28
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.2	33.07	ND	U	0.42	49.5	1.2		0.16	26.97	ND	U	0.22	31.81	0.007		0.005	0.72	0.27		0.24	38.28
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	0.24		0.2	33.07	ND	U	0.42	49.5	1.8		0.16	26.97	ND	U	0.22	31.81	ND	U	0.005	0.72	ND	U	0.24	38.28
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	20		2	330.69	ND	U	0.42	49.5	1.8		0.16	26.97	ND	U	0.22	31.81	0.007		0.005	0.72	ND	U	0.24	38.28
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.2	33.07	ND	U	0.42	49.5	ND	U	0.16	26.97	ND	U	0.22	31.81	ND	U	0.005	0.72	ND	U	0.24	38.28
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.2	33.07	ND	U	0.42	49.5	0.24		0.16	26.97	ND	U	0.22	31.81	0.006		0.005	0.72	ND	U	0.24	38.28
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	ND	U	3	5	ND	U	0.28	1	6.2		5.8	10	0.75		0.23	1	0.86		0.21	1	ND	U	1.1	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	ND	U	3	5	ND	U	0.28	1	5.9		5.8	10	0.84		0.23	1	0.83		0.21	1	1.4		1.1	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	ND	U	3	5	ND	U	0.28	1	ND	U	5.8	10	0.78		0.23	1	0.82		0.21	1	1.5		1.1	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	ND	U	3	5	ND	U	0.28	1	ND	U	5.8	10	1.1		0.23	1	1.1		0.21	1	2.1		1.1	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	ND	U	3	5	ND	U	0.28	1	ND	U	5.8	10	0.31		0.23	1	0.42		0.21	1	ND	U	1.1	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	ND	U	3	5	ND	U	0.28	1	7.8		5.8	10	0.82		0.23	1	0.92		0.21	1	1.4		1.1	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	3	5	4.2		0.28	1	7.8		5.8	10	1.1		0.23	1	1.9		0.21	1	ND	U	1.1	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	3	5	ND	U	0.28	1	6.8		5.8	10	0.7		0.23	1	0.37		0.21	1	ND	U	1.1	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	ND	U	3	5	ND	U	0.28	1	31		5.8	10	3		0.23	1	4.3		0.21	1	ND	U	1.1	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	ND	U	3	5	ND	U	0.28	1	15		5.8	10	2.3		0.23	1	2.5		0.21	1	1.4		1.1	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	27		2.32	1	66.3		3.38	1	410		2.29	1	**618**		2.7	1	**1070**		2.56	1	178		2.55	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	B-160				B-161				B-162				B-164				BH-02-06				BH-03-06			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-B160-030106-1-1.5				BH-B161-030106-1.5-2				BH-B162-030106-1-1.5				BH-B164-030106-1.5-2				BH-02-06-032206-1.5-2				BH-03-06-032206-1.5-2			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1-1.5				1.5-2				1-1.5				1.5-2				1.5-2				1.5-2			
							Sample Date	3/1/2006				3/1/2006				3/1/2006				3/1/2006				3/22/2006				3/22/2006			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	0.005	0.71	ND	U	**0.44**	68.87	ND	U	0.005	0.96	ND	U	**0.37**	60.02	NA				NA			
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.005	0.71	ND	U	0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.005	0.71	ND	U	0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.005	0.71	5.1		0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.005	0.71	ND	U	0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.005	0.71	2.2		0.44	68.87	ND	U	0.005	0.96	2.2		0.37	60.02	NA				NA			
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.005	0.71	ND	U	0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.005	0.71	ND	U	0.44	68.87	ND	U	0.005	0.96	ND	U	0.37	60.02	NA				NA			
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	ND	U	0.22	1	0.36		0.21	1	ND	U	0.18	1	ND	U	0.2	1	NA				NA			
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	ND	U	0.22	1	1.8		0.21	1	0.2		0.18	1	0.35		0.2	1	NA				NA			
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	ND	U	0.22	1	2.2		0.21	1	0.22		0.18	1	0.41		0.2	1	NA				NA			
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	ND	U	0.22	1	2.7		0.21	1	0.29		0.18	1	0.68		0.2	1	NA				NA			
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	ND	U	0.22	1	1.3		0.21	1	ND	U	0.18	1	0.27		0.2	1	NA				NA			
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	ND	U	0.22	1	2.1		0.21	1	0.25		0.18	1	0.36		0.2	1	NA				NA			
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	0.22	1	ND	U	0.21	1	ND	U	0.18	1	ND	U	0.2	1	NA				NA			
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.22	1	0.34		0.21	1	ND	U	0.18	1	ND	U	0.2	1	NA				NA			
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	ND	U	0.22	1	0.41		0.21	1	ND	U	0.18	1	0.4		0.2	1	NA				NA			
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	ND	U	0.22	1	2.1		0.21	1	0.32		0.18	1	0.5		0.2	1	NA				NA			
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	30.8		2.54	1	70.1		2.48	1	**584**		2.09	1	18.5		2.41	1	**1260**		3.4	1	**1650**		2.92	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				0.24		0.02	1	0.0901		0.02	1

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	BH-13-06				BH-14-06				BH-20-06				BH-21-06				BH-22-06				BH-23-06			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-13-06-032206-1-1.5				BH-14-06-032306-0.5-1				BH-20-06-032006-1-1.5				BH-21-06-032006-1.5-2				BH-22-06-032106-1.5-2				BH-23-06-032106-1-1.5			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1-1.5				0.5-1				1-1.5				1.5-2				1.5-2				1-1.5			
							Sample Date	3/22/2006				3/23/2006				3/20/2006				3/20/2006				3/21/2006				3/21/2006			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	NA				NA				ND	U	**0.2**	31.37	ND	U	**0.19**	34.77	ND	U	0.004	0.64	ND	U	**0.21**	33.03
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	NA				NA				ND	U	0.2	31.37	ND	U	0.19	34.77	ND	U	0.004	0.64	ND	U	0.21	33.03
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	NA				NA				0.29		0.2	31.37	0.34		0.19	34.77	ND	U	0.004	0.64	ND	U	0.21	33.03
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	NA				NA				1		0.2	31.37	0.83		0.19	34.77	ND	U	0.004	0.64	0.37		0.21	33.03
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	NA				NA				0.46		0.2	31.37	0.81		0.19	34.77	ND	U	0.004	0.64	ND	U	0.21	33.03
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	NA				NA				9.7		2	313.68	32		1.9	347.71	ND	U	0.004	0.64	0.81		0.21	33.03
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	NA				NA				ND	U	0.2	31.37	ND	U	0.19	34.77	ND	U	0.004	0.64	ND	U	0.21	33.03
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	NA				NA				0.41		0.2	31.37	ND	U	0.19	34.77	ND	U	0.004	0.64	ND	U	0.21	33.03
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	NA				NA				2.5		2.1	10	ND	U	1.8	10	ND	U	0.19	1	1.3		0.63	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	NA				NA				3.8		2.1	10	ND	U	1.8	10	ND	U	0.19	1	0.79		0.63	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	NA				NA				4.9		2.1	10	ND	U	1.8	10	0.35		0.19	1	1.1		0.63	1
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	NA				NA				6.3		2.1	10	ND	U	1.8	10	0.4		0.19	1	1.2		0.63	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	NA				NA				2.9		2.1	10	ND	U	1.8	10	0.29		0.19	1	0.89		0.63	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	NA				NA				4.2		2.1	10	ND	U	1.8	10	ND	U	0.19	1	1.3		0.63	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	NA				NA				71		4.2	20	ND	U	1.8	10	ND	U	0.19	1	3.5		0.63	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	NA				NA				ND	U	2.1	10	ND	U	1.8	10	ND	U	0.19	1	0.98		0.63	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	NA				NA				37		2.1	10	ND	U	1.8	10	ND	U	0.19	1	7.4		0.63	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	NA				NA				6.9		2.1	10	ND	U	1.8	10	0.22		0.19	1	1.6		0.63	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	283		3.15	1	**1040**		2.87	1	145		2.44	1	286		2.15	1	165		2.16	1	417		2.48	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				1.12		0.02	1	NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	BH-24-06				BH-25-06				BH-26-06				BH-27-06				BH-27-09				BH-28-06			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-24-06-032106-1-1.5				BH-25-06-032106-1-1.5				BH-26-06-032406-0.5-1				BH-27-06-032306-1-1.5				BH-27-09				BH-28-06-032306-1-1.5			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1-1.5				1-1.5				0.5-1				1-1.5				0-2				1-1.5			
							Sample Date	3/21/2006				3/21/2006				3/24/2006				3/23/2006				4/8/2009				3/23/2006			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.17**	29.69	ND	U	**0.22**	35.11	ND	U	**0.18**	32.94	ND	U	**0.18**	31.49	NA				ND	U	**0.38**	66.49
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.17	29.69	ND	U	0.22	35.11	ND	U	0.18	32.94	ND	U	0.18	31.49	NA				ND	U	0.38	66.49
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.17	29.69	**2.3**		0.22	35.11	**180**		**18**	3293.81	**2.2**		0.18	31.49	NA				**1.3**		0.38	66.49
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.56		0.17	29.69	1.1		0.22	35.11	9.3		0.18	32.94	0.77		0.18	31.49	NA				0.58		0.38	66.49
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.17	29.69	0.3		0.22	35.11	2.7		0.18	32.94	1.6		0.18	31.49	NA				0.67		0.38	66.49
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	9.9		0.17	29.69	2.7		0.22	35.11	800		18	3293.81	9.1		0.18	31.49	NA				6.4		0.38	66.49
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.17	29.69	ND	U	0.22	35.11	ND	U	0.18	32.94	ND	U	0.18	31.49	NA				ND	U	0.38	66.49
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.2		0.17	29.69	1.7		0.22	35.11	**260**		18	3293.81	ND	U	0.18	31.49	NA				0.59		0.38	66.49
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	3.9		1.9	10	10		2.1	10	ND	U	0.18	1	3.3		1.9	10	NA				2.5		0.19	1
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	ND	U	1.9	10	5.3		2.1	10	ND	U	0.18	1	ND	U	1.9	10	NA				4		0.19	1
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	ND	U	1.9	10	6		2.1	10	ND	U	0.18	1	ND	U	1.9	10	NA				4.2		0.96	5
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	ND	U	1.9	10	8.1		2.1	10	ND	U	0.18	1	ND	U	1.9	10	NA				6		0.96	5
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	ND	U	1.9	10	3.6		2.1	10	ND	U	0.18	1	ND	U	1.9	10	NA				1.9		0.19	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	2		1.9	10	4.8		2.1	10	ND	U	0.18	1	ND	U	1.9	10	NA				4.3		0.19	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	63		3.9	20	120		10	50	ND	U	0.18	1	16		1.9	10	NA				12		0.96	5
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	1.9	10	2.4		2.1	10	ND	U	0.18	1	12		1.9	10	NA				1		0.19	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	46		1.9	10	120		10	50	0.21		0.18	1	36		1.9	10	NA				16		0.96	5
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	5.8		1.9	10	11		2.1	10	0.3		0.18	1	2		1.9	10	NA				8.9		0.96	5
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	233		2.31	1	231		2.46	1	32.6		2.15	1	167		2.26	1	**463**		1.16	10	200		2.23	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	BH-28-09				BH-29-06				BH-29-09				BH-30-09				GP 797-HA-1				GP 797-HA-2			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Historical Tank Data				Historical Tank Data			
							Sample ID	BH-28-09				BH-29-06-032106-1.5-2				BH-29-09				BH-30-09				HA-1 (1-1.5)				HA-2 (1-1.5)			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	0-2				1.5-2				0-2				0-2				1-1.5				1-1.5			
							Sample Date	4/8/2009				3/21/2006				4/8/2009				4/8/2009				8/29/2002				5/24/2002			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	NA				ND	U	**0.23**	36.55	NA				NA				NA				NA			
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	NA				ND	U	0.23	36.55	NA				NA				NA				NA			
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	NA				0.41		0.23	36.55	NA				NA				**920**	D	0.24	1	**28**	D	0.26	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	NA				0.56		0.23	36.55	NA				NA				NA				NA			
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	NA				ND	U	0.23	36.55	NA				NA				**80**	JD	0.24	1	0.85		0.26	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	NA				0.99		0.23	36.55	NA				NA				1600	D	0.24	1	17	D	0.26	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				71	D	0.24	1	1.4		0.26	1
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	NA				ND	U	0.23	36.55	NA				NA				ND		0.24	1	ND		0.26	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	NA				ND	U	0.23	36.55	NA				NA				**1800**	D	0.24	1	11	D	0.26	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				310	D	0.24	1	4.5		0.26	1
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	NA				27		2.1	10	NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	NA				70		10	50	NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	NA				**59**		10	50	NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	NA				75		10	50	NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	NA				29		2.1	10	NA				NA				NA				NA			
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	NA				73		10	50	NA				NA				NA				NA			
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	NA				14		2.1	10	NA				NA				NA				NA			
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	NA				2.4		2.1	10	NA				NA				0.65		0.24	1	ND		0.26	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	NA				91		10	50	NA				NA				NA				NA			
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	NA				110		10	50	NA				NA				NA				NA			
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**993**		2.6	20	**2520**		2.48	1	409		1.07	10	**2310**		11.3	100	NA				NA			
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	GP 797-HA-3				GP 797-HA-3				GP 797-HA-4				GP 797-MW-1				GP 797-MW-2				GP 797-MW-3			
							Data Type	Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data			
							Sample ID	HA-3 (1-1.5)				HA-3 (2)				HA-4 (1-1.5)				MW-1(1-1.5)_09/17/2002				MW-2(1-1.5)_09/17/2002				MW-3(1-1.5)_09/16/2002			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1-1.5				1.5-2				1-1.5				1-1.5				1-1.5				1-1.5			
							Sample Date	5/24/2002				5/24/2002				5/24/2002				9/17/2002				9/17/2002				9/16/2002			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	NA				NA				NA				NA				NA				NA			
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	NA				NA				NA				NA				NA				NA			
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	NA				NA				NA				NA				NA				NA			
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	**310**	D	0.27	1	**170**	D	0.25	1	**190**	D	0.25	1	**2.6**		0.31	48.26	**6.5**		0.33	47.53	**610**		**11**	1879.7
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				3.5		0.31	48.26	0.86		0.33	47.53	67		1.1	187.97
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	37	JD	0.27	1	8.5		0.25	1	55	D	0.25	1	3.7		0.31	48.26	0.52		0.33	47.53	14		1.1	187.97
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	1000	D	0.27	1	230	D	0.25	1	950	D	0.25	1	60		1.6	241.31	190		3.3	475.29	270		11	1879.7
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	29	JD	0.27	1	7.7		0.25	1	50	JD	0.25	1	NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND		0.27	1	ND		0.25	1	ND		0.25	1	ND	U	0.31	48.26	ND	U	0.33	47.53	ND	U	1.1	187.97
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	**920**	D	0.27	1	**300**	D	0.25	1	**660**	D	0.25	1	1.6		0.31	48.26	ND	U	0.33	47.53	**300**		11	1879.7
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	140	D	0.27	1	29	D	0.25	1	210	D	0.25	1	NA				NA				NA			
Semi-Volatile Organic Compounds																															
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	NA				NA				NA				NA				NA				NA			
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	NA				NA				NA				NA				NA				NA			
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	NA				NA				NA				NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	NA				NA				NA				NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	NA				NA				NA				NA				NA				NA			
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	NA				NA				NA				NA				NA				NA			
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	NA				NA				NA				NA				NA				NA			
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	0.41		0.27	1	0.3		0.25	1	0.29		0.25	1	1.8		0.31	48.26	1.9		0.33	47.53	4.8		1.1	187.97
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	NA				NA				NA				NA				NA				NA			
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	NA				NA				NA				NA				NA				NA			
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	NA				NA				NA				NA				NA				NA			
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 4
Summary of Surface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Surface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Surface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[1]	Location	GP U 677-1				GP U 677-2				GP U 677-3				GP U 677-4				GP U 677-5			
							Data Type	Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data				Historical Tank Data			
							Sample ID	GP U 677-1_06/08/2011				GP U 677-2_06/08/2011				GP U 677-3_06/08/2011				GP U 677-4_06/08/2011				GP U 677-5_06/08/2011			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	1.5-2				0.8-1.3				1.5-2				0.3-0.8				0.8-1.3			
							Sample Date	6/8/2011				6/8/2011				6/8/2011				6/8/2011				6/8/2011			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																											
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	0.097	J	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	0.056		0.001	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	**0.13**	J	**0.07**	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	ND	U	0.001	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	ND	U	0.001	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	0.046		0.001	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	0.06	J	0.035	55.27	ND	U	0.0006	0.9	ND	U	0.0005	0.82	ND	U	0.0005	0.98	ND	U	0.0005	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.42		0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	0.005		0.001	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	0.11	J	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	ND	U	0.001	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	0.7		0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	ND	U	0.001	1
O-Xylene (1,2-Dimethylbenzene)	95-47-6	8000	1000	1000	3000	8000	mg/kg	NA				NA				NA				NA				NA			
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.035	55.27	ND	U	0.0006	0.9	ND	U	0.0005	0.82	ND	U	0.0005	0.98	ND	U	0.0005	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.12	J	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	0.001	J	0.001	1
Xylenes (M & P)	XYLENES-MP	8000	1000	1000	2700	8000	mg/kg	NA				NA				NA				NA				NA			
Semi-Volatile Organic Compounds																											
1-Bromo-4-Fluorobenzene Bromofluorobenzene)	460-00-4	NS	NS	NS	NS	NS	mg/kg	NA				NA				NA				NA				NA			
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.78		0.017	20	0.037	J	0.017	20	0.5		0.017	20	ND	U	0.028	20	0.99		0.036	50
Benzo(A)Anthracene	56-55-3	110	320	110	2.1	110	mg/kg	1		0.0084	20	0.11		0.0085	20	1.2		0.0086	20	0.031		0.0071	20	ND	U	0.59	50
Benzo(A)Pyrene	50-32-8	11	46	11	0.21	11	mg/kg	1.2		0.0084	20	0.12		0.0085	20	1.2		0.0086	20	0.05		0.0071	20	0.62		0.018	50
Benzo(B)Fluoranthene	205-99-2	110	170	110	2.1	110	mg/kg	0.8		0.0067	20	0.091		0.0068	20	0.85		0.0069	20	0.053		0.0057	20	0.81		0.014	50
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	1.7		0.051	20	0.19	J	0.051	20	1.5		0.051	20	0.13	J	0.043	20	1.4		0.11	50
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	2		0.076	20	0.16		0.076	20	1.6		0.077	20	0.25		0.064	20	4.3		0.16	50
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	1.3		0.084	20	ND	U	0.085	20	0.39		0.086	20	ND	U	0.071	20	2.5		0.18	50
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	0.29	J	0.07	55.27	ND	U	0.001	0.9	ND	U	0.001	0.82	ND	U	0.001	0.98	0.16		0.001	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	2.2		0.051	20	0.09	J	0.051	20	1.6		0.051	20	0.095	J	0.043	20	5.2		0.11	50
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	1.5		0.084	20	0.24	J	0.085	20	2.3		0.086	20	ND	U	0.37	20	ND	U	17	50
Metals																											
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**453**		0.268	1	67		0.276	1	**451**		0.272	1	47.8		0.232	1	18.5		0.232	1
Lead (TCLP)**	7439-92-1	NS	NS	NS	NS	5	mg/l	NA				NA				NA				NA				NA			

