

PHASE II INVESTIGATION REPORT

AREA B: PARCEL B13
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:



ENVIROANALYTICS GROUP
1650 Des Peres Road, Suite 230
Saint Louis, Missouri 63131

Prepared By:



ARM GROUP INC.
9175 Guilford Road
Suite 310
Columbia, Maryland 20146

ARM Project No. 150300M-13

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "E. Magdar".

Eric S. Magdar
Senior Geologist

A handwritten signature in black ink, appearing to read "Neil Peters".

T. Neil Peters, P.E.
Vice President

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1.0 INTRODUCTION

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has completed a Phase II Investigation of a portion of the Tradepoint Atlantic property (formerly Sparrows Point Terminal, LLC) that has been designated as Area B: Parcel B13 (the Site). Parcel B13 is comprised of 243 acres of the approximately 3,100-acre former steel making facility (**Figure 1**). The Site is bounded to the west by the turning basin, to the south by the Patapsco River, to the north by the former Blast Furnace Area, former Sinter Plant, and the Pennwood Canal (Parcel B5), and to the east by Parcel B20 which contains the Pennwood Wharf and other material handling areas. Any former buildings on Parcel B13 have been demolished, and the Site is currently occupied primarily by stockpiled materials.

The Phase II Investigation was performed in accordance with procedures outlined in the approved Phase II Investigation Work Plan – Parcel B13. This Work Plan (dated March 25, 2016) was approved by the Maryland Department of the Environment and the United States Environmental Protection Agency on September 21, 2016. Site investigations were performed in compliance with requirements pursuant to the following:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (effective September 12, 2014); and
- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (effective November 25, 2014).

Parcel B13 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency (EPA), and the Maryland Department of the Environment (MDE) (effective October 8, 1997) as documented in correspondence received from EPA on September 12, 2014. Based on this agreement, EPA determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the EPA's RCRA Corrective Action authorities.

An application to enter the Tradepoint Atlantic property into the Maryland Department of the Environment Voluntary Cleanup Program (MDE-VCP) was submitted to MDE on September 10, 2014. The property's current and anticipated future use is Tier 3 (Industrial), and plans for the property include demolition and redevelopment over the next several years.

1.1. SITE HISTORY

From the late 1800s until 2012, the production and manufacturing of steel was conducted at Sparrows Point. Iron and steel production operations and processes at Sparrows Point included raw material handling, coke production, sinter production, iron production, steel production, and semi-finished and finished product preparation. In 1970, Sparrows Point was the largest steel facility in the United States, producing hot and cold rolled sheets, coated materials, pipes, plates, and rod and wire. The steel making operations at Sparrows Point ceased in fall 2012.

Parcel B13 was formerly occupied by the Ore Yard Material Handling Area, Bedding Plant Material Handling area, and Ore Pier. Any former buildings on Parcel B13 have been demolished. Descriptions of the facilities and processes that were completed in Parcel B13 are provided below:

Ore Yard Material Handling:

Raw materials were transported to the Sparrows Point facility by ship, truck, and rail and unloaded at the Ore Pier, A Pier, and car dumper. From storage the raw materials were transported by truck or conveyors to the Ore Yard for storage. The Ore Yard was divided into seven distinct storage areas (A, B, C, D, E, F, and G yards). Material stored in the Ore Yard included, but was not limited to, iron ore, ore fines, sinter, lime, limestone, and coke breeze. The B yard was used for coke storage and miscellaneous materials. The A yard (also a coke-storage area) was leased to and operated by Kinder Morgan. Raw materials were conveyed from the central unloading station to one of the yards via one of three main conveyors. The three main conveyors discharged to several distributing conveyors that fed individual piles in the yard. The raw material from the yard was sent either to the Bedding Plant or the Blast Furnace stockhouse by a series of conveyors. Transitions between conveyors were enclosed or were located inside buildings for dust control and reclamation.

Bedding Plant Material Handling:

The Bedding Plant was a pre-processing operation to blend revert and recyclable materials from the iron and steel making operations so it could be reused at the blast furnace. Fines produced from screening coke, ore, sinter, and limestone along with mill scale and other recyclable iron-bearing materials comprised the majority of the mix. The plant stockpiled each component of the mix in bins. Using belt scales and weigh feeders, material from each of the bins was measured, blended and conveyed to one of two stockpiles in proportioned amounts. When the Sinter Plant required feed material, a reclaiming machine moved through the piles to recover the blended material and convey it to the Sinter Plant. Transition points between conveyors were enclosed or inside buildings.

1.2. OBJECTIVES

The objective of this Phase II Investigation was to fully characterize the nature and extent of contamination at the Site. This report includes a summary of the work performed, including the environmental setting, site investigation methods, analytical results and data usability assessment, and findings and recommendations. A summary table of the site investigation locations, including the boring identification numbers and the analyses performed, is provided as **Appendix A**. A human health screening level risk analysis was prepared to identify constituents and pathways of potential concern and to evaluate the significance of any observed impacts or elevated concentrations with respect to the potential future use of the Site.

2.0 ENVIRONMENTAL SETTING

2.1. LAND USE AND SURFACE FEATURES

The Tradepoint Atlantic property consists of the former Sparrows Point steel mill plant. According to the Phase I Environmental Site Assessment (ESA) prepared by Weaver Boos dated May 19, 2014, the property is zoned Manufacturing Heavy-Industrial Major (MH-IM). Surrounding property zoning classifications (beyond Tradepoint Atlantic) include the following: Manufacturing Light (ML); Resource Conservation (RC); Density Residential (DR); Business Roadside (BR); Business Major (BM); Business Local (BL); and Residential Office (RO). Light industrial and commercial properties are located northeast of the property and northwest of the property across Bear Creek. Residential areas of Edgemere and Fort Howard are located northeast of the property across Jones Creek and to the southeast across Old Road Bay, respectively. Residential and commercial areas of Dundalk are located northwest of the property across Bear Creek.

According to topographic maps provided by EAG, the Site is at an elevation of approximately 20 feet above mean sea level (amsl). Elevations at the Site range from 0 to 30 feet amsl across the majority of the parcel area, with increased elevations (>50 feet amsl) documented around several stockpiles. Across most of the Site, the surface elevations are varied but generally slope towards the west. According to Figure B-2 of the Stormwater Pollution Prevention Plan (SWPPP) Revision 3 dated August 19, 2016, stormwater from the majority of the Site appears to flow toward National Pollution Discharge Elimination System (NPDES) Outfalls 059 and 065, which discharge into Old Road Bay, or Outfall 056, which discharges to the turning basin. Runoff from the northern-central area of the parcel appears to drain through Parcels B5 into the Pennwood Canal to Outfall 001 (at the mouth of the Pennwood Canal identified on **Figure 1**). The western and southern edges of the Site are lined with gravel filter berm along the perimeter of the parcel.

2.2. REGIONAL GEOLOGY

The Site is located within the Atlantic Coastal Plain Physiographic Province (Coastal Plain). The western boundary of the Coastal Plain is the “Fall Line”, which separates the Coastal Plain from the Piedmont Plateau Province. The Fall Line runs from northeast to southwest along the western boundary of the Chesapeake Bay, passing through Elkton (MD), Havre de Grace (MD), Baltimore City (MD), and Laurel (MD). The eastern boundary of the Coastal Plain is the off-shore Continental Shelf.

The unconsolidated sediments beneath the Site belong to the Talbot Formation (Pleistocene), which is then underlain by the Cretaceous formations which comprise the Potomac Group (Patapsco Formation, Arundel Formation and the Patuxent Formation). The Potomac Group formations are comprised of unconsolidated sediments of varying thicknesses and types, which

may be several hundred feet to several thousand feet thick. These unconsolidated formations may overlies deeper Mesozoic and/or Precambrian bedrock. Depth to bedrock is approximately 700 feet within the Site.

2.3. SITE GEOLOGY/HYDROGEOLOGY

Groundcover at the Site is comprised of 100% slag fill based on the approximate shoreline of the Sparrows Point Peninsula in 1916, as shown on **Figure 2** (adapted from Figure 2-20 in the Description of Current Conditions (DCC) Report prepared by Rust Environmental and Infrastructure, dated January 1998).

In general, the encountered subsurface geology consisted of slag fill materials, which included primarily coarse grained sediments (sands and gravels). Shallow groundwater was observed in the soil borings at depths ranging from 4.7 to 29.2 feet below the ground surface (bgs) across the Site. Soil boring logs are provided in **Appendix B**. Please note that unless otherwise indicated, all Unified Soil Classification System (USCS) group symbols provided on the attached boring logs are from visual observations, and not from laboratory testing.

Temporary groundwater sample collection points were installed at twelve locations across the Site to investigate shallow groundwater conditions. The locations of the groundwater sampling points are given on **Figure 3**. The temporary groundwater sample collection points and existing wells were surveyed by a Maryland-licensed surveyor. Supporting documentation from the surveys is included as **Appendix C**. Please note that piezometers B13-049-PZ and B13-059-PZ are incorrectly labeled in the attached survey documentation as B13-047-PZ and B13-049-PZ, respectively. The piezometer labeled as B13-059-PZ in the attached survey documentation is not applicable.

A synoptic round of groundwater level measurements was collected on April 4, 2017 from each of the groundwater points included in the parcel-specific sampling plan. Surveyed top of casing (TOC) and ground surface elevations for all applicable locations can be found in **Table 1**, along with the depth to water (DTW) measurements from this date.

A groundwater potentiometric surface map was constructed for the shallow hydrogeologic zone based on the field measurements from this date, but the potentiometric surface did not indicate a clear discharge direction. The potentiometric surface in the shallow zone at the Site should be considered to be nearly flat with an average groundwater elevation of 0.6 feet amsl. The shallow groundwater elevation measurements have been included on **Figure 3**, but it is not appropriate to display the potentiometric contours in this case.

3.0 SITE INVESTIGATION

A total of 199 soil samples (from 82 boring locations) and 12 groundwater samples were collected for analysis between August 23, 2016 and September 12, 2016 as part of the Parcel B13 Phase II Investigation. This Phase II Investigation utilized methods and protocols that followed the procedures included in the Quality Assurance Project Plan (QAPP) dated October 2, 2015 (updated April 5, 2016) approved by the agencies to support the investigation and remediation of the Tradepoint Atlantic property. Information regarding the project organization, field activities and sampling methods, sampling equipment, sample handling and management procedures, the selected laboratory and analytical methods, quality control and quality assurance procedures, investigation-derived waste (IDW) management methods, and reporting requirements are described in detail in the approved Parcel B13 Work Plan dated September 21, 2016, and the QAPP.

All site characterization activities were conducted under the site-specific health and safety plan (HASP) provided as Appendix D of the approved Work Plan.

3.1. SAMPLE TARGET IDENTIFICATION

Previous activities within and around the buildings and facilities located on the Tradepoint Atlantic property may have been historical sources of environmental contamination. If present, source areas were identified as targets for sampling through a careful review of historical documents. When a sampling target was identified, a boring was placed at or next to its location using GIS software (ArcMap Version 10.3.1).

Sampling targets included, as applicable, 1) Recognized Environmental Conditions (RECs) shown on the REC Location Map provided in Weaver Boos' Phase I ESA, 2) additional findings (non-RECs) from the Phase I ESA which were identified as potential environmental concerns, and 3) Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified from the DCC Report prepared by Rust Environmental and Infrastructure. The following REC was identified in the Parcel B13 Work Plan: Southern Slag Pile Demolition Debris (REC 18, Finding 262). There were no additional SWMUs or AOCs identified as sampling targets, and no additional units were identified from the DCC report Table 3-1.

Four (4) sets of historical drawings were also reviewed to identify potential sampling targets for the Site. These drawings included the 5000 Set (Plant Arrangement), the 5100 Set (Plant Index), the 5500 Set (Plant Sewer Lines), and a set of drawings indicating coke oven gas distribution drip leg locations. Drip legs are points throughout the distribution system where coke oven gas condensate was removed from the gas pipelines. The condensate from the drip legs was typically discharged to drums, although it is possible some spilled out of the drums and on to the

ground. There were no drip legs identified within the parcel boundaries. A summary of the specific drawings covering the Site is presented in **Table 2**.

Additional Findings (non-RECs) from the Phase I ESA or features on the historical drawings which were identified as potential environmental concerns were also reviewed and targeted as applicable. Sampling target locations were identified if the historical site drawings depicted industrial activities or a specific feature at a location that may have been a source of environmental contamination that impacted the Site. Based on the review of plant drawings and Phase I ESA documents, sampling targets were identified at the Site that included the following: Oil Houses/Buildings, Diesel Fuel Tanks, Tanks (unknown contents), Thickener Tanks, Sump Pumps, Electric Substations, Skulling Pit (old car dumper), and Slag Pits. ARM received a list of former PCB-containing transformer equipment from Tradepoint Atlantic personnel, for inclusion as additional targets. There was no former PCB-containing equipment identified in the parcel based on this information.

A summary of the areas that were investigated, along with the applicable boring identification numbers and the analyses performed, has been provided as **Appendix A**. Additional sample locations were then added to fill in large spatial gaps between proposed borings to provide complete coverage of the Site. During the completion of fieldwork, it was necessary to shift some borings from the approved locations given in the Work Plan, primarily due to access restrictions, refusal, and/or utility conflicts. **Table 3** provides the identification numbers of the field adjusted borings, the coordinates of the proposed and final locations, and the distance/direction of the field shifts.

The density of soil borings met the requirements set forth in QAPP Worksheet 17 – Sampling Design and Rationale. The density requirements for the Site were based on existing engineered barriers, as stated in the approved Work Plan. Parcel B13 contains a total of 241.2 acres: 231.3 acres without engineered barriers and 9.9 acres with engineered barriers (parking/roads). The Ore Pier at the southwestern corner of the property (approximately 2.2 acres in area) was not included in the total area calculation because the pier itself was not included in this investigation. In accordance with the relevant sampling density requirements, a minimum of 77 soil boring locations were required in the areas without engineered barriers, and a minimum of 5 soil boring locations were required in the areas with current engineered barriers. A total of 77 borings were completed in areas without engineered barriers. A total of 5 borings were completed in areas with current engineered barriers.

3.2. SOIL INVESTIGATION

Continuous core soil borings were advanced at 82 locations across the Site to assess the presence or absence of soil contamination and to assess the vertical distribution of any encountered contamination (**Figure 4**). The continuous core soil borings were advanced to depths between 2.5 and 40 feet bgs using the Geoprobe[®] MC-7 Macrocore soil sampler (surface to 10 feet bgs)

and the Geoprobe[®] D-22 Dual-Tube Sampler (depths >10 feet bgs). At each location, each soil core was visually inspected and screened with a hand-held Photo Ionization Detector (PID) prior to logging soil types. Soil boring logs have been included as **Appendix B**, and the PID calibration log has been included as **Appendix D**. Unless otherwise indicated, all USCS group symbols provided on the attached boring logs are from visual observations.

One shallow sample was collected from the 0 to 1 foot depth interval, and a deeper sample was collected from the 4 to 5 foot depth interval from each continuous core soil boring. One additional set of samples was also collected from the 9 to 10 foot depth interval if groundwater had not been encountered; however, these samples were held by the laboratory pending the analysis of the 0 to 1 and 4 to 5 foot depth interval samples and were only analyzed for parameters that were detected in the 5 foot depth samples at concentrations above the Project Action Limits (PALs). If the PID or other field observations indicated contamination to exist at a depth greater than 5 feet bgs but less than 9 feet bgs, and was above the water table, the sample from the deeper 4 to 5 foot interval was shifted to the alternate depth interval. It should be noted that soil samples were not collected from a depth that was below the water table. Soil sampling activities were conducted in accordance with the procedures and methods referenced in **Field SOP Numbers 008, 009, 012, and 013** provided in Appendix A of the QAPP.

Down-hole soil sampling equipment was decontaminated after soil sampling had been concluded at a location, according to the procedures and methods referenced in **Field SOP Number 016** provided in Appendix A of the QAPP.

Soil samples were submitted to Pace Analytical Services, Inc. (PACE), and analyzed for Target Compound List (TCL) TCL semi-volatile organic compounds (SVOCs) via USEPA Methods 8270D and 8270D SIM, total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO) via USEPA Methods 8015B and 8015D, Oil & Grease via USEPA Method 9071, Target Analyte List (TAL) Metals via 6010C and 7471C, hexavalent chromium via USEPA Method 7196A, and cyanide via USEPA Method 9012. If a sample interval exceeded a PID reading of 10 ppm, the respective sample interval was analyzed for volatile organic compounds (VOCs) via USEPA Method 8260B. The 10 foot depth samples were initially held for analysis and analyzed for those parameters for which there were exceedances in the overlying 5 foot samples. Additionally, the shallow soil samples collected across the Site from the 0 to 1 foot bgs interval were also analyzed for polychlorinated biphenyls (PCBs) via USEPA Method 8082. Sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.3. GROUNDWATER INVESTIGATION

A total of 12 temporary groundwater sample collection points (piezometers) were proposed and installed in the shallow hydrogeologic zone to facilitate the collection of groundwater samples,

and to support the definition of the groundwater potentiometric surface. The soil boring locations where shallow piezometers were installed during the investigation included B13-001-PZ, B13-006-PZ, B13-021-PZ, B13-042-PZ, B13-045-PZ, B13-049-PZ, B13-059-PZ, B13-061-PZ, B13-066-PZ, B13-069-PZ, B13-076-PZ, and B13-078-PZ (**Figure 3**). Piezometer B13-042-PZ replaced the piezometer B13-047-PZ (originally proposed in the Phase II Investigation Work Plan), which could not be installed due to equipment refusal. One additional temporary piezometer, B13-073-PZ (as well as several surrounding delineation piezometers), was installed due to high PID readings and odors observed while screening the associated soil core to facilitate the exploration of potential impacts at this location. Construction logs for these temporary groundwater sample collection points have been included as **Appendix E**.

At each location, the Geoprobe[®] DT22 Dual Tube sampling system was advanced to a depth approximately 10 feet below where groundwater was identified in the associated soil cores, the 1.25-inch inner rod string was removed, and the temporary 1-inch PVC groundwater sample collection point was installed through the outer casing. Following the installation of each sample collection point, the 0-hour depth to water was documented and the collection point was checked for the presence of non-aqueous phase liquid (NAPL) using an oil-water interface probe in accordance with the methods referenced in **Field SOP Number 019** provided in Appendix A of the QAPP.

After the installation of each temporary groundwater sample collection point, down-hole equipment was decontaminated according to the procedures and methods referenced in **Field SOP Number 016** provided in Appendix A of the QAPP.

Groundwater samples were collected in accordance with methods referenced in **Field SOP Number 007** provided in Appendix A of the QAPP; which employed the use of a laboratory supplied sample containers and preservatives, a peristaltic pump, dedicated polyethylene tubing, and a YSI water quality meter with a flow-through cell. Groundwater samples submitted for analysis of TAL-Metals and hexavalent chromium were filtered in the field with an in-line 0.45 micron filter. The sampling and purge logs have been included in **Appendix F**. Calibration of the YSI meter was performed before the start of each day of the sampling event, and a calibration post-check was completed at the end of the day. Appropriate documentation of the YSI calibration has also been included in **Appendix F**.

Groundwater samples were submitted to PACE, and analyzed for TCL-VOCs via USEPA Method 8260B, TCL-SVOCs via USEPA Methods 8270D and 8270D SIM, DRO and GRO via USEPA Methods 8015B and 8015D, Oil & Grease via USEPA Method 1664A, TAL-Metals (dissolved) via 6010C, Mercury (total) via 7470A, hexavalent chromium (dissolved) via USEPA Method 7196A, and cyanide (total) via USEPA Method 9012A. Analytical samples were not collected from the supplemental piezometer B13-073-PZ based on observations of NAPL in the casing (discussed in trailing sections). Sample containers, preservatives, and holding times for

the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.4. MANAGEMENT OF INVESTIGATION-DERIVED WASTE (IDW)

In accordance with **Field SOP Number 005** provided in Appendix A of the QAPP, potentially impacted materials, or IDW, generated during this Phase II Investigation was containerized in 55-gallon (DOT-UN1A2) drums. The types of IDW that were generated during this Phase II Investigation included the following:

- soil cuttings generated from soil borings;
- decontamination fluids; and
- used personal protective equipment

Following the completion of field activities, one composite sample was gathered from the Parcel B13 Phase II IDW soil drums for TCLP analysis. Following this analysis, the waste soil was characterized as non-hazardous. A list of all results from the soil TCLP procedure can be found in **Table 4**, which indicates no exceedances of TCLP criteria.

IDW drums containing aqueous materials were characterized by preparing composite samples from randomly selected drums. Each composite sample included aliquots from individual drums being staged on-site at the date of collection. One aqueous composite sample was collected for TCLP analysis for Parcel B13. A list of all results from the aqueous TCLP procedure can be found in **Table 5**, which indicates no exceedances of TCLP criteria.

The parcel specific IDW drum log from the Phase II investigation is included as **Appendix G**. All IDW procedures were carried out in accordance with methods referenced in the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP.

4.0 ANALYTICAL RESULTS

4.1. SOIL CONDITIONS

Soil analytical results were screened against Project Action Limits (PALs) established in the site-wide Quality Assurance Project Plan (QAPP) dated April 5, 2016 (or other direct guidance from the agencies; i.e. TPH/Oil & Grease) to determine PAL exceedances. PALs are generally based on the USEPA's Regional Screening Levels (RSLs) for the Composite Worker exposure to soil. The Composite Worker is defined by the USEPA as a long-term receptor exposed during the work day who is a full time employee that spends most of the workday conducting maintenance activities (which typically involve on-site exposures to surface soils) outdoors.

The analytical results for the detected parameters are summarized and compared to the PALs in the attached **Table 6** (Organics) and **Table 7** (Inorganics). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports have been included as electronic attachments. The data validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

4.1.1. Soil Conditions: Organic Compounds

As provided on **Table 6**, several VOCs were identified above the laboratory's method detection limits (MDLs) in the soil boring samples collected from across the Site. There were no VOCs detected above their respective PALs.

Table 6 provides a summary of SVOCs detected above the laboratory's MDLs in the soil samples collected from across the Site. Five SVOCs, all polynuclear aromatic hydrocarbons (PAHs), were detected above their respective PALs in 13 samples. These SVOCs were benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and naphthalene. The PALs for relevant PAHs have been adjusted upward based on revised toxicity data for benzo[a]pyrene published in the USEPA Integrated Risk Information System (IRIS) Recent Additions dated January 19, 2017. Therefore, exceedances indicated for these PAHs are based on the adjusted PALs rather than those presented in the QAPP. Of the SVOC exceedances, benzo[a]pyrene exceeded the PAL in the largest number of samples (seven). Exceedances of SVOCs were noted at seven individual boring locations distributed throughout the eastern half of the parcel. Exceedances for four SVOCs were noted at boring location B13-068-SB. A summary of the SVOC PAL exceedance locations and results has been provided on **Figure S-1**.

Shallow soil samples collected across the Site from the 0 to 1 foot bgs interval were also analyzed for PCBs. **Table 6** provides a summary of the PCBs detected above the laboratory's MDLs. Only one sample (B13-007-SB-1 with a detection of 3.29 mg/kg) exceeded the PAL for

PCBs. This exceedance was due to the concentration of Aroclor 1242 (and total PCBs). Since PCB exceedances were limited to a single location, a figure is not warranted.

Table 6 provides a summary of the Oil & Grease, TPH-DRO and TPH-GRO detections in the parcel. Oil & Grease, DRO, and GRO were all detected above the laboratory's MDLs in multiple locations; however, no detections exceeded the respective PALs. Only one soil core (B13-073-SB) exhibited evidence of possible non-aqueous phase liquid (NAPL) during screening of the soil core. A strong chemical odor and greasy feel were noted. The conditions within this soil core are further described below.

4.1.2. Soil Conditions: Inorganic Constituents

Table 7 provides a summary of inorganic constituents detected above the laboratory's MDLs in the soil samples collected from across the Site. Five inorganic compounds (arsenic, manganese, thallium, vanadium, and hexavalent chromium) were detected above their respective PALs in 134 samples at 65 locations across the Site. Arsenic was by far the most common inorganic exceedance (detected above the PAL in 106 soil samples at 59 locations), followed by manganese (detected above the PAL in 17 soil samples at 15 locations). In comparison, thallium exceeded its PALs in eight samples at eight locations, while hexavalent chromium and vanadium exceeded their respective PALs in only one location each (B13-038-SB and B13-060-SB, respectively). A summary of the inorganic PAL exceedance locations and results has been provided on **Figure S-2**.

4.1.3. Soil Conditions: Results Summary

Table 6 and **Table 7** provide a summary of the detected organic compounds and inorganics in the soil samples submitted for laboratory analysis, and **Figures S-1** and **S-2** present a summary of the soil sample results that exceeded the PALs. **Table 8** provides a summary of results for all PAL exceedances in soil, including detection frequencies and maximum results. **Table 9** indicates which soil impacts (PAL exceedances) are associated with the specific targets listed in the Parcel B13 Work Plan. There were no detections of VOCs, DRO, GRO, or Oil & Grease above their applicable PALs. Exceedances in soil within Parcel B13 consisted of five inorganics (arsenic, manganese, thallium, vanadium, and hexavalent chromium), five SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and naphthalene), and PCBs (Aroclor 1242 and total PCBs).

Arsenic was detected above the PAL in approximately 55% of the Phase II samples analyzed for this compound, with a maximum detection of 896 mg/kg (B13-031-SB-1). Manganese was the next most common exceedance (10% of samples), with a maximum detection of 152,000 mg/kg (B13-031-SB-1). Thallium was detected above its PAL in eight samples, while hexavalent chromium and vanadium were only detected above their PALs at one location each. The maximum detections of thallium, vanadium, and hexavalent chromium were relatively low, with

each detection being less than 4 times the PAL. Naphthalene was only detected above the PAL in two samples at a single location (B13-073-SB). This location also exhibited possible field indicators of potential NAPL contamination as described in the following section. The remaining four SVOC PAL exceedances (benzo[a]pyrene, benz[a]anthracene, benzo[b]fluoranthene, and dibenz[a,h]anthracene) each had detections above the PALs at location B13-068-SB, which provided general site coverage. Benzo[a]pyrene was the most common SVOC exceedance and was detected above its PAL in approximately 4% of relevant Phase II samples. The Aroclor 1242 was detected above the PAL in only one sample (B13-007-SB-1) with a detection of 3.29 mg/kg (matching the detection of total PCBs). There were no soil PAL exceedances for Oil & Grease, GRO, or DRO.

4.1.4. Summary of NAPL Observations in Soil Cores

Soil cores were screened for evidence of possible NAPL contamination during the completion of the Phase II soil borings in Parcel B13. During the soil core screening, one sample location had physical evidence of possible product which was noted on the soil boring log (B13-073-SB). Groundwater was encountered at 15 feet bgs at this location. The observations of possible NAPL (as indicated on the boring log) included a greasy feel in the soil core from 15 to 35 feet bgs, which was accompanied by a strong chemical odor. The intermediate sample interval (6 to 7 feet bgs) had a detection of naphthalene at 1,970 mg/kg. The deep sample interval (9 to 10 feet bgs) also exceeded the PAL for naphthalene with a lower detection of 51.1 mg/kg. As discussed in Section 4.2.4, a piezometer was installed at this location (B13-073-PZ) to facilitate NAPL delineation. Delineation activities are ongoing as further discussed in Section 4.2.4.

4.2. GROUNDWATER CONDITIONS

The analytical results for the detected parameters are summarized and compared to the site-specific PALs in attached **Table 10** (Organics) and **Table 11** (Inorganics). The laboratory's Certificates of Analysis (including Chains of Custody) and the Data Validation Reports have been included as electronic attachments. The data validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

4.2.1. Groundwater Conditions: Organic Compounds

As provided on **Table 10**, several VOCs were identified above the laboratory's MDLs in groundwater samples collected from across the Site, with three compounds detected above their PALs. Benzene was detected above its PAL at two locations (B13-045-PZ and B13-078-PZ). Bromodichloromethane and chloroform were detected above their respective PALs together at one location (B13-059-PZ). This piezometer was installed near the piping junction of a ½-inch and 2-inch water line at an elbow turn, which is visible on the Plant Water Lines historical drawing 5618. The bromodichloromethane and chloroform exceedances (both trihalomethanes) could be created as disinfection byproducts in the potable water, and may have been released if a

leak occurred at the pipe junction. A summary of the PAL exceedance locations and results has been provided as **Figure GW-1**.

Table 10 provides a summary of SVOCs reported in groundwater above the laboratory's MDLs. Six SVOCs (1,1-biphenyl, 2-methylnaphthalene, benz[a]anthracene, benzo[b]fluoranthene, naphthalene, and pentachlorophenol) were detected above their respective PALs. The groundwater PALs for certain PAHs have been adjusted upward from the values presented in the QAPP based on revised toxicity data for benzo[a]pyrene published in the USEPA IRIS Recent Additions dated January 19, 2017. These adjustments were completed only for the PAHs for which the PALs are not based on a Maximum Contaminant Level (MCL) but rather are based on the toxicity values for benzo[a]pyrene and relative potency factors (i.e., benzo[a]pyrene and benz[a]anthracene were not adjusted). Each groundwater location had at least one SVOC exceedance except B13-059-PZ; there were no SVOCs detected above their respective PALs at this location. Three analytes were detected in more than one sample (benz[a]anthracene, naphthalene, and pentachlorophenol). Naphthalene was the most common aqueous PAL exceedance (detected above its PAL in eleven groundwater samples with a maximum detection of 3,920 µg/L at location B13-078-PZ). Benz[a]anthracene exceeded its PAL in four groundwater samples, with the highest detection of 0.23 µg/L observed at B13-078-PZ. Pentachlorophenol was detected above the PALs in five sample locations with a maximum detection of 2.1 µg/L at location B13-001-PZ. The remaining three SVOC compounds (1,1-biphenyl, benzo[b]fluoranthene and 2-methylnaphthalene) were co-located at a single groundwater sample location (B13-078-PZ). B13-078-PZ appeared to be the location which was most heavily impacted by SVOC contamination. A summary of the PAL exceedance locations and results has been provided as **Figure GW-2**.

Table 10 provides a summary of the Oil & Grease, GRO and DRO groundwater detections. There were detections of TPH-DRO/GRO and/or Oil & Grease in all of the 12 groundwater samples, and all 12 of the detections exceeded the applicable PAL (47 µg/L) for at least one of the parameters. PAL exceedances were obtained for DRO, GRO, and Oil & Grease at 11, three, and five locations, respectively. The highest detections of Oil & Grease, GRO, and DRO were obtained from location B13-078-PZ with results of 7,300 µg/L, 3,240 µg/L, and 2,570 µg/L, respectively. This was also the groundwater location which appeared to be most heavily impacted by SVOCs. A summary of TPH/Oil & Grease PAL exceedance locations has been provided as **Figure GW-3**.

4.2.2. Groundwater Conditions: Inorganic Constituents

Table 11 provides a summary of inorganic constituents detected above the MDLs in the groundwater samples collected from across the Site. Three inorganic compounds (thallium, vanadium, and hexavalent chromium) were detected above their respective PALs. Hexavalent chromium (dissolved) was the most common inorganic exceedance in groundwater and exceeded

its PAL in all 12 samples, with all exceedances between 8 and 10 µg/L. Most of these exceedances were flagged with “J” or “B” qualifiers, indicating that they are estimated values below the laboratory quantitation limit (J) or may be associated with blank contamination (B). Vanadium (dissolved) exceeded its PAL in two samples (B13-001-PZ and B13-078-PZ) with a maximum detection of 300 µg/L identified at B13-078-SB. Thallium (dissolved) exceeded its PAL in only one sample, B13-078-PZ, with a detection of 3.8 µg/L. A summary of the inorganic PAL exceedance locations and results has been provided as **Figure GW-4**.