Notes:

[1] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
** The criteria listed under the PADEP Non-Res Surface Soil Direct Contact MSC is based on the EPA Maximum Concentration of Contaminants for Toxicity Concentration.
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 5
Summary of Subsurface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Subsurface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Subsurface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[5]	Location	AOI6 B-166				AOI6 B-167				AOI6 BH-12-101				AOI6 BH-12-102				AOI6 BH-12-105			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	B-166_3'				B-167_4'				BH-12-101_2-3'				BH-12-102_2-2.5'				BH-12-105_2-2.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	2.5-3				3.5-4				2-3				2-2.5				2-2.5			
							Sample Date	12/13/2012				12/13/2012				12/4/2012				12/4/2012				12/3/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																											
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.009	1	0.481		0.3	1	ND	U	0.32	1	ND	U	0.66	1	3.11		1.8	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	0.002	1	ND	U	**0.06**	1	ND	U	**0.06**	1	ND	U	**0.13**	1	ND	U	**0.36**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.002	1	ND	U	0.059	1	ND	U	0.063	1	ND	U	0.13	1	ND	U	0.36	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.009	1	ND	U	0.3	1	ND	U	0.32	1	ND	U	0.66	1	ND	U	1.8	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	ND	U	0.002	1	0.136		0.059	1	0.121		0.063	1	ND	U	0.13	1	**5.21**		0.36	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	0.002	1	1.3		0.059	1	0.276		0.063	1	ND	U	0.13	1	4.24		0.36	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	0.002	1	0.309		0.059	1	0.068		0.063	1	ND	U	0.13	1	0.976		0.36	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.009	1	7.21		0.3	1	0.382		0.32	1	1.18		0.66	1	5.76		1.8	1
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.002	1	ND	U	0.059	1	ND	U	0.063	1	ND	U	0.13	1	ND	U	0.36	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	0.002	1	0.163		0.059	1	0.094		0.063	1	ND	U	0.13	1	ND	U	0.36	1
Semi-Volatile Organic Compounds																											
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.11		0.042	1	1.26		0.037	1	ND	U	0.037	1	1.02		0.049	1	0.746		0.035	1
Benzo(A)Anthracene	56-55-3	110	320	320	2.1	110	mg/kg	0.0939		0.042	1	2.36		0.037	1	0.091		0.037	1	0.276		0.049	1	1.85		0.035	1
Benzo(A)Pyrene	50-32-8	11	46	46	0.21	11	mg/kg	0.0956		0.042	1	2.07		0.037	1	0.112		0.037	1	0.246		0.049	1	1.55		0.035	1
Benzo(B)Fluoranthene	205-99-2	110	170	170	2.1	110	mg/kg	0.0998		0.042	1	2.42		0.037	1	0.122		0.037	1	0.376		0.049	1	1.48		0.035	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.0802		0.042	1	1.26		0.037	1	0.082		0.037	1	0.304		0.049	1	1.15		0.035	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.113		0.042	1	2.25		0.037	1	0.092		0.037	1	0.4		0.049	1	1.82		0.035	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	0.126		0.042	1	0.865		0.037	1	ND	U	0.037	1	5.64		0.25	5	2.3		0.035	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.042	1	0.226		0.037	1	ND	U	0.32	1	ND	U	0.66	1	ND	U	1.8	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.314		0.042	1	5.2		0.15	4	0.075		0.037	1	10.4		0.25	5	3.34		0.035	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	0.301		0.042	1	4.87		0.15	4	0.121		0.037	1	1.05		0.049	1	2.89		0.035	1
Metals																											
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**1020**		2.8	1	204		2.3	1	56.3		2.2	1	283		3.2	1	341		2.4	1

Notes:

[1] PADEP Non-Residential Direct Contact MSC for subsurface soils (2-15 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
[5] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - The analyte was positively identified below the reporting limit and the associated numerical value is the approximate concentration of the analyte in the sample.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 5
Summary of Subsurface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Subsurface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Subsurface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[5]	Location	AOI6 BH-12-106				AOI6 BH-12-107				AOI6 BH-12-108				AOI6 BH-12-109				AOI6 BH-12-110			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-106_2-2.5'				BH-12-107_2.5-3'				BH-12-108_2-2.5'				BH-12-109_3'				BH-12-110_3-3.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	2-2.5				2.5-3				2-2.5				2.5-3				3-3.5			
							Sample Date	12/3/2012				12/3/2012				12/3/2012				12/3/2012				12/3/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																											
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.005	1	ND	U	0.005	1	**455**		**47**	2	ND	U	0.31	1	4.23		1.8	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	ND	U	**0.23**	1	ND	U	**0.06**	1	ND	U	**0.35**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	ND	U	0.23	1	ND	U	0.061	1	ND	U	0.35	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.005	1	ND	U	0.005	1	**191**		**12**	1	ND	U	0.31	1	ND	U	1.8	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	0.001		9E-04	1	ND	U	0.001	1	**11.2**		0.23	1	0.476		0.061	1	**4.09**		0.35	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	675		2.3	1	0.17		0.061	1	2.72		0.35	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	**109**		2.3	1	0.153		0.061	1	0.712		0.35	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	ND	U	0.005	1	ND	U	0.005	1	58.7		12	1	1.55		0.31	1	23.1		1.8	1
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	ND	U	0.23	1	ND	U	0.061	1	ND	U	0.35	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	ND	U	9E-04	1	ND	U	0.001	1	5.26		0.23	1	0.099		0.061	1	0.889		0.35	1
Semi-Volatile Organic Compounds																											
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	2.34		0.035	1	1.97		0.035	1	2.23		0.032	1	3.49		0.071	2	8.81		1.5	40
Benzo(A)Anthracene	56-55-3	110	320	320	2.1	110	mg/kg	10.9		0.71	20	4.21		0.35	10	6.04		0.32	10	10.9		0.71	20	22.3		1.5	40
Benzo(A)Pyrene	50-32-8	11	46	46	0.21	11	mg/kg	11.6		0.71	20	3.59		0.35	10	5.93		0.32	10	10.5		0.71	20	20.6		1.5	40
Benzo(B)Fluoranthene	205-99-2	110	170	170	2.1	110	mg/kg	14		0.71	20	3.49		0.35	10	8.41		0.32	10	13.9		0.71	20	24.3		1.5	40
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	7.06		0.71	20	2.53		0.035	1	4.07		0.32	10	6.29		0.071	2	11.9		1.5	40
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	11.1		0.71	20	3.92		0.35	10	7.37		0.32	10	13.7		0.71	20	22		1.5	40
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	0.818		0.035	1	0.848		0.035	1	15.8		0.32	10	6.98		0.071	2	11.4		1.5	40
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.005	1	ND	U	0.005	1	**65.2**		12	1	0.512		0.31	1	2.49		1.8	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	10.7		0.71	20	7.48		0.35	10	18.5		0.32	10	24.9		0.71	20	44.4		1.5	40
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	18.7		0.71	20	7.59		0.35	10	11.3		0.32	10	19.7		0.71	20	41.9		1.5	40
Metals																											
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	**960**		4.5	2	**546**		2.3	1	383		2.3	1	**954**		2.3	1	**2930**		5	2

Notes:

[1] PADEP Non-Residential Direct Contact MSC for subsurface soils (2-15 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
[5] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - The analyte was positively identified below the reporting limit and the associated numerical value is the approximate concentration of the analyte in the sample.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 5
Summary of Subsurface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Subsurface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Subsurface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[5]	Location	AOI6 BH-12-114				AOI6 BH-12-116				AOI6 BH-12-117				AOI6 BH-12-118				AOI6 BH-12-121			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-114_3-3.5'				BH-12-116_3.5'				BH-12-117_2-2.5'				BH-12-118_2-2.5'				BH-12-121_2-2.5'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	3-3.5				3-3.5				2-2.5				2-2.5				2-2.5			
							Sample Date	12/3/2012				12/3/2012				12/3/2012				12/4/2012				12/3/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																											
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	ND	U	0.29	1	ND	U	0.28	1	ND	U	0.35	1	ND	U	0.005	1	ND	U	0.004	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.06**	1	ND	U	**0.06**	1	ND	U	**0.07**	1	ND	U	1E-03	1	ND	U	8E-04	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.059	1	ND	U	0.056	1	ND	U	0.069	1	ND	U	1E-03	1	ND	U	8E-04	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.29	1	ND	U	0.28	1	ND	U	0.35	1	ND	U	0.005	1	ND	U	0.004	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	0.245		0.059	1	0.068		0.056	1	0.157		0.069	1	ND	U	1E-03	1	0.01		8E-04	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.612		0.059	1	0.245		0.056	1	ND	U	0.069	1	ND	U	1E-03	1	1E-03		8E-04	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	0.107		0.059	1	0.071		0.056	1	ND	U	0.069	1	ND	U	1E-03	1	ND	U	8E-04	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	0.387		0.29	1	0.524		0.28	1	0.797		0.35	1	ND	U	0.005	1	ND	U	0.004	1
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.059	1	ND	U	0.056	1	ND	U	0.069	1	ND	U	1E-03	1	ND	U	8E-04	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.224		0.059	1	0.1		0.056	1	0.081		0.069	1	ND	U	1E-03	1	0.002		8E-04	1
Semi-Volatile Organic Compounds																											
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.31		0.038	1	0.142		0.035	1	0.262		0.039	1	0.151		0.035	1	3.43		0.32	10
Benzo(A)Anthracene	56-55-3	110	320	320	2.1	110	mg/kg	0.699		0.038	1	0.233		0.035	1	0.436		0.039	1	0.608		0.035	1	9.6		0.32	10
Benzo(A)Pyrene	50-32-8	11	46	46	0.21	11	mg/kg	0.653		0.038	1	0.269		0.035	1	0.534		0.039	1	0.602		0.035	1	9.39		0.32	10
Benzo(B)Fluoranthene	205-99-2	110	170	170	2.1	110	mg/kg	0.615		0.038	1	0.328		0.035	1	0.446		0.039	1	0.616		0.035	1	9.66		0.32	10
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.537		0.038	1	0.302		0.035	1	0.488		0.039	1	0.343		0.035	1	5.39		0.32	10
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	0.872		0.038	1	0.29		0.035	1	0.664		0.039	1	0.599		0.035	1	10.5		0.32	10
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	0.177		0.038	1	0.12		0.035	1	0.07		0.039	1	ND	U	0.035	1	2.89		0.032	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.29	1	ND	U	0.28	1	ND	U	0.35	1	ND	U	0.005	1	ND	U	0.004	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	0.751		0.038	1	0.318		0.035	1	0.374		0.039	1	0.248		0.035	1	22.9		0.32	10
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	1.24		0.038	1	0.446		0.035	1	0.984		0.039	1	0.728		0.035	1	23.1		0.32	10
Metals																											
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	34.7		2.4	1	**1070**		2.3	1	350		2.4	1	93.1		2.3	1	199		2.1	1

Notes:

[1] PADEP Non-Residential Direct Contact MSC for subsurface soils (2-15 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
[5] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - The analyte was positively identified below the reporting limit and the associated numerical value is the approximate concentration of the analyte in the sample.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 5
Summary of Subsurface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Subsurface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Subsurface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[5]	Location	AOI6 BH-12-122				AOI6 BH-12-123				AOI6 BH-12-124				AOI6 BH-12-125				AOI6 BH-12-126			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-122_2.5-3'				BH-12-123_2-2.5'				BH-12-124_3-3.5'				BH-12-125_2.5-3'				BH-12-126_2.5-3'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	2.5-3				2-2.5				3-3.5				2.5-3				2.5-3			
							Sample Date	12/3/2012				12/4/2012				12/4/2012				12/4/2012				12/4/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																											
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	0.291		0.28	1	0.593		0.25	1	3.46		2.4	1	ND	U	12	1	4.62		1.3	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.06**	1	ND	U	**0.05**	1	ND	U	**0.47**	1	ND	U	**2.5**	1	ND	U	**0.26**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.056	1	ND	U	0.049	1	ND	U	0.47	1	ND	U	**2.5**	1	ND	U	0.26	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	ND	U	0.28	1	ND	U	0.25	1	ND	U	2.4	1	ND	U	**12**	1	2.08		1.3	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	**1.83**		0.056	1	**2.07**		0.049	1	**1380**		**24**	10	ND	U	**2.5**	1	**87.2**		**26**	5
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	0.407		0.056	1	0.924		0.049	1	22.6		0.47	1	ND	U	2.5	1	68.5		0.26	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	0.191		0.056	1	0.464		0.049	1	5.87		0.47	1	ND	U	2.5	1	14.6		0.26	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	0.72		0.28	1	16.9		1.2	1	2110		120	10	64.2		12	1	678		130	5
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.056	1	ND	U	0.049	1	ND	U	0.47	1	ND	U	**2.5**	1	ND	U	0.26	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	0.261		0.056	1	0.722		0.049	1	**1640**		24	10	ND	U	2.5	1	**197**		26	5
Semi-Volatile Organic Compounds																											
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	0.625		0.032	1	2.32		0.035	1	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Benzo(A)Anthracene	56-55-3	110	320	320	2.1	110	mg/kg	1.05		0.032	1	8.99		0.35	10	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Benzo(A)Pyrene	50-32-8	11	46	46	0.21	11	mg/kg	1.06		0.032	1	7.91		0.35	10	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Benzo(B)Fluoranthene	205-99-2	110	170	170	2.1	110	mg/kg	1.21		0.032	1	9.36		0.35	10	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	0.764		0.032	1	3.58		0.35	10	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	1.28		0.032	1	8.28		0.35	10	ND	U	0.033	1	ND	U	0.035	1	0.085		0.073	2
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	1.3		0.032	1	3.39		0.035	1	ND	U	0.033	1	ND	U	0.035	1	ND	U	0.073	2
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	0.5		0.28	1	1.11		0.25	1	ND	U	2.4	1	ND	U	12	1	ND	U	1.3	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	2.03		0.032	1	6.1		0.35	10	0.0626		0.033	1	ND	U	0.035	1	0.115		0.073	2
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	1.95		0.032	1	11.3		0.35	10	ND	U	0.033	1	0.036		0.035	1	0.123		0.073	2
Metals																											
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	173		2.3	1	133		2.2	1	5.5		2.3	1	11.4		2.2	1	8.7		2.3	1

Notes:

[1] PADEP Non-Residential Direct Contact MSC for subsurface soils (2-15 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
[5] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - The analyte was positively identified below the reporting limit and the associated numerical value is the approximate concentration of the analyte in the sample.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 5
Summary of Subsurface Soil Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Subsurface Soil Direct Contact MSC[1]	PADEP Non-Res Soil to GW MSC[2]	PADEP Non-Res Subsurface Soil MSC[3]	EPA Industrial Soil RSL[4]	PADEP Non-Res Surface Soil Direct Contact MSC[5]	Location	AOI6 BH-12-127				AOI6 BH-12-128				AOI6 BH-12-129				AOI6 BH-12-135				AOI6 BH-12-138				AOI6 BH-12-149			
							Data Type	Langan Data				Langan Data				Langan Data				Langan Data				Langan Data				Langan Data			
							Sample ID	BH-12-127_2.5-3'				BH-12-128_3-3.5'				BH-12-129_2.5-3'				BH-12-135_2-2.5'				BH-12-138_2-2.5'				BH-12-149_2.5-3'			
							Sample Matrix	Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)				Soil (unsaturated)			
							Sample Depth	2.5-3				3-3.5				2.5-3				2-2.5				2-2.5				2.5-3			
							Sample Date	12/4/2012				12/4/2012				12/4/2012				12/5/2012				12/5/2012				12/4/2012			
							Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																															
1,2,4-Trimethylbenzene	95-63-6	560	35	35	260	560	mg/kg	3.04		0.25	1	6.32		0.25	1	9.43		1.4	1	ND	U	0.007	1	ND	U	0.007	1	ND	U	7	1
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	3.7	0.005	0.005	0.17	3.7	mg/kg	ND	U	**0.05**	1	ND	U	**0.05**	1	ND	U	**0.27**	1	ND	U	0.001	1	ND	U	0.001	1	ND	U	**1.4**	1
1,2-Dichloroethane	107-06-2	86	0.5	0.5	2.2	86	mg/kg	ND	U	0.05	1	ND	U	0.05	1	ND	U	0.27	1	ND	U	0.001	1	ND	U	0.001	1	ND	U	**1.4**	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	480	9.3	9.3	10000	480	mg/kg	1.41		0.25	1	2.92		0.25	1	3.38		1.4	1	ND	U	0.007	1	ND	U	0.007	1	ND	U	7	1
Benzene	71-43-2	290	0.5	0.5	5.4	290	mg/kg	**149**		**2.5**	1	**535**		**13**	50	**1850**		**54**	10	ND	U	0.001	1	ND	U	0.001	1	**517**		**2.8**	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	8000	1000	1000	2700	8000	mg/kg	83.6		2.5	1	248		1.3	5	51.6		0.27	1	ND	U	0.001	1	ND	U	0.001	1	ND	U	1.4	1
Ethylbenzene	100-41-4	10000	70	70	27	10000	mg/kg	18.7		2.5	1	57.8		1.3	5	12.6		0.27	1	ND	U	0.001	1	ND	U	0.001	1	ND	U	1.4	1
Isopropylbenzene (Cumene)	98-82-8	10000	2500	2500	11000	10000	mg/kg	374		13	1	919		63	50	**6600**		270	10	ND	U	0.007	1	ND	U	0.007	1	74.7		7	1
Tert-Butyl Methyl Ether	1634-04-4	3200	2	2	220	3200	mg/kg	ND	U	0.05	1	ND	U	0.05	1	ND	U	0.27	1	ND	U	0.001	1	ND	U	0.001	1	ND	U	1.4	1
Toluene	108-88-3	10000	100	100	45000	10000	mg/kg	**339**		2.5	1	**1050**		13	50	**2070**		54	10	ND	U	0.001	1	ND	U	0.001	1	21.2		1.4	1
Semi-Volatile Organic Compounds																															
Anthracene	120-12-7	190000	350	350	170000	190000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	ND	U	0.07	2	0.485		0.042	1	0.18		0.09	2	ND	U	0.036	1
Benzo(A)Anthracene	56-55-3	110	320	320	2.1	110	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.177		0.07	2	0.992		0.042	1	0.424		0.09	2	0.403		0.036	1
Benzo(A)Pyrene	50-32-8	11	46	46	0.21	11	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.121		0.07	2	1.33		0.042	1	0.414		0.09	2	0.452		0.036	1
Benzo(B)Fluoranthene	205-99-2	110	170	170	2.1	110	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.126		0.07	2	1.2		0.042	1	0.416		0.09	2	0.708		0.036	1
Benzo(G,H,I)Perylene	191-24-2	170000	180	180	NS	170000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.0832		0.07	2	1.27		0.042	1	0.378		0.09	2	0.458		0.036	1
Chrysene	218-01-9	11000	230	230	210	11000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.243		0.07	2	1.07		0.042	1	0.468		0.09	2	0.493		0.036	1
Fluorene	86-73-7	110000	3800	3800	22000	110000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.182		0.07	2	0.202		0.042	1	ND	U	0.09	2	ND	U	0.036	1
Naphthalene	91-20-3	56000	25	25	18	56000	mg/kg	ND	U	0.25	1	ND	U	0.25	1	ND	U	1.4	1	0.524		0.042	1	ND	U	0.09	2	ND	U	7	1
Phenanthrene	85-01-8	190000	10000	10000	NS	190000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.437		0.07	2	1.16		0.042	1	0.609		0.09	2	0.154		0.036	1
Pyrene	129-00-0	84000	2200	2200	17000	84000	mg/kg	ND	U	0.032	1	ND	U	0.035	1	0.406		0.07	2	1.33		0.042	1	0.73		0.09	2	0.601		0.036	1
Metals																															
Lead	7439-92-1	1000	450	450	800	1000	mg/kg	13.8		2.3	1	6.5		2.4	1	107		2.2	1	311		2.6	1	**1150**		2.9	1	127		2.2	1

Notes:

[1] PADEP Non-Residential Direct Contact MSC for subsurface soils (2-15 feet below ground surface) (last updated Jan. 2011).
[2] PADEP Non-Residential Soil to Groundwater MSC for unsaturated soils in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[3] Criteria shown in gray were used to determine the non-residential soil MSCs used to screen the sample results. The lowest, most conservative, value of the soil-to-groundwater or direct contact criteria was used as the value for screening purposes.
[4] EPA Industrial Soil Regional Screening Level (last updated November 2012).
[5] PADEP Non-Residential Direct Contact MSC for surface soils (0-2 feet below ground surface) (last updated Jan. 2011).
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
mg/kg - milligram per kilogram
MSC - Medium Specific Concentration
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier
NS - No Standard
NA - Not Analyzed
Result screened against Non-Residential Direct Contact MSC for surface soils only if the result also exceeds the PADEP MSC and EPA RSL.

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - The analyte was positively identified below the reporting limit and the associated numerical value is the approximate concentration of the analyte in the sample.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Soil MSC
10	Reported result exceeds the PADEP Non-Residential Soil MSC and the EPA Industrial Soil RSL
10	Reported result exceeds the PADEP Soil MSC, EPA Industrial Soil RSL and the PADEP Non-Residential Direct Contact MSC for Surface Soils (0-2 feet below ground surface)
10	RL exceeds the PADEP Non-Residential Soil MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-115				B-115				B-115				B-116				B-116				B-116				B-117				B-117				B-123			
				Sample ID	B115-052405				B115-060706				B115_010413				B116-052405				B116-081006				B116_010413				B117-052405				B117-060706				B123-052505			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	5/24/2005				6/7/2006				1/4/2013				5/24/2005				8/10/2006				1/4/2013				5/24/2005				6/7/2006				5/25/2005			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0097	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0097	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.0097	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				NA				3.7		2	1	NA				NA				3.4		2	1	NA				NA				NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				NA				ND	U	2	1	NA				NA				ND	U	2	1	NA				NA				NA			
Benzene	71-43-2	5	0.39	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	0.8	1	ND	U	0.8	1	7.4		1	1	ND	U	0.8	1	ND	U	0.8	1	6.3		1	1	ND	U	0.8	1	16		0.8	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	0.8	1	ND	U	0.8	1	2		1	1	ND	U	0.8	1	ND	U	0.8	1	1.7		1	1	ND	U	0.8	1	ND	U	0.8	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	ND	U	1	1	ND	U	1	1	ND	U	2	1	ND	U	1	1	ND	U	1	1	ND	U	2	1	ND	U	1	1	ND	U	1	1	36		1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	NA				NA				ND	U	1	1	NA				NA				0.363		0.1	1	NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	1.5		0.1	1	ND	U	1	1	ND	U	1	1	31		1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	ND	U	1	1	1.24		1	1	ND	U	1	1	ND	U	1	1	0.793		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	0.946		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	0.383		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	0.18	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.18	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.18	1	ND	U	0.047	1	ND	U	0.18	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
ug/l - microgram per liter
ugCaCO3/l - micrograms of calcium carbonate per liter
MSC - Medium Specific Concentration
RSL - Regional Screening Level
NS - No Standard
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
NA - Not Analyzed
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered estimated.