4.2.3. Groundwater Conditions: Results Summary

Groundwater data were screened to determine whether individual sample results may exceed the USEPA Vapor Intrusion (VI) Screening Levels (Target Cancer Risk (TCR) of 1E-5 and Target Hazard Quotient (THQ) of 1) as determined by the Vapor Intrusion Screening Level (VISL) Calculator version 3.5.1 (<https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls>). The PALs specified in the QAPP are based upon drinking water use, which is not a potential exposure pathway for groundwater at the Site. Any potential surface water discharges will be addressed in a comprehensive site-wide groundwater evaluation as well as off-shore investigation reports for select areas of the Tradepoint Atlantic property.

The results of the individual sample screening against the VI criteria are summarized in **Table 12**. One parameter (cyanide) exceeded the individual VI THQ screening level at eight sample locations (B13-001-PZ, B13-006-PZ, B13-042-PZ, B13-045-PZ, B13-049-PZ, B13-061-PZ, B13-066-PZ, B13-069-PZ). Chloroform, naphthalene, and xylenes exceeded the individual VI TCR or THQ screening levels at one location each (B13-059-PZ, B13-078-PZ, and B13-078-PZ, respectively). The groundwater sample locations which exceeded the individual VI criteria are shown in **Figure GW-5**. Following the initial screening, a cumulative risk analysis was also performed for each individual sample location, with the results separated by cancer versus non-cancer risk. All compounds with detections were included in the computation of the cumulative cancer risk, and all compounds with detections exceeding 10% of the THQ level were included in the evaluation of non-cancer risk. The results of the cumulative VI comparisons are provided in **Table 13**, with the exceedances highlighted. Two locations (B13-059-PZ and B13-078-PZ) exceeded the cumulative VI cancer risk criteria (i.e. the carcinogenic risk exceeded 1E-5 rounded to one significant digit). Four locations (B13-001-PZ, B13-006-PZ, B13-042-PZ, and B13-066-PZ) exceeded the cumulative VI non-cancer risk criterion (i.e. the non-cancer hazard index exceeded 1 rounded to one significant digit).

The presence and absence of groundwater impacts within the Site boundaries have been adequately described. Cumulative VI risks were evaluated and identified four locations which may be impacted by elevated cyanide. However, the detected levels of cyanide (maximum of 7.4 µg/L) did not suggest that sources of continuing releases of contaminant mass to the groundwater are present. The VI risks were conservatively screened using total cyanide rather than free

cyanide or cyanide amenable to chlorination. The concentrations of free cyanide that could contribute to VI risks would be expected to be significantly lower than the total cyanide. Based on the sporadic and relatively low-level results identified during this effort, significant ongoing sources of cyanide contamination have not been identified within the Site boundaries.

Further assessment or mitigation is recommended to address the potential vapor intrusion carcinogenic risks identified at piezometers B13-059-PZ and B13-078-PZ caused by elevated detections of chloroform and naphthalene, respectively, if an enclosed structure is proposed in the vicinity of these groundwater locations in the future. The selection of appropriate response measures, based on the specific development proposed for the parcel, should be addressed in a project-specific Response and Development Work Plan for Parcel B13.

4.2.4. Summary of NAPL Observations in Piezometers

One temporary groundwater monitoring point (B13-073-PZ) was installed on September 2, 2016 in Parcel B13 based on potential field indicators of contamination. Chemical odors, a greasy feel, and elevated PID detections were noted while screening the original boring location. Following the installation of the piezometer, measureable NAPL accumulated in the casing, warranting additional delineation activities. Due to the known impacts at this location, a groundwater sample was not collected. No other piezometers contained measureable NAPL during any gauging events.

At this time, a total of 12 additional piezometers have been installed at varying distances from B13-073-PZ to delineate the extent of NAPL. Measurements for potential NAPL have been completed using an oil-water interface probe immediately after piezometer construction, after 48 hours, and again after 30 days. The locations of each piezometer installed for NAPL delineation are provided on **Figure 5**. Boring logs documenting soil core observations were completed for all delineation piezometers installed in the vicinity of B13-073-PZ. The boring logs relevant for NAPL delineation are given in **Appendix H**. NAPL has been periodically monitored in B13-073-PZ and its associated delineation piezometers. The exact dates of monitoring activities, as well as product thickness measurements, have been included in **Appendix I**. The delineation of NAPL in this location is ongoing.

5.0 DATA USABILITY ASSESSMENT

The approved site-wide QAPP specified a process for evaluating data usability in the context of meeting project goals. Specifically, the goal of the Phase II Investigation is to determine if potentially hazardous substances or petroleum products (VOCs, SVOCs, PCBs, TAL-Metals, cyanide, or TPH/Oil & Grease) are present in Site media (soil and groundwater) at concentrations that could pose an unacceptable risk to Site receptors. Individual results are compared to the Project Action Limits established in the QAPP (i.e., the most current USEPA RSLs) or other direct guidance from the agencies, to identify the presence of exceedances in each environmental medium.

Quality control (QC) samples were collected during field studies to evaluate field/laboratory variability. A summary of QA/QC samples associated with this investigation has been included as **Appendix J**. The following QC samples were submitted for analysis to support the data validation:

- Trip Blank – at a rate of one per day in coolers with VOC samples only
 - Soil – VOCs only
 - Water – VOCs only
- Blind Field Duplicate – at a rate of one per twenty samples
 - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, PCBs, Hexavalent Chromium, and Cyanide
 - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide
- Matrix Spike/Matrix Spike Duplicate – at a rate of one per twenty samples
 - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, PCBs, and Hexavalent Chromium
 - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide
- Field Blank and Equipment Blank – at a rate of one per twenty samples
 - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide
 - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide

The QC samples were collected and analyzed in accordance with the QAPP Worksheet 12 – Measurement Performance Criteria, QAPP Worksheet 20 – Field Quality Control, and QAPP Worksheet 28 – Analytical Quality Control and Corrective Action.

5.1. DATA VERIFICATION

A verification review was performed on documentation generated during sample collection and analysis. The verification included a review of field log books, field data sheets, and chain-of-

custody (COC) forms to ensure that all planned samples were collected, and to ensure consistency with the field methods and decontamination procedures specified in the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP. In addition, calibration logs were reviewed to ensure that field equipment was calibrated and/or checked once per day. The logs have been provided in **Appendix D** (PID calibration log).

The laboratory deliverables were reviewed to ensure that all records specified in the QAPP as well as necessary signatures and dates are present. Sample receipt records were reviewed to ensure that the sample condition upon receipt was noted, and any missing/broken sample containers (if any) were noted and reported according to plan. The data packages were compared to the COCs to verify that results were provided for all collected samples. The data package case narratives were reviewed to ensure that all exceptions (if any) are described.

5.2. DATA VALIDATION

USEPA Stage 2B data validation was completed for a representative 50% of the environmental sample analyses performed by PACE and supporting Level IV Data Package information by Environmental Data Quality Inc. (EDQI).

Sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. The Stage 2B review was performed as outlined in “Guide for Labeling Externally Validated Laboratory Analytical Data for Superfund Use”, EPA-540-R-08-005. Results have been validated or qualified according to general guidance provided in “USEPA National Functional Guidelines for Inorganic Superfund Data Review (ISM02.1)”, USEPA October 2013. Region III references this guidance for validation requirements. This document specifies procedures for validating data generated for Contract Laboratory Program (CLP) analyses. The approved QAPP dated October 2, 2015 (updated April 5, 2016) and the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data.

Data validation has been completed for a representative 50% of all sample results, and the Data Validation Reports (DVRs) provided by EDQI have been included as electronic attachments.

5.3. DATA USABILITY

The data were evaluated with respect to the quality control elements of precision, bias, representativeness, comparability, completeness and sensitivity relative to data quality indicators and performance measurement criteria outlined in QAPP Worksheet 12 – Measurement Performance Criteria. The following discussion details deviation from the performance measurement criteria, and the impact on data quality and usability.

The measurement performance criteria of precision and bias were evaluated in the data validation process as described in the Data Validation Reports provided as electronic attachments. Where appropriate, potential limitations in the results have been indicated through final data flags. These flags indicate whether particular data points were quantitative estimates, biased high/low, associated with blank contamination, etc. Individual data flags are provided with the results in the detection summary tables. A qualifier code glossary is included with each data validation report provided by EDQI. Particular results may have been marked with the “R” flag if the result was deemed to be unreliable and was not included in any further data evaluation. A summary of the results that were rejected during data validation has been provided on **Table 14** (soil). There was one rejected result for groundwater at location B13-021-PZ, representing a non-detection of 3,3'-dichlorobenzidine (reported by the laboratory with a “U” flag designation). A discussion of data completeness (the proportion of validated data) is included below.

Representativeness is a measure of how accurately and precisely the data describe the Site conditions. Representativeness of the samples submitted for analysis was ensured by adherence to standard sampling techniques and protocols, as well as appropriate sample preservation prior to analysis. Sampling was conducted in accordance with the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP. Specific Field SOPs applicable to the assessment of representativeness include **Field SOP Numbers 006, 007, 008, 009, 010, 011, 017, and 024**. Review of the field notes and laboratory sample receipt records indicated that collection of soil and groundwater at the Site was representative, with no significant deviations from the SOPs.

Comparability describes the degree of confidence in comparing two sets of data. Comparability is maintained across multiple datasets by the use of consistent sampling and analytical methods across multiple project phases. Comparability of sample results was ensured through the use of approved standard sampling and analysis methods outlined in the QAPP. QA/QC protocols help to maintain the comparability of datasets, and in this case were assessed via blind duplicates, blank samples, and spiked samples, where applicable. No deviations from the QAPP were noted in the data set.

Sensitivity is a determination of whether the analytical methods and quantitation limits will satisfy the requirements of the project. The laboratory reports were reviewed to verify that reporting limits met the quantitation limits for specific analytes provided in QAPP Worksheet #15 – Project Action Limits and Laboratory-Specific Detection/Quantitation Limits. In general the laboratory reporting limits met the detection and quantitation limits specified in the QAPP.

Completeness is expressed as a ratio of the number of valid data points to the total number of analytical data results. Non-usable (“R” flagged) data results were determined through the data validation process. The approved QAPP specifies that the completeness of data is assessed by professional judgement, but should be greater than or equal to 90%. Data completeness for each

compound is provided in **Appendix K**. This evaluation of completeness includes only the representative 50% of sample results which were randomly selected for validation.

A total of 14 analytes did not meet the completeness goal of 90% for soils in Parcel B13. Of these 14 compounds, 11 acid extractable SVOCs (2,3,4,6-tetrachlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2,4-dimethylphenol, 2,4-dinitrophenol, 2-chlorophenol, 2-methylphenol, 3&4-methylphenol (m&p Cresol), pentachlorophenol, and phenol) had soil completeness values of 63.6% (or similar values of 62.6%, 61.6%, and 56.6% for 3&4-methylphenol, 2,3,4,6-tetrachlorophenol, and 2,4-dinitrophenol, respectively). Some of the results for these compounds were rejected due to poor recoveries, which are believed to be due to the highly alkaline conditions typical of slag fill. These compounds are generally not expected to be site-related contaminants, and have not been detected above the PALs on any portion of the Tradepoint Atlantic property completed to date. Each of these SVOCs had a very low number of detections at the Site, with no concentrations remotely approaching the PAL. Since these compounds are unlikely to be site-related contaminants and were detected only at very low levels across the Site, these are not considered to be significant data gaps.

Of the remaining three compounds with reduced completeness percentages in soil (1,4-dioxane, methyl acetate, and benzaldehyde), only benzaldehyde had any detections in soil, and the maximum benzaldehyde detection (0.18 mg/kg) was well below the established PAL (120,000 mg/kg). In addition, all three of these compounds had corresponding groundwater completeness values of 100%. Based on the infrequency and low magnitude of soil detections for these compounds and the corresponding high groundwater completeness values, these are not considered to be significant data gaps.

Only one compound (3,3'-dichlorobenzidine) did not meet the completeness goal of 90% for groundwater in Parcel B13 with a value of 87.5%. Only one result was rejected out of the eight total validated groundwater samples, and none of the results for 3,3'-dichlorobenzidine were detections. This does not represent a significant data gap for the Site.

Overall, the soil and groundwater data can be used as intended, and no significant data gaps were identified. While a limited set of compounds did not meet the completeness goal of 90%, these compounds do not appear to be significant contaminants at the Site.

6.0 HUMAN HEALTH SCREENING LEVEL RISK ANALYSIS (SLRA)

6.1. ANALYSIS PROCESS

A human health Screening Level Risk Analysis (SLRA) has been conducted for soils to further evaluate the Site conditions in support of the design of necessary response measures. The SLRA included the following evaluation process:

Identification of Constituents of Potential Concern (COPCs): Compounds that are present at concentrations at or above the EPA Regional Screening Levels (RSLs) set at a target cancer risk of $1E-6$ or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. The COPC screening levels for PAHs were modified for the SLRA based on the USEPA IRIS Recent Additions for benzo[a]pyrene dated January 19, 2017 with adjustments for PAH relative potency factors. A COPC screening analysis is provided in **Table 15** to identify compounds above the relevant screening levels in Parcel B13.

Identification of Exposure Units (EUs): Five EUs were identified for Parcel B13, as indicated on **Figure 6**. The five EUs (EU1 through EU5) are comprised of 43.4 acres, 55.3 acres, 46.6 acres, 53.7 acres, and 44.3 acres, respectively.

Exposure Point Concentrations (EPCs): The COPC soil data for the exposure units were divided into surface (0-1 ft) and subsurface (>1 ft) depths for estimation of potential exposure point concentrations. An evaluation of pooled surface and subsurface soil data was also performed. Thus, for Parcel B13 there are three soil datasets associated with each EU. A statistical analysis was performed for each COPC data set using the ProUCL software (version 5.0) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the arithmetic mean for each depth category was calculated for comparison to the Adult Lead Model-based values, and any individual results exceeding 10,000 would be delineated for possible excavation and removal (if applicable). For PCBs, all results equaling or exceeding 50 mg/kg would be delineated for excavation and removal (if applicable). All PCB results less than 50 mg/kg are included in the EPCs and risk ratio calculations.

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Industrial Worker and to site-specific Soil Screening Levels (SSLs) for the Construction Worker based on equation derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). For the Construction Worker scenario, a baseline scenario was evaluated using the default exposure frequency of 250 work days

(1 year construction period) for future potential risk. The risk ratios were calculated with a cancer risk of $1E-6$ and a non-cancer Hazard Quotient (HQ) of 1. The risk ratios for the carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk. The risk ratios for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer hazard.

There is no potential for human exposure to groundwater for a Composite Worker since groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized). In the event that future construction/excavation leads to a potential Construction Worker exposure to groundwater, health and safety plans and procedures shall be followed to limit exposure risk.

Assessment of Lead: For lead, the arithmetic mean concentrations for surface soils, subsurface soils, and pooled soils for each EU were compared to the applicable RSL (800 mg/kg) as an initial screening. If the mean concentrations for the EU were below the applicable RSL, the EU was identified as requiring no further action for lead. If a mean concentration exceeded the RSL, the mean values were compared to calculated Adult Lead Model values (ALM Version dated 6/21/2009 updated with the 8/2/2016 OLEM Directive) with inputs of 1.7 for the geometric standard deviation and a blood baseline lead level of 0.7 ug/dL. The ALM calculation generates a soil lead concentration of 2,737 mg/kg, which is the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 10 ug/dL. If the arithmetic mean concentrations for the EU were below 2,737 mg/kg, the EU was identified as requiring no further action for lead. The lead averages and screening levels are presented for surface, subsurface, and pooled soils in **Table 16**. For lead, any results equaling or exceeding 10,000 mg/kg would warrant additional delineation for possible excavation and removal (if applicable).

Assessment of TPH-DRO/GRO and Oil & Grease: EPCs were not calculated for TPH-DRO/GRO or Oil & Grease. Instead, the individual results were compared to the PAL set to a HQ of 1 (6,200 mg/kg). No samples exceeded the PAL for Oil & Grease, GRO, or DRO. One boring (B13-073-SB) had physical evidence of possible NAPL in the soil core (and subsequently accumulated NAPL in the casings of delineation piezometers). An evaluation of the potential for product mobility based on these NAPL observations and response actions is presented following the SLRA in Section 7.3.

Risk Characterization Approach: For each EU, if the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1 (with the exception of lead), and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of $1E-5$, then a no further action determination will be recommended. The primary EPC comparisons to determine the need for possible remedial action will be the Construction Worker scenario comparisons to the surface and subsurface soil EPCs, as well as the Composite Worker comparison to the surface soil EPCs. However, no further action will only be approvable if subsurface soil EPCs are compared to the Composite Worker RSLs in addition to the Construction Worker SSLs, and the cancer and non-cancer risk estimates are equal to or less than $1E-5$ and 1, respectively. Pooled soil data has also been evaluated and included for discussion.

If the baseline estimate of cumulative cancer risk exceeds $1E-5$, but is less than or equal to $1E-4$, then capping of the EU will be considered to be an acceptable remedy for the Composite Worker. For the Construction Worker, cumulative cancer risks exceeding $1E-5$, but less than or equal to $1E-4$, will be mitigated via site-specific health and safety requirements. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability of the COPC. Similarly, for lead, if the ALM results indicate that the mean concentrations would present a 5% to 10% probability of a blood concentration of 10 ug/dL for the EU, then capping of the EU would be an acceptable presumptive remedy. The mean soil lead concentrations corresponding to ALM probabilities of 5% and 10% are 2,737 mg/kg, and 3,417 mg/kg, respectively. If capping of the identified area is not proposed, additional more detailed quantitative evaluation of risk will be required for the EU. This supplemental risk evaluation may include an evaluation of selective removal (excavation) to reduce site-wide cancer and/or non-cancer risks to acceptable levels.

The USEPA's acceptable risk range is between $1E-6$ and $1E-4$. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of $1E-4$, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of non-carcinogen hazard exceedances and bioavailability of the COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy. In addition, if the ALM indicates that the mean concentrations would present a >10% probability of a blood concentration of 10 ug/dL for the EU, further analysis of site conditions including toxicity reduction will be completed such that the probability would be reduced to less than 10% after toxicity reduction, but before capping.

6.2. PARCEL B13 SLRA RESULTS AND RISK CHARACTERIZATION

The soil data were divided into three datasets (surface, subsurface, and pooled) for each EU in Parcel B13 to evaluate potential current and future exposure scenarios. The pooled data may be applicable for future development plans that involve disturbances of the surface soil, since workers would likely not be exposed solely to the subsurface soil.

If the detection frequency of an analyte is less than 5% in a dataset with a minimum of 20 samples, the COPC can be eliminated from the risk analysis assuming the detections are not extremely high (based on agency discretion). A single detection that is extremely high could require delineation rather than elimination. No analyte designated as a COPC in Parcel B13 had a detection frequency less than 5%, thus no COPCs were removed due to low detection frequencies. Total PCBs have been included in the risk ratio analysis, but Aroclor 1242 was omitted to avoid double-counting the carcinogenic risk associated with PCBs. The total PCB values are caused by Aroclor 1242, and the screening level for total PCBs is as conservative as that of Aroclor 1242. No samples exceeded the mandatory excavation criterion for PCBs of 50 mg/kg. All remaining COPCs have been retained for the risk assessment based on the frequency of detections (>5%) in the overall soil dataset.

EPCs were calculated for each soil dataset (i.e., surface, subsurface, and pooled surface/subsurface) for each EU. As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. The average lead concentrations are presented for each dataset in **Table 16**. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with computations presented and EPCs calculated for COPCs within each of the three datasets (surface, subsurface, and pooled) for each EU. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated EPCs are shown in **Table 17** (surface soils) and **Table 18** (subsurface soils). **Table 19** presents the supplemental EPCs generated from the pooled surface and subsurface soils for the each EU.

As indicated on **Table 16**, neither surface, subsurface, nor pooled soils exceeded an average lead value of 800 mg/kg. The screening criterion for lead was set at an exposure unit arithmetic mean of 800 mg/kg based on the RSL, with a secondary limit of 2,737 mg/kg based on the Adult Lead Model developed by the USEPA (corresponding to a 5% probability of a blood lead level of 10 ug/dL). There were no locations where detections of lead exceeded 10,000 mg/kg, the designated threshold at which delineation would be required.

Composite Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker scenario are shown in **Table 20** (surface), **Table 21** (subsurface), and **Table 22** (pooled surface and subsurface soils). The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	EU1 (43.4 acres)	Surface Soil	none	4E-06
		Subsurface Soil	none	7E-06
		Surface & Subsurface Soil	none	5E-06
	EU2 (55.3 acres)	Surface Soil	none	3E-06
		Subsurface Soil	none	6E-06
		Surface & Subsurface Soil	none	4E-06
	EU3 (46.6 acres)	Surface Soil	none	1E-04
		Subsurface Soil	none	9E-06
		Surface & Subsurface Soil	none	3E-05
	EU4 (53.7 acres)	Surface Soil	none	9E-06
		Subsurface Soil	none	1E-05
		Surface & Subsurface Soil	none	9E-06
	EU5 (44.3 acres)	Surface Soil	none	1E-05
		Subsurface Soil	Respiratory System = 2 Nervous System = 2	6E-05
		Surface & Subsurface Soil	Nervous System = 2	5E-05

The current Composite Worker will be exposed only to surface soils in the Parcel B13. The risk ratios indicated that the cumulative cancer risks for potential Composite Worker exposures to surface soil exceeded the acceptable risk criterion identified in the Risk Characterization Approach for no further action (1E-5) in EU3 only, which had a cumulative cancer risk of 1E-4. The main contributor to cumulative cancer risk in surface soils in EU3 was arsenic. When the non-cancer risks due to surface soil were segregated and summed by target organ, the cumulative Hazard Index (HI) did not exceed a cumulative HI of 1 for an individual target organ.

Future construction activities were assumed to result in the placement of subsurface material over existing surface soils exposing a future Composite Worker to a mixture of surface and subsurface soils. This exposure scenario is dependent on any future development proposed for the parcel. The risk ratios indicated that the cumulative cancer risks for the Composite Worker exposures to subsurface soil exceeded 1E-5 for EU5 only, with a value of 6E-5. The main

contributor to cumulative cancer risk in subsurface soils in EU5 was naphthalene. When the non-cancer risks were segregated and summed by target organ for cumulative HI, elevated non-cancer hazards for subsurface soils were identified above the HI of 1 for EU5 for the respiratory system (HI=2) and the nervous system (HI=2). These impacts to the respiratory and nervous systems were caused primarily by elevated naphthalene, with a minor nervous system HI contribution from manganese. Supplemental analysis evaluating the exposure to pooled soils (which may be applicable depending on future proposed development) resulted in similar values for carcinogenic risk and non-carcinogenic hazard, although some non-cancer risk ratios fell below a HI of 1 after pooling (EU2).

The risk ratios for potential exposures to surface soils for a current Composite Worker indicated that mitigative action or further quantitative risk assessment is warranted for EU3. The risk ratios in this EU indicated that capping or selective removal would be acceptable remedies for the elevated surface hazard posed by the presence of arsenic. Based on this assessment, additional unacceptable risks to a future Composite Worker may be encountered in EU5 if intrusive activities which relocate subsurface soils to the surface were to occur. Institutional controls to ensure proper oversight and management of any future construction activity that includes disturbances of the existing subsurface soil below 1-foot bgs would be protective of future Composite Workers by limiting potential exposures to subsurface soil which may be impacted above the acceptable risk criteria. Alternatively, a selective removal remedy would be appropriate to address the subsurface non-cancer hazard. Potential risks associated with any proposed future intrusive construction activities that would disturb the soil should be addressed in a Response and Development Work Plan for that work.

Construction Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Construction Worker scenario (250-day baseline exposure frequency) are shown in **Table 23** (surface), **Table 24** (subsurface), and **Table 25** (pooled surface and subsurface soils). The variables entered for calculation of site-specific SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheets used for computation of the baseline 250-day Construction Worker SSLs are included as **Appendix L**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker (250 day work schedule)	EU1 (43.4 acres)	Surface Soil	Nervous System = 4	7E-07
		Subsurface Soil	Nervous System = 6	1E-06
		Surface & Subsurface Soil	Nervous System = 6	1E-06
	EU2 (55.3 acres)	Surface Soil	Nervous System = 3	6E-07
		Subsurface Soil	Nervous System = 3 Unspecified Target Organ = 2	9E-07
		Surface & Subsurface Soil	Nervous System = 2	7E-07
	EU3 (46.6 acres)	Surface Soil	Dermal System = 4 Nervous System = 7 Unspecified Target Organ = 2	2E-05
		Subsurface Soil	Nervous System = 4 Unspecified Target Organ = 2	2E-06
		Surface & Subsurface Soil	Nervous System = 7 Unspecified Target Organ = 2	6E-06
	EU4 (53.7 acres)	Surface Soil	Nervous System = 5 Unspecified Target Organ = 2	1E-06
		Subsurface Soil	Nervous System = 5 Unspecified Target Organ = 3	2E-06
		Surface & Subsurface Soil	Nervous System = 5 Unspecified Target Organ = 2	1E-06
	EU5 (44.3 acres)	Surface Soil	Nervous System = 3 Unspecified Target Organ = 2	2E-06
		Subsurface Soil	Dermal System = 2 Respiratory System = 30 Nervous System = 32	4E-05
		Surface & Subsurface Soil	Respiratory System = 23 Nervous System = 25 Unspecified Target Organ = 2	3E-05

The Construction Worker may be exposed to only surface soils or a combination of surface and subsurface soils (i.e. pooled) during future excavation or other earth moving activities. Elevated screening level estimates of Construction Worker cancer risk above the acceptable risk criterion of 1E-5 were obtained for the baseline 250-day exposure frequency for surface soils in EU3. Using the baseline 250-day exposure, elevated non-cancer hazards in surface soils were identified above the HI of 1 for the nervous system (HI=4, HI=3, HI=7, HI=5, and HI=3 for EU1 through EU5, respectively), the dermal system (HI=4 for EU3), and the unspecified system

(HI=2 for EU3 through EU5, respectively). The impacts to the nervous system for surface soils were caused primarily by elevated manganese. The surface impacts for the unspecified organ system in EU3 were caused by the additive effects of arsenic (HQ=3) and vanadium (HQ=1). The surface impacts for the unspecified organ system were caused primarily by the additive effects of benzo[a]pyrene, thallium, and/or iron.

For subsurface soils evaluated for the baseline 250-day exposure, an elevated screening level estimate of Construction Worker cancer risk above the acceptable risk criterion of $1E-5$ was obtained for subsurface (and pooled) soils in EU5. Elevated non-cancer hazards in subsurface soils were noted for the nervous system (HI=6, HI=3, HI=4, HI=5, and HI=32 for EU1 through EU5, respectively), the dermal system (HI=2 for EU5), the respiratory system (HI=30 for EU5), and the unspecified system (HI=2, HI=2, and HI=3 for EU2, EU3, and EU4, respectively). The impacts to the nervous system were caused primarily by elevated manganese in EU1, EU2, EU3, and EU4 and by elevated naphthalene (HQ=30) and manganese (HQ=2) in EU5. The impacts to the dermal system in EU5 were caused primarily by elevated vanadium (HQ=2). The impacts to the respiratory system in EU5 were caused primarily by elevated naphthalene (HQ=30). The impacts to the unspecified system were caused primarily by the additive effects of benzo[a]pyrene, thallium, and/or iron. Supplemental analysis evaluating the non-cancer hazards in pooled soils (which may be applicable depending on future proposed development) resulted in similar values for non-cancer hazard, although some non-cancer risk ratios fell below a HI of 1 after pooling.

The risks may be re-evaluated based on the proposed schedule for any potential future intrusive construction work, which may be less than the 250 work day exposure presented herein.

Arsenic Hazard and Removal Assessment:

A supplemental analysis was performed to determine whether selective removal of localized soil impacts could reduce the carcinogenic risks associated with the potential Composite Worker exposures to surface soils for EU3 to the no further action limit of $1E-5$. Surface carcinogenic risk in EU3 is driven by elevated arsenic. Capping of arsenic-impacted areas in EU3 would be an appropriate remedy to address potential Composite Worker exposures to surface soil. Alternatively, the excavation and removal of arsenic impacts in select areas would be adequate to reduce the EU3 cumulative cancer risk for exposure to the surface soil to an acceptable level. If a response measure (excavation or capping) is not planned, further analysis including a more detailed risk assessment that addresses the arsenic risk may be warranted in a Response and Development Work Plan.

The maximum concentration for arsenic (896 mg/kg) was identified at B13-031-SB-1 and was replaced in the surface dataset with proposed maximum concentrations of the material to remain in place and uncapped (assumed as the second highest value in the surface dataset which is also located in EU3; arsenic = 18.7 mg/kg). The EPC for arsenic was then recomputed and the

revised risk ratios resulted in a cumulative carcinogenic risk of less than $1E-5$. Thus, the carcinogenic risk in surface soils for the Composite Worker could be adequately addressed by removing or capping arsenic impacts associated with the surface soil sample B13-031-SB-1. Potential future risks to the Composite Worker from the subsurface soil in EU5 can be addressed by institutional controls, or could also be addressed via localized capping or excavation.

7.0 FINDINGS AND RECOMMENDATIONS

The objective of this Phase II Investigation was to fully characterize the nature and extent of contamination at the Site. During the investigation, a total of 199 Phase II Investigation soil samples and 12 groundwater samples were collected and analyzed to define the nature and extent of contamination in Parcel B13. The sampling and analysis plan for the parcel was developed to target specific features which represented a potential release of hazardous substances and/or petroleum products to the environment. Soil samples were analyzed for TCL-VOCs, TCL-SVOCs, Oil & Grease, TPH-DRO/GRO, TAL-Metals, hexavalent chromium, and cyanide. Shallow soil samples (0-1 foot bgs) were analyzed for PCBs. Groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs, Oil & Grease, TPH-DRO/GRO, TAL-Metals (dissolved), hexavalent chromium (dissolved), and cyanide.

7.1. SOIL

The concentrations of constituents in the soil have been characterized by the Phase II Investigation to provide estimates of exposure point concentrations to support risk assessment.

Lead and PCB concentrations are well below the levels that would warrant evaluation of a removal remedy. None of the individual lead detections exceeded the mandatory delineation threshold of 10,000 mg/kg. The average lead concentrations in the surface, subsurface, and pooled (surface and subsurface) soils were below the 800 mg/kg RSL in all five EUs, indicating that no further action is needed with respect to lead. One soil sample location exceeded the PAL specified in the QAPP for total PCBs; however, no total PCB concentrations were identified in Parcel B13 above the 50 mg/kg level that would warrant evaluation of a removal remedy. The maximum detection of total PCBs (with a matching detection of Aroclor 1242) was relatively minor (3.29 mg/kg at sample location B13-007-SB).

There were no soil PAL exceedances or concerns related to VOCs at the Site. There were no exceedances of Oil & Grease, GRO, or DRO in any samples in Parcel B13, although one soil core has physical evidence of possible NAPL contamination (as discussed in Section 7.3).

The remaining PAL exceedances in soil consisted of five inorganics (arsenic, manganese, thallium, vanadium, and hexavalent chromium) and five SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and naphthalene). Arsenic was the most common inorganic exceedance, and was detected above the PAL in the majority of soil samples analyzed at the Site (106 total). The maximum detection of arsenic was 896 mg/kg at sample location B13-031-SB-1. Benzo[a]pyrene exceeded its PAL in the largest number of samples (seven total) of any SVOC. The largest number of exceedances for all SVOCs occurred at location B13-068-SB which provided general coverage of the Site. Naphthalene was detected above its PAL only at boring B13-073-SB, at a concentration of 1,970 mg/kg at 7 feet bgs.

7.2. GROUNDWATER

The concentrations of constituents in the groundwater have been characterized by the Phase II Investigation to provide estimates of exposure point concentrations to support risk assessment.

Analysis of the groundwater samples identified concentrations of three inorganic compounds that exceeded their PALs (hexavalent chromium, thallium, and vanadium). Hexavalent chromium (dissolved) was the most common inorganic exceedance in groundwater and exceeded its PAL in all 12 samples. Most of these exceedances were flagged with “J” or “B” qualifiers, indicating that they are estimated values below the laboratory quantitation limit (J) or may be associated with blank contamination (B). Vanadium and thallium exceeded their PALs in two samples and one sample, respectively.

Three VOCs were detected above their respective PALs. Benzene was detected above the PALs at two locations. Bromodichloromethane and chloroform were detected above their respective PALs together at one location (B13-059-PZ).

Six SVOCs (1,1-biphenyl, 2-methylnaphththalene, benz[a]anthracene, benzo[b]fluoranthene, naphthalene, and pentachlorophenol) were detected above their respective PALs. Each groundwater location had at least one SVOC exceedance except B13-059-PZ. Three SVOC analytes were detected above their applicable PALs in more than one sample (benz[a]anthracene, naphthalene, and pentachlorophenol). Naphthalene was detected above its PAL in eleven groundwater samples with a maximum detection of 3,920 µg/L at location B13-078-PZ. Benz[a]anthracene exceeded its PAL in seven groundwater samples. Pentachlorophenol was detected above the PALs in five sample locations. The remaining three SVOC compounds (1,1-biphenyl, benzo[b]fluoranthene, and 2-methylnaphthalene) were co-located at a single groundwater sample location (B13-078-PZ). B8-078-PZ appeared to be the location which was most heavily impacted by SVOC contamination.

There were detections of TPH-DRO/GRO and/or Oil & Grease in all of the twelve groundwater samples, and all twelve of the locations exceeded the PAL (47 µg/L) for at least one of these parameters. PAL exceedances were most common for DRO, with 11 total exceedance locations (each piezometer except B13-059-PZ). The highest detections of Oil & Grease, GRO, and DRO were all obtained from the same location (B13-078-PZ) with results of 7,300 µg/L, 3,240 µg/L, and 2,570 µg/L, respectively. The DRO result was flagged with the “J” qualifier, indicating that it was an estimated value below the laboratory quantitation limit.

7.3. NON-AQUEOUS PHASE LIQUID

No elevated Oil & Grease, GRO, or DRO levels were identified above the PAL (6,200 mg/kg) in any soil sample in Parcel B13. Soil cores were screened for evidence of possible NAPL contamination during the completion of the Phase II soil borings in Parcel B13. The field

observations were noted on the boring logs, and one sample location had physical evidence of NAPL as determined by field personnel (B13-073-SB). The observations of possible NAPL (as indicated on the boring log in **Appendix B**) included a greasy feel in the soil core from 15 to 35 feet bgs, which was accompanied by a strong chemical odor. Temporary screening piezometers have been installed at B13-073-SB and in the vicinity of this boring; continued NAPL delineation activities are ongoing in this area based on the observation of accumulated NAPL in the casings of several piezometer. Appropriate protocols should be documented in a Response and Development Work Plan (as necessary) to prevent the mobilization of any product if future utilities are proposed in the vicinity of this boring.

7.4. HUMAN HEALTH SCREENING ANALYSIS

Groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized); therefore there is no potential for direct human exposure for a Composite Worker. In the event that future construction/excavation leads to a potential Construction Worker exposure to groundwater, health and safety plans should be implemented to limit exposure risk. The groundwater data were screened to determine whether any cumulative (or individual) sample results exceeded the USEPA VI TCR (carcinogen) or THQ (non-carcinogen) Screening Levels. One parameter (cyanide) exceeded the individual VI THQ screening levels at eight sample locations. Chloroform, naphthalene, and xylenes exceeded the individual VI TCR or THQ screening levels at one location each. Two locations exceeded the cumulative VI cancer risk criteria, with the most significant carcinogenic risk observed in the vicinity of piezometer B13-078-PZ (with a cumulative cancer risk of $2E-4$). There were four locations where the screening level estimates of cumulative VI non-cancer hazard exceeded 1 (rounded to one significant digit), caused by the individual detections of total cyanide. However, detected levels of cyanide across the parcel did not suggest that sources of continuing releases of contaminant mass to the groundwater are present. The maximum detection of total cyanide on the parcel was $7.4 \mu\text{g/L}$ (versus the VI screening criterion of $3.5 \mu\text{g/L}$) observed in B13-066-PZ. The VI risks were conservatively screened using total cyanide rather than free cyanide or cyanide amenable to chlorination, and the fraction of free cyanide that could contribute to VI risks would be expected to be significantly lower than the total cyanide. Therefore, cyanide in groundwater is not expected to present a significant VI risk.

The current Composite Worker will be exposed only to surface soils in the Parcel B13. When the non-cancer risks were segregated and summed by target organ for cumulative HI, no target organ exceeded a cumulative HI of 1 in surface soils. The risk ratios indicated that the cumulative cancer risks for potential Composite Worker exposures to surface soil exceeded the acceptable risk criterion identified in the Risk Characterization Approach for no further action ($1E-5$) in EU3 only, which had a cumulative cancer risk of $1E-4$. The main contributor to

cumulative cancer risk in subsurface soils in EU3 was arsenic. Capping of impacted areas in EU3 would be an appropriate remedy to address potential Composite Worker exposures to surface soil. Alternatively, the excavation and removal of the arsenic impacts in the vicinity of soil sample B13-031-SB-1 would be adequate to reduce the EU1 cumulative carcinogenic risk estimate for exposure to the surface soils to an acceptable level. If a response measure (excavation or capping) is not planned, further analysis including a more detailed risk assessment may be warranted in a Response and Development Work Plan.

For a potential future Composite Worker exposure to subsurface soils, the risk ratios indicated that the cumulative cancer risks for the potential Composite Worker exposures to subsurface soil exceeded $1E-5$ for EU5 only. The main contributor to cumulative cancer risk in subsurface soils in EU5 was naphthalene. When the non-cancer risks were segregated and summed by target organ for cumulative Hazard Index (HI), elevated non-cancer hazards in subsurface soils were identified above the HI of 1 for EU5 for the respiratory system (HI=2) and the nervous system (HI=2). These impacts to the respiratory and nervous systems were caused primarily by elevated naphthalene, with a minor contribution from manganese. Based on this assessment, unacceptable risk to a future Composite Worker may be encountered if soil disturbances occur that relocate subsurface soils in EU5 to the surface. If a selective removal (capping or excavation remedy) is not proposed to mitigate potential subsurface exposures in EU5, institutional controls should be implemented for the protection of Composite Workers to ensure proper oversight and management of any future intrusive construction activity that would include disturbance of subsurface soil below 1-foot bgs. If future development of EU5 would relocate subsurface materials below 1-foot bgs to the surface, the risks would require further evaluation including a more detailed risk assessment in a Response and Development Work Plan.

The Construction Worker risk analysis for a potential baseline exposure (250 work days) indicated that the cumulative cancer risks were above the acceptable risk criterion of $1E-5$ for surface soils in EU3. Elevated non-cancer hazards in surface soils were identified above the HI of 1 for the nervous system in all five EUs, the dermal system in EU3, and the unspecified system in EU3, EU4, and EU5. The surface impacts to the nervous system were caused primarily by elevated manganese. The impacts for the unspecified organ system were caused primarily by the additive effects of arsenic and vanadium. The impacts for the unspecified organ system were caused primarily by the additive effects of benzo[a]pyrene, thallium, and/or iron.

An elevated screening level estimate of Construction Worker cancer risk above the acceptable risk criterion of $1E-5$ was obtained for the baseline 250-day exposure frequency for subsurface soils in EU5. Elevated non-cancer hazards in subsurface soils were noted for the nervous system in all five EUs, the dermal system in EU5, the respiratory system in EU5, and the unspecified target organ system in EU2, EU3, and EU4. The impacts to the nervous system were caused primarily by elevated manganese in EU1 through EU4, and by elevated naphthalene and manganese in EU5. The impacts to the dermal system were caused primarily by elevated

vanadium. The impacts to the respiratory system were caused primarily by elevated naphthalene. The impacts to the unspecified system were caused primarily by the additive effects of benzo[a]pyrene, thallium, and/or iron.

While not quantified, the mineralized manganese in the Parcel B13 soils is likely less bioavailable than the source materials from which the manganese toxicity criteria (and basis of the SSLs) were derived. Therefore, the non-cancer manganese hazard is likely overstated. The total HI values for the future Construction Worker (all five EUs) may indicate the need for protective controls (dust mask, etc.) if a long term construction project is proposed for the property in the future. The risks may be re-evaluated based on the proposed schedule of construction, which may be less than the baseline 250 work day exposure presented herein. Unacceptable risks due to elevated metals or SVOCs can be addressed by the implementation of worker health and safety protocols. A supplemental Response and Development Work Plan would specify appropriate measures to protect future Construction Workers in the event of any future intrusive construction activity.

7.5. RECOMMENDATIONS

Sufficient remedial investigation data has been collected to evaluate the nature and extent of possible constituents of concern in Parcel B13. The presence and absence of soil and groundwater impacts within Parcel B13 have been adequately described, with the exception of the ongoing NAPL delineation surrounding location B13-073-SB, and further investigation is not warranted. Portions of the Site are not currently suitable for future use by industrial workers; remedial and/or further action is required to support occupancy and use of the parcel via the following:

- Future use of the parcel should include the following deed restrictions:
 - Deed restriction for industrial Site use only, no portion of the Site should be used for agricultural, recreational or residential purposes.
 - Deed restriction on groundwater use, no subsurface water or groundwater should be extracted from aquifers for any purpose.
- Elevated surface soil impacts in the vicinity of B13-031-SB-1 (arsenic) causing elevated cancer risk (1E-4) should be remediated either by capping or a selective removal remedy via excavation to provide Composite Worker protection. Elevated subsurface impacts in excess of the acceptable Composite Worker cancer risk and non-cancer hazard level (EU5) may be addressed either by selective removal or capping, or by institutional controls (see below).

- Institutional controls should be implemented for the protection of workers to ensure proper oversight and management of any future intrusive construction activity that would disturb the existing surface soil layer. These institution controls would include a requirement for written notice to the MDE of any future soil disturbance activities, and may require health and safety requirements for any excavations of substantial time periods, and proper management and characterization of any material disturbed at the Site.
- If future development proposes disturbance of the subsurface soil below 1-foot bgs in Parcel B13, then a detailed risk analysis should be completed and presented in a Response and Development Work Plan to further assess potential exposures to future workers.
- Additional piezometers should be installed surrounding soil boring B13-073-SB to delineate the extent of NAPL impacts. These piezometers should be gauged at standard intervals (0-hours, 48-hours, 30-days) to document any accumulation of NAPL in the casing. Following the completion of delineation, further remedial actions will be determined as necessary. The delineation area (B13-073-SB) should be considered for proximity to proposed utilities in any future development plans. If future utilities are proposed in the vicinity of this boring, appropriate protocols for the mitigation of potential product mobility should be specified in a Response and Development Work Plan.
- If an enclosed structure is proposed for construction in the vicinity of B13-059-PZ or B13-078-PZ, further assessment or mitigation of the potential for human exposures via the vapor intrusion to indoor air pathway should be addressed in a Response and Development Work Plan.

8.0 REFERENCES

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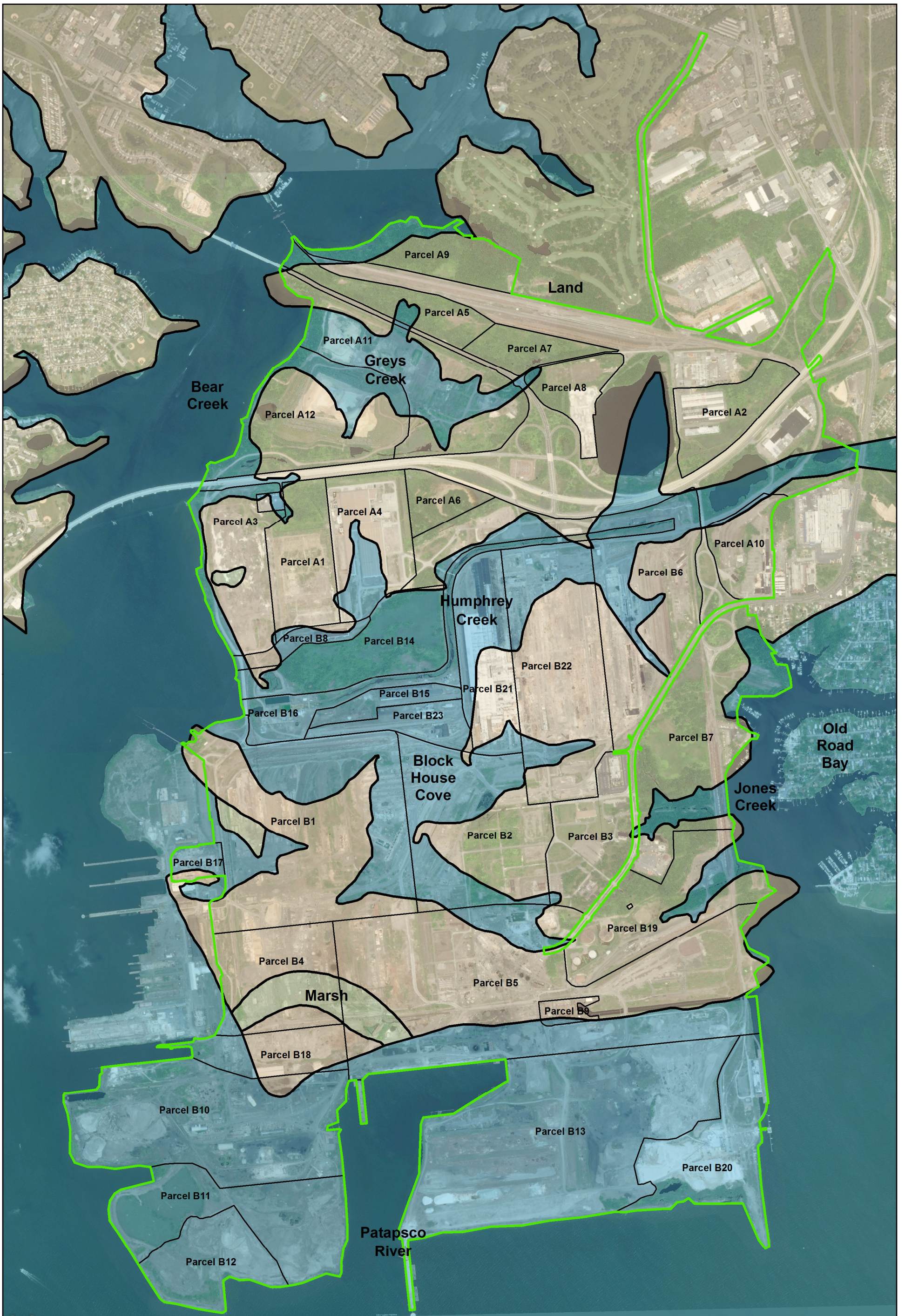
FIGURES



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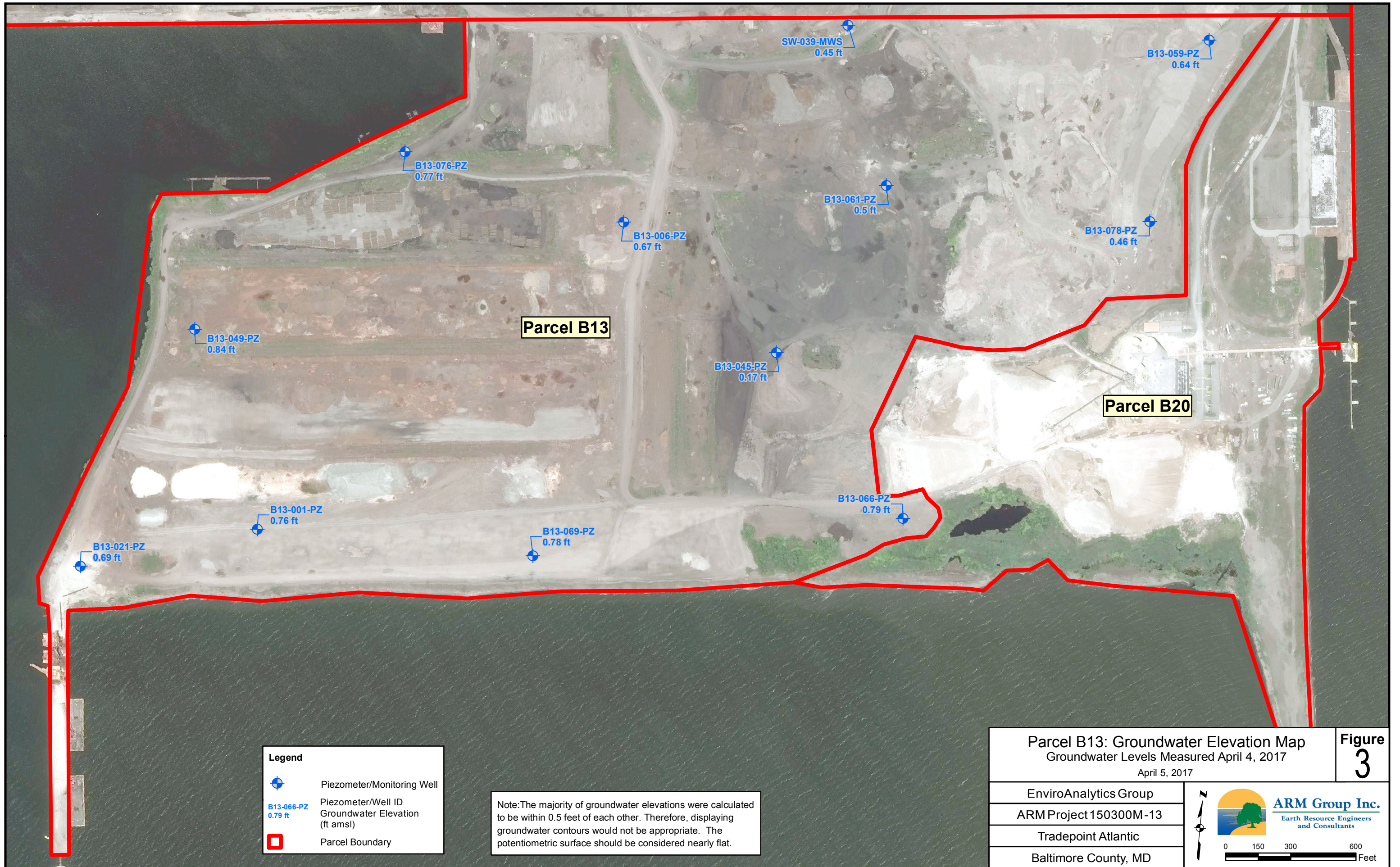
		Site Boundary Private Property Area A Boundaries Area B Boundaries	Tradepoint Atlantic Area A and Area B Parcels August 1, 2016		EnviroAnalytics Group Tradepoint Atlantic	Figure 1
				Area A: Project 150298M Area B: Project 150300M	Baltimore County, MD	






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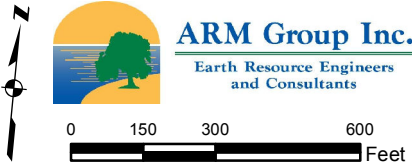
		Site Boundary	Land	<h3>Approximate Shoreline 1916</h3> <p>August 1, 2016</p> <p><small>Adapted from Figure 2-5 of the Description of Current Conditions Report prepared by Rust Environmental and Infrastructure, dated January 1998</small></p>	EnviroAnalytics Group	Tradepoint Atlantic	Figure 2
		Area A Boundaries	Marsh		Water	Area A: Project 150298M Area B: Project 150300M	

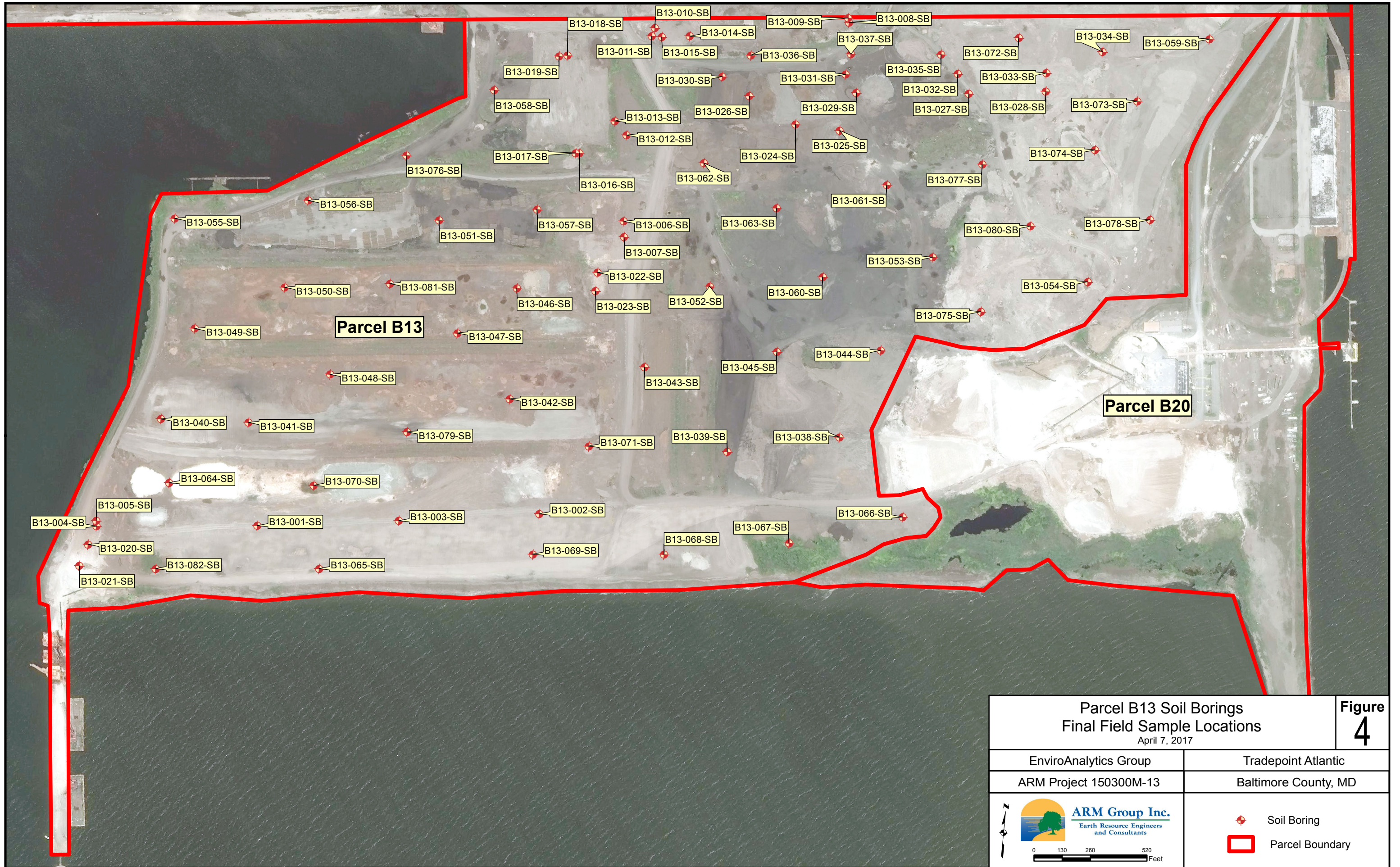


Legend

-  Piezometer/Monitoring Well
-  Piezometer/Well ID
Groundwater Elevation (ft amsl)
-  Parcel Boundary

Note: The majority of groundwater elevations were calculated to be within 0.5 feet of each other. Therefore, displaying groundwater contours would not be appropriate. The potentiometric surface should be considered nearly flat.

<p>Parcel B13: Groundwater Elevation Map Groundwater Levels Measured April 4, 2017 April 5, 2017</p>		<p>Figure 3</p>
<p>EnviroAnalytics Group ARM Project 150300M-13 Tradeport Atlantic Baltimore County, MD</p>		 <p>ARM Group Inc. Earth Resource Engineers and Consultants</p> <p>0 150 300 600 Feet</p>



Parcel B13 Soil Borings
 Final Field Sample Locations
 April 7, 2017



Figure
 4

EnviroAnalytics Group

Tradepoint Atlantic

ARM Project 150300M-13

Baltimore County, MD

-  Soil Boring
-  Parcel Boundary



Parcel B13 Soil Borings
Phase II SVOC Exceedances (mg/kg)
April 6, 2017

Figure
S-1

EnviroAnalytics Group
ARM Project 150300M-13

Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers
and Consultants

0 150 300 600 Feet

- ◆ Soil Boring
- Parcel Boundary



Parcel B13 Soil Borings
Phase II Inorganic Exceedances (mg/kg)
 April 6, 2017

Figure S-2

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150300M-13	Baltimore County, MD
<ul style="list-style-type: none"> ◆ Soil Boring Parcel Boundary 	



Parcel B13 Groundwater
 Phase II VOC Exceedances (ug/L)
 April 6, 2017

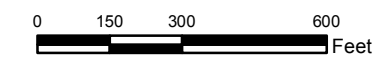
Figure
 GW-1

EnviroAnalytics Group


Tradepoint Atlantic

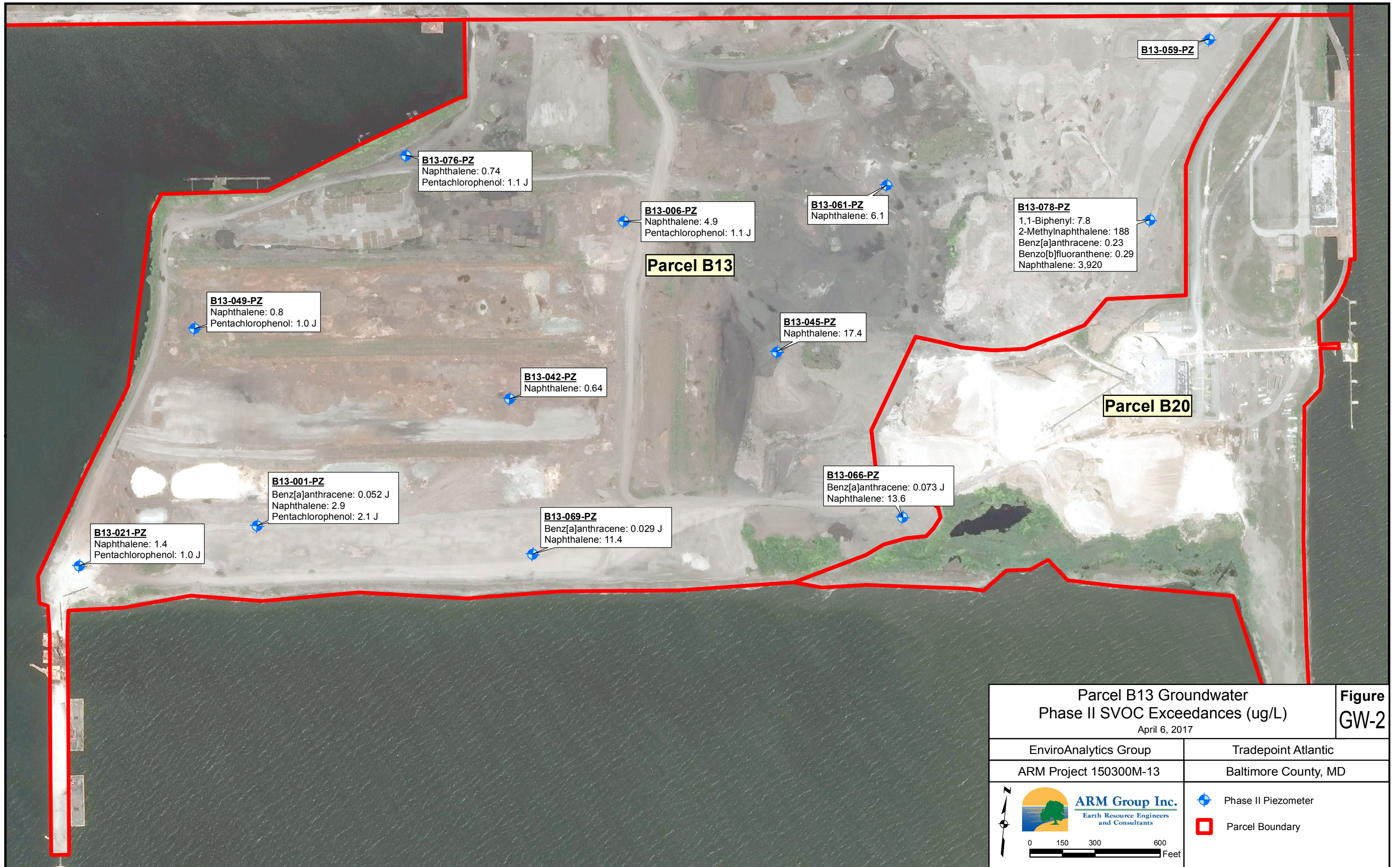
ARM Project 150300M-13

Baltimore County, MD



 Phase II Piezometer




 Parcel Boundary

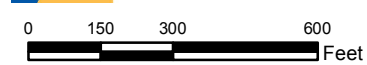


Parcel B13 Groundwater
Phase II SVOC Exceedances (ug/L)
April 6, 2017

Figure
GW-2

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150300M-13	Baltimore County, MD





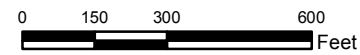
 ARM Group Inc. Earth Resource Engineers and Consultants	 Phase II Piezometer  Parcel Boundary
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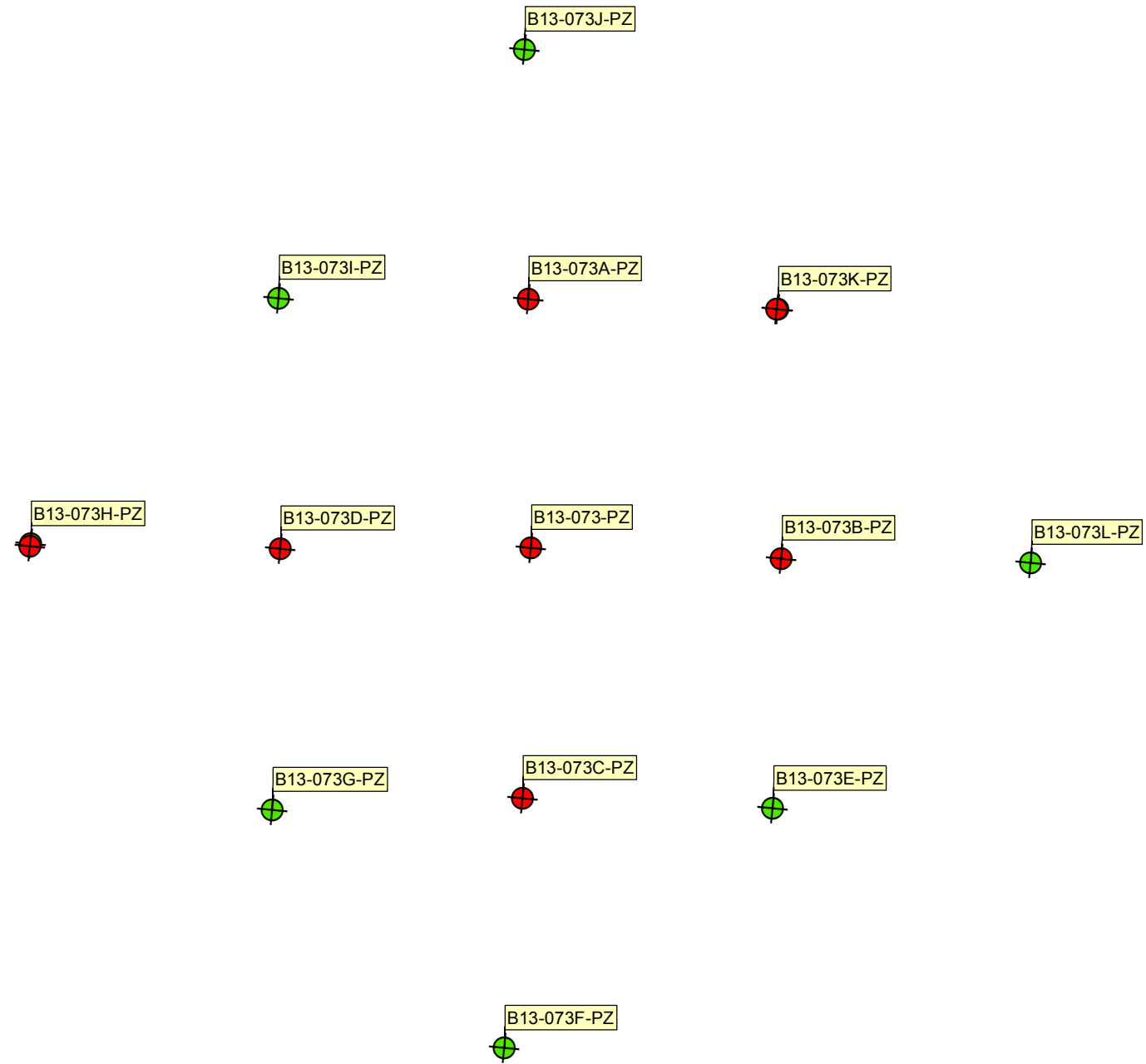
Parcel B13 Groundwater
 Phase II TPH/O&G Exceedances (ug/L)
 April 6, 2017