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-123				B-123				B-125				B-125				B-125				B-126				B-126				B-126				B-132			
				Sample ID	B123-060706				B123_010813				B125-052405				B125-060606				B125_010813				B126-052405				B126-060606				B126-060606				B132D-060606			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	6/7/2006				1/8/2013				5/24/2005				6/6/2006				1/8/2013				5/24/2005				6/6/2006				1/7/2013				6/6/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0097	1	ND	U	0.0094	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0095	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				2.4		2	1	NA				NA				ND	U	2	1	NA				NA				12.3		2	1	NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				ND	U	2	1	NA				NA				ND	U	2	1	NA				NA				6.6		2	1	NA			
Benzene	71-43-2	5	0.39	ug/l	ND	U	0.5	1	ND	U	1	1	**66**		0.5	1	**73**		0.5	1	**173**		1	1	**200**		0.5	1	**220**		0.5	1	**189**		5	5	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	0.8	1	6		1	1	78		0.8	1	110		0.8	1	9		1	1	87		0.8	1	110		0.8	1	76.2		1	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	0.8	1	1.4		1	1	10		0.8	1	12		0.8	1	1.3		1	1	19		0.8	1	24		0.8	1	17.7		1	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	38		1	1	29.7		2	1	7		1	1	10		1	1	14		2	1	26		1	1	42		1	1	63.5		2	1	ND	U	1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	0.7	1	ND	U	1	1	75		0.7	1	79		0.7	1	6.1		1	1	50		0.7	1	61		0.7	1	43.1		1	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	NA				4.51		0.11	1	NA				NA				2.15		0.1	1	NA				NA				10.5		1	1	NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				ND	U	0.11	1	NA				NA				0.559		0.1	1	NA				NA				0.363		0.1	1	NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				ND	U	0.11	1	NA				NA				**0.262**		0.1	1	NA				NA				0.119		0.1	1	NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				ND	U	0.11	1	NA				NA				0.224		0.1	1	NA				NA				ND	U	0.1	1	NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				ND	U	0.11	1	NA				NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	ND	U	0.11	1	ND	U	1	1	ND	U	1	1	0.414		0.1	1	ND	U	1	1	ND	U	1	1	0.296		0.1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	45		1	1	14.4		1.1	1	15		1	1	17		1	1	5.77		1	1	12		1	1	36		1	1	49.5		1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	2.12		0.11	1	ND	U	1	1	7		1	1	1.16		0.1	1	ND	U	1	1	23		1	1	25.3		1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	17		1	1	5.34		1.1	1	ND	U	1	1	7		1	1	1.48		0.1	1	ND	U	1	1	16		1	1	54.4		1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	7		1	1	2.44		0.11	1	ND	U	1	1	7		1	1	2.55		0.1	1	ND	U	1	1	6		1	1	3.88		0.1	1	ND	U	1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	0.047	1	ND	U	3	1	ND	U	0.18	1	ND	U	0.047	1	4.4		3	1	ND	U	0.18	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
ug/l - microgram per liter
ugCaCO3/l - micrograms of calcium carbonate per liter
MSC - Medium Specific Concentration
RSL - Regional Screening Level
NS - No Standard
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
NA - Not Analyzed
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered est

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-133				B-134				B-135				B-144				B-145				B-145				B-145				B-149				B-149			
				Sample ID	B133_010913				B134_010913				B135_010913				B144_010813				B145-052605				B145-060906				B145_010813				B149-052505				B149-060806			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	1/9/2013				1/9/2013				1/9/2013				1/8/2013				5/26/2005				6/9/2006				1/8/2013				5/25/2005				6/9/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0096	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	3.6		2	1	4.7		2	1	4.3		2	1	**212**		10	5	NA				NA				2.9		2	1	NA				NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1000	1000	ND	U	50	50
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	ND	U	2	1	2		2	1	2		2	1	**64.4**		2	1	NA				NA				2		2	1	NA				NA			
Benzene	71-43-2	5	0.39	ug/l	ND	U	1	1	ND	U	1	1	2.9		1	1	**77.5**		1	1	**38**		0.5	1	**43**		0.5	1	**18**		1	1	**140000**		500	1000	**79000**		250	500
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	9.1		1	1	11.2		1	1	17.7		1	1	506		5	5	13		0.8	1	11		0.8	1	8.1		1	1	ND	U	800	1000	ND	U	40	50
Ethylbenzene	100-41-4	700	1.3	ug/l	1.7		1	1	1.9		1	1	3.2		1	1	101		1	1	ND	U	0.8	1	ND	U	0.8	1	2.3		1	1	ND	U	800	1000	ND	U	40	50
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	52		2	1	67.8		2	1	33.6		2	1	60		2	1	62		1	1	78		1	1	58.8		2	1	ND	U	1000	1000	810		50	50
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	3.2		1	1	2.5		1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	500	1000	ND	U	25	50
Toluene	108-88-3	1000	860	ug/l	ND	U	1	1	ND	U	1	1	1.9		1	1	35.6		1	1	5		0.7	1	ND	U	0.7	1	2.9		1	1	ND	U	700	1000	**2200**		35	50
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	5.66		1	1	5.26		1	1	9.34		1	1	0.27		0.1	1	NA				NA				4.92		0.1	1	NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	0.866		0.1	1	0.148		0.1	1	**7.94**		1	1	ND	U	0.1	1	NA				NA				0.397		0.1	1	NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	**0.245**		0.1	1	ND	U	0.1	1	**4.02**		0.1	1	ND	U	0.1	1	NA				NA				0.141		0.1	1	NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	0.193		0.1	1	ND	U	0.1	1	**4.35**		0.1	1	ND	U	0.1	1	NA				NA				0.137		0.1	1	NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	ND	U	0.1	1	ND	U	0.1	1	**1.46**		0.1	1	ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Chrysene	218-01-9	1.9	2.9	ug/l	0.663		0.1	1	0.121		0.1	1	**4.87**		0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1	0.341		0.1	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	26.4		1	1	31.9		1	1	37.6		1	1	2.14		0.1	1	41		1	1	50		1	1	19.4		1	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	1.41		0.1	1	0.964		0.1	1	1.86		0.1	1	4.01		0.1	1	11		1	1	11		1	1	3.4		0.1	1	32		1	1	7		1	1
Phenanthrene	85-01-8	1100	NS	ug/l	32.7		1	1	29		1	1	32.7		1	1	0.917		0.1	1	24		1	1	43		1	1	11.7		1	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	4.45		0.1	1	1.93		0.1	1	19.6		1	1	0.123		0.1	1	14		1	1	12		1	1	2.79		0.1	1	ND	U	1	1	ND	U	1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	3	1	ND	U	3	1	ND	U	3	1	4.2		3	1	ND	U	0.18	1	ND	U	0.047	1	3.7		3	1	ND	U	0.18	1	ND	U	0.047	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
ug/l - microgram per liter
ugCaCO3/l - micrograms of calcium carbonate per liter
MSC - Medium Specific Concentration
RSL - Regional Screening Level
NS - No Standard
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
NA - Not Analyzed
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered est

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-149				B-151				B-151				B-152				B-153				B-152				B-153				B-154				B-154			
				Sample ID	B-149_010713				B151-060806				B-151_010713				B152-060906				B153-060906				B-152_010713				B-153_010413				B154-060806				B-154_010713			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	1/7/2013				6/8/2006				1/7/2013				6/9/2006				6/9/2006				1/7/2013				1/4/2013				6/8/2006				1/7/2013			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.0097	1	ND	U	0.02	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	ND	U	400	200	NA				ND	U	2	1	NA				NA				6		2	1	ND	U	2	1	NA				ND	U	2000	1000
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	200	200	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	200	200	ND	U	1000	1000
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	ND	U	400	200	NA				ND	U	2	1	NA				NA				4.7		2	1	ND	U	2	1	NA				ND	U	2000	1000
Benzene	71-43-2	5	0.39	ug/l	**47400**		500	500	ND	U	0.5	1	**15.2**		1	1	**78**		0.5	1	ND	U	0.5	1	**38.8**		1	1	ND	U	1	1	**450000**		1000	2000	**238000**		5000	5000
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	200	200	ND	U	0.8	1	6.2		1	1	5		0.8	1	ND	U	0.8	1	29		1	1	1.4		1	1	ND	U	160	200	ND	U	1000	1000
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	200	200	ND	U	0.8	1	1.3		1	1	ND	U	0.8	1	ND	U	0.8	1	3.5		1	1	ND	U	1	1	ND	U	160	200	ND	U	1000	1000
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	1750		400	200	ND	U	1	1	15.6		2	1	94		1	1	9		1	1	104		2	1	ND	U	2	1	ND	U	200	200	ND	U	2000	1000
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	200	200	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	1.6		1	1	ND	U	1	1	ND	U	100	200	ND	U	1000	1000
Toluene	108-88-3	1000	860	ug/l	357		200	200	ND	U	0.7	1	4.4		1	1	6		0.7	1	ND	U	0.7	1	16.8		1	1	ND	U	1	1	**6200**		140	200	**1100**		1000	1000
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	1.33		0.1	1	NA				0.522		0.1	1	NA				NA				1.41		0.1	1	0.19		0.1	1	NA				3.1		0.1	1
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	0.193		0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	0.122		0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	ND	U	0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	ND	U	0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	ND	U	0.1	1	NA				ND	U	0.1	1
Chrysene	218-01-9	1.9	2.9	ug/l	0.141		0.1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1	ND	U	0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.1	1
Fluorene	86-73-7	1900	220	ug/l	4.66		0.1	1	ND	U	1	1	1.64		0.1	1	7		1	1	ND	U	1	1	4.72		0.1	1	0.192		0.1	1	21		1	1	15.8		1	1
Naphthalene	91-20-3	100	0.14	ug/l	27.7		1	1	ND	U	1	1	0.453		0.1	1	ND	U	1	1	ND	U	1	1	1.46		0.1	1	0.466		0.1	1	76		1	1	57.3		1	1
Phenanthrene	85-01-8	1100	NS	ug/l	7.35		1	1	ND	U	1	1	0.114		0.1	1	ND	U	1	1	ND	U	1	1	2.3		0.1	1	ND	U	0.1	1	18		1	1	17		1	1
Pyrene	129-00-0	130	87	ug/l	1.01		0.1	1	ND	U	1	1	0.433		0.1	1	ND	U	1	1	ND	U	1	1	1.04		0.1	1	0.213		0.1	1	ND	U	1	1	0.983		0.1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	3	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	ND	U	0.047	1	ND	U	3	1	ND	U	3	1	ND	U	0.047	1	ND	U	3	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011)

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

CAS - Chemical Abstracts Service Registry Number
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Qualifiers:

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Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-155				B-155				B-156				B-156				B-157				B-158				B-158				B-159				B-160			
				Sample ID	B155-060806				B-155_010713				B156-060806				B-156_010713				B157-060906				B158-060806				B-158_010713				B159-060806				B160-060806			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	6/8/2006				1/7/2013				6/8/2006				1/7/2013				6/9/2006				6/8/2006				1/7/2013				6/8/2006				6/8/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.0096	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				ND	U	1000	500	NA				5.5		2	1	NA				NA				ND	U	2	1	NA				NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	200	200	ND	U	500	500	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				ND	U	1000	500	NA				5.6		2	1	NA				NA				ND	U	2	1	NA				NA			
Benzene	71-43-2	5	0.39	ug/l	**280000**		1000	2000	**77800**		500	500	**390**		5	10	**301**		5	5	**66**		0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	160	200	ND	U	500	500	39		0.8	1	33.2		1	1	79		0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	0.8	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	160	200	ND	U	500	500	6		0.8	1	5.5		1	1	14		0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	0.8	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	ND	U	200	200	ND	U	1000	500	84		1	1	101		2	1	6		1	1	ND	U	1	1	ND	U	2	1	ND	U	1	1	ND	U	1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	100	200	ND	U	500	500	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	140	200	ND	U	500	500	22		0.7	1	21		1	1	40		0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	NA				1.74		0.1	1	NA				1.79		0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				ND	U	0.1	1	NA				0.184		0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				ND	U	0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				ND	U	0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				ND	U	0.1	1	NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA				NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	0.161		0.1	1	**6**		1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	10		1	1	6.74		1	1	16		1	1	8.16		1	1	14		1	1	ND	U	1	1	ND	U	0.1	1	9		1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	29		1	1	52.4		1	1	ND	U	1	1	1.65		0.1	1	ND	U	1	1	ND	U	1	1	0.155		0.1	1	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	14		1	1	8.73		1	1	17		1	1	9.87		1	1	25		1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	ND	U	1	1	0.746		0.1	1	ND	U	1	1	0.883		0.1	1	20		1	1	ND	U	1	1	0.196		0.1	1	ND	U	1	1	ND	U	1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	ND	U	3	1	**16.6**		0.047	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	ND	U	0.047	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011)
[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)
CAS - Chemical Abstracts Service Registry Number
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Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-160				B-162				B-162				B-163				B-163				B-164				B-164				B-165				B-166			
				Sample ID	B160_010713				B162-081006				B162_010413				B163-060906				B-163_010713				B164-060606				B164_010813				B-165_010413				B166_010713			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	1/7/2013				8/10/2006				1/4/2013				6/9/2006				1/7/2013				6/6/2006				1/8/2013				1/4/2013				1/7/2013			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.02	1	ND	U	0.0094	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	7.9		2	1	NA				3.3		2	1	NA				ND	U	2	1	NA				ND	U	2	1	ND	U	2	1	2.3		2	1
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	5	5	ND	U	1	1	ND	U	5	5	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	2.2		2	1	NA				ND	U	2	1	NA				ND	U	2	1	NA				ND	U	2	1	ND	U	2	1	ND	U	2	1
Benzene	71-43-2	5	0.39	ug/l	ND	U	1	1	ND	U	3	5	ND	U	1	1	**4800**		25	50	**373**		5	5	ND	U	0.5	1	**99.1**		1	1	ND	U	1	1	ND	U	1	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	15.3		1	1	ND	U	4	5	6.3		1	1	ND	U	4	5	3.5		1	1	ND	U	0.8	1	1.2		1	1	ND	U	1	1	3.9		1	1
Ethylbenzene	100-41-4	700	1.3	ug/l	4.1		1	1	ND	U	4	5	1.7		1	1	ND	U	4	5	1.8		1	1	ND	U	0.8	1	ND	U	1	1	ND	U	1	1	1.1		1	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	2.9		2	1	ND	U	5	5	ND	U	2	1	ND	U	5	5	3.5		2	1	7		1	1	7.2		2	1	3		2	1	2.1		2	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	1	1	ND	U	3	5	ND	U	1	1	ND	U	3	5	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Toluene	108-88-3	1000	860	ug/l	1.7		1	1	ND	U	4	5	ND	U	1	1	ND	U	4	5	6.4		1	1	ND	U	0.7	1	1.7		1	1	ND	U	1	1	ND	U	1	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	ND	U	10	1	NA				ND	U	1	1	NA				0.156		0.1	1	NA				ND	U	0.1	1	0.79		0.1	1	ND	U	0.1	1
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	ND	U	10	1	NA				ND	U	1	1	NA				ND	U	0.1	1	NA				ND	U	0.1	1	0.223		0.1	1	ND	U	0.1	1
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	ND	U	10	1	NA				ND	U	1	1	NA				ND	U	0.1	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	ND	U	10	1	NA				ND	U	1	1	NA				ND	U	0.1	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	ND	U	10	1	NA				ND	U	1	1	NA				ND	U	0.1	1	NA				ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	0.1	1	0.148		0.1	1	ND	U	0.1	1
Fluorene	86-73-7	1900	220	ug/l	ND	U	10	1	ND	U	1	1	1.51		1	1	35		1	1	8.24		1	1	ND	U	1	1	0.184		0.1	1	2.03		0.1	1	0.42		0.1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	0.491		0.1	1	ND	U	1	1	0.304		0.1	1	1.29		0.1	1	0.438		0.1	1
Phenanthrene	85-01-8	1100	NS	ug/l	ND	U	10	1	ND	U	1	1	ND	U	1	1	20		1	1	0.17		0.1	1	ND	U	1	1	ND	U	0.1	1	0.446		0.1	1	ND	U	0.1	1
Pyrene	129-00-0	130	87	ug/l	ND	U	10	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	0.177		0.1	1	ND	U	1	1	0.123		0.1	1	1.65		0.1	1	0.135		0.1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	3	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	ND	U	3	1	5		0.047	1	ND	U	3	1	ND	U	3	1	ND	U	3	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

CAS - Chemical Abstracts Service Registry Number
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ug/l - microgram per liter
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Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-167				B-168				B-169				B-169				B-39				B-46				B-46				B-46				B-48			
				Sample ID	B167_010713				B-168_010413				B-169_010413				B-169_010913				B39_010813				B46-052505				B46-060706				B46_010713				B48-052405			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	1/7/2013				1/4/2013				1/4/2013				1/9/2013				1/8/2013				5/25/2005				6/7/2006				1/7/2013				5/24/2005			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0098	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	4		2	1	ND	U	2	1	4.7		2	1	ND	U	2	1	ND	U	2	1	NA				NA				3.7		2	1	NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	ND	U	2	1	NA				NA				ND	U	2	1	NA			
Benzene	71-43-2	5	0.39	ug/l	**10.2**		1	1	ND	U	1	1	**5.2**		1	1	**6.4**		1	1	**44**		1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	17.4		1	1	2		1	1	6.3		1	1	ND	U	1	1	3.8		1	1	ND	U	0.8	1	ND	U	0.8	1	7.3		1	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	3.9		1	1	ND	U	1	1	1.8		1	1	ND	U	1	1	ND	U	1	1	ND	U	0.8	1	ND	U	0.8	1	2		1	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	81.6		2	1	3.8		2	1	8.3		2	1	ND	U	2	1	30.1		2	1	ND	U	1	1	ND	U	1	1	ND	U	2	1	ND	U	1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	4.5		1	1	ND	U	1	1	2		1	1	ND	U	1	1	3.1		1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	ND	U	0.1	1	0.503		0.1	1	0.377		0.1	1	0.217		0.1	1	14.2		1	1	NA				NA				ND	U	0.1	1	NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	ND	U	0.1	1	0.254		0.1	1	0.197		0.1	1	0.187		0.1	1	**8.27**		1	1	NA				NA				0.175		0.1	1	NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	**0.223**		0.1	1	**6.03**		1	1	NA				NA				0.177		0.1	1	NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	0.222		0.1	1	**6.09**		1	1	NA				NA				0.167		0.1	1	NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	ND	U	0.1	1	ND	U	0.1	1	ND	U	0.1	1	0.173		0.1	1	**2.89**		1	1	NA				NA				0.12		0.1	1	NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	0.1	1	0.19		0.1	1	0.131		0.1	1	0.268		0.1	1	**6.78**		1	1	ND	U	1	1	ND	U	1	1	0.19		0.1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	0.316		0.1	1	3.09		0.1	1	1.98		0.1	1	0.527		0.1	1	36.6		1	1	ND	U	1	1	ND	U	1	1	0.319		0.1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	2.08		0.1	1	1.38		0.1	1	41.7		0.1	1	0.165		0.1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1	0.914		0.1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	0.289		0.1	1	0.172		0.1	1	1.44		0.1	1	0.296		0.1	1	74.9		1	1	ND	U	1	1	ND	U	1	1	0.219		0.1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	ND	U	0.1	1	1.07		0.1	1	0.646		0.1	1	0.587		0.1	1	24.1		1	1	ND	U	1	1	ND	U	1	1	0.53		0.1	1	ND	U	1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	3	1	ND	U	3	1	ND	U	3	1	ND	U	3	1	**5.7**		3	1	ND	U	0.18	1	ND	U	0.047	1	4.2		3	1	ND	U	0.18	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

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Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	B-48				B-48				B-92				B-92				B-92				B-94				B-94				B-94				U-1			
				Sample ID	B48-060806				B48_010413				B92-052505				B92-060706				B92_010813				B94-052505				B94-060906				B94_010713				U1-060606			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	6/8/2006				1/4/2013				5/25/2005				6/7/2006				1/8/2013				5/25/2005				6/9/2006				1/7/2013				6/6/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0097	1	ND	U	0.0094	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0095	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				3.7		2	1	NA				NA				2.3		2	1	NA				NA				2.5		2	1	NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				ND	U	2	1	NA				NA				ND	U	2	1	NA				NA				ND	U	2	1	NA			
Benzene	71-43-2	5	0.39	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	0.8	1	7.4		1	1	ND	U	0.8	1	ND	U	0.8	1	4.8		1	1	ND	U	0.8	1	ND	U	0.8	1	4.7		1	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	0.8	1	2		1	1	ND	U	0.8	1	ND	U	0.8	1	1		1	1	ND	U	0.8	1	ND	U	0.8	1	1.2		1	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	ND	U	1	1	ND	U	2	1	9		1	1	7		1	1	11		2	1	ND	U	1	1	ND	U	1	1	ND	U	2	1	ND	U	1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	**34**		0.5	1	20		0.5	1	12.3		1	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	NA				ND	U	1	1	NA				NA				6		1	1	NA				NA				0.154		0.1	1	NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				ND	U	1	1	NA				NA				0.36		0.1	1	NA				NA				ND	U	0.1	1	NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				ND	U	1	1	NA				NA				0.133		0.1	1	NA				NA				ND	U	0.1	1	NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				ND	U	1	1	NA				NA				ND	U	0.1	1	NA				NA				ND	U	0.1	1	NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	0.315		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	0.1	1	**810**		10	1
Fluorene	86-73-7	1900	220	ug/l	6		1	1	2.12		1	1	22		1	1	24		1	1	28		1	1	ND	U	1	1	ND	U	1	1	1.16		0.1	1	550		10	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	1.44		1	1	ND	U	1	1	ND	U	1	1	1.18		0.1	1	ND	U	1	1	ND	U	1	1	0.601		0.1	1	60		10	1
Phenanthrene	85-01-8	1100	NS	ug/l	ND	U	1	1	1.26		1	1	15		1	1	15		1	1	30.4		1	1	ND	U	1	1	ND	U	1	1	1.18		0.1	1	1100		10	1
Pyrene	129-00-0	130	87	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	2.91		0.1	1	ND	U	1	1	ND	U	1	1	0.384		0.1	1	**2600**		50	5
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	0.047	1	ND	U	3	1	ND	U	0.18	1	ND	U	0.047	1	4.1		3	1	ND	U	0.18	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1

Notes:

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Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	U-2				U-4				U-4				U-5				URS-1				URS-1				URS-2				URS-2				URS-3			
				Sample ID	U2-060606				U4-060606				U4_010913				U5-060606				URS1-060606				URS-1_010913				URS2-060606				URS2_010913				B134U-052505			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	6/6/2006				6/6/2006				1/9/2013				6/6/2006				6/6/2006				1/9/2013				6/6/2006				1/9/2013				5/25/2005			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																																								
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0096	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0098	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				NA				2.9		2	1	NA				NA				ND	U	2	1	NA				6.2		2	1	NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				NA				ND	U	2	1	NA				NA				ND	U	2	1	NA				2.2		2	1	NA			
Benzene	71-43-2	5	0.39	ug/l	ND	U	0.5	1	ND	U	0.5	1	1.4		1	1	ND	U	0.5	1	ND	U	0.5	1	**13**		1	1	**8**		0.5	1	3.4		1	1	**12**		0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	0.8	1	ND	U	0.8	1	8.3		1	1	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	7		0.8	1	19.9		1	1	9		0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	0.8	1	ND	U	0.8	1	1.7		1	1	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	0.8	1	3.8		1	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	ND	U	1	1	ND	U	1	1	3.4		2	1	ND	U	1	1	ND	U	1	1	ND	U	2	1	11		1	1	7.7		2	1	5		1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1	8		0.5	1	ND	U	1	1	ND	U	0.5	1	ND	U	1	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	2.3		1	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																																								
Anthracene	120-12-7	66	1300	ug/l	NA				NA				1.18		0.1	1	NA				NA				ND	U	0.1	1	NA				1.23		0.1	1	NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				NA				0.997		0.1	1	NA				NA				ND	U	0.1	1	NA				0.787		0.1	1	NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				NA				**0.686**		0.1	1	NA				NA				ND	U	0.1	1	NA				**0.407**		0.1	1	NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				NA				0.35		0.1	1	NA				NA				ND	U	0.1	1	NA				0.333		0.1	1	NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				NA				**0.344**		0.1	1	NA				NA				ND	U	0.1	1	NA				**0.314**		0.1	1	NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	ND	U	1	1	1.59		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	0.805		0.1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	ND	U	1	1	ND	U	1	1	1.91		0.1	1	ND	U	1	1	ND	U	1	1	1.37		0.1	1	ND	U	1	1	1.61		0.1	1	29		1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	ND	U	1	1	0.692		0.1	1	ND	U	1	1	ND	U	1	1	1.74		0.1	1	ND	U	1	1	1.24		0.1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	ND	U	1	1	ND	U	1	1	3.29		0.1	1	ND	U	1	1	ND	U	1	1	0.127		0.1	1	6		1	1	1.99		0.1	1	21		1	1
Pyrene	129-00-0	130	87	ug/l	ND	U	1	1	ND	U	1	1	2.59		0.1	1	ND	U	1	1	ND	U	1	1	0.218		0.1	1	ND	U	1	1	2.09		0.1	1	15		1	1
Metals																																								
Lead	7439-92-1	5	NS	ug/l	ND	U	0.047	1	ND	U	0.047	1	ND	U	3	1	3.6		0.047	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	3.5		3	1	ND	U	0.18	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).
[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)
CAS - Chemical Abstracts Service Registry Number
PADEP - Pennsylvania Department of Environmental Protection
EPA - Environmental Protection Agency
ug/l - microgram per liter
ugCaCO3/l - micrograms of calcium carbonate per liter
MSC - Medium Specific Concentration
RSL - Regional Screening Level
NS - No Standard
DL - Lab detection limit (actual limit may be either the quantification or method detection limit)
NA - Not Analyzed
ND - Not Detected
DF - Dilution Factor
Q - Lab Qualifier

Qualifiers:

U - The analyte was analyzed but not detected above the reporting limit.
J - Compound was detected below the quantification limit and above the method detection limit. The result should be considered est

Exceedance Summary:

10	Reported result exceeds the PADEP Non-Residential Groundwater MSC
10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	URS-3				URS-4				URS-4				URS-5				WP16-5				WP16-5			
				Sample ID	URS3-060606				URS4-060606				URS4-4_010913				URS5-060606				WP16-5-052605				WP16-5-060906			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	6/6/2006				6/6/2006				1/9/2013				6/6/2006				5/26/2005				6/9/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																												
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0094	1	ND	U	0.0095	1	ND	U	0.02	1	ND	U	0.0096	1	ND	U	0.01	1	ND	U	0.0098	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				NA				ND	U	2	1	NA				NA				NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	1	1	ND	U	1	1	ND	U	1	1	**140**		5	5	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				NA				ND	U	2	1	NA				NA				NA			
Benzene	71-43-2	5	0.39	ug/l	**18**		0.5	1	ND	U	0.5	1	**46.8**		1	1	**5900**		25	50	ND	U	0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	9		0.8	1	ND	U	0.8	1	ND	U	1	1	2900		40	50	ND	U	0.8	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	600		4	5	ND	U	0.8	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	18		1	1	ND	U	1	1	2.8		2	1	37		5	5	ND	U	1	1	ND	U	1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	0.5	1	ND	U	0.5	1	4.7		1	1	ND	U	3	5	ND	U	0.5	1	ND	U	0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	**4900**		35	50	ND	U	0.7	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																												
Anthracene	120-12-7	66	1300	ug/l	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				NA				ND	U	0.1	1	NA				NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				NA				ND	U	0.1	1	NA				NA				NA			
Chrysene	218-01-9	1.9	2.9	ug/l	**45**		1	1	ND	U	1	1	ND	U	0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	98		1	1	ND	U	1	1	0.144		0.1	1	17		1	1	ND	U	1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	ND	U	1	1	0.268		0.1	1	**270**		5	5	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	260		5	5	ND	U	1	1	0.113		0.1	1	25		1	1	ND	U	1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	**160**		5	5	ND	U	1	1	0.443		0.1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
Metals																												
Lead	7439-92-1	5	NS	ug/l	ND	U	0.047	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.047	1	1.5		0.18	1	ND	U	0.047	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011)