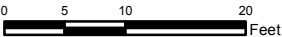
Figure
 GW-3

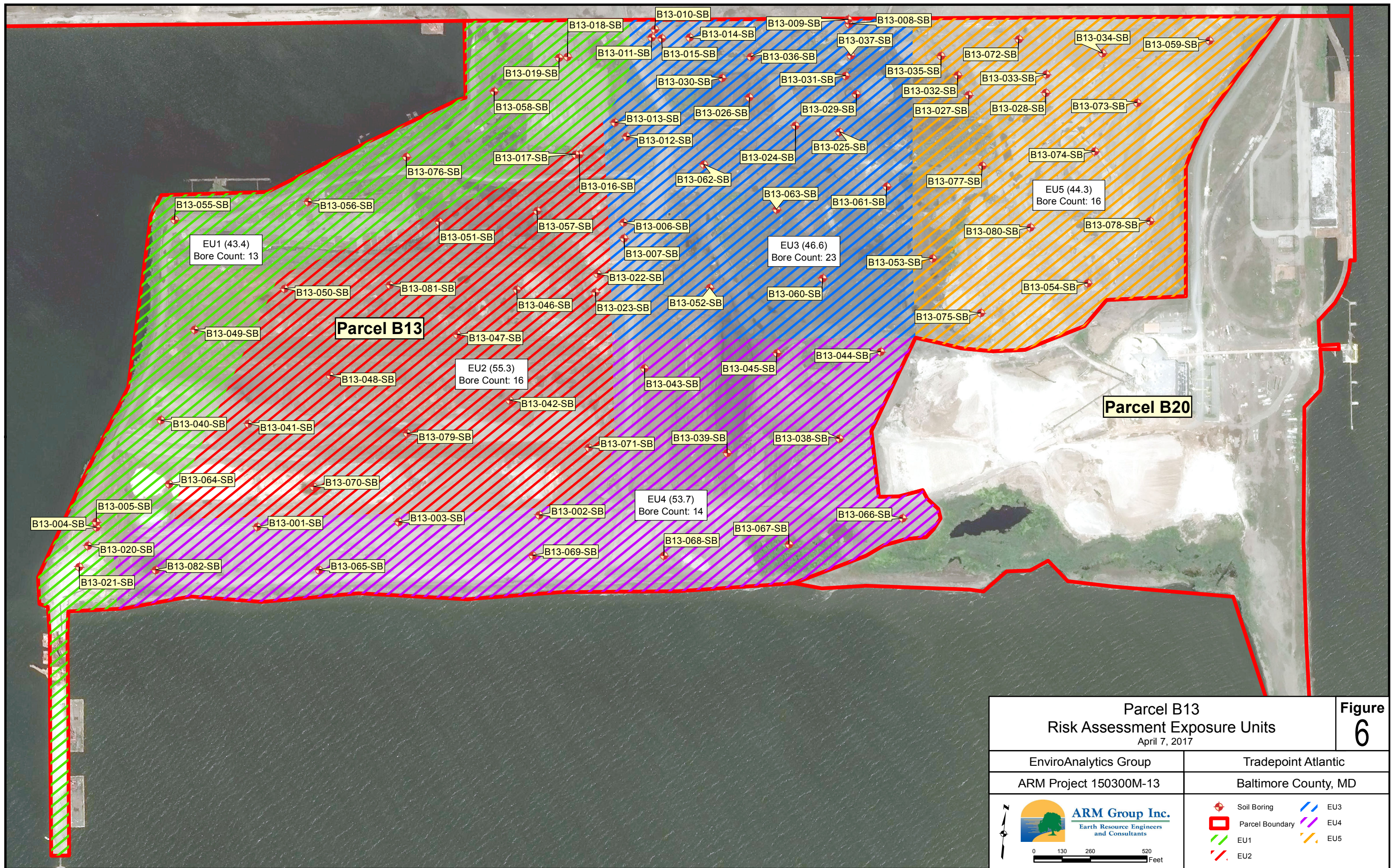
EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150300M-13	Baltimore County, MD
 ARM Group Inc. Earth Resource Engineers and Consultants	 Phase II Piezometer  Parcel Boundary
 	







Parcel B13 NAPL Delineation Piezometer Locations April 11, 2017		Figure 5
EnviroAnalytics Group	Tradepoint Atlantic	
ARM Project 150300M-13	Baltimore County, MD	
 ARM Group Inc. Earth Resource Engineers and Consultants	 Measurable NAPL Observed  No Measurable NAPL Observed	
 		



Parcel B13
 Risk Assessment Exposure Units
 April 7, 2017

Figure
 6

EnviroAnalytics Group

Tradepoint Atlantic

ARM Project 150300M-13

Baltimore County, MD

ARM Group Inc.
 Earth Resource Engineers
 and Consultants

0 130 260 520 Feet

- Soil Boring
- Parcel Boundary
- EU1
- EU2
- EU3
- EU4
- EU5

TABLES

**Table 1 - Parcel B13
Groundwater Elevation Data**

<u>Location Name</u>	<u>TOC Elevation (feet AMSL)</u>	<u>Ground Elevation (feet AMSL)</u>	<u>Measured DTW (ft)</u>	<u>Groundwater Elevation (feet AMSL)</u>
B13-001-PZ	19.75	16.4	18.99	0.76
B13-006-PZ	31.63	28.46	30.96	0.67
B13-021-PZ	14.31	13.89	13.2	0.69
B13-042-PZ*	NA	NA	NA	NA
B13-045-PZ	32.18	28.99	32.01	0.17
B13-049-PZ	20.13	16.85	19.29	0.84
B13-059-PZ	28.92	28.69	28.28	0.64
B13-061-PZ	31.61	29.21	31.11	0.5
B13-066-PZ	6.60	4.13	5.81	0.79
B13-069-PZ	23.33	19.52	22.55	0.78
B13-076-PZ	17.09	14.19	16.32	0.77
B13-078-PZ	30.68	27.19	30.22	0.46
SW-039-MWS	19.91	17.91	19.46	0.45

DTW = Depth to water

TOC = Top of casing

AMSL = Above mean sea level

NA = Not Applicable

* Piezometer B13-042-PZ was not surveyed and could not be located during gauging event

**Table 2 - Parcel B13
Historical Site Drawing Details**

Set Name	Typical Features Shown	Drawing Number	Original Date Drawn	Latest Revision Date
Plant Arrangement	Roads, water bodies, building/structure footprints, electric lines, above-ground pipelines (e.g.: steam, nitrogen, etc.)	5003	10/22/1958	1/8/1982
		5004	9/7/1960	1/21/1982
		5005	3/22/1961	1/8/1982
		5009	6/25/1958	3/12/1982
		5010	9/22/1961	3/12/1982
		5011	9/25/1961	3/12/1982
		5012	7/7/1958	3/12/1982
		5016	5/28/1958	3/12/1982
		5017	7/7/1958	3/12/1982
		5018	7/7/1958	3/12/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5103	<i>Unknown</i>	3/7/2008
		5104	<i>Unknown</i>	8/18/2008
		5105	<i>Unknown</i>	3/10/2008
		5109	<i>Unknown</i>	3/10/2008
		5110	<i>Unknown</i>	3/10/2008
		5111	<i>Unknown</i>	3/10/2008
		5112	<i>Unknown</i>	9/5/2008
		5116	<i>Unknown</i>	8/14/2008
		5117	<i>Unknown</i>	8/14/2008
		5118	<i>Unknown</i>	8/14/2008
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5503	5/27/1975	3/9/1982
		5504	5/30/1975	1/11/1982
		5505	5/30/1975	1/11/1982
		5509	9/11/1959	3/18/1982
		5510	<i>Unknown</i>	9/26/2008
		5511	2/16/1976	1/7/1982
		5512	2/16/1960	1/20/1982
		5516	9/1/1958	9/12/2008
		5517	8/21/1959	2/9/1982
		5518	1/21/1957	2/10/1982
Drip Legs	Coke Oven Gas Drip Legs Locations	5886B	<i>Unknown</i>	Sept. 1988

**Table 3 - Parcel B13
Field Shifted Boring Locations**

<u>Location ID</u>	<u>Sample Target</u>	<u>Proposed Location</u> ¥		<u>Final Location</u> ¥		<u>Relocation Distance & Direction</u>	
		<u>Northing</u>	<u>Easting</u>	<u>Northing</u>	<u>Easting</u>		
B13-001-SB	Southern Slag Pile Demolition Debris REC 18, Finding 262	560953	1459997	560941	1460000	12	SE
B13-016-SB	Sump Pump	562802	1461310	562795	1461310	7	S
B13-017-SB	Sump Pump	562801	1461293	562786	1461311	23	SE
B13-030-SB	Slag Pits	563216	1461931	563229	1461928	14	N
B13-042-SB	Parcel coverage	561644	1461098	561629	1461106	17	SE
B13-050-SB	Parcel coverage	562056	1460017	562066	1460008	13	NW
B13-054-SB	Parcel coverage	562436	1463696	562384	1463708	54	S
B13-057-SB	Parcel coverage	562526	1461141	562572	1461085	72	NW
B13-062-SB	Parcel coverage	562811	1461883	562809	1461892	9	E
B13-067-SB	Parcel coverage	561108	1462442	561110	1462679	237	E
B13-070-SB	Parcel coverage	561162	1460238	561189	1460242	27	NE
B13-074-SB	Parcel coverage	563044	1463671	563064	1463714	47	NE
B13-076-SB	Parcel coverage	562716	1460517	562738	1460511	23	N

¥ Reported northing and eastings are not survey accurate. Coordinates are reported in NAD 1983 Maryland State Plane (US feet).

**Table 4 - Parcel B13
TCLP Results for Solid IDW**

Sample ID	Parameter	Result (mg/L)	Laboratory Flag	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory LOQ (mg/L)
B13 Waste Chara. (10/7/16)	1,1-Dichloroethene	0.05	U	0.7	no	0.05
	1,2-Dichloroethane	0.05	U	0.5	no	0.05
	1,4-Dichlorobenzene	0.5	U	7.5	no	0.5
	2,4,5-Trichlorophenol	5	U	400	no	5
	2,4,6-Trichlorophenol	0.1	U	2	no	0.1
	2,4-Dinitrotoluene	0.1	U	0.13	no	0.1
	2-Butanone (MEK)	5	U	200	no	5
	2-Methylphenol	2	U	200	no	2
	3&4-Methylphenol(m&p Cresol)	2	U	200	no	2
	Arsenic	0.0068	J	5	no	0.05
	Barium	0.28	J	100	no	1
	Benzene	0.05	U	0.5	no	0.05
	Cadmium	0.003	J	1	no	0.05
	Carbon tetrachloride	0.05	U	0.5	no	0.05
	Chlorobenzene	1	U	100	no	1
	Chloroform	0.5	U	6	no	0.5
	Chromium	0.0014	JB	5	no	0.05
	Hexachlorobenzene	0.1	U	0.13	no	0.1
	Hexachloroethane	0.5	U	3	no	0.5
	Lead	0.05	U	5	no	0.05
	Mercury	0.001	U	0.2	no	0.001
	Nitrobenzene	0.1	U	2	no	0.1
	Pentachlorophenol	5	U	100	no	5
	Selenium	0.0065	JB	1	no	0.1
	Silver	0.05	U	5	no	0.05
	Tetrachloroethene	0.05	U	0.7	no	0.05
	Trichloroethene	0.05	U	0.5	no	0.05
Vinyl chloride	0.05	U	0.2	no	0.05	

U: The analyte was not detected in the sample. The numeric value represents the sample LOQ.

J: The positive result for this analyte is a quantitative estimate below the laboratory LOQ.

B: The compound/analyte was not detected substantially above the level of the associated method

TCLP = Toxicity characteristic leaching procedure

LOQ = Limit of Quantitation

**Table 5 - Parcel B13
TCLP Results for Liquid IDW**

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance?	Flag	Laboratory LOQ (mg/L)
Water Disposal (2/2/17)	1,1-Dichloroethene	0.001	0.7	no	U	0.001
	1,2-Dichloroethane	0.001	0.5	no	U	0.001
	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
	2-Butanone (MEK)	0.01	200	no	U	0.01
	Arsenic	0.005	5	no	U	0.005
	Barium	0.0564	100	no		0.01
	Benzene	0.0019	0.5	no		0.001
	Cadmium	0.003	1	no	U	0.003
	Carbon tetrachloride	0.001	0.5	no	U	0.001
	Chlorobenzene	0.001	100	no	U	0.001
	Chloroform	0.00092	6	no	J	0.001
	Chromium	0.0021	5	no	J	0.005
	Lead	0.005	5	no	U	0.005
	Mercury	0.0002	0.2	no	U	0.0002
	Selenium	0.008	1	no	U	0.008
	Silver	0.006	5	no	U	0.006
	Tetrachloroethene	0.001	0.7	no	U	0.001
	Trichloroethene	0.001	0.5	no	U	0.001
Vinyl chloride	0.001	0.2	no	U	0.001	

J: The positive result reported for this analyte is a quantitative estimate below the laboratory PQL

U: The analyte was not detected in the sample. The numeric value represents the sample LOQ

TCLP: Toxicity Characterization Leaching Procedure

LOQ: Limit of Quantitation

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-001-SB-1	B13-001-SB-4	B13-002-SB-1*	B13-002-SB-8*	B13-003-SB-1	B13-003-SB-5	B13-004-SB-1
Metal									
Aluminum	mg/kg	1,100,000	26,800	21,000	21,100	29,500	35,400	37,500	18,100
Antimony	mg/kg	470	2.7 UJ	2.7 UJ	2.6 U	2.8 U	2.8 UJ	2.7 UJ	2.6 UJ
Arsenic	mg/kg	3	2.5	2.3 U	4.7	2.3 U	2.2 J	2.3 U	3.4
Barium	mg/kg	220,000	322 J	249 J	286	563	389	467	160 J
Beryllium	mg/kg	2,300	3.3	2.4	2.2	2.9	4.5	5.1	3.4
Cadmium	mg/kg	980	0.66 B	0.86 B	0.47 JB	0.45 JB	0.57 B	0.38 B	0.52 B
Chromium	mg/kg	120,000	298 J	487 J	448	480	172	115	68.5 J
Chromium VI	mg/kg	6.3	0.4 B	0.27 B	0.48 JB	0.39 JB	0.31 B	0.36 B	0.33 B
Cobalt	mg/kg	350	10.9 J	12.2 J	6.1	5.8	4.9	5	2.4 J
Copper	mg/kg	47,000	34 J	39.6 J	36.9	22.9	13.5	10.2	7.9 J
Iron	mg/kg	820,000	98,200	129,000	138,000	83,900	59,300	41,300	84,700
Lead	mg/kg	800	42.3 J	82.4 J	19.4	17.3	20.7	11.3	28.8 J
Manganese	mg/kg	26,000	7,220	13,900	11,900	20,900	7,710	4,980	3,580
Mercury	mg/kg	350	0.0031 J-	0.03 J-	0.0049 J	0.0021 J	0.0031 J	0.0057 J	0.0046 J-
Nickel	mg/kg	22,000	96 J	90.9 J	42.2	31	27.7	67.1	11.1 J
Selenium	mg/kg	5,800	2.2 B	2.7 B	3.4 U	3.7 U	3.4 B	3.6 U	2.8 B
Silver	mg/kg	5,800	2.7 U	2.7 U	2.6 U	2.8 U	2.8 U	2.7 U	2.6 U
Thallium	mg/kg	12	9.1 UJ	9 UJ	8.5 U	9.2 U	9.2 U	9 U	8.7 UJ
Vanadium	mg/kg	5,800	479	598	442	2,200	309	172	39.6
Zinc	mg/kg	350,000	126 J	288 J	66.4	46.1	50.7 J	19.6 J	47.9 J
Other									
Cyanide	mg/kg	150	1.2	0.78	1.2	0.56 J	0.97 J-	0.7 J-	1.1

Detection in bold

N/A indicates that the parameter was not analyzed for this sample

* indicates non-validated data results

Value in red indicate an exceedance of the Project Action Limit (PAL)

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

UJ: This analyte was not detected in the sample. The quantitation/detection limit may be higher than reported.

B: The analyte was not detected substantially above the level of the associated method blank or field blank.

J+: The positive result for this analyte is a quantitative estimate, but may be biased high.

J-: The positive result for this analyte is a quantitative estimate, but may be biased low.

J: The positive result for this analyte is a quantitative estimate.

R: The result for this analyte is unreliable.

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-004-SB-4	B13-004-SB-10	B13-005-SB-1	B13-005-SB-4	B13-006-SB-1*	B13-006-SB-4*	B13-007-SB-1*
Metal									
Aluminum	mg/kg	1,100,000	39,600	N/A	11,700	38,000	19,000	9,290	14,400
Antimony	mg/kg	470	2.6 UJ	N/A	2.6 UJ	2.7 UJ	2.8 U	2.8 U	2.6 U
Arsenic	mg/kg	3	3.5	1.9	3.9	2.2 U	2.3 U	4.1	4.4
Barium	mg/kg	220,000	675 J	N/A	185 J	548 J	53	132	190
Beryllium	mg/kg	2,300	4.5	N/A	0.89	4.7	0.49 J	0.35 J	1.9
Cadmium	mg/kg	980	0.37 B	N/A	3.4	0.48 B	0.8 JB	0.77 JB	5.8
Chromium	mg/kg	120,000	76.9 J	N/A	705 J	180 J	1,090	837	117
Chromium VI	mg/kg	6.3	0.3 B	N/A	0.39 B	0.35 B	1.3 B	0.64 JB	0.51 JB
Cobalt	mg/kg	350	2.9 J	N/A	5.6 J	4.6 J	2.8 J	34.2	6.7
Copper	mg/kg	47,000	20.5 J	N/A	60.8 J	13.8 J	30	99.1	35.6
Iron	mg/kg	820,000	21,400	N/A	169,000	44,500	172,000	162,000	122,000
Lead	mg/kg	800	12.4 J	N/A	126 J	33.3 J	37.8	47.8	183
Manganese	mg/kg	26,000	8,400	N/A	18,600	9,650	26,800	34,700	4,800
Mercury	mg/kg	350	0.11 UJ	N/A	0.025 J-	0.0022 J-	0.02 J	0.024 J	0.028 J
Nickel	mg/kg	22,000	4.2 J	N/A	31.2 J	12.1 J	20.4	20.5	50.2
Selenium	mg/kg	5,800	4.4	N/A	3.5 U	6.3	3.7 U	3.7 U	3.5 U
Silver	mg/kg	5,800	2.6 U	N/A	2.6 U	2.7 U	2.8 U	2.8 U	2.6 U
Thallium	mg/kg	12	8.5 UJ	N/A	8.8 UJ	9 UJ	9.2 U	9.2 U	8.8 U
Vanadium	mg/kg	5,800	433	N/A	1,270	685	491	2,190	103
Zinc	mg/kg	350,000	19.2 J	N/A	892 J	81.4 J	122	104	259
Other									
Cyanide	mg/kg	150	0.6	N/A	3.4	0.77	0.57	0.59	0.49 J

Detection in bold

N/A indicates that the parameter was not analyzed for this sample

* indicates non-validated data results

Value in red indicate an exceedance of the Project Action Limit (PAL)

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J-: The positive result for this analyte is a quantitative estimate, but may be biased low.

J: The positive result for this analyte is a quantitative estimate.

R: The result for this analyte is unreliable.

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-007-SB-4*	B13-008-SB-1*	B13-008-SB-4*	B13-009-SB-1*	B13-009-SB-4*	B13-009-SB-10*	B13-010-SB-1
Metal									
Aluminum	mg/kg	1,100,000	36,200	36,500	48,100	19,100	25,500	N/A	12,900
Antimony	mg/kg	470	2.7 U	2.8 U	2.8 U	2.6 U	3 U	N/A	2.6 UJ
Arsenic	mg/kg	3	2.2 U	2.3	2.4 U	2.1 U	6.5	2.1 U	2.2 U
Barium	mg/kg	220,000	362	384	878	192	527	N/A	68 J
Beryllium	mg/kg	2,300	4.1	5.9	2.4	2.1	2.6	N/A	0.88 U
Cadmium	mg/kg	980	0.48 JB	0.63 JB	0.46 JB	0.38 JB	2.5	N/A	0.58 J
Chromium	mg/kg	120,000	43.1	252	109	922	161	N/A	1,110
Chromium VI	mg/kg	6.3	0.38 JB	0.35 JB	0.32 JB	0.67 JB	0.35 JB	N/A	4.1 J-
Cobalt	mg/kg	350	1 J	2.1 J	7.8	4.3 U	8.3	N/A	4.4 U
Copper	mg/kg	47,000	11	22.5	55.3	101	70	N/A	18.4 J
Iron	mg/kg	820,000	16,400	62,200	45,100	137,000	28,300	N/A	187,000
Lead	mg/kg	800	4.9	40.9	16.6	10.6	292	N/A	13.1
Manganese	mg/kg	26,000	4,280	7,960	3,060	23,600	7,980	N/A	29,000
Mercury	mg/kg	350	0.11 U	0.12 U	0.12 U	0.098 U	0.13 U	N/A	0.045 J
Nickel	mg/kg	22,000	6.1 J	23.8	32.9	13.2	44	N/A	15.3 J
Selenium	mg/kg	5,800	5.2	3.7 U	5.1	3.4 U	2.5 J	N/A	3.5 U
Silver	mg/kg	5,800	2.7 U	2.8 U	2.8 U	1.2 J	3 U	N/A	1.8 J
Thallium	mg/kg	12	8.8 U	9.2 U	9.5 U	7.1 J	5.1 J	N/A	9.6
Vanadium	mg/kg	5,800	133	121	89.8	565	361	N/A	655
Zinc	mg/kg	350,000	13.2	270	35.4	105	1,200	N/A	279 J
Other									
Cyanide	mg/kg	150	0.36 J	0.49 J	1.5	0.28 J	3.8	N/A	0.18 B

Detection in bold

N/A indicates that the parameter was not analyzed for this sample

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R: The result for this analyte is unreliable.

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-010-SB-8	B13-010-SB-10*	B13-011-SB-1	B13-011-SB-8	B13-011-SB-10*	B13-012-SB-1	B13-012-SB-4
Metal									
Aluminum	mg/kg	1,100,000	10,200	N/A	13,600	9,660	N/A	5,980	16,600
Antimony	mg/kg	470	2.8 UJ	N/A	2.5 UJ	2.6 UJ	N/A	2.4 UJ	2.3 UJ
Arsenic	mg/kg	3	2.3 U	N/A	2.1 U	2.2 U	N/A	8.4	5.7
Barium	mg/kg	220,000	37.6 J	N/A	78.6 J	106 J	N/A	45.2 J	62.1 J
Beryllium	mg/kg	2,300	0.21 J	N/A	0.83 U	0.88 U	N/A	0.66 J	0.27 J
Cadmium	mg/kg	980	0.74 J	N/A	0.82 J	0.51 J	N/A	0.44 J	0.39 J
Chromium	mg/kg	120,000	945	N/A	1,000	1,060	N/A	287	1,430
Chromium VI	mg/kg	6.3	0.31 B	N/A	2.9 J-	1 J-	N/A	0.74 B	0.74 B
Cobalt	mg/kg	350	4.6 U	N/A	4.2 U	1.7 J	N/A	4.2	6.3
Copper	mg/kg	47,000	14.6 J	N/A	22 J	30.5 J	N/A	55.3 J	35.6 J
Iron	mg/kg	820,000	175,000	N/A	167,000	148,000	N/A	153,000	247,000
Lead	mg/kg	800	37.4	N/A	28.3	6	N/A	33	6.9
Manganese	mg/kg	26,000	32,400	5,470	24,500	26,600	2,120	6,470	27,000
Mercury	mg/kg	350	0.043 J	N/A	0.011 J	0.0051 J	N/A	0.031 J	0.014 J
Nickel	mg/kg	22,000	17.2 J	N/A	16.5 J	31.9 J	N/A	67 J	35.4 J
Selenium	mg/kg	5,800	3.7 U	N/A	3.3 U	3.5 U	N/A	3.2 U	3 U
Silver	mg/kg	5,800	1.9 J	N/A	1.6 J	1.4 J	N/A	1.6 J	3.6
Thallium	mg/kg	12	7.2 J	N/A	8.6	7.1 J	N/A	8 U	4.7 J
Vanadium	mg/kg	5,800	430	N/A	556	497	N/A	208	346
Zinc	mg/kg	350,000	85.3 J	N/A	299 J	40.7 J	N/A	84.5 J	17.7 J
Other									
Cyanide	mg/kg	150	1.7 J+	N/A	0.46 B	2.7 J+	N/A	0.83 J+	0.47 B

Detection in bold

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-012-SB-10*	B13-013-SB-1	B13-013-SB-5	B13-013-SB-10*	B13-014-SB-1	B13-014-SB-8	B13-014-SB-10*
Metal									
Aluminum	mg/kg	1,100,000	N/A	7,800	4,370	N/A	12,900	42,300	N/A
Antimony	mg/kg	470	N/A	2.7 UJ	2.2 UJ	N/A	2.8 UJ	2.7 UJ	N/A
Arsenic	mg/kg	3	12.2	12.1	10.1	15.8	3.2	3.7	5.1
Barium	mg/kg	220,000	N/A	92.8 J	34.7 J	N/A	149 J	599 J	N/A
Beryllium	mg/kg	2,300	N/A	0.88 J	0.41 J	N/A	1.8	2.3	N/A
Cadmium	mg/kg	980	N/A	0.62 J	0.67 J	N/A	0.4 J	0.44 J	N/A
Chromium	mg/kg	120,000	N/A	228	367	N/A	206	359	N/A
Chromium VI	mg/kg	6.3	N/A	0.69 B	0.29 B	N/A	0.49 B	0.31 B	N/A
Cobalt	mg/kg	350	N/A	11.2	8.9	N/A	4 J	11.2	N/A
Copper	mg/kg	47,000	N/A	117 J	129 J	N/A	17.2 J	122 J	N/A
Iron	mg/kg	820,000	N/A	236,000	182,000	N/A	122,000	20,300	N/A
Lead	mg/kg	800	N/A	127	75.1	N/A	19.4	5.6	N/A
Manganese	mg/kg	26,000	7,830	3,490	1,860	N/A	4,830	2,590	N/A
Mercury	mg/kg	350	N/A	0.04 J	0.13	N/A	0.024 J	0.0032 J	N/A
Nickel	mg/kg	22,000	N/A	193 J	185 J	N/A	41.9 J	62.5 J	N/A
Selenium	mg/kg	5,800	N/A	2.2 J	2.9 U	N/A	3.7 U	6.3	N/A
Silver	mg/kg	5,800	N/A	2.9	3	N/A	1 J	2.7 U	N/A
Thallium	mg/kg	12	N/A	9 U	7.3 U	N/A	9.3 U	8.9 U	N/A
Vanadium	mg/kg	5,800	N/A	96.1	38.5	N/A	139	25.4	N/A
Zinc	mg/kg	350,000	N/A	118 J	103 J	N/A	107 J	6.9 J	N/A
Other									
Cyanide	mg/kg	150	N/A	1.2 J+	1 J+	N/A	5 J+	1.5 J+	N/A

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-015-SB-1	B13-015-SB-9	B13-016-SB-1*	B13-016-SB-8*	B13-016-SB-10*	B13-017-SB-1*	B13-017-SB-4*
Metal									
Aluminum	mg/kg	1,100,000	9,670	39,800	19,200	28,000	N/A	38,900	22,400
Antimony	mg/kg	470	2.9 UJ	2.2 UJ	2.7	2.8 U	N/A	2.5 U	2.8 U
Arsenic	mg/kg	3	2.5 U	1.8 J	6.7	6.9	4.1	3.3	7.4
Barium	mg/kg	220,000	94.9 J	383 J	227	314	N/A	308	364
Beryllium	mg/kg	2,300	0.19 J	7.1	3.3	3.3	N/A	5.6	1.8
Cadmium	mg/kg	980	0.73 J	0.39 J	0.55 JB	0.88 JB	N/A	0.41 JB	0.65 JB
Chromium	mg/kg	120,000	1,010	12.7	101	135	N/A	13.2	215
Chromium VI	mg/kg	6.3	3 J-	0.31 B	0.39 JB	0.31 JB	N/A	0.51 JB	0.33 JB
Cobalt	mg/kg	350	4.9 U	1.4 J	6.1	14	N/A	3.7 J	19.4
Copper	mg/kg	47,000	14.7 J	5 J	37.8	45.1	N/A	8.1	36.8
Iron	mg/kg	820,000	172,000	16,900	86,200	53,400	N/A	20,500	90,100
Lead	mg/kg	800	65.4	31	56.6	145	N/A	22.6	66.8
Manganese	mg/kg	26,000	23,200	2,410	3,330	4,400	N/A	3,000	14,600
Mercury	mg/kg	350	0.027 J	0.11 U	0.027 J	0.12 U	N/A	0.0026 JB	0.042 J
Nickel	mg/kg	22,000	18 J	2.6 J	30.3	78.5	N/A	4.3 J	134
Selenium	mg/kg	5,800	3.9 U	4.6	3.6 U	3.7 U	N/A	3.3 U	3.8 U
Silver	mg/kg	5,800	1.5 J	2.2 U	2.7 U	2.8 U	N/A	2.5 U	1.7 J
Thallium	mg/kg	12	9.2 J	7.4 U	9.1 U	9.3 U	N/A	8.2 U	9.4 U
Vanadium	mg/kg	5,800	690	39.7	182	164	N/A	36.4	206
Zinc	mg/kg	350,000	248 J	26.4 J	134	181	N/A	49.8	138
Other									
Cyanide	mg/kg	150	0.85 J+	0.26 B	2.1	2.4	N/A	0.37 J	1.6

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-017-SB-10*	B13-018-SB-1*	B13-018-SB-9*	B13-019-SB-1*	B13-019-SB-4*	B13-020-SB-1	B13-020-SB-9
Metal									
Aluminum	mg/kg	1,100,000	N/A	7,160	37,800	10,600	30,300	30,500	42,000
Antimony	mg/kg	470	N/A	2.2 U	2.3 U	2.6 U	2.2 U	2.9 UJ	2.7 UJ
Arsenic	mg/kg	3	5.2	6.4	1.9 U	3.9	5.5	2.5 UJ	2.3 UJ
Barium	mg/kg	220,000	N/A	102	573	91.3	635	177 J	381 J
Beryllium	mg/kg	2,300	N/A	0.81	4.3	0.55 J	2.7	1	5.8
Cadmium	mg/kg	980	N/A	0.78 JB	0.3 JB	0.89 JB	1.4 B	0.71 B	0.42 B
Chromium	mg/kg	120,000	N/A	343	15.7	701	369	1,260	204
Chromium VI	mg/kg	6.3	N/A	0.48 JB	0.31 JB	0.38 JB	0.49 JB	0.33 B	0.26 B
Cobalt	mg/kg	350	N/A	3.3 J	1.2 J	1.9 J	50.5	0.3 J	28.1
Copper	mg/kg	47,000	N/A	25.8	19.1	25.5	316	7.9	9.9
Iron	mg/kg	820,000	N/A	160,000	9,390	178,000	66,100	128,000 J	33,000 J
Lead	mg/kg	800	N/A	39.1	450	47.2	190	13	7.7
Manganese	mg/kg	26,000	N/A	8,620	3,730	16,500	6,550	38,900	3,310
Mercury	mg/kg	350	N/A	0.068 J	0.11 U	0.035 J	0.11 U	0.0044 J	0.1 U
Nickel	mg/kg	22,000	N/A	35	1.8 JB	28	326	10.9 J	159 J
Selenium	mg/kg	5,800	N/A	3 U	2.1 J	3.5 U	2.9 U	3.9 U	4.3
Silver	mg/kg	5,800	N/A	2.1 J	2.3 U	2.6	2.2 U	2.9 UJ	2.7 UJ
Thallium	mg/kg	12	N/A	7.5 U	7.6 U	4.2 J	7.4 U	9.8 UJ	9 UJ
Vanadium	mg/kg	5,800	N/A	185	83.5	429	271	357	101
Zinc	mg/kg	350,000	N/A	142	23.1	282	340	70.8 J	18.1 J
Other									
Cyanide	mg/kg	150	N/A	1.9	4	0.96	0.98	4.5	0.71

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Table 7
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Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-021-SB-1	B13-021-SB-9	B13-022-SB-1*	B13-022-SB-4*	B13-022-SB-10	B13-023-SB-1*	B13-023-SB-4*
Metal									
Aluminum	mg/kg	1,100,000	24,300	40,600	38,900	22,600	N/A	6,620	50,300
Antimony	mg/kg	470	2.6 UJ	2.8 UJ	2.6 U	2.6 U	N/A	2.5 U	2.7 U
Arsenic	mg/kg	3	2.2 UJ	2.5 J	2.2 U	13.4	1.9	2.6	2.3 U
Barium	mg/kg	220,000	232 J	363 J	563	241	N/A	96.7	623
Beryllium	mg/kg	2,300	3.8	6.4	4.7	2.8	N/A	0.68 J	5
Cadmium	mg/kg	980	0.54 B	0.26 B	0.32 JB	0.53 JB	N/A	0.81 JB	0.41 JB
Chromium	mg/kg	120,000	135	23.2	21.1	129	N/A	155	17.5
Chromium VI	mg/kg	6.3	0.3 B	0.31 B	0.31 JB	0.4 JB	N/A	0.38 JB	0.31 JB
Cobalt	mg/kg	350	1.7 J	2.1 J	1.4 J	11.3	N/A	3.4 J	2.4 J
Copper	mg/kg	47,000	74.2	4.8	6.2	51.2	N/A	27.1	8
Iron	mg/kg	820,000	45,100 J	17,200 J	13,900	120,000	N/A	82,500	16,800
Lead	mg/kg	800	11	6.6	4.3	38.5	N/A	45.4	2.3 U
Manganese	mg/kg	26,000	8,050	2,440	5,820	4,350	N/A	4,100	7,440
Mercury	mg/kg	350	0.01 J	0.1 U	0.0049 J	0.005 J	N/A	0.015 J	0.11 U
Nickel	mg/kg	22,000	12.6 J	7 J	3.5 J	57.1	N/A	31.5	6.4 J
Selenium	mg/kg	5,800	2.5 J	2.6 J	3.5 U	2.1 J	N/A	3.4 U	3.7 U
Silver	mg/kg	5,800	2.6 UJ	2.8 UJ	2.6 U	2.6 U	N/A	2.5 U	2.7 U
Thallium	mg/kg	12	8.8 UJ	9.2 UJ	8.7 U	8.7 U	N/A	8.5 U	9.1 U
Vanadium	mg/kg	5,800	161	37	26.7	196	N/A	96.6	50.9
Zinc	mg/kg	350,000	34.2 J	9.4 J	11.9	97.3	N/A	208	4.3 JB
Other									
Cyanide	mg/kg	150	0.49 J	0.84	0.94	0.32 J	N/A	1.2	0.62

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-024-SB-1	B13-024-SB-7	B13-024-SB-10	B13-025-SB-1	B13-025-SB-5	B13-025-SB-10	B13-026-SB-1*
Metal									
Aluminum	mg/kg	1,100,000	5,610	3,930	N/A	6,100	6,750	N/A	8,990
Antimony	mg/kg	470	2.7 UJ	2.7 UJ	N/A	2.3 UJ	2.4 UJ	N/A	2.8 U
Arsenic	mg/kg	3	6.8 J	6.3 J	10.4	1.9 U	8 J	9.3	2.3 U
Barium	mg/kg	220,000	48.8	201	N/A	28.5	80.1	N/A	31.6
Beryllium	mg/kg	2,300	0.45 J	0.38 J	N/A	0.77 U	0.63 J	N/A	0.92 U
Cadmium	mg/kg	980	0.45 B	0.56 B	N/A	0.43 B	0.42 B	N/A	0.61 JB
Chromium	mg/kg	120,000	496 J	263 J	N/A	1,110 J	81.7 J	N/A	1,240
Chromium VI	mg/kg	6.3	0.5 B	0.55 B	N/A	2.4 J-	0.29 B	N/A	0.97 JB
Cobalt	mg/kg	350	4.3 J	10.6	N/A	3.8 U	4	N/A	0.34 J
Copper	mg/kg	47,000	25.7 J	40.3 J	N/A	11.8 J	26.8 J	N/A	16.3
Iron	mg/kg	820,000	198,000 J	177,000 J	N/A	146,000 J	148,000 J	N/A	193,000
Lead	mg/kg	800	7.9	18.4	N/A	4.1	12.7	N/A	8.1
Manganese	mg/kg	26,000	12,000	8,010	N/A	31,600	2,920	N/A	28,100
Mercury	mg/kg	350	0.0087 J-	0.1 R	N/A	0.019 J-	0.014 J-	N/A	0.005 J
Nickel	mg/kg	22,000	75.7 J	80.8 J	N/A	14.9 J	21.2 J	N/A	22.2
Selenium	mg/kg	5,800	3.7 U	3.5 U	N/A	3.1 U	3.2 U	N/A	3.7 U
Silver	mg/kg	5,800	2.6 J	2.3 J	N/A	2.9	2 J	N/A	2.8 U
Thallium	mg/kg	12	9.1 U	8.9 U	N/A	7.7	7.9 U	N/A	6.4 J
Vanadium	mg/kg	5,800	356 J	142 J	N/A	576 J	94.9 J	N/A	565
Zinc	mg/kg	350,000	81.4 J	146 J	N/A	1.9 B	54.3 J	N/A	55.7
Other									
Cyanide	mg/kg	150	0.28 J+	0.31 J+	N/A	0.15 J+	1.5 J+	N/A	0.41 JB

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Parameter	Units	PAL	B13-026-SB-5*	B13-026-SB-10*	B13-027-SB-1	B13-027-SB-4	B13-028-SB-1	B13-028-SB-5	B13-028-SB-10
Metal									
Aluminum	mg/kg	1,100,000	4,860	N/A	1,090 J	45,500 J	48,600 J	41,000 J	N/A
Antimony	mg/kg	470	2.7 U	N/A	2.8 U	2.3 U	2.3 U	2.6 U	N/A
Arsenic	mg/kg	3	23.1	7.4	13.9	2.8	3.2	34.6	5.1
Barium	mg/kg	220,000	77.9	N/A	63.7 J	419 J	776 J	573 J	N/A
Beryllium	mg/kg	2,300	0.31 J	N/A	0.94 U	7.6	7.7	6.7	N/A
Cadmium	mg/kg	980	0.57 JB	N/A	0.67 B	0.24 B	0.16 B	0.61 B	N/A
Chromium	mg/kg	120,000	654	N/A	293	26.4	38.3	76.3	N/A
Chromium VI	mg/kg	6.3	5.5	N/A	1.2 UJ	0.3 B	0.29 B	0.3 B	N/A
Cobalt	mg/kg	350	6.5	N/A	3.5 J	0.54 J	1.1 J	13.5	N/A
Copper	mg/kg	47,000	55.1	N/A	99.1 J	7.1 J	8.7 J	40 J	N/A
Iron	mg/kg	820,000	187,000	N/A	508,000 J	31,800 J	26,000 J	98,800 J	N/A
Lead	mg/kg	800	27.2	N/A	2.3 U	5.3	5.8	10.9	N/A
Manganese	mg/kg	26,000	17,700	N/A	7,370	3,320	4,250	10,900	N/A
Mercury	mg/kg	350	0.0077 J	N/A	0.11 U	0.1 U	0.1 U	0.1 U	N/A
Nickel	mg/kg	22,000	93.8	N/A	87.7 J	4.4 J	5.9 B	37.6 J	N/A
Selenium	mg/kg	5,800	3.6 U	N/A	3.8 U	4.3	3.1 U	3.5 U	N/A
Silver	mg/kg	5,800	2.7 U	N/A	8.6	2.3 U	2.3 U	2.6 U	N/A
Thallium	mg/kg	12	6.2 J	N/A	9.4 U	7.6 U	7.8 U	8.7 U	N/A
Vanadium	mg/kg	5,800	480	N/A	56.3 J	17.6 J	44.5 J	52.2 J	N/A
Zinc	mg/kg	350,000	108	N/A	9	9.4	28.8	35	N/A
Other									
Cyanide	mg/kg	150	1	N/A	0.66 U	0.81	1.3	2.2	N/A

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-029-SB-1	B13-029-SB-8	B13-029-SB-10	B13-030-SB-1*	B13-030-SB-5*	B13-030-SB-10*	B13-031-SB-1
Metal									
Aluminum	mg/kg	1,100,000	5,490	17,300	N/A	8,690	31,600	N/A	6,080
Antimony	mg/kg	470	2.6 UJ	2.8 UJ	N/A	3.1 U	2.8 U	N/A	2 UJ
Arsenic	mg/kg	3	7.5 J	39.6 J	9	4.4	3.7	8.5	896 J
Barium	mg/kg	220,000	152	464	N/A	150	353	N/A	802
Beryllium	mg/kg	2,300	0.31 J	2.7	N/A	1.2	4.3	N/A	0.52 J
Cadmium	mg/kg	980	1 B	4.9	N/A	2.4 B	0.52 JB	N/A	5.3
Chromium	mg/kg	120,000	337 J	137 J	N/A	291	137	N/A	432 J
Chromium VI	mg/kg	6.3	1 J-	0.23 B	N/A	0.56 JB	0.34 JB	N/A	1.6 J-
Cobalt	mg/kg	350	6.7	4.4 J	N/A	5.5	3.9 J	N/A	71.4
Copper	mg/kg	47,000	71.5 J	103 J	N/A	134	121	N/A	618 J
Iron	mg/kg	820,000	251,000 J	83,100 J	N/A	226,000	111,000	N/A	183,000 J
Lead	mg/kg	800	79.5	716	N/A	74.1	48.6	N/A	371
Manganese	mg/kg	26,000	8,520	5,570	N/A	7,520	5,250	N/A	152,000
Mercury	mg/kg	350	0.39 J-	0.12	N/A	0.021 J	0.0096 J	N/A	0.003 J-
Nickel	mg/kg	22,000	83.2 J	15.2 J	N/A	61	31.2	N/A	337 J
Selenium	mg/kg	5,800	3.5 U	4.6	N/A	4.2 U	3.8 U	N/A	2.7 U
Silver	mg/kg	5,800	3.3	5.6	N/A	3.1 U	2.8 U	N/A	26.6
Thallium	mg/kg	12	8.6 U	9.7	N/A	10.4 U	9.4 U	N/A	43
Vanadium	mg/kg	5,800	213 J	409 J	N/A	154	82.5	N/A	259 J
Zinc	mg/kg	350,000	124 J	5,900 J	N/A	1,900	136	N/A	236 J
Other									
Cyanide	mg/kg	150	0.33 J+	2.4 J+	N/A	0.47 JB	0.79	N/A	0.67 J+

Detection in bold

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-031-SB-5	B13-032-SB-1	B13-032-SB-5	B13-032-SB-10	B13-033-SB-1	B13-033-SB-8	B13-034-SB-1*
Metal									
Aluminum	mg/kg	1,100,000	9,210	25,900	24,300	N/A	47,200 J	50,300 J	30,400
Antimony	mg/kg	470	3.1 UJ	2.9 UJ	2.4 U	N/A	2.4 U	2.6 U	2.1 U
Arsenic	mg/kg	3	2.8 J	5.2 J	7.4 J	3.4	2 UJ	2.1 J	1.8 U
Barium	mg/kg	220,000	23.8	337	283	N/A	645 J	615 J	400
Beryllium	mg/kg	2,300	1 U	3.8	3.7	N/A	8.5	7.6	4.8
Cadmium	mg/kg	980	0.58 B	0.54 B	0.52 B	N/A	0.27 B	0.26 B	0.32 JB
Chromium	mg/kg	120,000	990 J	248 J	237 J	N/A	30	34.1	396
Chromium VI	mg/kg	6.3	0.62 B	0.29 B	0.37 B	N/A	0.3 B	0.31 B	0.29 JB
Cobalt	mg/kg	350	3.6 J	2.4 J	4	N/A	0.97 J	1.4 J	0.93 J
Copper	mg/kg	47,000	187 J	60.3 J	98.9 J	N/A	5.5 J	8.9 J	16.6
Iron	mg/kg	820,000	269,000 J	81,100 J	191,000 J	N/A	18,700 J	23,600 J	82,300
Lead	mg/kg	800	5.2	6	43.9	N/A	7.1	9.4	6.6
Manganese	mg/kg	26,000	22,500	8,600	5,210	N/A	3,210	3,370	15,300
Mercury	mg/kg	350	0.0085 J-	0.13 R	0.11 R	N/A	0.11 U	0.11 U	0.0051 J
Nickel	mg/kg	22,000	59.3 J	34.1 J	57.3 J	N/A	4 B	5.4 B	16.6
Selenium	mg/kg	5,800	4.2 U	3.9 U	6	N/A	2.3 J	2.4 J	1.7 JB
Silver	mg/kg	5,800	3.6	2.9 U	2 J	N/A	2.4 U	2.6 U	2.1 U
Thallium	mg/kg	12	5.5 J	9.7 U	7.9 U	N/A	8 U	8.5 U	3.5 J
Vanadium	mg/kg	5,800	593 J	142 J	78.3 J	N/A	22.1 J	29.1 J	247
Zinc	mg/kg	350,000	6.4 J	48 J	56.7 J	N/A	25.6	23.5	42.1
Other									
Cyanide	mg/kg	150	0.097 J+	0.58 J+	3.3 J+	N/A	1.1	0.99	1.4

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-034-SB-9*	B13-035-SB-1	B13-035-SB-7	B13-036-SB-1	B13-036-SB-5	B13-037-SB-1	B13-037-SB-4
Metal									
Aluminum	mg/kg	1,100,000	32,000	7,780	39,500	7,180	41,000	6,810	43,200
Antimony	mg/kg	470	2.4 U	2.4 UJ	2.4 UJ	2.7 UJ	2.8 UJ	3.7 UJ	2.3 UJ
Arsenic	mg/kg	3	2.2	6.1 J	3.2 J	13.9	2.3 U	10.1 J	2.2 J
Barium	mg/kg	220,000	307	192	348	105 J	307 J	63.5	402
Beryllium	mg/kg	2,300	5	0.46 J	6.1	1.2	6.8	0.79 J	7.1
Cadmium	mg/kg	980	0.32 JB	0.49 B	0.76 B	0.49 J	0.25 J	1.3 B	0.29 B
Chromium	mg/kg	120,000	67.6	699 J	24.7 J	98.3	15.2	490 J	26 J
Chromium VI	mg/kg	6.3	0.31 JB	1 UJ	0.35 B	0.41 B	0.3 B	0.39 B	0.3 B
Cobalt	mg/kg	350	1.2 J	5.5	2.5 J	8.5	4.6 U	2.8 J	0.64 J
Copper	mg/kg	47,000	7.9	125 J	189 J	32.2 J	1.8 J	46.9 J	5.2 J
Iron	mg/kg	820,000	32,800	295,000 J	22,800 J	204,000	6,650	147,000 J	25,000 J
Lead	mg/kg	800	18.5	25.7	116	23.2	4.8	85.7	3.6
Manganese	mg/kg	26,000	5,710	14,400	2,640	4,250	1,600	11,400	3,410
Mercury	mg/kg	350	0.11 U	0.1 R	0.013 J-	0.076 J	0.003 J	0.13 R	0.023 J-
Nickel	mg/kg	22,000	6.2 J	81.4 J	7.8 J	94.9 J	3.8 J	42.2 J	4 J
Selenium	mg/kg	5,800	3.3 U	3.3 U	2.7 J	3.6 U	3.3 J	4.9 U	3 U
Silver	mg/kg	5,800	2.4 U	4.4	2.4 U	2.5 J	2.8 U	1.9 J	2.3 U
Thallium	mg/kg	12	8.1 U	5.3 J	8.1 U	9.1 U	9.2 U	5.8 J	7.6 U
Vanadium	mg/kg	5,800	93.9	440 J	22.8 J	61	16.7	372 J	17.7 J
Zinc	mg/kg	350,000	41.7	86.7 J	170 J	77.3 J	12.2 J	371 J	6.6 J
Other									
Cyanide	mg/kg	150	0.84	1 J+	1.6 J+	0.43 B	4.1 J+	2.3 J+	1.2 J+

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-038-SB-1	B13-038-SB-5	B13-039-SB-1	B13-039-SB-4	B13-040-SB-1	B13-040-SB-5	B13-040-SB-10
Metal									
Aluminum	mg/kg	1,100,000	5,880	6,040	27,000	3,850	18,300	16,800	N/A
Antimony	mg/kg	470	2.6 UJ	2.8 UJ	2.7 UJ	2.6 UJ	2.6 UJ	2.7 UJ	N/A
Arsenic	mg/kg	3	2.1 U	2.4 U	2.3 U	2.2 U	16	3.3	16.3
Barium	mg/kg	220,000	145	36.5	62.5 J	41.1 J	277	250	N/A
Beryllium	mg/kg	2,300	0.85 U	0.94 U	0.91 U	0.86 U	2.5	1.8	N/A
Cadmium	mg/kg	980	0.47 B	0.39 B	0.37 B	0.36 B	0.37 B	0.62 B	N/A
Chromium	mg/kg	120,000	954 J	1,280 J	873	862	141	209	N/A
Chromium VI	mg/kg	6.3	17.9 J-	27 J-	4.3 J-	0.6 J-	0.34 B	0.47 B	N/A
Cobalt	mg/kg	350	1 J	4.7 U	4.5 U	4.3 U	7.6	7	N/A
Copper	mg/kg	47,000	38.5	6.8	8.4 J	12.6 J	46.2	27.7	N/A
Iron	mg/kg	820,000	156,000	87,700	147,000 J	169,000 J	78,300	91,600	N/A
Lead	mg/kg	800	14.8	3.8	2.3 UJ	10 J	36.6	52.1	N/A
Manganese	mg/kg	26,000	23,700	37,300	24,500	23,900	7,330	17,300	N/A
Mercury	mg/kg	350	0.012 J-	0.11 UJ	0.11 UJ	0.1 UJ	0.11 U	0.014 J	N/A
Nickel	mg/kg	22,000	33.5	4 J	9.6	8.6 J	50.2	88.8	N/A
Selenium	mg/kg	5,800	3.4 U	3.8 U	3.6 U	3.5 U	3.5 U	3.6 U	N/A
Silver	mg/kg	5,800	1.3 J	2.8 UJ	0.9 J	2.6 U	2.6 U	2.7 U	N/A
Thallium	mg/kg	12	10.4	21.3	9.1 U	8.6 U	8.8 U	9.1 U	N/A
Vanadium	mg/kg	5,800	720	1,570	776	502	297	479	N/A
Zinc	mg/kg	350,000	45.3 J	4.7 U	19.3 J	178 J	69.2 J	55.2 J	N/A
Other									
Cyanide	mg/kg	150	0.39 J-	0.69 UJ	0.11 J-	0.13 J-	1.1 J-	0.67 J-	N/A

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-041-SB-1	B13-041-SB-4	B13-042-SB-1	B13-042-SB-9	B13-043-SB-1*	B13-043-SB-4*	B13-043-SB-10
Metal									
Aluminum	mg/kg	1,100,000	25,300	23,600	9,370	33,600	3,160	22,000	N/A
Antimony	mg/kg	470	2.8 UJ	2.9 UJ	2.5 UJ	2.6 UJ	2.6 U	2.6 U	N/A
Arsenic	mg/kg	3	2.4 U	6.7	2.1 U	2.2 U	4.6	11.9	1.9 U
Barium	mg/kg	220,000	267	258	42.6	521	60.2	640	N/A
Beryllium	mg/kg	2,300	2.4	2.3	0.4 J	3.3	0.47 J	1.7	N/A
Cadmium	mg/kg	980	0.64 B	0.64 B	0.48 B	0.59 B	0.34 JB	3.1	N/A
Chromium	mg/kg	120,000	408	444	427	428	80.6	476	N/A
Chromium VI	mg/kg	6.3	0.36 B	0.36 B	1.9 J-	0.47 B	0.3 JB	0.49 JB	N/A
Cobalt	mg/kg	350	40.4	45.2	2.7 J	5	6.2	15.6	N/A
Copper	mg/kg	47,000	23.9	32	7.9	34.7	14.3	83.1	N/A
Iron	mg/kg	820,000	125,000	142,000	145,000	102,000	112,000	147,000	N/A
Lead	mg/kg	800	9.9	9.6	6.6	20.4	6.8	713	N/A
Manganese	mg/kg	26,000	13,100	14,900	10,900	15,300	3,220	20,400	N/A
Mercury	mg/kg	350	0.0066 J	0.0065 J	0.0065 J	0.005 J	0.014 J	0.004 J	N/A
Nickel	mg/kg	22,000	32.2	26.7	17.9	28.3	44.5	34.7	N/A
Selenium	mg/kg	5,800	2.4 B	3.9 U	3.4 U	2.5 B	3.5 U	2 JB	N/A
Silver	mg/kg	5,800	2.8 U	2.9 U	2.5 U	2.6 U	2.6 U	2.6 U	N/A
Thallium	mg/kg	12	9.4 U	9.7 U	8.4 U	8.7 U	8.8 U	8.5 U	N/A
Vanadium	mg/kg	5,800	308	366	270	1,690	56.9	3,240	N/A
Zinc	mg/kg	350,000	88.1 J	83.1 J	87.6 J	54.1 J	54.6	1,300	N/A
Other									
Cyanide	mg/kg	150	0.79 J-	0.36 J	0.19 J-	1.3 J-	0.39 J	5.3	N/A

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-044-SB-1	B13-044-SB-4	B13-045-SB-1	B13-045-SB-4	B13-046-SB-1*	B13-047-SB-1*	B13-047-SB-4*
Metal									
Aluminum	mg/kg	1,100,000	27,900	32,200	5,360	39,400	4,070	18,800	36,500
Antimony	mg/kg	470	2.7 UJ	2.8 UJ	3.3 UJ	2.3 UJ	2.3 U	2.7 U	2.8 U
Arsenic	mg/kg	3	2.5	2.3 U	3.4	2 U	7.8	13	6.7
Barium	mg/kg	220,000	427 J	668 J	98.1	511	81.1	496	671
Beryllium	mg/kg	2,300	2.8	3	0.5 J	4.5	0.55 J	2.1	4.4
Cadmium	mg/kg	980	0.95 B	0.46 B	0.3 B	0.24 J	0.36 JB	0.3 JB	0.37 JB
Chromium	mg/kg	120,000	379	123	218 J	20.6 J	115	53.6	65.4
Chromium VI	mg/kg	6.3	0.53 J-	0.55 J-	0.28 B	0.4 B	0.72 JB	0.46 JB	0.31 JB
Cobalt	mg/kg	350	1.6 J	3.7 J	2.8 J	0.55 J	14.6	3.5 J	10.8
Copper	mg/kg	47,000	30.4 J	19.4 J	15.7	7.3	20.5	16.9	22
Iron	mg/kg	820,000	71,500 J	52,000 J	55,200	47,900 J	187,000	165,000	65,200
Lead	mg/kg	800	47.5 J	24.6 J	17.6	3.4	7.1	6	2.4 U
Manganese	mg/kg	26,000	14,000	9,080	5,050	5,060	3,680	5,130	6,860
Mercury	mg/kg	350	0.021 J-	0.01 J-	0.01 J-	0.11 UJ	0.0072 J	0.098 U	0.11 U
Nickel	mg/kg	22,000	13.6	9.3	17	2.9 J	272	16.4	18.3
Selenium	mg/kg	5,800	3.6 U	3.7 U	4.4 U	3.6	3.1 U	3.6 U	3.8 U
Silver	mg/kg	5,800	2.7 U	2.8 U	3.3 UJ	2.3 U	2.7	1.3 J	2.8 U
Thallium	mg/kg	12	9 U	9.3 U	11.1 U	7.8 U	7.7 U	9 U	8.6 J
Vanadium	mg/kg	5,800	1,020	495	125	75.7 J	65.2	158	648
Zinc	mg/kg	350,000	241 J	90.8 J	142 J	4.2	33.5	37.8	4.7 U
Other									
Cyanide	mg/kg	150	4.1 J-	3.6 J-	0.74 J-	0.34 J-	0.14 J	0.62	1.9

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
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Parameter	Units	PAL	B13-047-SB-10*	B13-048-SB-1	B13-048-SB-7	B13-049-SB-1	B13-049-SB-5	B13-049-SB-10	B13-050-SB-1
Metal									
Aluminum	mg/kg	1,100,000	N/A	4,550	40,900	25,900	33,900	N/A	4,890
Antimony	mg/kg	470	N/A	1.7 UJ	2.7 UJ	2.6 UJ	2.7 UJ	N/A	2.2 J
Arsenic	mg/kg	3	2.2 U	9.9	3.4	9.6	6.2	2 U	14.1 J
Barium	mg/kg	220,000	N/A	52.6	620	510	897	N/A	63.2
Beryllium	mg/kg	2,300	N/A	0.59 J	4	2.4	3.4	N/A	0.62 J
Cadmium	mg/kg	980	N/A	0.22 B	0.34 B	0.77 B	0.5 B	N/A	0.2 B
Chromium	mg/kg	120,000	N/A	91.1	99.3	124	198	N/A	36.1 J
Chromium VI	mg/kg	6.3	N/A	0.37 B	0.36 B	2.5 J-	0.35 B	N/A	0.28 B
Cobalt	mg/kg	350	N/A	12.7	13.3	6.8	11.6	N/A	18.1
Copper	mg/kg	47,000	N/A	32.5	37.7	33.3	45.7	N/A	28.3
Iron	mg/kg	820,000	N/A	172,000	44,100	83,500	81,000	N/A	170,000
Lead	mg/kg	800	N/A	19.3	4.8	445	37.1	N/A	23.5 J
Manganese	mg/kg	26,000	N/A	2,720	8,350	6,430	11,900	N/A	5,900
Mercury	mg/kg	350	N/A	0.019 J	0.11 U	0.0025 J	0.0031 J	N/A	0.021 J
Nickel	mg/kg	22,000	N/A	29.2	60.6	19.6	18.7	N/A	39.5 J
Selenium	mg/kg	5,800	N/A	3.4 U	3.6 U	2.6 B	3.6 B	N/A	3.2 U
Silver	mg/kg	5,800	N/A	2.5 U	2.7 U	2.6 U	2.7 U	N/A	2.4 U
Thallium	mg/kg	12	N/A	8.4 U	9 U	8.6 U	9 U	N/A	8 U
Vanadium	mg/kg	5,800	N/A	207	562	241	627	N/A	48.9 J
Zinc	mg/kg	350,000	N/A	42.5 J	3.5 B	193 J	11.7 J	N/A	76.1 J
Other									
Cyanide	mg/kg	150	N/A	0.095 J	1 J-	1.3 J-	0.96 J-	N/A	1.3 J-

Detection in bold

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-050-SB-5	B13-051-SB-1*	B13-051-SB-7*	B13-052-SB-1	B13-052-SB-8	B13-053-SB-1*	B13-053-SB-4*
Metal									
Aluminum	mg/kg	1,100,000	36,000	5,980	39,100	3,100	45,000	3,100	29,200
Antimony	mg/kg	470	2.6 UJ	2.7 U	2.3 U	2.5 UJ	2.8 UJ	2.5 U	2.8 U
Arsenic	mg/kg	3	2.2 U	14.6	1.9 U	5.2	2.4 U	15.2	6.8
Barium	mg/kg	220,000	614	71	552	44.4 J	475 J	32.5	1,110
Beryllium	mg/kg	2,300	2.9	0.3 J	3.3	0.37 J	5.6	0.27 J	1.8
Cadmium	mg/kg	980	0.36 B	0.61 JB	0.25 JB	0.29 B	0.16 B	1.3 U	0.27 J
Chromium	mg/kg	120,000	27.1	566	32.7	44.8	29.6	140	221
Chromium VI	mg/kg	6.3	0.3 B	0.3 JB	0.31 JB	0.3 J-	0.32 J-	0.29 JB	0.36 JB
Cobalt	mg/kg	350	1.4 J	8.8	4.6	4.7	0.36 J	6.8	9.5
Copper	mg/kg	47,000	2.6 J	37.4	11.5	10.1 J	4.7 J	243	89.7
Iron	mg/kg	820,000	11,500	151,000	32,700	143,000 J	1,260 J	235,000	127,000
Lead	mg/kg	800	2.4	8.1	4.5	6.1 J	2.4 UJ	28.4	37.8
Manganese	mg/kg	26,000	8,880	13,700	6,940	2,240	9,060	1,900	7,180
Mercury	mg/kg	350	0.11 U	0.01 J	0.1 U	0.0081 J-	0.11 UJ	0.098 U	0.016 J
Nickel	mg/kg	22,000	1.7 J	36.9	4.5 J	58.6	9.4 U	185	21.5
Selenium	mg/kg	5,800	3.5 U	3.5 U	3 U	3.3 U	3.8 U	3.4 U	3.5 J
Silver	mg/kg	5,800	2.6 U	2.7 U	2.3 U	1.7 J	2.8 U	2.7	2.8 U
Thallium	mg/kg	12	8.7 U	7.8 J	7.5 U	8.3 U	9.4 U	8.4 U	12.8
Vanadium	mg/kg	5,800	317	775	169	24.6	19.1	18.5	1,110
Zinc	mg/kg	350,000	4.3 U	39.6	11.7	17.1 J	4.7 U	17.4	27.6
Other									
Cyanide	mg/kg	150	0.046 J	0.37 J	0.34 J	0.041 J-	0.13 J-	0.4 J	4.4