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

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Exceedance Summary:

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10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 6
Summary of Groundwater Analytical Results
AOI 6
PES Facility
Philadelphia, Pennsylvania

Chemical Name	CAS Number	PADEP Non-Res Groundwater MSC[1]	EPA Tapwater RSL[2]	Location	WP9-1				WPM-11				WPM-11				WPM-11				WPM-8				WPM-8			
				Sample ID	WP9-1-052505				WPM11-052605				WPM11-060906				WPM-11_010913				WPM8-052605				WPM8-060906			
				Sample Matrix	Groundwater				Groundwater				Groundwater				Groundwater				Groundwater				Groundwater			
				Sample Date	5/25/2005				5/26/2005				6/9/2006				1/9/2013				5/26/2005				6/9/2006			
				Unit	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF	Result	Q	DL	DF
Volatile Organic Compounds																												
1,2-Dibromoethane (Ethylene Dibromide)	106-93-4	0.05	0.0065	ug/l	ND	U	0.0094	1	ND	U	0.097	10	ND	U	0.0096	1	ND	U	0.02	1	ND	U	0.0097	1	ND	U	0.0097	1
1,2,4-Trimethylbenzene	95-63-6	62	15	ug/l	NA				NA				NA				ND	U	2	1	NA				NA			
1,2-Dichloroethane	107-06-2	5	0.15	ug/l	ND	U	20	20	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1	ND	U	1	1
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	53	87	ug/l	NA				NA				NA				ND	U	2	1	NA				NA			
Benzene	71-43-2	5	0.39	ug/l	**1700**		10	20	ND	U	0.5	1	ND	U	0.5	1	**20.5**		1	1	**27**		0.5	1	ND	U	0.5	1
Dimethyl Benzene/ Xylenes, Total	1330-20-7	10000	190	ug/l	ND	U	16	20	ND	U	0.8	1	ND	U	0.8	1	2.2		1	1	ND	U	0.8	1	ND	U	0.8	1
Ethylbenzene	100-41-4	700	1.3	ug/l	ND	U	16	20	ND	U	0.8	1	ND	U	0.8	1	ND	U	1	1	ND	U	0.8	1	ND	U	0.8	1
Isopropylbenzene (Cumene)	98-82-8	3500	390	ug/l	ND	U	20	20	ND	U	1	1	ND	U	1	1	ND	U	2	1	27		1	1	40		1	1
Tert-Butyl Methyl Ether	1634-04-4	20	12	ug/l	ND	U	10	20	ND	U	0.5	1	ND	U	0.5	1	ND	U	1	1	**24**		0.5	1	**23**		0.5	1
Toluene	108-88-3	1000	860	ug/l	ND	U	14	20	ND	U	0.7	1	ND	U	0.7	1	ND	U	1	1	ND	U	0.7	1	ND	U	0.7	1
Semi-Volatile Organic Compounds																												
Anthracene	120-12-7	66	1300	ug/l	NA				NA				NA				24.8		0.5	5	NA				NA			
Benzo(A)Anthracene	56-55-3	3.6	0.029	ug/l	NA				NA				NA				**66**		5	5	NA				NA			
Benzo(A)Pyrene	50-32-8	0.2	0.0029	ug/l	NA				NA				NA				**115**		5	5	NA				NA			
Benzo(B)Fluoranthene	205-99-2	1.2	0.029	ug/l	NA				NA				NA				**161**		5	5	NA				NA			
Benzo(G,H,I)Perylene	191-24-2	0.26	NS	ug/l	NA				NA				NA				**118**		5	5	NA				NA			
Chrysene	218-01-9	1.9	2.9	ug/l	ND	U	1	1	**300**		5	1	**28**		1	1	**149**		5	5	**2**		1	1	ND	U	1	1
Fluorene	86-73-7	1900	220	ug/l	ND	U	1	1	36		5	1	6		1	1	18		0.5	5	6		1	1	ND	U	1	1
Naphthalene	91-20-3	100	0.14	ug/l	ND	U	1	1	ND	U	5	1	ND	U	1	1	1.86		0.5	5	ND	U	1	1	ND	U	1	1
Phenanthrene	85-01-8	1100	NS	ug/l	14		1	1	200		5	1	14		1	1	96.5		5	5	2		1	1	ND	U	1	1
Pyrene	129-00-0	130	87	ug/l	22		1	1	**400**		5	1	50		1	1	**265**		5	5	9		1	1	ND	U	1	1
Metals																												
Lead	7439-92-1	5	NS	ug/l	ND	U	0.18	1	ND	U	0.18	1	ND	U	0.047	1	ND	U	3	1	ND	U	0.18	1	ND	U	0.047	1

Notes:

[1] PADEP Non-Residential Groundwater MSC in a used aquifer with total dissolved solids less than 2500 mg/l (last updated Jan. 2011).

[2] EPA Tapwater Regional Screening Level (last updated Nov. 2012)

CAS - Chemical Abstracts Service Registry Number
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Exceedance Summary:

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10	Reported result exceeds the PADEP Non-Residential Groundwater MSC and the EPA Tapwater RSL
10	RL exceeds the PADEP Non-Residential Groundwater MSC

Table 7
Summary of Air Analytical Results
AOI-6
PES Facility
Philadelphia, Pennsylvania

Sample	*Type*	*Location/description*	*Volatile hydrocarbon compounds*											
			Methyl tert-butyl ether	*1,2-dichloro-ethane*	*Benzene*	*Toluene*	*1,2-dibromo-ethane*	*Ethyl-benzene*	*m,p-xylenes*	*o-xylene*	*Xylenes, total*	*Cumene*	*1,3,5-trimethyl-benzene*	*1,2,4-trimethyl-benzene*
3	I	24 Gate Building (1st floor)	ND	ND	2.1	7	ND	1.5	4	1.5	5.5	1	ND	1.7
4	I	24 Gate Building (2nd floor)	ND	ND	1.8	6.8	ND	1.2	3.8	1.4	5.2	ND	ND	1.5
5	I	GP Training Building (1st floor vending area)	ND	ND	3.5	7.2	ND	1.3	3.7	1.4	5.1	1	ND	1.6
6	I	GP Training Building (1st floor west)	ND	ND	4.2	7.5	ND	2.2	4.6	1.7	6.3	1.3	ND	1.8
7	I	GP Training Building (3rd floor gym)	ND	ND	4.2	12	ND	1.8	6.3	2.2	8.5	2	1.2	4
8	I	GP Training Building (basement)	ND	ND	3.1	7.8	ND	1.5	4.9	1.8	6.7	1.5	0.97	3.2
9	I	GP Main Office Building (basement west)	ND	ND	2.3	6.9	ND	1.3	4.2	1.5	5.7	1.4	ND	1.6
10	I	GP Main Office Building (basement center)	ND	ND	2.2	6.9	ND	1.2	3.6	1.3	4.9	1	ND	1.3
11	I	GP Main Office Building (basement east)	ND	ND	1.6	6.1	ND	0.86	2.7	1	3.7	ND	ND	0.93
12	I	GP Main Office Building (1st floor entrance)	ND	ND	1.7	6.2	ND	0.99	2.9	1.1	4	ND	ND	1
13	I	GP Main Office Building (1st floor west)	ND	ND	1.5	5.6	ND	0.86	2.6	0.96	3.56	ND	ND	ND
14	I	GP Main Office Building (2nd floor west)	ND	ND	1.6	6	ND	1.1	3	1.1	4.1	0.79	ND	1
15	I	GP Main Office Building (2nd floor east)	ND	ND	1.9	6.4	ND	1.2	3.4	1.2	4.6	1	ND	1.2
16	O	GP Main Office Building (outside west)	ND	ND	1.3	4.6	ND	ND	2	ND	2	ND	ND	ND
24	TB	Trip blank -not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	TB	Trip blank -not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
44	TB	Trip blank -not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes

(1) All units are in micrograms per cubic meter of air (ug/m3) by volume.

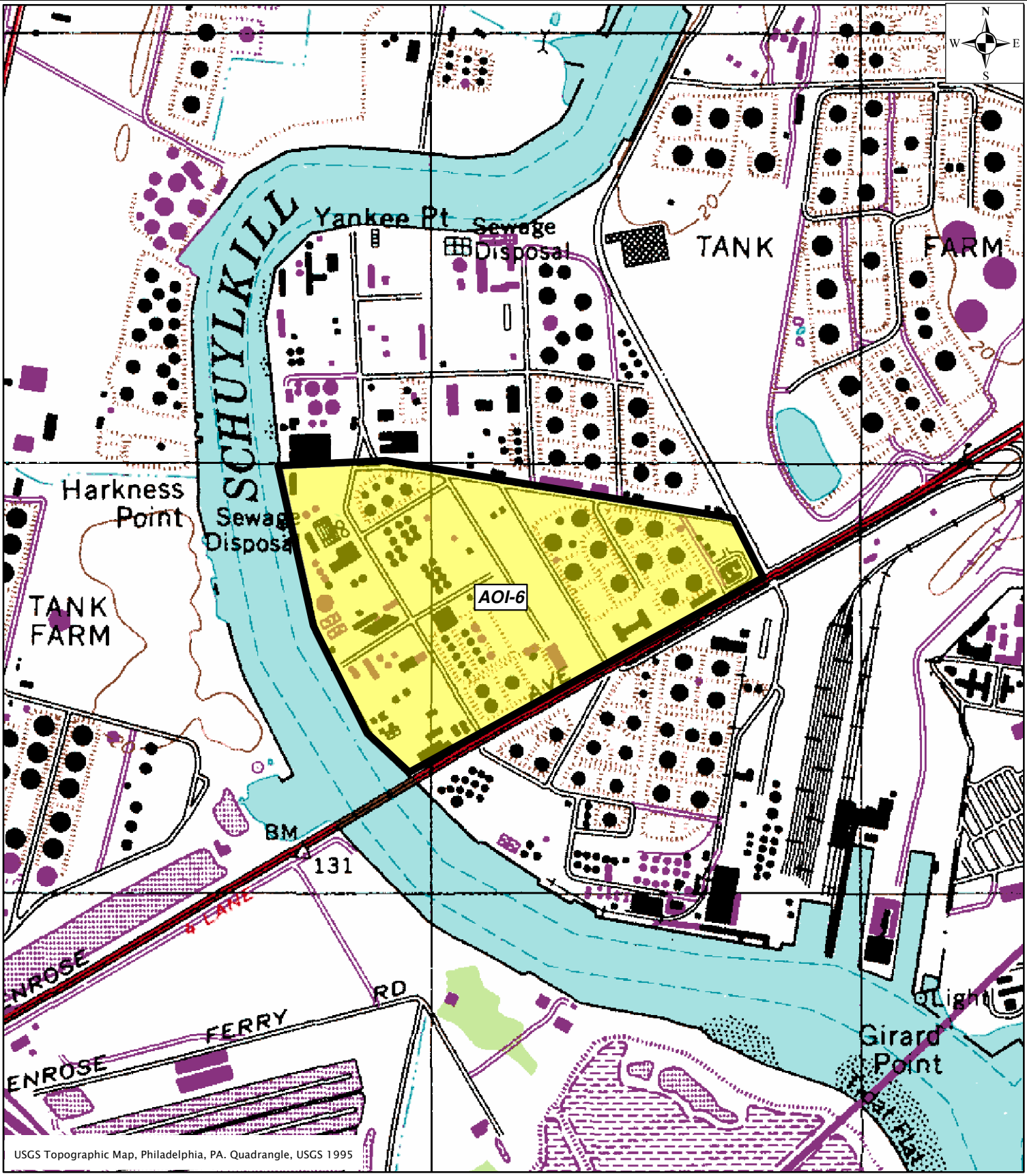
(2) All samples were analyzed utilizing EPA Method TO-15.

(3) I=Indoor air sample; "O"=Outdoor air sample; "TB"= Trip Blank, SUMMA canisters which were not opened, used for QA/QC.