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-053-SB-10*	B13-054-SB-1	B13-054-SB-5	B13-054-SB-10	B13-055-SB-1*	B13-055-SB-9*	B13-056-SB-1*
Metal									
Aluminum	mg/kg	1,100,000	N/A	18,900 J	24,900 J	N/A	10,700	9,210	2,520
Antimony	mg/kg	470	N/A	3 U	3 U	N/A	2.1 U	2.6 U	2.4 U
Arsenic	mg/kg	3	2.8 U	3.9	8.4	46	9.5	6.2	2 U
Barium	mg/kg	220,000	N/A	164 J	242 J	N/A	122	239	31.1
Beryllium	mg/kg	2,300	N/A	2.3	4	N/A	0.92	1.5	0.8 U
Cadmium	mg/kg	980	N/A	0.82 B	1.3 B	N/A	0.36 JB	0.64 JB	0.4 JB
Chromium	mg/kg	120,000	N/A	403	84.4	N/A	771	829	220
Chromium VI	mg/kg	6.3	N/A	0.4 J	0.32 J	N/A	0.2 JB	0.29 JB	0.35 JB
Cobalt	mg/kg	350	N/A	0.85 J	2.3 J	N/A	4.6	3.5 J	37.9
Copper	mg/kg	47,000	N/A	17.6 J	36.5 J	N/A	70.3	130	10.9
Iron	mg/kg	820,000	N/A	67,900 J	94,700 J	N/A	268,000	139,000	46,500
Lead	mg/kg	800	N/A	87.5	228	N/A	27.5	14.7	2.8
Manganese	mg/kg	26,000	N/A	12,800	3,560	N/A	19,300	90,000	4,020
Mercury	mg/kg	350	N/A	0.055 J	0.083 J	N/A	0.0044 J	0.099 U	0.11 U
Nickel	mg/kg	22,000	N/A	10 J	11.5 J	N/A	44.7	29.8	865
Selenium	mg/kg	5,800	N/A	4 U	3.9 U	N/A	2.8 U	3.5 U	3.2 U
Silver	mg/kg	5,800	N/A	3 U	1.3 J	N/A	2.1 U	2.6 U	2.4 U
Thallium	mg/kg	12	6.4 J	7.7 J	9.9 U	N/A	5.8 J	14.3	3.5 J
Vanadium	mg/kg	5,800	N/A	644 J	95.1 J	N/A	459	1,230	264
Zinc	mg/kg	350,000	N/A	252	594	N/A	133	32.7	23.5
Other									
Cyanide	mg/kg	150	N/A	1.5	5.8	N/A	0.46 J	1.9	0.58 U

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-056-SB-5*	B13-056-SB-10*	B13-057-SB-1*	B13-057-SB-5*	B13-057-SB-10*	B13-058-SB-1*	B13-058-SB-7*
Metal									
Aluminum	mg/kg	1,100,000	36,500	N/A	4,500	24,500	N/A	17,300	4,020
Antimony	mg/kg	470	2.1 U	N/A	2.4 U	2.7 U	N/A	2.5 U	2.4 U
Arsenic	mg/kg	3	7	3.9	11.8	3.5	2.2 U	14.9	17.7
Barium	mg/kg	220,000	377	N/A	1,030	431	N/A	246	38.1
Beryllium	mg/kg	2,300	4.1	N/A	0.59 J	1.8	N/A	2.5	0.43 J
Cadmium	mg/kg	980	0.87 JB	N/A	0.48 J	0.42 J	N/A	1.3 B	0.61 JB
Chromium	mg/kg	120,000	173	N/A	239	327	N/A	205	516
Chromium VI	mg/kg	6.3	0.35 JB	N/A	0.37 JB	0.4 JB	N/A	0.3 JB	0.33 JB
Cobalt	mg/kg	350	15.7	N/A	15.5	5.8	N/A	10.6	13.7
Copper	mg/kg	47,000	125	N/A	100	92.3	N/A	53.5	162
Iron	mg/kg	820,000	78,700	N/A	304,000	85,500	N/A	105,000	299,000
Lead	mg/kg	800	75.6	N/A	46	133	N/A	161	65.7
Manganese	mg/kg	26,000	11,900	N/A	31,600	10,200	N/A	5,660	4,400
Mercury	mg/kg	350	0.11 U	N/A	0.016 J	0.24	N/A	0.1 U	0.046 J
Nickel	mg/kg	22,000	34.9	N/A	81.3	34.7	N/A	43.2	287
Selenium	mg/kg	5,800	2.6 JB	N/A	3.2 U	3.6 U	N/A	3.3 U	2.1 J
Silver	mg/kg	5,800	2.1 U	N/A	4	2.7 U	N/A	2.5 U	1 J
Thallium	mg/kg	12	6.9 J	N/A	8 U	9.1	N/A	3.9 J	8.1 U
Vanadium	mg/kg	5,800	438	N/A	171	650	N/A	288	95.3
Zinc	mg/kg	350,000	221	N/A	60.1	189	N/A	538	113
Other									
Cyanide	mg/kg	150	3.6	N/A	0.21 J	0.65 J	N/A	1.2	0.4 JB

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-058-SB-10*	B13-059-SB-1*	B13-059-SB-4*	B13-059-SB-10*	B13-060-SB-1	B13-060-SB-4	B13-061-SB-1
Metal									
Aluminum	mg/kg	1,100,000	N/A	29,600	21,700	N/A	21,000	34,900	7,520 J
Antimony	mg/kg	470	N/A	2.1 U	2.8 U	N/A	2.4 UJ	2.8 UJ	2.5 U
Arsenic	mg/kg	3	27	4.5	3	2.7	7.2	2.3 U	3.5
Barium	mg/kg	220,000	N/A	307	565	N/A	390 J	793 J	81 J
Beryllium	mg/kg	2,300	N/A	4.5	1.6	N/A	0.23 J	2.9	1
Cadmium	mg/kg	980	N/A	1.7 B	0.94 JB	N/A	0.77 B	0.26 B	0.28 B
Chromium	mg/kg	120,000	N/A	35.8	234	N/A	1,210	8.8	64.2
Chromium VI	mg/kg	6.3	N/A	0.38 JB	0.68 JB	N/A	1.4 J-	0.31 J-	0.29 B
Cobalt	mg/kg	350	N/A	6.4	5.8	N/A	6.6	0.77 J	2.9 J
Copper	mg/kg	47,000	N/A	38.4	49.6	N/A	32.9 J	3.7 J	16.9 J
Iron	mg/kg	820,000	N/A	49,700	42,400	N/A	152,000 J	5,110 J	25,200 J
Lead	mg/kg	800	N/A	357	165	N/A	11.1 J	2.3 UJ	12.9
Manganese	mg/kg	26,000	N/A	2,370	13,800	N/A	32,500	2,580	1,740
Mercury	mg/kg	350	N/A	0.067 J	0.12 U	N/A	0.011 J-	0.11 UJ	0.023 J
Nickel	mg/kg	22,000	N/A	21.2	32	N/A	14.4	9.2 U	15.9 J
Selenium	mg/kg	5,800	N/A	2.8 U	3.8 U	N/A	3.3 U	3.2 J	3.4 U
Silver	mg/kg	5,800	N/A	2.1 U	2.8 U	N/A	7.9	2.8 U	2.5 U
Thallium	mg/kg	12	N/A	6.9 U	20.3	10 U	22.2	9.2 U	8.4 U
Vanadium	mg/kg	5,800	N/A	99.7	1,730	N/A	8,090	106	59.5 J
Zinc	mg/kg	350,000	N/A	485	185	N/A	97.6 J	4.6 U	45.3
Other									
Cyanide	mg/kg	150	N/A	0.9	2.7	N/A	2.3 J-	1 J-	1.8

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-061-SB-4	B13-062-SB-1*	B13-062-SB-5*	B13-062-SB-10*	B13-063-SB-1	B13-063-SB-9	B13-063-SB-10*
Metal									
Aluminum	mg/kg	1,100,000	46,000 J	3,720	23,700	N/A	2,430	14,500	N/A
Antimony	mg/kg	470	2.8 U	2.5 U	2.6 U	N/A	2.9 UJ	2.6 UJ	N/A
Arsenic	mg/kg	3	2.9	4.8	7.5	2	18.7	13.1	5
Barium	mg/kg	220,000	450 J	120	387	N/A	73.9 J	251 J	N/A
Beryllium	mg/kg	2,300	6.7	0.4 J	2.3	N/A	0.36 J	1.6	N/A
Cadmium	mg/kg	980	0.42 B	0.45 J	0.92 J	N/A	0.44 B	0.84 B	N/A
Chromium	mg/kg	120,000	46.7	170	87.6	N/A	115	198	N/A
Chromium VI	mg/kg	6.3	0.31 B	0.38 JB	0.34 JB	N/A	0.32 J-	0.72 J-	N/A
Cobalt	mg/kg	350	4.1 J	13.3	20	N/A	9.5	56.7	N/A
Copper	mg/kg	47,000	21.3 J	21.9	66.4	N/A	27.6 J	95.1 J	N/A
Iron	mg/kg	820,000	25,000 J	173,000	122,000	N/A	41,400 J	85,400 J	N/A
Lead	mg/kg	800	23.1	10.3	82.3	N/A	10.2 J	76.1 J	N/A
Manganese	mg/kg	26,000	3,820	6,120	5,470	N/A	5,870	6,620	N/A
Mercury	mg/kg	350	0.1 U	0.017 J	0.015 J	N/A	0.02 J-	0.1 UJ	N/A
Nickel	mg/kg	22,000	10.7 J	183	33.4	N/A	106	37.3	N/A
Selenium	mg/kg	5,800	4.1	3.3 U	3.5 U	N/A	3.9 U	3.4 U	N/A
Silver	mg/kg	5,800	2.8 U	1.6 J	2.6 U	N/A	2.9 U	2.6 U	N/A
Thallium	mg/kg	12	9.3 U	8.2 U	4.1 J	N/A	9.8 U	8.6 U	N/A
Vanadium	mg/kg	5,800	121 J	114	281	N/A	72.6	855	N/A
Zinc	mg/kg	350,000	40.6	140	615	N/A	49.9 J	141 J	N/A
Other									
Cyanide	mg/kg	150	0.39 J	0.42 J	1.5	N/A	0.39 J-	1.5 J-	N/A

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-064-SB-1	B13-064-SB-5	B13-065-SB-1	B13-065-SB-8	B13-065-SB-10*	B13-066-SB-1	B13-066-SB-4
Metal									
Aluminum	mg/kg	1,100,000	26,300	41,800	13,300	7,220	N/A	7,450	5,100
Antimony	mg/kg	470	2.7 UJ	2.7 UJ	2.6 UJ	2.6 UJ	N/A	2.4 UJ	2.7 UJ
Arsenic	mg/kg	3	3.8	2.2 U	2.2 UJ	2.2 UJ	N/A	6.4	2.3 U
Barium	mg/kg	220,000	292 J	343 J	266 J	261 J	N/A	120	99.2
Beryllium	mg/kg	2,300	3.1	6.5	1.3	0.22 J	N/A	0.82 U	0.91 U
Cadmium	mg/kg	980	0.51 B	0.24 B	0.97 B	0.89 B	N/A	0.61 B	0.48 B
Chromium	mg/kg	120,000	237 J	10.4 J	1,160	1,390	N/A	1,760 J	1,010 J
Chromium VI	mg/kg	6.3	0.4 B	0.31 B	0.26 B	0.31 B	N/A	0.3 B	0.4 B
Cobalt	mg/kg	350	12.7 J	0.8 J	3.7 J	1.3 J	N/A	3.6 J	4.5 U
Copper	mg/kg	47,000	44.1 J	1.8 J	35.6	23.6	N/A	61.4	13.9
Iron	mg/kg	820,000	111,000	9,090	164,000 J	269,000 J	N/A	272,000	156,000
Lead	mg/kg	800	39.9 J	4 J	89.7	17.2	N/A	38	7.8
Manganese	mg/kg	26,000	6,940	2,510	24,100	26,000	9,320	25,700	22,400
Mercury	mg/kg	350	0.0036 J-	0.11 UJ	0.018 J	0.012 J	N/A	0.12 J-	0.1 UJ
Nickel	mg/kg	22,000	25.1 J	1.1 J	36.7 J	22.1 J	N/A	40.7	9.9
Selenium	mg/kg	5,800	4.8	3.4 B	3.5 U	3.5 U	N/A	3.3 U	3.6 U
Silver	mg/kg	5,800	2.7 U	2.7 U	2.6 UJ	2.6 UJ	N/A	2.8 J	2.7 UJ
Thallium	mg/kg	12	8.8 UJ	8.9 UJ	8.8 UJ	8.8 UJ	N/A	10.3	18.9
Vanadium	mg/kg	5,800	517	48	745	759	N/A	772	1,460
Zinc	mg/kg	350,000	29.2 J	6 J	141 J	96.2 J	N/A	123 J	50.5 J
Other									
Cyanide	mg/kg	150	0.5 J	0.24 J	2.3	0.61 J	N/A	2.5 J-	0.25 J-

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-067-SB-1	B13-067-SB-5	B13-068-SB-1	B13-068-SB-4	B13-068-SB-10*	B13-069-SB-1	B13-069-SB-9
Metal									
Aluminum	mg/kg	1,100,000	11,500	25,200	21,300	16,100	N/A	30,700	8,720
Antimony	mg/kg	470	2.6 UJ	3.6 UJ	2.7 UJ	2.7 UJ	N/A	2.7 UJ	2.8 UJ
Arsenic	mg/kg	3	2.5	6.5	4.8	6.5	2.9	2.3 UJ	2.1 J
Barium	mg/kg	220,000	60.5 J	75.1 J	256 J	187 J	N/A	447 J	227 J
Beryllium	mg/kg	2,300	0.87 U	1.3	2.5	2.1	N/A	3.9	0.29 J
Cadmium	mg/kg	980	0.68 B	0.34 B	1.2 B	1.1 B	N/A	0.47 B	0.68 B
Chromium	mg/kg	120,000	1,190	116	373	336	N/A	266	1,460
Chromium VI	mg/kg	6.3	0.51 J-	0.35 J-	0.47 J-	0.51 J-	N/A	0.3 B	0.31 B
Cobalt	mg/kg	350	4.4 U	12.1	5.3	6	N/A	20.6	2.4 J
Copper	mg/kg	47,000	13.6 J	25.1 J	67.6 J	80.5 J	N/A	21.7	42.5
Iron	mg/kg	820,000	127,000 J	57,100 J	165,000 J	135,000 J	N/A	73,100 J	212,000 J
Lead	mg/kg	800	21.3 J	36.7 J	104 J	156 J	N/A	15.5	28.1
Manganese	mg/kg	26,000	30,500	3,390	9,680	8,430	N/A	8,220	25,800
Mercury	mg/kg	350	0.024 J-	0.035 J-	0.43 J-	0.46 J-	N/A	0.1 U	0.0085 J
Nickel	mg/kg	22,000	15.5	31.4	58.7	62.3	N/A	166 J	26.6 J
Selenium	mg/kg	5,800	3.5 U	4.9 U	3.6 U	3.6 U	N/A	3.2 J	3.7 U
Silver	mg/kg	5,800	0.93 J	3.6 U	0.92 J	0.95 J	N/A	2.7 UJ	2.8 UJ
Thallium	mg/kg	12	8.7 U	9.7 U	9.1 U	9.1 U	N/A	9.1 UJ	9.3 UJ
Vanadium	mg/kg	5,800	501	102	239	219	N/A	457	642
Zinc	mg/kg	350,000	47.8 J	125 J	638 J	424 J	N/A	38.2 J	106 J
Other									
Cyanide	mg/kg	150	0.91 J-	0.12 J-	2.9 J-	2.6 J-	N/A	1.1 J-	0.61 J-

Detection in bold

N/A indicates that the parameter was not analyzed for this sample

* indicates non-validated data results

Value in red indicate an exceedance of the Project Action Limit (PAL)

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

UJ: This analyte was not detected in the sample. The quantitation/detection limit may be higher than reported.

B: The analyte was not detected substantially above the level of the associated method blank or field blank.

J+: The positive result for this analyte is a quantitative estimate, but may be biased high.

J-: The positive result for this analyte is a quantitative estimate, but may be biased low.

J: The positive result for this analyte is a quantitative estimate.

R: The result for this analyte is unreliable.

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-070-SB-1	B13-070-SB-5	B13-071-SB-1*	B13-071-SB-6*	B13-072-SB-1	B13-072-SB-4	B13-073-SB-1*
Metal									
Aluminum	mg/kg	1,100,000	2,810	35,000	34,100	34,700	24,600 J	46,400 J	37,900
Antimony	mg/kg	470	3.4 UJ	2.7 UJ	2.6 U	2.6 U	2.3 U	2.5 U	2.2 U
Arsenic	mg/kg	3	2.8 U	2.3 U	2.2 U	2.1 U	6.7	1.9 J	6.2
Barium	mg/kg	220,000	30.6 J	318 J	234	397	275 J	602 J	465
Beryllium	mg/kg	2,300	1.1 U	3.8	4.9	6.1	3	6.7	6.6
Cadmium	mg/kg	980	0.42 B	0.5 B	0.4 JB	0.37 JB	0.85 B	0.33 B	0.34 JB
Chromium	mg/kg	120,000	246 J	226 J	9	18.4	267	41.6	96
Chromium VI	mg/kg	6.3	0.37 B	0.33 B	0.3 JB	0.31 JB	0.49 B	0.32 B	0.31 JB
Cobalt	mg/kg	350	33.9 J	7.4 J	0.64 J	1.2 J	8.2	1.4 J	2.3 J
Copper	mg/kg	47,000	9.8 J	19.3 J	1.9 J	3.9 J	54.5 J	15.5 J	9.9
Iron	mg/kg	820,000	35,900	69,900	16,300	11,000	132,000 J	25,000 J	40,200
Lead	mg/kg	800	5 J	18.5 J	11.6	4.6	127	8.4	13
Manganese	mg/kg	26,000	718	13,200	2,870	3,540	8,280	5,270	5,790
Mercury	mg/kg	350	0.0043 J-	0.0031 J-	0.1 U	0.0022 J	0.045 J	0.11 U	0.11 U
Nickel	mg/kg	22,000	748 J	72.7 J	1.6 J	3.3 J	49.8 J	7.1 B	11.2
Selenium	mg/kg	5,800	4.5 U	4	2.5 J	2 JB	3.1 U	2.5 J	2.9 U
Silver	mg/kg	5,800	3.4 U	2.7 U	2.6 U	2.6 U	1.1 J	2.5 U	2.2 U
Thallium	mg/kg	12	11.3 UJ	9 UJ	8.8 U	8.5 U	4.7 J	8.4 U	7.2 U
Vanadium	mg/kg	5,800	17.5	843	40.7	73.2	339 J	43.2 J	61.3
Zinc	mg/kg	350,000	19.7 J	44 J	2.6 JB	6.7 B	230	18.9	31.9
Other									
Cyanide	mg/kg	150	0.75 U	0.35 J	0.048 J	0.17 J	3	0.86	0.89

Detection in bold

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R: The result for this analyte is unreliable.

Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-073-SB-7*	B13-074-SB-1	B13-075-SB-1*	B13-075-SB-9*	B13-076-SB-1*	B13-076-SB-7*	B13-076-SB-10*
Metal									
Aluminum	mg/kg	1,100,000	48,300	37,600 J	50,200	47,600	8,890	23,700	N/A
Antimony	mg/kg	470	2.3 U	2.3 U	2.8 U	2.8 U	2.9 U	3.2 U	N/A
Arsenic	mg/kg	3	1.9 U	2.3	2.3 U	2.3 U	10	4.4	2.6
Barium	mg/kg	220,000	967	462 J	1,430	796	99.8	447	N/A
Beryllium	mg/kg	2,300	2.5	5.5	3.6	4.2	1.2	2.5	N/A
Cadmium	mg/kg	980	0.34 JB	0.41 B	0.36 J	0.2 J	0.64 JB	0.35 JB	N/A
Chromium	mg/kg	120,000	49.2	390	62.8	53.9	270	131	N/A
Chromium VI	mg/kg	6.3	0.27 JB	0.35 B	0.48 JB	0.48 JB	0.33 JB	0.62 JB	N/A
Cobalt	mg/kg	350	1 J	1.1 J	1 J	1.2 J	10.7	15.7	N/A
Copper	mg/kg	47,000	13	14.5 J	4.7 J	19	55.1	37.5	N/A
Iron	mg/kg	820,000	4,190	74,900 J	2,890	6,290	121,000	37,500	N/A
Lead	mg/kg	800	398	7.7	5.4	2.3 U	52.6	25.1	N/A
Manganese	mg/kg	26,000	6,300	13,500	11,300	13,900	5,080	4,130	N/A
Mercury	mg/kg	350	0.11 U	0.11 U	0.11 U	0.11 U	0.51	0.13 U	N/A
Nickel	mg/kg	22,000	2.2 J	16.8 J	9.4 U	2.1 J	51.4	125	N/A
Selenium	mg/kg	5,800	2.2 JB	3 U	3.7 U	3.7 U	3.9 U	4.2 U	N/A
Silver	mg/kg	5,800	2.3 U	2.3 U	2.8 U	2.8 U	2.9 U	3.2 U	N/A
Thallium	mg/kg	12	7.7 U	7.6 U	6.6 J	7.3 J	9.7 U	10.5 U	N/A
Vanadium	mg/kg	5,800	103	173 J	344	494	233	117	N/A
Zinc	mg/kg	350,000	9.9 B	19.8	4.7 U	4.6 U	240	54.9	N/A
Other									
Cyanide	mg/kg	150	4.8	0.8	0.84	0.26 J	2.8	1.8	N/A

Detection in bold

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-077-SB-1*	B13-077-SB-9*	B13-077-SB-10*	B13-078-SB-1	B13-078-SB-9	B13-079-SB-1	B13-079-SB-5
Metal									
Aluminum	mg/kg	1,100,000	25,000	22,100	N/A	42,800	47,200	27,900	33,800
Antimony	mg/kg	470	2.8 U	2.7 U	N/A	2.2 UJ	2.3 UJ	2.8 UJ	2.8 UJ
Arsenic	mg/kg	3	6.5	4.1	6.8	1.8 U	1.8 J	2.3 U	7
Barium	mg/kg	220,000	265	498	N/A	369	993	331	555
Beryllium	mg/kg	2,300	4.2	2.2	N/A	6.2	4.4	4.4	3.7
Cadmium	mg/kg	980	0.44 J	0.51 J	N/A	0.47 B	0.26 B	0.88 B	0.45 B
Chromium	mg/kg	120,000	150	649	N/A	77.6 J	92.4 J	381	102
Chromium VI	mg/kg	6.3	0.39 JB	0.35 JB	N/A	0.3 B	0.3 B	0.41 B	0.43 B
Cobalt	mg/kg	350	4.8	16.6	N/A	1.9 J	1.5 J	1.1 J	38.4
Copper	mg/kg	47,000	135	135	N/A	32.8	5.7	12.5	58.5
Iron	mg/kg	820,000	82,200	136,000	N/A	26,500	8,900	75,000	98,700
Lead	mg/kg	800	32.9	41.7	N/A	17.1	3.2	65.8	30
Manganese	mg/kg	26,000	4,050	18,100	N/A	5,310	10,300	15,000	8,560
Mercury	mg/kg	350	0.026 J	0.0026 J	N/A	0.1 UJ	0.1 UJ	0.017 J	0.0099 J
Nickel	mg/kg	22,000	83.3	48.9	N/A	9.8	1.6 J	7.5 J	36.4
Selenium	mg/kg	5,800	3 J	3.6 U	N/A	2.8 B	3.1 U	3.7 U	3.1 B
Silver	mg/kg	5,800	2.8 U	1.2 J	N/A	2.2 UJ	2.3 UJ	2.8 U	2.8 U
Thallium	mg/kg	12	9.2 U	33.1	11.1 U	7.3 U	8.1	9.4 U	9.4 U
Vanadium	mg/kg	5,800	62.2	3,140	N/A	69.4	559	174	276
Zinc	mg/kg	350,000	93.3	76.7	N/A	41 J	3.9 J	211 J	54.5 J
Other									
Cyanide	mg/kg	150	1.1	1.8	N/A	1.2 J-	1 J-	4.8 J-	0.86 J-

Detection in bold

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Table 7
Summary of Inorganics Detected in Soil
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-080-SB-1*	B13-080-SB-9*	B13-081-SB-1*	B13-081-SB-9*	B13-082-SB-1	B13-082-SB-5
Metal								
Aluminum	mg/kg	1,100,000	15,700	37,700	31,500	28,200	6,310	32,000
Antimony	mg/kg	470	2.7 U	3.4 U	2.3 U	2.7 U	2.5 UJ	2.5 UJ
Arsenic	mg/kg	3	3.3	2.9 U	1.9 U	8.7	2.1 UJ	2.1 UJ
Barium	mg/kg	220,000	148	1,160	827	661	99 J	224 J
Beryllium	mg/kg	2,300	1.5	2.9	4.6	2.3	0.36 J	5.8
Cadmium	mg/kg	980	0.37 J	1.7 U	0.34 JB	0.48 JB	0.99 B	0.37 B
Chromium	mg/kg	120,000	1,000	8.8	17	118	2,040	673
Chromium VI	mg/kg	6.3	0.5 JB	0.41 JB	0.3 JB	0.52 JB	1.5 J-	0.25 B
Cobalt	mg/kg	350	2.6 J	4.1 J	0.59 J	7.7	6	4.2 U
Copper	mg/kg	47,000	26.6	48.7	6	24.2	48.2	3.6 J
Iron	mg/kg	820,000	178,000	87,800	18,900	78,400	246,000 J	74,900 J
Lead	mg/kg	800	4.6	2.8 J	2.5	2.6	6.8	3.4
Manganese	mg/kg	26,000	21,400	1,220	8,400	10,300	37,300	14,200
Mercury	mg/kg	350	0.0054 J	0.14 U	0.1 U	0.11 U	0.0021 J	0.1 U
Nickel	mg/kg	22,000	27.9	6.1 J	3.8 JB	16.9	72.7 J	3.4 J
Selenium	mg/kg	5,800	3.7 U	3.9 J	3.1 U	2.7 J	3.3 U	2.3 J
Silver	mg/kg	5,800	0.93 J	3.4 U	2.3 U	2.7 U	2.5 UJ	2.5 UJ
Thallium	mg/kg	12	9.8	11.4 U	7.8 U	9.9	8.3 UJ	8.4 UJ
Vanadium	mg/kg	5,800	678	90.2	132	754	815	320
Zinc	mg/kg	350,000	55	5.7 U	7.1	8.2	28.4 J	2 B
Other								
Cyanide	mg/kg	150	0.63 J	0.59 J	0.1 J	0.23 J	0.15 J	0.39 J

Detection in bold

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**Table 8 - Parcel B13
Summary of Soil PAL Exceedances**

Parameter	CAS#	Frequency of Detections (%)	Sample ID of Max Result	Unit	PAL Solid	Max Result
Aroclor 1242	53469-21-9	7.32	B13-007-SB-1	mg/kg	0.97	3.29
Arsenic	7440-38-2	67.71	B13-002-SB-1	mg/kg	3	896
Benz[a]anthracene	56-55-3	92.17	B13-068-SB-4	mg/kg	21	22.5
Benzo[a]pyrene	50-32-8	88.14	B13-032-SB-1	mg/kg	2.1	20.3
Benzo[b]fluoranthene	205-99-2	95.78	B13-068-SB-4	mg/kg	21	27.6
Chromium VI	18540-29-9	98.77	B13-038-SB-1	mg/kg	6.3	27
Dibenz[a,h]anthracene	53-70-3	91.98	B13-063-SB-9	mg/kg	2.1	3.5
Manganese	7439-96-5	100.00	B13-006-SB-1	mg/kg	26,000	152,000
Naphthalene	91-20-3	91.46	B13-073-SB-10	mg/kg	17	1,970
PCBs (total)	1336-36-3	17.07	B13-007-SB-1	mg/kg	0.97	3.29
Thallium	7440-28-0	26.06	B13-031-SB-1	mg/kg	12	43
Vanadium	7440-62-2	100.00	B13-060-SB-1	mg/kg	5,800	8,090

**Table 9 - Parcel B13
Soil PAL Exceedances for Specific Targets**

Target Feature	Boring ID	Sample Depth (ft.)	Parameter	PAL (mg/kg)	Result (mg/kg)	Final Flag
Southern Slag Pile Demolition Debris	B13-002-SB	1	Arsenic	3	4.7	
Oil Building/ Oil House	B13-004-SB	1	Arsenic	3	3.4	
	B13-004-SB	4	Arsenic	3	3.4	
	B13-005-SB	1	Arsenic	3	3.9	
	B13-006-SB	1	Manganese	26,000	26,800	
	B13-006-SB	4	Arsenic	3	4.1	
	B13-006-SB	4	Manganese	26,000	34,700	
	B13-007-SB	1	Aroclor 1242	0.97	3.29	
	B13-007-SB	1	Arsenic	3	4.4	
Diesel Fuel Tanks	B13-007-SB	1	PCBs (total)	3	3.29	
	B13-009-SB	4	Arsenic	3	6.5	
Tank (Unknown Contents)	B13-010-SB	1	Manganese	26,000	29,000	
	B13-010-SB	8	Manganese	26,000	32,400	
	B13-011-SB	8	Manganese	26,000	26,000	
Thickener Tanks	B13-012-SB	1	Arsenic	3	8.4	
	B13-012-SB	4	Arsenic	3	5.7	
	B13-012-SB	4	Manganese	26,000	27,000	
	B13-012-SB	10	Arsenic	3	12.2	
	B13-013-SB	1	Arsenic	3	12.1	
	B13-013-SB	5	Arsenic	3	10.1	
	B13-013-SB	10	Arsenic	3	15.8	
	B13-014-SB	1	Arsenic	3	3.2	
	B13-014-SB	8	Arsenic	3	3.7	
Sump Pump	B13-014-SB	10	Arsenic	3	5.1	
	B13-016-SB	1	Arsenic	3	6.7	
	B13-016-SB	8	Arsenic	3	6.9	
	B13-016-SB	10	Arsenic	3	4.1	
	B13-017-SB	1	Arsenic	3	3.3	
	B13-017-SB	4	Arsenic	3	7.4	
Electric Sub-Station	B13-017-SB	10	Arsenic	3	5.2	
	B13-018-SB	1	Arsenic	3	6.4	
	B13-019-SB	1	Arsenic	3	3.9	
	B13-020-SB	1	Manganese	26,000	38,900	
	B13-022-SB	4	Arsenic	3	13.4	

**Table 9 - Parcel B13
Soil PAL Exceedances for Specific Targets**

Target Feature	Boring ID	Sample Depth (ft.)	Parameter	PAL (mg/kg)	Result (mg/kg)	Final Flag
Skulling Pit (Old Car Dumper)	B13-024-SB	1	Arsenic	3	6.8	J
	B13-024-SB	7	Arsenic	3	6.3	J
	B13-024-SB	10	Arsenic	3	10.4	
	B13-025-SB	1	Manganese	26,000	28,100	
	B13-025-SB	5	Arsenic	3	8	J
	B13-025-SB	10	Arsenic	3	9.3	
Slag Pitts	B13-026-SB	1	Manganese	26,000	28,100	
	B13-026-SB	5	Arsenic	3	23.1	
	B13-026-SB	10	Arsenic	3	7.4	
	B13-027-SB	1	Arsenic	3	13.9	
	B13-028-SB	1	Arsenic	3	3.2	
	B13-028-SB	5	Arsenic	3	34.6	
	B13-028-SB	10	Arsenic	3	5.1	
	B13-029-SB	1	Arsenic	3	7.5	J
	B13-029-SB	8	Arsenic	3	39.6	J
	B13-029-SB	10	Arsenic	3	9	
	B13-030-SB	1	Arsenic	3	4.4	
	B13-030-SB	5	Arsenic	3	3.7	
	B13-030-SB	10	Arsenic	3	8.5	
	B13-031-SB	1	Arsenic	3	896	J
	B13-031-SB	1	Manganese	26,000	152,000	
	B13-031-SB	1	Thallium	12	43	
	B13-032-SB	1	Arsenic	3	5.2	J
	B13-032-SB	1	Benzo[a]pyrene	2.1	8.7	J
	B13-032-SB	5	Arsenic	3	7.4	J
	B13-032-SB	10	Arsenic	3	3.4	
	B13-035-SB	1	Arsenic	3	6.1	J
B13-035-SB	7	Arsenic	3	3.2	J	
B13-036-SB	1	Arsenic	3	13.9		
B13-037-SB	1	Arsenic	3	10.1	J	

J: The positive result reported is a quantitative estimate.