(4) ND=Non-Detect

(5) Source: "Evaluation of Specific Volatile Organic Compounds in Occupied Buildings at the Former Philadelphia Refinery," Stantec, March 2013

FIGURES



SUNOCO

PHILADELPHIA ENERGY SOLUTIONS

Sunoco, Inc. (R&M)

PES Facility

3144 Passyunk Avenue
Philadelphia, PA. 19145

Figure 1: Site Location Map
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility

Philadelphia Pennsylvania

Job Number	Scale: 1" = 1,000'	Date
2574601	0 500 1,000 Feet	June 6, 2013

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 1- Site Location Map_6-5-13.mxd

N
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Legend

- Penrose Avenue Sewer
- Sheet Pile Wall
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

Figure 2: Site Plan
AOI 6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

SUNOCO
PHILADELPHIA ENERGY SOLUTIONS

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: June 5, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Q:\Data\2574601\ArcGIS\MapDocuments\AOI 6 Site Characterization\Figure 8 Summary of Non SWMUs Soil Sample Exceedances.mxd

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

Figure 3: Completed Activities Plan
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 3 - Completed Activities_8-29-13.mxd

Legend

- Monitoring Wells in Q-Q' Cross Section
- Soil Borings in Q-Q' Cross Section
- Deep Monitoring Wells
- Shallow Monitoring Wells
- Shallow Piezometer
- Shallow Recovery Well
- Monitoring Well Abandoned/Damaged/ Unable to Locate
- Q — Q' AOI-6 Cross Section Location
- Sheet Pile Wall
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

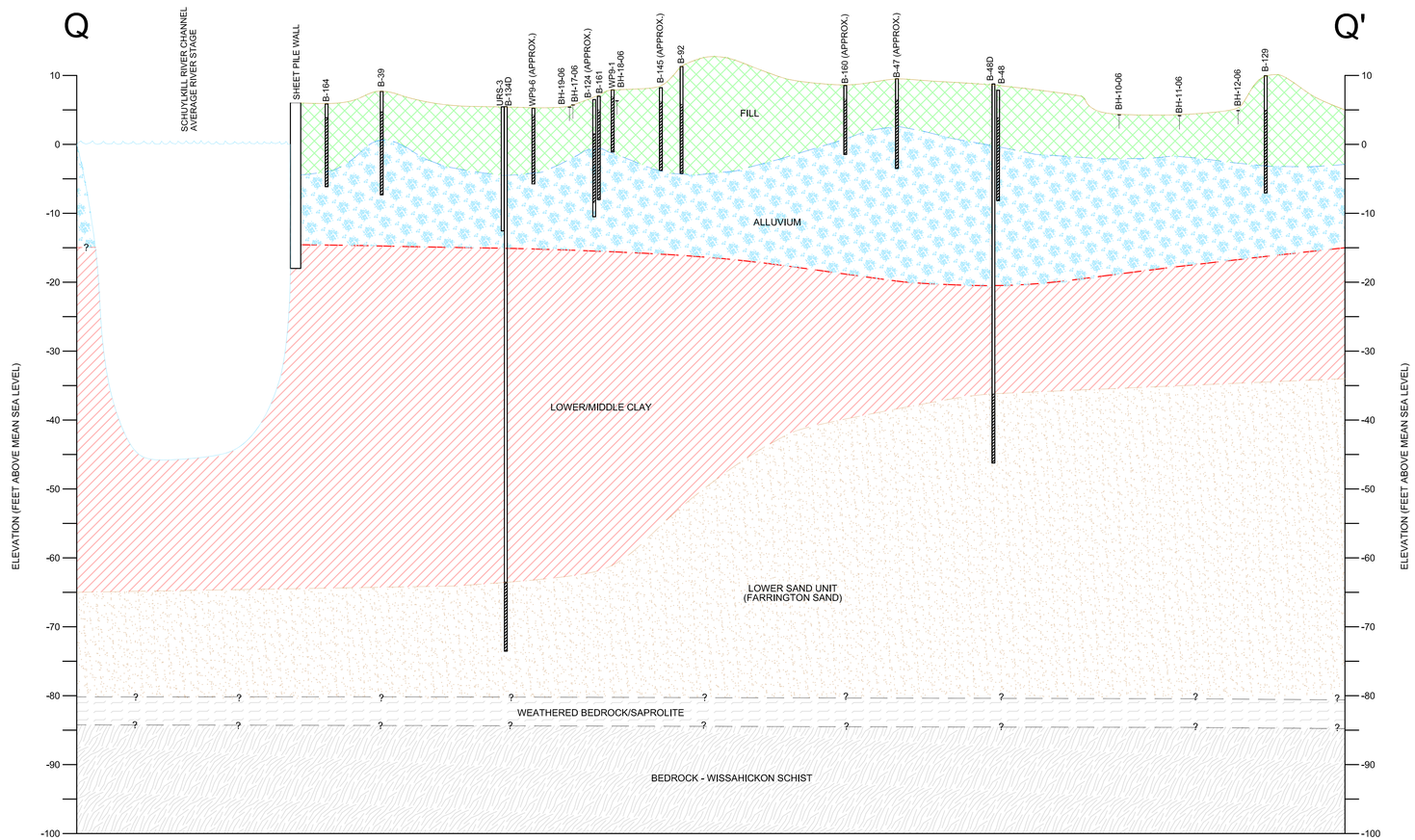
Figure 4: Cross Section Location Plan
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: June 7, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 4 - Cross Section Location Plan_6-14-13.mxd



LEGEND:

- FILL
- ALLUVIUM
- CLAY
- SAND
- WEATHERED BEDROCK
- WISSAHICKON SCHIST
- B-129 LOCATION ID
- INFERRED CONTACTS
- WELL CASING
- WELL SCREEN
- SOIL BORING

NOTES:

1. DEPTH OF SCHUYLKILL RIVER FROM SIMULATION OF GROUNDWATER FLOW IN THE POTOMIC-RARITAN-MAGOTHY AQUIFER SYSTEM NEAR THE DEFENSE SUPPLY CENTER PHILADELPHIA, AND THE POINT BREEZE REFINERY, SOUTHERN PHILADELPHIA COUNTY, PENNSYLVANIA BY CURTIS L. SCHREFFLER DATED 2001.
2. DEPTH OF SHEET PILE WALL DETERMINED FROM FIGURE 3-8 GENERALIZED GEOLOGIC CROSS SECTION A-C DATED 13 NOVEMBER 1992 FROM DAMES & MOORE, RCRA VERIFICATION INVESTIGATION REPORT, CHEVRON REFINERY, 1992. CROSS SECTION RENAMED C-J.
3. CONTACT BETWEEN FILL AND ALLUVIUM IS APPROXIMATED BASED ON AVAILABLE HISTORIC WELL LOGS.

10 0 2 4 10
VERTICAL SCALE IN FEET

200 0 100 200
HORIZONTAL SCALE IN FEET

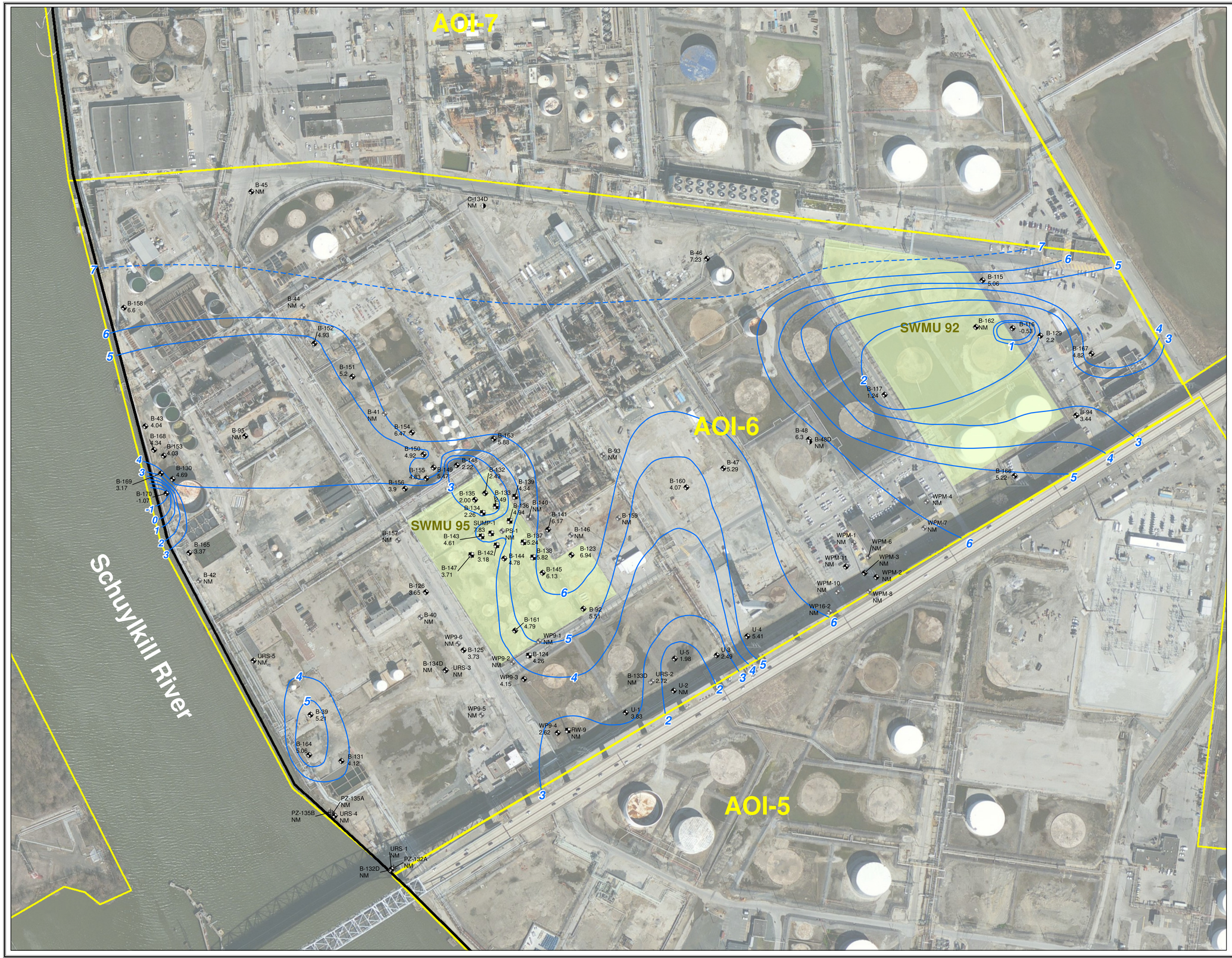
PHILADELPHIA ENERGY SOLUTIONS

Project
SUNOCO, INC. (R&M)
PES FACILITY
PHILADELPHIA COUNTY PENNSYLVANIA

Drawing Title
GEOLOGIC CROSS SECTION Q-Q'

Project No. 2574601	Figure No. 5
Date 6/11/2013	
Scale 1"=200' HOR. 1"=10' VER.	
Drn. By DMM/AE	
Last Revised X	Of

Filename: \\langan.com\data\PH\data6\2574601\CADD Drawings\Appendix E – Geologic Cross-Section Q-Q_rev8-27-13.dwg Date: 8/27/2013 Time: 9:38 User: mhagan Style Table: Langan.stb Layout: D Size Sheet (Bottom)



Legend

- Shallow Monitoring Well and Groundwater Elevation (ft.)
- Shallow Recovery Well and Groundwater Elevation (ft.)
- Deep Monitoring Wells
- Shallow Piezometer
- Monitoring Well Abandoned/Damaged/Unable to Locate
- Groundwater Elevation Contour (ft.) (dashed where inferred)
- Sheet Pile Wall
- Solid Waste Management Unit (SWMU)
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Groundwater elevations based on groundwater gauging data provided by Aquaterra, December 2012.

Figure 6: Fill/Alluvium Groundwater Elevations
December 2012
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 6 - Groundwater Elevations_8-29-13.mxd

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Legend

- Indoor Air Sample Locations
- Sheet Pile Wall
- Occupied Buildings Not Under Positive Pressure
- Occupied Buildings Under Positive Pressure
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Indoor air samples referenced from "Evaluation of Specific Volatile Organic Compounds in Occupied Buildings on the Philadelphia Refinery Properties" completed by Stantec, December 14, 2012.

Figure 7: Indoor Air Sample Locations
October 2012
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
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PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: June 5, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 7 - Indoor Air.mxd

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Legend

- Sheet Pile Wall
- Tank Closed in Place (797)
- Tank With Release Assessment (250)
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.

Figure 8: Storage Tanks in AOI-6
AOI-6 Site Characterization/
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PES Facility
Philadelphia, Pennsylvania

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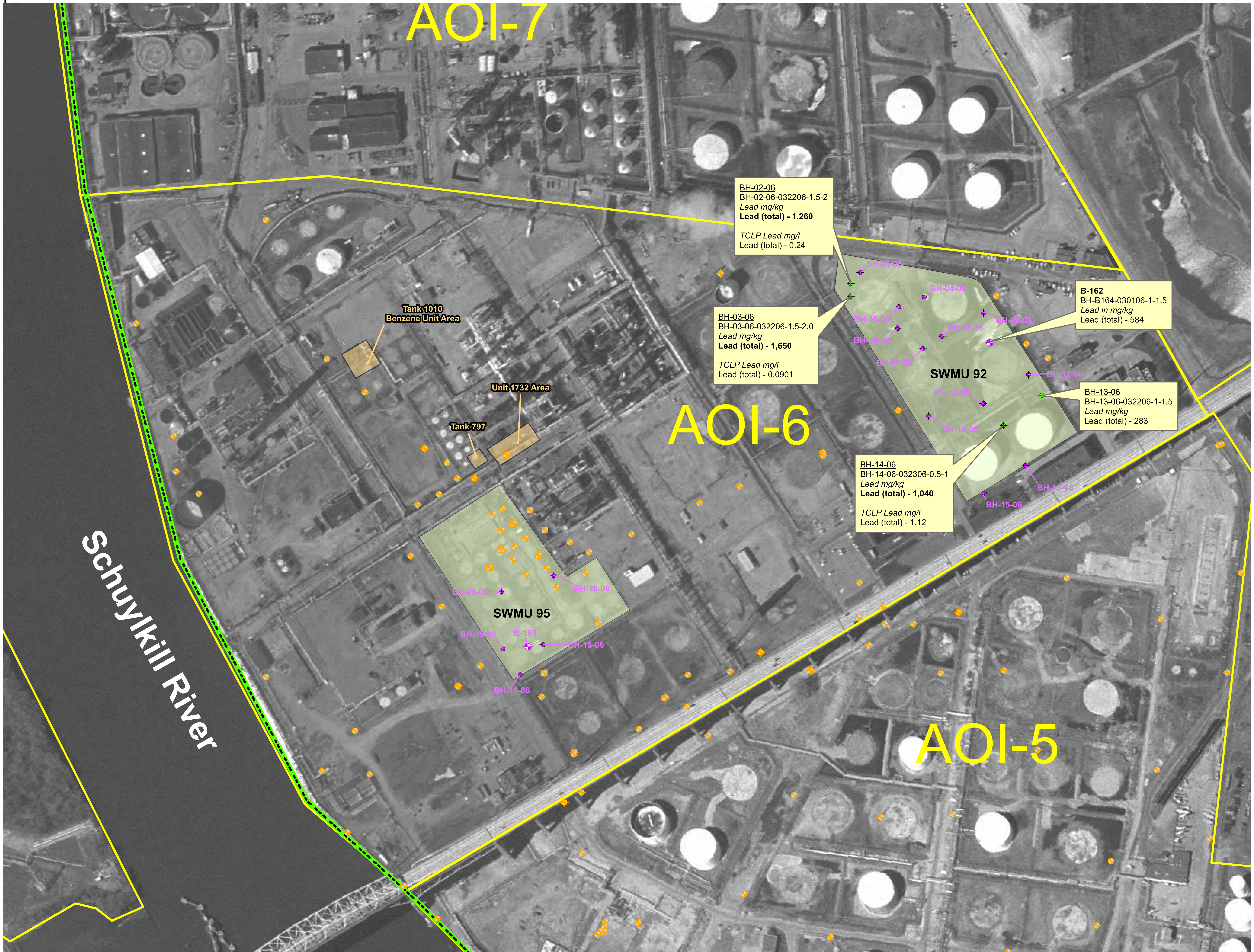
Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT-data\E\257460\1\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 8 - Storage Tanks_8-29-13.mxd



N
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Legend

- Shallow SWMU Soil Boring Locations with Suspected Leaded Tank Bottom Materials Observed
- Shallow SWMU Soil Boring Location with Leaded Tank Bottom Materials Not Observed
- Fill/Alluvium Non SWMU Monitoring Well
- Existing Monitoring Point
- Existing Recovery Well
- Potential Source Areas
- Leaded Tank Bottom Solid Waste Management Unit (SWMU)
- AOI Boundary
- Sheet Pile Wall

Compound of Concern for SWMU Areas and PADEP MSCs and EPA TCLP Standards

	Analytical Method	CAS No	PADEP Non-Residential MSCs	EPA Maximum Concentration of Contaminants for Toxicity Concentration
			0-2' Dry	
Metals				
Lead (Total)	SW846 6010B	7439-92-1	450 (mg/kg)	
TCLP Metals				
Lead (Total)	SW846 1311	7439-92-1	-	5 (mg/L)

Notes:
1. The soil boring B-162 did not display visual characteristics of a leaded tank bottom; however, the sample did exceed the PADEP lead MSC.
2. The soil boring BH-13-06 displayed visual characteristics of leaded tank bottom material and was therefore analyzed for lead. However, the sample did not exceed the PADEP MSC so the sample was not analyzed by TCLP.

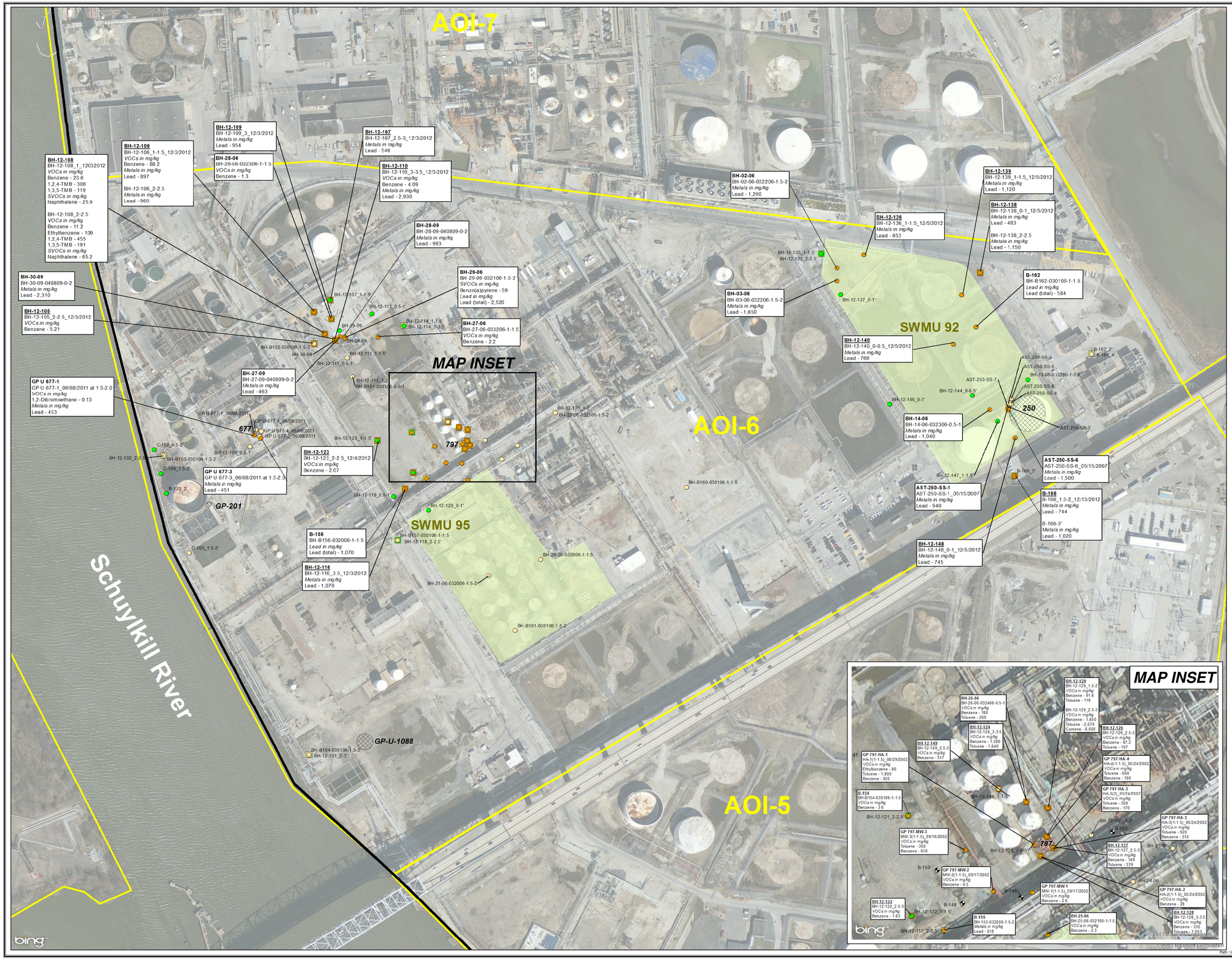
Figure 9: Summary of Leaded Tank Bottom Investigation 2006
AOI 6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: July 11, 2013
DRN. BY: JSC/AE
CKD. BY: JH
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 9 - Summary of Leaded Tank Bottom Investigation 2006.mxd



Legend

- Shallow Soil Boring Location with Exceedance of PADEP Non-Res Soil MSCs
- Shallow Soil Boring Location with No Exceedance of PADEP Non-Res Soil MSCs (see note 2)
- Shallow Soil Boring Location with No Exceedances of PADEP Non-Res Soil MSCs
- Deep Soil Boring Location with Exceedances of PADEP Non-Res Soil MSCs
- Deep Soil Boring Location with No Exceedance of PADEP Non-Res Soil MSCs (see note 2)
- Deep Soil Boring Location with No Exceedances of PADEP Non-Res Soil MSCs
- Sheet Pile Wall
- 797 — Tank Closed in Place
- 250 — Tank With Release Assessment
- Solid Waste Management Unit (SWMU)
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Soil sample usable for qualitative assessment but cannot be used for site characterization, delineation or to show attainment of an Act 2 standard.

Figure 10: Summary of Soil Sample Exceedances
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 10 - Summary of Soil Sample Exceedances_8-29-13.mxd

Legend

- Shallow Monitoring Well and Groundwater Elevation (ft.)
- Shallow Recovery Well and Groundwater Elevation (ft.)
- Deep Monitoring Wells
- Shallow Piezometer
- Monitoring Well Abandoned/Damaged/Unable to Locate
- Shallow Monitoring Well with No Exceedance of PADEP Non-Res GW MSCs
- Shallow Monitoring Well Location with No Exceedance of PADEP Non-Res GW MSCs (see Note 2)
- Shallow Monitoring Well Location with Exceedance of PADEP Non-Res GW MSCs
- Sheet Pile Wall
- Solid Waste Management Unit (SWMU)
- AOIs

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Groundwater sample usable for qualitative assessment but cannot be used for site characterization, delineation or to show attainment of an Act 2 standard.
3. Monitoring wells sampled January 2013.

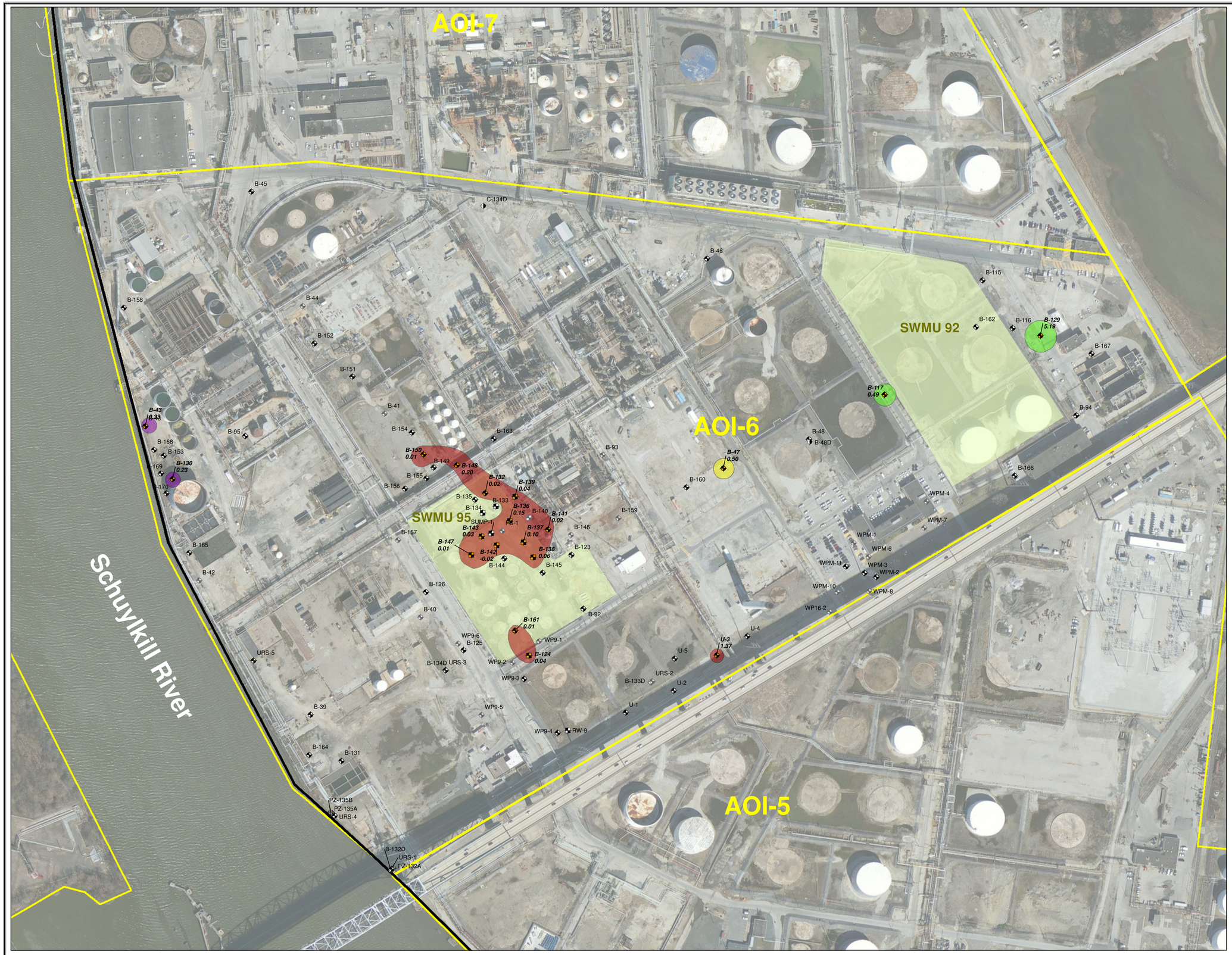
Figure 11: Summary of Groundwater Sample Exceedances - January 2013
AOI-6 Site Characterization/ Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Path: \\langan.com\data\DT\data6\2574601\ArcGIS\MapDocuments\AOI 6 Repackaged SCR\Figure 11 - Summary of Groundwater Exceedances_8-29-13.mxd



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Legend

- B-117 0.49 — Shallow Monitoring Well with Apparent LNAPL Thickness (ft.)
- B-147 0.01 — Shallow Recovery Well with Apparent LNAPL Thickness (ft.)
- Shallow Monitoring Well with No LNAPL
- Deep Monitoring Well with No LNAPL
- Shallow Recovery Well with No LNAPL
- Monitoring Wells Not Gauged
- Recovery Well Not Gauged
- Shallow Piezometer
- Sheet Pile Wall
- Solid Waste Management Unit (SWMU)
- AOIs

LNAPL Types

- Gasoline
- Residual Oil and Middle Distillate
- Middle Distillate
- Residual Oil

Notes:
1. Bing Maps aerial imagery provided by © 2010 Microsoft Corporation and its data suppliers and obtained under the licensing agreement with ESRI.
2. Apparent LNAPL thickness and plumes based on gauging data provided by Aquaterra, December 2012.

Figure 12: Apparent LNAPL Thickness
December 2012
AOI-6 Site Characterization/
Remedial Investigation Report
PES Facility
Philadelphia, Pennsylvania

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Sunoco, Inc. (R&M)
PES Facility
3144 Passyunk Avenue
Philadelphia, PA.
19145

0 150 300 Feet

SCALE: 1" = 150'
DATE: August 29, 2013
DRN. BY: MH
CKD. BY: PT
JOB#: 2574601

Q:\Data\2574601\ArcGIS\MapDocuments\AOI 6 Site Characterization\Figure 8 Summary of Non SWMUs Soil Sample Exceedances.mxd