Table 10
Summary of Organics Detected in Groundwater
Parcel B13
Tradeport Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-001-PZ*	B13-006-PZ	B13-021-PZ	B13-042-PZ*	B13-045-PZ	B13-049-PZ	B13-059-PZ	B13-061-PZ	B13-066-PZ*	B13-069-PZ*	B13-076-PZ	B13-078-PZ
Volatile Organic Compounds														
2-Butanone (MEK)	µg/L	5,600	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.2 J	10 U	10 U
Acetone	µg/L	14,000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	48.6	10 U	10 U
Benzene	µg/L	5	0.82 J	1 U	0.57 J	0.9 J	29.6	1 U	1 U	1 U	3.2	0.81 J	1 U	17
Bromodichloromethane	µg/L	0.13	1 U	1 U	1 U	1 U	1 U	1 U	1.1	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	µg/L	810	1.4	1.8	1 U	1.8	1.4	1.6	1.8	1.1	1.5	1.7	1.3	6.2
Chloroform	µg/L	0.22	1 U	1 U	1 U	1 U	1 U	1 U	58.6	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	µg/L	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	18.2
Isopropylbenzene	µg/L	450	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	7.7
Tetrachloroethene	µg/L	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.66 J	1 U	1 U	1 U
Toluene	µg/L	1,000	1 U	0.38 B	1.4	0.34 J	1.7	0.6 J	0.34 J	0.23 B	2.7	0.48 J	0.95 J	102
Xylenes	µg/L	10,000	3 U	2.7 B	3 U	3 U	5.6 B	3 U	3 U	3.8 B	2.6 J	3 U	3 U	1,630
Semi-Volatile Organic Compounds^														
1,1-Biphenyl	µg/L	0.83	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.3 J	1 U	1 U	7.8
1,4-Dioxane	µg/L	0.46	0.09 J	0.15	0.12	0.11	0.097 J	0.1	0.1 U	0.18	0.083 J	0.086 J	0.11	0.07 J
2,4-Dimethylphenol	µg/L	360	0.51 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10.4 U
2-Methylnaphthalene	µg/L	36	0.37	0.22	0.093 B	0.059 J	0.75	0.048 B	0.1 U	0.27	1.3	1.4	0.1	188
2-Methylphenol	µg/L	930	0.36 J	1 U	1 U	1 U	0.48 J	1 U	1 U	1 U	0.52 J	0.31 J	1 U	1.9
3&4-Methylphenol(m&p Cresol)	µg/L	930	1 J	2.1 U	2 U	2.1 U	1 J	2.1 U	2.1 U	2.1 U	1.2 J	1.3 J	2.1 U	4.7
Acenaphthene	µg/L	530	0.69	0.085 J	0.15	0.055 J	0.097 J	0.043 J	0.1 U	0.028 J	2.1	2.8	0.079 J	2
Acenaphthylene	µg/L	530	0.081 J	0.028 J	0.015 J	0.019 J	0.18	0.029 J	0.1 U	0.02 J	0.099 J	0.29	0.1 U	5.6
Acetophenone	µg/L	1,900	1 U	1 U	1 U	1 U	1.9	1 U	1 U	1 U	0.66 J	0.71 J	1 U	13.8
Anthracene	µg/L	1,800	0.095 J	0.039 J	0.022 J	0.02 J	0.076 J	0.1 U	0.1 U	0.017 J	0.98	0.36	0.018 J	0.51
Benz[a]anthracene	µg/L	0.012	0.052 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.073 J	0.029 J	0.1 U	0.23
Benzo[a]pyrene	µg/L	0.2	0.059 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12
Benzo[b]fluoranthene	µg/L	0.25	0.067 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.29
Benzo[g,h,i]perylene	µg/L		0.045 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.044 J
Benzo[k]fluoranthene	µg/L	2.5	0.028 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.22
bis(2-Ethylhexyl)phthalate	µg/L	6	0.21 J	1 U	1 U	0.94 J	1 U	1 U	1 U	0.23 J	1 U	0.27 J	1 U	1 U
Carbazole	µg/L		0.44 J	0.27 J	1 U	0.14 J	0.8 J	1 U	1 U	1 U	3.6	1.5	1 U	1.7
Chrysene	µg/L	25	0.038 J	0.1 U	0.1 U	0.1 U	0.1 U	0.0097 J	0.1 U	0.1 U	0.065 J	0.014 J	0.0079 J	0.2
Fluoranthene	µg/L	800	0.2	0.084 J	0.032 J	0.077 J	0.24	0.084 J	0.1 U	0.035 J	2.6	0.35	0.092 J	1.1
Fluorene	µg/L	290	0.33	0.079 J	0.061 J	0.063 J	0.36	0.041 J	0.1 U	0.031 J	1.8	0.88	0.061 J	8.8
Indeno[1,2,3-c,d]pyrene	µg/L	0.25	0.04 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.053 J
Naphthalene	µg/L	0.17	2.9	4.9	1.4	0.64	17.4	0.8	0.1	6.1	13.6	11.4	0.74	3,920
Pentachlorophenol	µg/L	1	2.1 J	1.1 J	1 J	0.89 J	2.6 U	1 J	2.6 U	2.6 U	0.91 J	0.91 J	1.1 J	2.6 U
Phenanthrene	µg/L		0.61	0.12	0.091 J	0.19	0.69	0.093 J	0.1 U	0.073 J	6.1	2.5	0.18	7.3
Phenol	µg/L	5,800	1 U	0.27 J	1 U	1 U	1 U	1 U	1 U	1 U	0.6 J	19.5	1 U	4
Pyrene	µg/L	120	0.16	0.068 J	0.021 J	0.052 J	0.12	0.055 J	0.1 U	0.019 J	1.7	0.21	0.062 J	0.66
Total Petroleum Hydrocarbons/Oil and Grease														
Diesel Range Organics	µg/L	47	327	172 J	116 J	210	311 J	50.1 J	102 UJ	176 J	471	960	59.4 J	2,570 J
Gasoline Range Organics	µg/L	47	200 U	200 U	200 U	200 U	138 JB	76.4 J	200 U	200 U	200 U	200 U	200 U	3,240
Oil and Grease	µg/L	47	4,770 U	1,300 J	1,200 J	4,800 U	1,200 J	4,820 U	1,300 J	4,870 U	4,800 U	4,770 U	4,820 U	7,300

Detections in bold

* indicates non-validated data results

Values in Red indicate an exceedance of the Project Action Limit (PAL)

U: The analyte was not detected in the sample. The numeric value represents the sample quantitative/detection limit.

UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.

J: The positive result reported for this analyte is a quantitative estimate.

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

^PAH compounds were analyzed via SIM

Table 11
Summary of Inorganics Detected in Groundwater
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B13-001-PZ*	B13-006-PZ	B13-021-PZ	B13-042-PZ*	B13-045-PZ	B13-049-PZ	B13-059-PZ	B13-061-PZ	B13-066-PZ*	B13-069-PZ*	B13-076-PZ	B13-078-PZ
Dissolved Metals														
Aluminum, Dissolved	µg/L	20,000	158	90.4	150	159	75.6	107	310	96.9	83	96	343	127
Arsenic, Dissolved	µg/L	10	5 U	5 U	5 U	5 U	2.9 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Barium, Dissolved	µg/L	2,000	48.6	71.3	33.6	46.2	37.1	38.1	60.8	30.7	132	458	44.5	30.7
Chromium VI, Dissolved	µg/L	0.035	9 J	8 B	8 B	9 J	8 B	8 B	10	8 B	9 J	9 J	8 B	9 B
Chromium, Dissolved	µg/L	100	5 U	5 U	1.6 J	1.1 J	1.4 J	1.7 J	2 J	1.4 J	1 J	1.6 J	1.4 J	3.6 J
Iron, Dissolved	µg/L	14,000	70 U	70 U	70 U	70 U	70 U	70 U	70 U	13.6 B	25 JB	17 JB	70 U	70 U
Lead, Dissolved	µg/L	15	5 U	5 U	5 U	5 U	3.4 J	5 U	5 U	5 U	5 U	3.3 J	5 U	5 U
Manganese, Dissolved	µg/L	430	5 U	6.6	0.94 J	5 U	1.5 J	1 J	5 U	1.3 J	1.2 J	1.1 J	1 J	8.1
Nickel, Dissolved	µg/L	390	1.7 J	10 U	1.2 B	10 U	0.9 J	1.1 B	10 U	10 U	10 U	16.8	0.87 B	10 U
Selenium, Dissolved	µg/L	50	7.9 J	5.2 J	4.1 J	8 U	5.4 J	8 U	3.1 J	7 J	7.9 J	5 J	8 U	11.8
Thallium, Dissolved	µg/L	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3.8 J
Vanadium, Dissolved	µg/L	86	117	29.6	34.9	18.5	22.9	40.4	6.4	3.4 J	3 J	1.4 J	4.1 J	300
Zinc, Dissolved	µg/L	6,000	2.1 JB	2.4 B	1.6 B	1.6 JB	2 B	1.2 B	1.5 B	2.2 B	2 JB	1.9 JB	1.7 B	0.75 B
Other														
Cyanide	µg/L	200	6.1 J	6.3 J	3.2 J	6.3 J	5.1 J	4.1 J	2.5 J	4.5 J	7.4 J	5.1 J	10 U	2.4 J

Detections in bold

* indicates non-validated data results

Values in Red indicates an exceedance of the Project Action Limit (PAL).

U: This analyte was not detected in the sample. The numeric value represents the sample quantitative/detection limit.

J: The positive result reported for this analyte is a quantitative estimate.

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

**Table 12 - Parcel B13
Vapor Intrusion Criteria Comparison**

Sample Location	Parameter	Result (ug/L)	Final Flag	Target Groundwater Concentration (ug/L) TCR=1E-05 or THQ=1	Comparison= <u>Result</u> <u>Target</u>	Exceeds Criteria	Toxicity Type
B13-001-PZ*	Cyanide	6.1	J	3.5	1.74	YES	NC
B13-006-PZ	Cyanide	6.3	J	3.5	1.80	YES	NC
B13-042-PZ*	Cyanide	6.3	J	3.5	1.80	YES	NC
B13-045-PZ	Cyanide	5.1	J	3.5	1.46	YES	NC
B13-049-PZ	Cyanide	4.1	J	3.5	1.17	YES	NC
B13-059-PZ	Chloroform	58.6		36	1.63	YES	C
B13-061-PZ	Cyanide	4.5	J	3.5	1.29	YES	NC
B13-066-PZ*	Cyanide	7.4	J	3.5	2.11	YES	NC
B13-069-PZ*	Cyanide	5.1	J	3.5	1.46	YES	NC
B13-078-PZ	Naphthalene	3920		200	19.60	YES	C
B13-078-PZ	Xylenes	1630		1600	1.02	YES	NC

C indicates carcinogenic

NC indicates non-carcinogenic

J: The positive result reported for this analyte is a quantitative estimate.

**Table 13 - Parcel B13
Cumulative Vapor Intrusion Criteria Comparison**

Parameter	Type	Organ Systems	B13-001-PZ	B13-006-PZ	B13-021-PZ	B13-042-PZ
Cancerous Risk						
1,4-Dioxane	SVOC	Hepatic; Nervous; Respiratory; Urinary	6.9E-12	1.2E-11	9.2E-12	8.5E-12
Naphthalene	SVOC	Nervous; Respiratory	1.5E-07	2.5E-07	7.0E-08	3.2E-08
Benzene	VOC	Immune	1.2E-07	0	8.3E-08	1.3E-07
Bromodichloromethane	VOC	Urinary	0	0	0	0
Chloroform	VOC	Hepatic	0	0	0	0
Ethylbenzene	VOC	Developmental; Hepatic; Urinary	0	0	0	0
Cumulative Vapor Intrusion - Target Cancer Risk =			3E-07	2E-07	2E-07	2E-07
Non-Cancerous Risk						
Cyanide	Other	None Specified	1.7	1.8	0.9	1.8
Cumulative Vapor Intrusion - Target Hazard Index =			2	2	1	2
Xylenes	VOC	Nervous	0	0.002	0	0
Cumulative Vapor Intrusion - Target Hazard Index =			0	0	0	0

Values highlighted in red indicate exceedances of the cumulative vapor intrusion criteria
 TCR > 1E-05
 THI > 1

**Table 13 - Parcel B13
Cumulative Vapor Intrusion Criteria Comparison**

Parameter	Type	Organ Systems	B13-045-PZ	B13-049-PZ	B13-059-PZ	B13-061-PZ
Cancerous Risk						
1,4-Dioxane	SVOC	Hepatic; Nervous; Respiratory; Urinary	7.5E-12	7.7E-12	0	1.4E-11
Naphthalene	SVOC	Nervous; Respiratory	8.7E-07	4.0E-08	5.0E-09	3.1E-07
Benzene	VOC	Immune	4.3E-06	0	0	0
Bromodichloromethane	VOC	Urinary	0	0	2.9E-07	0
Chloroform	VOC	Hepatic	0	0	1.6E-05	0
Ethylbenzene	VOC	Developmental; Hepatic; Urinary	0	0	0	0
Cumulative Vapor Intrusion - Target Cancer Risk =			5E-06	4E-08	2E-05	3E-07
Non-Cancerous Risk						
Cyanide	Other	None Specified	1.5	1.2	0.7	1.3
Cumulative Vapor Intrusion - Target Hazard Index =			1	1	1	1
Xylenes	VOC	Nervous	0.004	0	0	0.002
Cumulative Vapor Intrusion - Target Hazard Index =			0	0	0	0

Values highlighted in red indicate exceedances of the cumulative vapor intrusion criteria
 TCR > 1E-05
 THI > 1

**Table 13 - Parcel B13
Cumulative Vapor Intrusion Criteria Comparison**

Parameter	Type	Organ Systems	B13-066-PZ	B13-069-PZ	B13-076-PZ	B13-078-PZ
Cancerous Risk						
1,4-Dioxane	SVOC	Hepatic; Nervous; Respiratory; Urinary	6.4E-12	6.6E-12	8.5E-12	5.4E-12
Naphthalene	SVOC	Nervous; Respiratory	6.8E-07	5.7E-07	3.7E-08	2.0E-04
Benzene	VOC	Immune	4.6E-07	1.2E-07	0	2.5E-06
Bromodichloromethane	VOC	Urinary	0	0	0	0
Chloroform	VOC	Hepatic	0	0	0	0
Ethylbenzene	VOC	Developmental; Hepatic; Urinary	0	0	0	1.2E-06
Cumulative Vapor Intrusion - Target Cancer Risk =			1E-06	7E-07	4E-08	2E-04
Non-Cancerous Risk						
Cyanide	Other	None Specified	2.1	1.5	0	0.7
Cumulative Vapor Intrusion - Target Hazard Index =			2	1	0	1
Xylenes	VOC	Nervous	0.002	0	0	1.0
Cumulative Vapor Intrusion - Target Hazard Index =			0	0	0	1

Values highlighted in red indicate exceedances of the cumulative vapor intrusion criteria
 TCR > 1E-05
 THI > 1



Table 14 - Parcel 13

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-001-SB-1**

1,4-Dioxane	0.14	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-001-SB-4**

1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.075	mg/kg	120,000	no	R

Sample: **B13-003-SB-1**

Benzaldehyde	0.073	mg/kg	120,000	no	R
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Sample: **B13-003-SB-5**

Benzaldehyde	0.073	mg/kg	120,000	no	R
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Sample: **B13-004-SB-1**

Benzaldehyde	0.069	mg/kg	120,000	no	R
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Sample: **B13-004-SB-4**

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-005-SB-1**

2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Hexachlorocyclopentadiene	0.072	mg/kg	7.5	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R

Sample: **B13-005-SB-4**

1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	0.074	mg/kg	120,000	no	R

Sample: **B13-010-SB-1**

2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-010-SB-8**

2,3,4,6-Tetrachlorophenol	0.076	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.076	mg/kg	210	no	R
2,4-Dichlorophenol	0.076	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.076	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.076	mg/kg	5,800	no	R
2-Methylphenol	0.076	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.076	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-010-SB-8**

Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.076	mg/kg	250,000	no	R

Sample: **B13-011-SB-1**

2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-011-SB-8**

1,4-Dioxane	0.12	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.077	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.077	mg/kg	210	no	R
2,4-Dichlorophenol	0.077	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.077	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.077	mg/kg	5,800	no	R
2-Methylphenol	0.077	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.077	mg/kg	120,000	no	R
Methyl Acetate	0.058	mg/kg	1,200,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.077	mg/kg	250,000	no	R

Sample: **B13-012-SB-1**

2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-012-SB-1**

2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-012-SB-4**

1,4-Dioxane	0.075	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Methyl Acetate	0.038	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-013-SB-1**

Benzaldehyde	0.071	mg/kg	120,000	no	R
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Sample: **B13-013-SB-5**

1,4-Dioxane	0.091	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-014-SB-1**

2,3,4,6-Tetrachlorophenol	0.074	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.074	mg/kg	210	no	R
2,4-Dichlorophenol	0.074	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.074	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.074	mg/kg	5,800	no	R
2-Methylphenol	0.074	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.074	mg/kg	120,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.074	mg/kg	250,000	no	R

Sample: **B13-014-SB-8**

1,4-Dioxane	0.14	mg/kg	24	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Methyl Acetate	0.069	mg/kg	1,200,000	no	R

Sample: **B13-015-SB-1**

2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-015-SB-9**

Benzaldehyde	0.075	mg/kg	120,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-020-SB-1**

2,3,4,6-Tetrachlorophenol	0.079	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.2	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.079	mg/kg	210	no	R
2,4-Dichlorophenol	0.079	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.079	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.2	mg/kg	1,600	no	R
2-Chlorophenol	0.079	mg/kg	5,800	no	R
2-Methylphenol	0.079	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.16	mg/kg	41,000	no	R
Pentachlorophenol	0.2	mg/kg	4	no	R
Phenol	0.079	mg/kg	250,000	no	R

Sample: **B13-020-SB-9**

1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.05	mg/kg	1,200,000	no	R

Sample: **B13-021-SB-1**

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

Sample: **B13-021-SB-9**

1,4-Dioxane	0.14	mg/kg	24	no	R
Benzaldehyde	0.074	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-021-SB-9**

Methyl Acetate	0.068	mg/kg	1,200,000	no	R
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Sample: **B13-024-SB-1**

2,3,4,6-Tetrachlorophenol	0.07	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.17	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.07	mg/kg	210	no	R
2,4-Dichlorophenol	0.07	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.07	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.17	mg/kg	1,600	no	R
2-Chlorophenol	0.07	mg/kg	5,800	no	R
2-Methylphenol	0.07	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Pentachlorophenol	0.17	mg/kg	4	no	R
Phenol	0.07	mg/kg	250,000	no	R

Sample: **B13-024-SB-7**

1,4-Dioxane	0.075	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.069	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.17	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.069	mg/kg	210	no	R
2,4-Dichlorophenol	0.069	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.069	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.17	mg/kg	1,600	no	R
2-Chlorophenol	0.069	mg/kg	5,800	no	R
2-Methylphenol	0.069	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.069	mg/kg	120,000	no	R
Mercury	0.1	mg/kg	350	no	R
Methyl Acetate	0.037	mg/kg	1,200,000	no	R
Pentachlorophenol	0.17	mg/kg	4	no	R
Phenol	0.069	mg/kg	250,000	no	R

Sample: **B13-025-SB-1**

2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-025-SB-1**

2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-025-SB-5**

Benzaldehyde	0.068	mg/kg	120,000	no	R
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Sample: **B13-027-SB-1**

2,4-Dinitrophenol	0.2	mg/kg	1,600	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R

Sample: **B13-027-SB-4**

1,4-Dioxane	0.11	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.054	mg/kg	1,200,000	no	R

Sample: **B13-028-SB-1**

Benzaldehyde	0.069	mg/kg	120,000	no	R
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Sample: **B13-028-SB-5**

Benzaldehyde	0.073	mg/kg	120,000	no	R
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Sample: **B13-029-SB-1**

2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-029-SB-1**

2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-029-SB-8**

1,1,2,2-Tetrachloroethane	0.0054	mg/kg	2.7	no	R
1,4-Dioxane	0.11	mg/kg	24	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
Benzaldehyde	0.076	mg/kg	120,000	no	R
Methyl Acetate	0.054	mg/kg	1,200,000	no	R

Sample: **B13-031-SB-5**

2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-032-SB-1**

2,4-Dinitrophenol	0.21	mg/kg	1,600	no	R
Benzaldehyde	0.082	mg/kg	120,000	no	R
Mercury	0.13	mg/kg	350	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: *B13-032-SB-5*

Benzaldehyde	0.075	mg/kg	120,000	no	R
Mercury	0.11	mg/kg	350	no	R

Sample: *B13-033-SB-1*

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Sample: *B13-033-SB-8*

Benzaldehyde	0.074	mg/kg	120,000	no	R
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Sample: *B13-035-SB-1*

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Mercury	0.1	mg/kg	350	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

Sample: *B13-035-SB-7*

1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	0.073	mg/kg	120,000	no	R
Methyl Acetate	0.061	mg/kg	1,200,000	no	R

Sample: *B13-036-SB-1*

Benzaldehyde	0.075	mg/kg	120,000	no	R
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Sample: *B13-036-SB-5*

1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-036-SB-5**

Methyl Acetate	0.058	mg/kg	1,200,000	no	R
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Sample: **B13-037-SB-1**

Benzaldehyde	0.091	mg/kg	120,000	no	R
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Mercury	0.13	mg/kg	350	no	R
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Sample: **B13-037-SB-4**

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Sample: **B13-038-SB-1**

Benzaldehyde	0.073	mg/kg	120,000	no	R
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Sample: **B13-038-SB-5**

2,3,4,6-Tetrachlorophenol	0.076	mg/kg	25,000	no	R
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2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
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2,4,6-Trichlorophenol	0.076	mg/kg	210	no	R
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2,4-Dichlorophenol	0.076	mg/kg	2,500	no	R
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2,4-Dimethylphenol	0.076	mg/kg	16,000	no	R
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2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
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2-Chlorophenol	0.076	mg/kg	5,800	no	R
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2-Methylphenol	0.076	mg/kg	41,000	no	R
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3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
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Benzaldehyde	0.076	mg/kg	120,000	no	R
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Pentachlorophenol	0.19	mg/kg	4	no	R
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Phenol	0.076	mg/kg	250,000	no	R
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Sample: **B13-039-SB-1**

2,3,4,6-Tetrachlorophenol	0.074	mg/kg	25,000	no	R
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2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
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2,4,6-Trichlorophenol	0.074	mg/kg	210	no	R
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2,4-Dichlorophenol	0.074	mg/kg	2,500	no	R
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2,4-Dimethylphenol	0.074	mg/kg	16,000	no	R
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2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
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2-Chlorophenol	0.074	mg/kg	5,800	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-039-SB-1**

2-Methylphenol	0.074	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.074	mg/kg	250,000	no	R

Sample: **B13-039-SB-4**

2,3,4,6-Tetrachlorophenol	0.07	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.07	mg/kg	210	no	R
2,4-Dichlorophenol	0.07	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.07	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.07	mg/kg	5,800	no	R
2-Methylphenol	0.07	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.07	mg/kg	250,000	no	R

Sample: **B13-040-SB-1**

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Sample: **B13-040-SB-5**

Benzaldehyde	0.071	mg/kg	120,000	no	R
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Sample: **B13-041-SB-1**

2,3,4,6-Tetrachlorophenol	0.075	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.075	mg/kg	210	no	R
2,4-Dichlorophenol	0.075	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.075	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.075	mg/kg	5,800	no	R
2-Methylphenol	0.075	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: *B13-041-SB-1*

Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.075	mg/kg	250,000	no	R

Sample: *B13-041-SB-4*

1,4-Dioxane	0.13	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.076	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.076	mg/kg	210	no	R
2,4-Dichlorophenol	0.076	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.076	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.076	mg/kg	5,800	no	R
2-Methylphenol	0.076	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.076	mg/kg	120,000	no	R
Methyl Acetate	0.065	mg/kg	1,200,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.076	mg/kg	250,000	no	R

Sample: *B13-042-SB-1*

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-042-SB-9**

1,4-Dioxane	0.11	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.055	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-044-SB-4**

1,4-Dioxane	0.12	mg/kg	24	no	R
Methyl Acetate	0.058	mg/kg	1,200,000	no	R

Sample: **B13-045-SB-1**

2,3,4,6-Tetrachlorophenol	0.077	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.077	mg/kg	210	no	R
2,4-Dichlorophenol	0.077	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.077	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.077	mg/kg	5,800	no	R
2-Methylphenol	0.077	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.077	mg/kg	250,000	no	R

Sample: **B13-045-SB-4**

1,4-Dioxane	0.11	mg/kg	24	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: *B13-045-SB-4*

Benzaldehyde	0.073	mg/kg	120,000	no	R
Methyl Acetate	0.056	mg/kg	1,200,000	no	R

Sample: *B13-048-SB-1*

1,4-Dioxane	0.09	mg/kg	24	no	R
Benzaldehyde	0.069	mg/kg	120,000	no	R
Methyl Acetate	0.045	mg/kg	1,200,000	no	R

Sample: *B13-048-SB-7*

1,4-Dioxane	0.091	mg/kg	24	no	R
Benzaldehyde	0.074	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R

Sample: *B13-049-SB-1*

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Sample: *B13-049-SB-5*

Benzaldehyde	0.074	mg/kg	120,000	no	R
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Sample: *B13-050-SB-1*

2,4-Dinitrophenol	0.17	mg/kg	1,600	no	R
Benzaldehyde	0.067	mg/kg	120,000	no	R

Sample: *B13-050-SB-5*

Benzaldehyde	0.071	mg/kg	120,000	no	R
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Sample: *B13-052-SB-8*

1,4-Dioxane	0.14	mg/kg	24	no	R
Methyl Acetate	0.072	mg/kg	1,200,000	no	R

Sample: *B13-054-SB-1*

Benzaldehyde	0.087	mg/kg	120,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-060-SB-4**

1,4-Dioxane	0.11	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.075	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.075	mg/kg	210	no	R
2,4-Dichlorophenol	0.075	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.075	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.075	mg/kg	5,800	no	R
2-Methylphenol	0.075	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Methyl Acetate	0.053	mg/kg	1,200,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.075	mg/kg	250,000	no	R

Sample: **B13-061-SB-4**

1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.06	mg/kg	1,200,000	no	R

Sample: **B13-063-SB-9**

1,4-Dioxane	0.097	mg/kg	24	no	R
Methyl Acetate	0.049	mg/kg	1,200,000	no	R

Sample: **B13-064-SB-1**

1,4-Dioxane	0.09	mg/kg	24	no	R
Benzaldehyde	0.075	mg/kg	120,000	no	R

Sample: **B13-064-SB-5**

Benzaldehyde	0.072	mg/kg	120,000	no	R
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Sample: **B13-065-SB-1**

2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-065-SB-1**

2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-065-SB-8**

1,4-Dioxane	0.092	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.074	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.074	mg/kg	210	no	R
2,4-Dichlorophenol	0.074	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.074	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.074	mg/kg	5,800	no	R
2-Methylphenol	0.074	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Benzaldehyde	0.074	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.074	mg/kg	250,000	no	R

Sample: **B13-066-SB-1**

2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-066-SB-1**

2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: **B13-066-SB-4**

1,4-Dioxane	0.1	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.051	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-068-SB-4**

1,1,2,2-Tetrachloroethane	0.0048	mg/kg	2.7	no	R
1,4-Dioxane	0.095	mg/kg	24	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R

Sample: **B13-069-SB-1**

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-069-SB-1**

2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

Sample: **B13-069-SB-9**

1,4-Dioxane	0.094	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.047	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-070-SB-1**

Benzaldehyde	0.091	mg/kg	120,000	no	R
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Sample: **B13-070-SB-5**

1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R

Sample: **B13-072-SB-1**

Benzaldehyde	0.074	mg/kg	120,000	no	R
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Sample: **B13-072-SB-4**

Benzaldehyde	0.076	mg/kg	120,000	no	R
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Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-074-SB-1**

2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Sample: **B13-078-SB-1**

1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Methyl Acetate	0.05	mg/kg	1,200,000	no	R

Sample: **B13-078-SB-9**

1,1,2,2-Tetrachloroethane	0.0052	mg/kg	2.7	no	R
1,4-Dioxane	0.1	mg/kg	24	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
Benzaldehyde	0.07	mg/kg	120,000	no	R
Methyl Acetate	0.052	mg/kg	1,200,000	no	R

Sample: **B13-079-SB-1**

2,3,4,6-Tetrachlorophenol	0.075	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.075	mg/kg	210	no	R
2,4-Dichlorophenol	0.075	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.075	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.075	mg/kg	5,800	no	R
2-Methylphenol	0.075	mg/kg	41,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-079-SB-1**

3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R
Phenol	0.075	mg/kg	250,000	no	R

Sample: **B13-079-SB-5**

2,3,4,6-Tetrachlorophenol	0.079	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.2	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.079	mg/kg	210	no	R
2,4-Dichlorophenol	0.079	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.079	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.2	mg/kg	1,600	no	R
2-Chlorophenol	0.079	mg/kg	5,800	no	R
2-Methylphenol	0.079	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.16	mg/kg	41,000	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Pentachlorophenol	0.2	mg/kg	4	no	R
Phenol	0.079	mg/kg	250,000	no	R

Sample: **B13-082-SB-1**

2,3,4,6-Tetrachlorophenol	0.07	mg/kg	25,000	no	R
2,4-Dinitrophenol	0.17	mg/kg	1,600	no	R
Benzaldehyde	0.07	mg/kg	120,000	no	R
Pentachlorophenol	0.17	mg/kg	4	no	R

Sample: **B13-082-SB-5**

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
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Sample: **B13-082-SB-5**

Benzaldehyde	0.071	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

**Table 15 - Parcel B13
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	B13-073-SB-7	14.1		0.014	0.34	162	33.33	409	20	no
1,2,3-Trichlorobenzene	87-61-6	B13-073-SB-7	0.0021	J	0.0021	0.002	66	1.52		93.4	no
1,2,4,5-Tetrachlorobenzene	95-94-3	B13-063-SB-1	0.03	J	0.028	0.03	162	1.23		35	no
2,3,4,6-Tetrachlorophenol	58-90-2	B13-073-SB-7	0.67		0.67	0.67	125	0.80		2,460	no
2,4-Dimethylphenol	105-67-9	B13-063-SB-1	0.098		0.018	0.06	126	3.97		1,640	no
2-Butanone (MEK)	78-93-3	B13-018-SB-9	0.012	J	0.003	0.01	66	9.09		19,300	no
2-Butanone (MEK)	78-93-3	B13-076-SB-1	0.012		0.003	0.01	66	9.09		19,300	no
2-Chloronaphthalene	91-58-7	B13-077-SB-1	0.16		0.036	0.09	162	3.70		6,030	no
2-Hexanone	591-78-6	B13-043-SB-4	0.0023	J	0.0023	0.002	66	1.52		134	no
2-Methylnaphthalene	91-57-6	B13-073-SB-7	189		0.0019	1.46	163	85.28		301	no
2-Methylphenol	95-48-7	B13-063-SB-1	0.081		0.02	0.05	126	2.38		4,100	no
Acenaphthene	83-32-9	B13-068-SB-4	13.8		0.00052	0.21	163	83.44		4,520	no
Acenaphthylene	208-96-8	B13-073-SB-7	1.6		0.00062	0.06	163	82.82			no
Acetone	67-64-1	B13-065-SB-8	0.28		0.0045	0.02	66	75.76		67,000	no
Acetophenone	98-86-2	B13-055-SB-1	0.12		0.02	0.05	162	4.94		11,700	no
Aluminum	7429-90-5	B13-023-SB-4	50,300		1,090	22,930	162	100.00		112,000	no
Aluminum	7429-90-5	B13-033-SB-8	50,300	J	1,090	22,930	162	100.00		112,000	no
Anthracene	120-12-7	B13-068-SB-4	14.9		0.00065	0.34	163	88.96		22,600	no
Antimony	7440-36-0	B13-016-SB-1	2.7		2.2	2.45	162	1.23		46.7	no
Aroclor 1242	53469-21-9	B13-007-SB-1	3.29		0.0466	0.71	82	7.32	0.95		YES (C)
Aroclor 1248	12672-29-6	B13-049-SB-1	0.128		0.1	0.11	82	2.44	0.954		no
Aroclor 1254	11097-69-1	B13-068-SB-1	0.236		0.0421	0.12	82	3.66	0.972	1.47	no
Aroclor 1260	11096-82-5	B13-067-SB-1	0.204		0.043	0.12	82	2.44	0.991		no
Arsenic	7440-38-2	B13-031-SB-1	896	J	1.8	14.3	192	67.71	3	47.9	YES (C/NC)
Barium	7440-39-3	B13-075-SB-1	1,430		23.8	334	162	100.00		21,700	no
Benzaldehyde	100-52-7	B13-045-SB-1	0.18	J	0.016	0.05	91	43.96	818	11,700	no
Benzene	71-43-2	B13-056-SB-5	0.029		0.0013	0.01	66	16.67	5.08	42.3	no
Benz[a]anthracene	56-55-3	B13-068-SB-4	22.5		0.0012	0.64	166	92.17	21		YES (C)
Benzo[a]pyrene	50-32-8	B13-068-SB-4	20.3		0.0011	0.65	177	88.14	2.1	22	YES (C)
Benzo[b]fluoranthene	205-99-2	B13-068-SB-4	27.6		0.00054	0.92	166	95.78	21		YES (C)
Benzo[g,h,i]perylene	191-24-2	B13-068-SB-4	10.1		0.00099	0.38	163	85.89			no
Benzo[k]fluoranthene	207-08-9	B13-068-SB-4	9.7		0.0014	0.50	165	89.09	210		no
Beryllium	7440-41-7	B13-033-SB-1	8.5		0.19	2.88	162	90.12	6,950	229	no
bis(2-Ethylhexyl)phthalate	117-81-7	B13-044-SB-1	0.8		0.015	0.12	162	19.75	164	1,640	no

**Table 15 - Parcel B13
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Cadmium	7440-43-9	B13-007-SB-1	5.8		0.16	0.69	162	98.77	9,260	98.2	no
Carbazole	86-74-8	B13-063-SB-9	6.9		0.018	0.30	162	34.57			no
Chromium	7440-47-3	B13-082-SB-1	2,040		8.8	364	162	100.00			no
Chromium VI	18540-29-9	B13-038-SB-5	27	J-	0.2	0.84	162	98.77	6.33	348	YES (C)
Chrysene	218-01-9	B13-068-SB-4	23.4		0.00063	0.69	163	93.87	2,100		no
Cobalt	7440-48-4	B13-031-SB-1	71.4		0.3	8.30	162	91.98	1,850	34.7	YES (NC)
Copper	7440-50-8	B13-031-SB-1	618	J	1.8	46.8	162	100.00		4,670	no
Cyanide	57-12-5	B13-054-SB-5	5.8		0.041	1.24	162	97.53		14.7	no
Dibenz[a,h]anthracene	53-70-3	B13-068-SB-4	3.5		0.0013	0.14	166	80.12	2.1		YES (C)
Diesel Range Organics	DRO	B13-073-SB-10	4,450		2.8	136	164	97.56		620	YES (NC)
Diethylphthalate	84-66-2	B13-064-SB-1	0.086		0.023	0.05	162	2.47		65,700	no
Di-n-butylphthalate	84-74-2	B13-022-SB-4	0.37	J	0.019	0.14	162	3.09		8,210	no
Di-n-octylphthalate	117-84-0	B13-044-SB-1	1	J	1	1.00	162	0.62		821	no
Ethylbenzene	100-41-4	B13-081-SB-9	0.021	J	0.0021	0.01	66	10.61	25.4	2,050	no
Fluoranthene	206-44-0	B13-068-SB-4	62		0.00048	1.40	163	98.16		3,010	no
Fluorene	86-73-7	B13-068-SB-4	11.1		0.00064	0.19	163	80.98		3,010	no
Gasoline Range Organics	GRO	B13-076-SB-7	26.7		8.6	14.0	162	6.17		620	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B13-068-SB-4	9.1		0.0011	0.36	166	84.94	21		no
Iron	7439-89-6	B13-027-SB-1	508,000	J	1,260	108,481	162	100.00		81,800	YES (NC)
Lead [^]	7439-92-1	B13-029-SB-8	716		2.4	58.1	162	95.68		800	no
Manganese	7439-96-5	B13-031-SB-1	152,000		718	12,246	166	100.00		2,560	YES (NC)
Mercury	7439-97-6	B13-076-SB-1	0.51		0.0021	0.04	157	63.69		4.56	no
Naphthalene	91-20-3	B13-073-SB-7	1,970		0.0018	13.6	164	91.46	16.7	58.5	YES (C/NC)
Nickel	7440-02-0	B13-056-SB-1	865		1.1	54.3	162	98.15	64,100	2,240	no
N-Nitrosodiphenylamine	86-30-6	B13-055-SB-1	0.063	J	0.063	0.06	162	0.62	469		no
Oil and Grease	O&G	B13-073-SB-7	5,840		90.7	747	162	100.00		620	YES (NC)
PCBs (total)*	1336-36-3	B13-007-SB-1	3.29		0.0421	0.42	82	17.07	0.942		YES (C)
Phenanthrene	85-01-8	B13-068-SB-4	54.3		0.00057	0.96	163	99.39			no
Phenol	108-95-2	B13-063-SB-1	0.13		0.023	0.06	126	6.35		24,600	no
Pyrene	129-00-0	B13-068-SB-4	49		0.00078	1.21	163	94.48		2,260	no

**Table 15 - Parcel B13
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Selenium	7782-49-2	B13-014-SB-8	6.3		1.7	3.26	162	30.86		584	no
Selenium	7782-49-2	B13-005-SB-4	6.3		1.7	3.26	162	30.86		584	no
Silver	7440-22-4	B13-031-SB-1	26.6		0.9	2.92	162	27.78		584	no
Styrene	100-42-5	B13-073-SB-7	0.011		0.011	0.01	66	1.52		3,480	no
Tetrachloroethene	127-18-4	B13-009-SB-4	0.011		0.011	0.01	66	1.52	103	38.9	no
Thallium	7440-28-0	B13-031-SB-1	43		3.5	9.99	165	26.06		1.17	YES (NC)
Toluene	108-88-3	B13-081-SB-9	0.033	J	0.0011	0.01	66	16.67		4,680	no
Vanadium	7440-62-2	B13-060-SB-1	8,090		16.7	444	162	100.00		583	YES (NC)
Xylenes	1330-20-7	B13-076-SB-7	0.076		0.0066	0.02	66	10.61		249	no
Zinc	7440-66-6	B13-029-SB-8	5,900	J	1.9	174	162	95.06		35,000	no

J: The positive result reported for this analyte is a quantitative estimate.

J-: The positive result reported for this analyte is a quantitative estimate but may be biased low.

COPC = Constituent of Potential Concern

C = Compound was identified as a cancer COPC

NC = Compound was identified as a non-cancer COPC

TR = Target Risk

HQ = Hazard Quotient

*PCBs (total) include the sum of all detected aroclor mixtures, including those without regional screening levels (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.

^The COPC screening level for lead was not adjusted to the HQ=0.1 because lead is not assessed in the SLRA. The 800 mg/kg PAL is relevant to the Adult Lead Model procedure.

**Table 16 - Parcel B13
Assessment of Lead**

Exposure Unit	Surface/Sub-Surface	Arithmetic Mean (mg/kg)
EU1 (43.4 ac.)	Surface	79.269
	Sub-Surface	74.946
	Pooled	77.11
EU2 (55.3 ac.)	Surface	21.27
	Sub-Surface	32.36
	Pooled	26.64
EU3 (46.6 ac.)	Surface	54.90
	Sub-Surface	67.22
	Pooled	61.06
EU4 (53.7 ac.)	Surface	31.91
	Sub-Surface	79.64
	Pooled	55.78
EU5 (44.3 ac.)	Surface	45.88
	Sub-Surface	72.75
	Pooled	58.88

Adult Lead Model (ALM) Risk Levels	
Soil Concentration (mg/kg)	Probability of Blood Concentration of 10 ug/dL
2,737 mg/kg	5%
3,417 mg/kg	10%

**Table 17 - Parcel B13
EPCs - Surface Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 1	EPC EU 1 (mg/kg)	EPC Type EU 2	EPC EU 2 (mg/kg)
Arsenic	3.00	48.0	95% KM (t) UCL	9.15	95% KM (t) UCL	8.33
Chromium VI	6.30	350	95% Chebyshev (Mean, Sd) UCL	1.24	95% Modified-t UCL	0.67
Cobalt	1,900	35.0	95% Student's-t UCL	13.0	95% Student's-t UCL	15.7
Iron		82,000	95% Student's-t UCL	151,600	95% Student's-t UCL	146,200
Manganese		2,600	95% Adjusted Gamma UCL	17,960	95% Adjusted Gamma UCL	12,751
Thallium		1.2	95% KM (t) UCL	5.25	Maximum Value	7.8
Vanadium		580	95% Student's-t UCL	514	95% Adjusted Gamma UCL	281
PCBs (total)	0.94		95% KM (t) UCL	0.09	Maximum Value	0.05
Benz[a]anthracene	21.0		95% Student's-t UCL	0.33	95% Adjusted Gamma UCL	0.12
Benzo[a]pyrene	2.10	22.0	95% Student's-t UCL	0.28	95% KM (Chebyshev) UCL	0.17
Benzo[b]fluoranthene	21.0		95% Student's-t UCL	0.53	95% Adjusted Gamma UCL	0.31
Dibenz[a,h]anthracene	2.10		95% Student's-t UCL	0.09	95% KM (Chebyshev) UCL	0.05
Naphthalene	17.0	59.0	95% Adjusted Gamma UCL	0.53	97.5% KM (Chebyshev) UCL	0.24

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 17 - Parcel B13
EPCs - Surface Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 3	EPC EU 3 (mg/kg)	EPC Type EU 4	EPC EU 4 (mg/kg)
Arsenic	3.00	48.0	97.5% KM (Chebyshev) UCL	289	95% KM (t) UCL	3.83
Chromium VI	6.30	350	95% H-UCL	1.60	95% Chebyshev (Mean, Sd) UCL	7.47
Cobalt	1,900	35.0	95% KM (Chebyshev) UCL	20.9	95% Adjusted Gamma KM-UCL	9.06
Iron		82,000	95% Student's-t UCL	177,300	95% Student's-t UCL	165,500
Manganese		2,600	95% Adjusted Gamma UCL	30,907	95% Student's-t UCL	21,713
Thallium		1.2	95% KM (% Bootstrap) UCL	12.4	95% KM (t) UCL	9.13
Vanadium		580	95% Chebyshev (Mean, Sd) UCL	2,123	95% Student's-t UCL	668
PCBs (total)	0.94		95% KM (t) UCL	0.49	Maximum Value	0.96
Benz[a]anthracene	21.0		95% Chebyshev (Mean, Sd) UCL	0.52	99% Chebyshev (Mean, Sd) UCL	9.32
Benzo[a]pyrene	2.10	22.0	95% Chebyshev (Mean, Sd) UCL	0.58	99% Chebyshev (Mean, Sd) UCL	8.47
Benzo[b]fluoranthene	21.0		95% Adjusted Gamma UCL	0.67	99% Chebyshev (Mean, Sd) UCL	10.65
Dibenz[a,h]anthracene	2.10		97.5% KM (Chebyshev) UCL	0.18	99% KM (Chebyshev) UCL	1.50
Naphthalene	17.0	59.0	95% Chebyshev (Mean, Sd) UCL	0.37	95% KM (t) UCL	0.19

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

Table 17 - Parcel B13 EPCs - Surface Soils				
Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 5	EPC EU 5 (mg/kg)
Arsenic	3.00	48.0	95% GROS Adjusted Gamma UCL	16.7
Chromium VI	6.30	350	95% KM (Chebyshev) UCL	0.45
Cobalt	1,900	35.0	95% Student's-t UCL	4.21
Iron		82,000	95% Adjusted Gamma UCL	209,400
Manganese		2,600	95% Student's-t UCL	11,176
Thallium		1.2	95% KM (t) UCL	6.75
Vanadium		580	95% Student's-t UCL	310
PCBs (total)	0.94		Maximum Value	0.04
Benz[a]anthracene	21.0		99% KM (Chebyshev) UCL	8.87
Benzo[a]pyrene	2.10	22.0	99% KM (Chebyshev) UCL	7.02
Benzo[b]fluoranthene	21.0		99% Chebyshev (Mean, Sd) UCL	10.98
Dibenz[a,h]anthracene	2.10		99% KM (Chebyshev) UCL	1.09
Naphthalene	17.0	59.0	99% KM (Chebyshev) UCL	0.60

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated Janu

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 18 - Parcel B13
EPCs - Sub-Surface Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 1	EPC EU 1 (mg/kg)	EPC Type EU 2	EPC EU 2 (mg/kg)
Arsenic	3.00	48.0	95% GROS Adjusted Gamma UCL	18.4	95% KM (Percentile Bootstrap) UCL	5.79
Chromium VI	6.30	350	95% Modified-t UCL	0.42	95% Student's-t UCL	0.39
Cobalt	1,900	35.0	95% Student's-t UCL	19.0	95% Adjusted Gamma UCL	21.6
Iron		82,000	95% Student's-t UCL	110,000	95% Student's-t UCL	86,231
Manganese		2,600	95% H-UCL	26,366	95% Student's-t UCL	10,952
Thallium		1.2	95% KM (t) UCL	8.85	95% KM (t) UCL	8.77
Vanadium		580	95% Student's-t UCL	529	95% Student's-t UCL	657
Benz[a]anthracene	21.0		95% GROS Adjusted Gamma UCL	0.22	95% Adjusted Gamma KM-UCL	2.43
Benzo[a]pyrene	2.10	22.0	99% KM (Chebyshev) UCL	0.82	99% KM (Chebyshev) UCL	6.31
Benzo[b]fluoranthene	21.0		95% Adjusted Gamma KM-UCL	0.46	95% Adjusted Gamma KM-UCL	7.20
Dibenz[a,h]anthracene	2.10		97.5% KM (Chebyshev) UCL	0.08	95% Adjusted Gamma KM-UCL	1.18
Naphthalene	17.0	59.0	95% GROS Adjusted Gamma UCL	0.09	95% KM (t) UCL	0.11

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 18 - Parcel B13
EPCs - Sub-Surface Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 3	EPC EU 3 (mg/kg)	EPC Type EU 4	EPC EU 4 (mg/kg)
Arsenic	3.00	48.0	95% GROS Adjusted Gamma UCL	13.6	95% KM (t) UCL	4.52
Chromium VI	6.30	350	95% Chebyshev (Mean, Sd) UCL	1.62	95% Chebyshev (Mean, Sd) UCL	10.58
Cobalt	1,900	35.0	95% KM (Chebyshev) UCL	20.5	95% KM (t) UCL	7.54
Iron		82,000	95% Adjusted Gamma UCL	156,200	95% Student's-t UCL	150,800
Manganese		2,600	95% H-UCL	15,119	95% Student's-t UCL	20,807
Thallium		1.2	95% KM (t) UCL	6.67	95% KM (t) UCL	12.5
Vanadium		580	95% Adjusted Gamma UCL	530	95% Adjusted Gamma UCL	1,621
Benz[a]anthracene	21.0		99% KM (Chebyshev) UCL	5.65	99% KM (Chebyshev) UCL	16.5
Benzo[a]pyrene	2.10	22.0	99% KM (Chebyshev) UCL	5.94	99% KM (Chebyshev) UCL	13.4
Benzo[b]fluoranthene	21.0		99% KM (Chebyshev) UCL	7.72	95% Adjusted Gamma KM-UCL	15.2
Dibenz[a,h]anthracene	2.10		99% KM (Chebyshev) UCL	1.53	99% KM (Chebyshev) UCL	2.60
Naphthalene	17.0	59.0	95% Adjusted Gamma KM-UCL	0.48	95% KM (t) UCL	0.16

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

Table 18 - Parcel B13 EPCs - Sub-Surface Soils				
Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 5	EPC EU 5 (mg/kg)
Arsenic	3.00	48.0	95% KM (Chebyshev) UCL	18.0
Chromium VI	6.30	350	95% Modified-t UCL	0.41
Cobalt	1,900	35.0	95% Adjusted Gamma UCL	7.78
Iron		82,000	95% Adjusted Gamma UCL	109,600
Manganese		2,600	95% Student's-t UCL	9,627
Thallium		1.2	95% KM (t) UCL	12.5
Vanadium		580	99% Chebyshev (Mean, Sd) UCL	2,765
Benz[a]anthracene	21.0		95% KM (t) UCL	0.21
Benzo[a]pyrene	2.10	22.0	95% KM (Percentile Bootstrap) UCL	0.16
Benzo[b]fluoranthene	21.0		95% KM (t) UCL	0.36
Dibenz[a,h]anthracene	2.10		95% KM (t) UCL	0.04
Naphthalene	17.0	59.0	97.5% Chebyshev (Mean, Sd) UCL	894

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated Janu

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 19 - Parcel B13
EPCs - Pooled Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 1	EPC EU 1 (mg/kg)	EPC Type EU 2	EPC EU 2 (mg/kg)
Arsenic	3.00	48.0	95% GROS Adjusted Gamma UCL	13.1	95% KM (t) UCL	6.37
Chromium VI	6.30	350	95% Modified-t UCL	0.59	95% Modified-t UCL	0.52
Cobalt	1,900	35.0	95% Adjusted Gamma UCL	15.3	95% Adjusted Gamma UCL	16.4
Iron		82,000	95% Student's-t UCL	121,000	95% Student's-t UCL	110,500
Manganese		2,600	95% H-UCL	16,971	95% Student's-t UCL	10,482
Thallium		1.2	95% KM (t) UCL	6.45	95% KM (t) UCL	8.05
Vanadium		580	95% Student's-t UCL	468	95% Adjusted Gamma UCL	441
PCBs (total)	0.94		95% KM (t) UCL	0.09	Maximum Value	0.05
Benz[a]anthracene	21.0		95% KM (Chebyshev) UCL	0.31	99% KM (Chebyshev) UCL	1.58
Benzo[a]pyrene	2.10	22.0	99% KM (Chebyshev) UCL	0.60	99% KM (Chebyshev) UCL	3.27
Benzo[b]fluoranthene	21.0		95% KM (Chebyshev) UCL	0.52	99% KM (Chebyshev) UCL	4.28
Dibenz[a,h]anthracene	2.10		99% KM (Chebyshev) UCL	0.13	99% KM (Chebyshev) UCL	0.64
Naphthalene	17.0	59.0	99% KM (Chebyshev) UCL	0.55	95% KM (Chebyshev) UCL	0.14

N/A indicates no detections in specified exposure unit

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 19 - Parcel B13
EPCs - Pooled Soils**

Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 3	EPC EU 3 (mg/kg)	EPC Type EU 4	EPC EU 4 (mg/kg)
Arsenic	3.00	48.0	95% KM (Chebyshev) UCL	90.5	95% KM (Percentile Bootstrap) UCL	3.90
Chromium VI	6.30	350	95% Chebyshev (Mean, Sd) UCL	1.56	95% Chebyshev (Mean, Sd) UCL	7.02
Cobalt	1,900	35.0	95% KM (Chebyshev) UCL	16.9	95% Adjusted Gamma KM-UCL	7.38
Iron		82,000	95% Chebyshev (Mean, Sd) UCL	177,200	95% Student's-t UCL	147,800
Manganese		2,600	95% Chebyshev (Mean, Sd) UCL	28,607	95% Student's-t UCL	19,667
Thallium		1.2	95% KM (% Bootstrap) UCL	9.17	95% KM (t) UCL	10.06
Vanadium		580	95% H-UCL	717	95% Adjusted Gamma UCL	975
PCBs (total)	0.94		95% KM (t) UCL	0.49	Maximum Value	0.96
Benz[a]anthracene	21.0		97.5% KM (Chebyshev) UCL	2.03	99% KM (Chebyshev) UCL	10.09
Benzo[a]pyrene	2.10	22.0	97.5% KM (Chebyshev) UCL	2.21	99% KM (Chebyshev) UCL	8.64
Benzo[b]fluoranthene	21.0		99% KM (Chebyshev) UCL	4.18	99% KM (Chebyshev) UCL	12.4
Dibenz[a,h]anthracene	2.10		97.5% KM (Chebyshev) UCL	0.54	99% KM (Chebyshev) UCL	1.58
Naphthalene	17.0	59.0	95% KM (Chebyshev) UCL	0.34	95% KM (Chebyshev) UCL	0.22

N/A indicates no detections in specified exposure unit

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated January 19, 2017

PAH compounds screening levels were adjusted based on the relative potency factor

Table 19 - Parcel B13 EPCs - Pooled Soils				
Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type EU 5	EPC EU 5 (mg/kg)
Arsenic	3.00	48.0	95% KM (BCA) UCL	8.89
Chromium VI	6.30	350	95% KM (Chebyshev) UCL	0.44
Cobalt	1,900	35.0	95% Adjusted Gamma UCL	5.10
Iron		82,000	95% Adjusted Gamma UCL	131,100
Manganese		2,600	95% Student's-t UCL	9,676
Thallium		1.2	95% Adjusted Gamma KM-UCL	9.30
Vanadium		580	95% H-UCL	720
PCBs (total)	0.94		Maximum Value	0.04
Benz[a]anthracene	21.0		99% KM (Chebyshev) UCL	4.70
Benzo[a]pyrene	2.10	22.0	99% KM (Chebyshev) UCL	3.24
Benzo[b]fluoranthene	21.0		99% KM (Chebyshev) UCL	5.89
Dibenz[a,h]anthracene	2.10		99% KM (Chebyshev) UCL	0.58
Naphthalene	17.0	59.0	99% KM (Chebyshev) UCL	676

N/A indicates no detections in specified exposure unit

Bold indicates EPC higher than SL

COPC = Constituent of Potential Concern

Benzo[a]pyrene screening level was derived from the USEPA IRIS Recent Additions dated Janu

PAH compounds screening levels were adjusted based on the relative potency factor

**Table 20 - Parcel B13
Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	9.15	3.00	480	3.1E-06	0.02	8.33	3.00	480	2.8E-06	0.02
Chromium VI	Respiratory	1.24	6.30	3,500	2.0E-07	0.0004	0.67	6.30	3,500	1.1E-07	0.0002
Cobalt	None Specified	13.0	1,900	350	6.8E-09	0.04	15.7	1,900	350	8.3E-09	0.04
Iron	None Specified	151,600		820,000		0.2	146,200		820,000		0.2
Manganese	Nervous	17,960		26,000		0.7	12,751		26,000		0.5
Thallium	None Specified	5.25		12		0.4	7.8		12		0.7
Vanadium	Dermal	514		5,800		0.09	281		5,800		0.05
PCBs (total)		0.09	0.94		9.4E-08		0.05	0.94		5.0E-08	
Benz[a]anthracene		0.33	21.0		1.6E-08		0.12	21.0		5.7E-09	
Benzo[a]pyrene	None Specified	0.28	2.10	220	1.4E-07	0.001	0.17	2.10	220	8.2E-08	0.0008
Benzo[b]fluoranthene		0.53	21.0		2.5E-08		0.31	21.0		1.5E-08	
Dibenz[a,h]anthracene		0.09	2.10		4.3E-08		0.05	2.10		2.3E-08	
Naphthalene	Nervous; Respiratory	0.53	17.0	590	3.1E-08	0.0009	0.24	17.0	590	1.4E-08	0.0004
					4E-06	↓				3E-06	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	0
	None Specified	1

Table 20 - Parcel B13
Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	289	3.00	480	9.6E-05	0.6	3.83	3.00	480	1.3E-06	0.008
Chromium VI	Respiratory	1.60	6.30	3,500	2.5E-07	0.0005	7.47	6.30	3,500	1.2E-06	0.002
Cobalt	None Specified	20.9	1,900	350	1.1E-08	0.06	9.06	1,900	350	4.8E-09	0.03
Iron	None Specified	177,300		820,000		0.2	165,500		820,000		0.2
Manganese	Nervous	30,907		26,000		1	21,713		26,000		0.8
Thallium	None Specified	12.4		12		1	9.13		12		0.8
Vanadium	Dermal	2,123		5,800		0.4	668		5,800		0.1
PCBs (total)		0.49	0.94		5.2E-07		0.96	0.94		1.0E-06	
Benz[a]anthracene		0.52	21.0		2.5E-08		9.32	21.0		4.4E-07	
Benzo[a]pyrene	None Specified	0.58	2.10	220	2.7E-07	0.003	8.47	2.10	220	4.0E-06	0.04
Benzo[b]fluoranthene		0.67	21.0		3.2E-08		10.65	21.0		5.1E-07	
Dibenz[a,h]anthracene		0.18	2.10		8.7E-08		1.50	2.10		7.1E-07	
Naphthalene	Nervous; Respiratory	0.37	17.0	590	2.2E-08	0.0006	0.19	17.0	590	1.1E-08	0.0003
					1E-04	↓				9E-06	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	1
	Dermal	1
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

**Table 20 - Parcel B13
Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 5 (44.3 ac.)				
		EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	16.7	3.00	480	5.6E-06	0.03
Chromium VI	Respiratory	0.45	6.30	3,500	7.2E-08	0.0001
Cobalt	None Specified	4.21	1,900	350	2.2E-09	0.01
Iron	None Specified	209,400		820,000		0.3
Manganese	Nervous	11,176		26,000		0.4
Thallium	None Specified	6.75		12		0.6
Vanadium	Dermal	310		5,800		0.05
PCBs (total)		0.04	0.94		4.8E-08	
Benz[a]anthracene		8.87	21.0		4.2E-07	
Benzo[a]pyrene	None Specified	7.02	2.10	220	3.3E-06	0.03
Benzo[b]fluoranthene		10.98	21.0		5.2E-07	
Dibenz[a,h]anthracene		1.09	2.10		5.2E-07	
Naphthalene	Nervous; Respiratory	0.60	17.0	590	3.5E-08	0.001
					1E-05	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	0
	None Specified	1

**Table 21 - Parcel B13
Sub-Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	18.4	3.00	480	6.1E-06	0.04	5.79	3.00	480	1.9E-06	0.01
Chromium VI	Respiratory	0.42	6.30	3,500	6.6E-08	0.0001	0.39	6.30	3,500	6.3E-08	0.0001
Cobalt	None Specified	19.0	1,900	350	1.0E-08	0.05	21.6	1,900	350	1.1E-08	0.06
Iron	None Specified	110,000		820,000		0.1	86,231		820,000		0.1
Manganese	Nervous	26,366		26,000		1	10,952		26,000		0.4
Thallium	None Specified	8.85		12		0.7	8.77		12		0.7
Vanadium	Dermal	529		5,800		0.09	657		5,800		0.1
Benz[a]anthracene		0.22	21.0		1.1E-08		2.43	21.0		1.2E-07	
Benzo[a]pyrene	None Specified	0.82	2.10	220	3.9E-07	0.004	6.31	2.10	220	3.0E-06	0.03
Benzo[b]fluoranthene		0.46	21.0		2.2E-08		7.20	21.0		3.4E-07	
Dibenz[a,h]anthracene		0.08	2.10		3.6E-08		1.18	2.10		5.6E-07	
Naphthalene	Nervous; Respiratory	0.09	17.0	590	5.1E-09	0.0001	0.11	17.0	590	6.3E-09	0.0002
					7E-06	↓				6E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	0
	None Specified	1

**Table 21 - Parcel B13
Sub-Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	13.6	3.00	480	4.5E-06	0.03	4.52	3.00	480	1.5E-06	0.009
Chromium VI	Respiratory	1.62	6.30	3,500	2.6E-07	0.0005	10.58	6.30	3,500	1.7E-06	0.003
Cobalt	None Specified	20.5	1,900	350	1.1E-08	0.06	7.54	1,900	350	4.0E-09	0.02
Iron	None Specified	156,200		820,000		0.2	150,800		820,000		0.2
Manganese	Nervous	15,119		26,000		0.6	20,807		26,000		0.8
Thallium	None Specified	6.67		12		0.6	12.5		12		1
Vanadium	Dermal	530		5,800		0.09	1,621		5,800		0.3
Benz[a]anthracene		5.65	21.0		2.7E-07		16.5	21.0		7.9E-07	
Benzo[a]pyrene	None Specified	5.94	2.10	220	2.8E-06	0.03	13.4	2.10	220	6.4E-06	0.06
Benzo[b]fluoranthene		7.72	21.0		3.7E-07		15.2	21.0		7.2E-07	
Dibenz[a,h]anthracene		1.53	2.10		7.3E-07		2.60	2.10		1.2E-06	
Naphthalene	Nervous; Respiratory	0.48	17.0	590	2.8E-08	0.0008	0.16	17.0	590	9.7E-09	0.0003
					9E-06	↓				1E-05	↓

RSLs were obtained from the EPA Regional Screening Levels at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

**Table 21 - Parcel B13
Sub-Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 5 (44.3 ac.)				
		EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	18.0	3.00	480	6.0E-06	0.04
Chromium VI	Respiratory	0.41	6.30	3,500	6.5E-08	0.0001
Cobalt	None Specified	7.78	1,900	350	4.1E-09	0.02
Iron	None Specified	109,600		820,000		0.1
Manganese	Nervous	9,627		26,000		0.4
Thallium	None Specified	12.5		12		1
Vanadium	Dermal	2,765		5,800		0.5
Benz[a]anthracene		0.21	21.0		9.8E-09	
Benzo[a]pyrene	None Specified	0.16	2.10	220	7.7E-08	0.0007
Benzo[b]fluoranthene		0.36	21.0		1.7E-08	
Dibenz[a,h]anthracene		0.04	2.10		1.8E-08	
Naphthalene	Nervous; Respiratory	894	17.0	590	5.3E-05	2
					6E-05	↓

RSLs were obtained from the EPA Regional Screening Levels at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	2
	Nervous	2
	None Specified	1

**Table 22 - Parcel B13
Pooled Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	13.1	3.00	480	4.4E-06	0.03	6.37	3.00	480	2.1E-06	0.01
Chromium VI	Respiratory	0.59	6.30	3,500	9.4E-08	0.0002	0.52	6.30	3,500	8.3E-08	0.0001
Cobalt	None Specified	15.3	1,900	350	8.0E-09	0.04	16.4	1,900	350	8.7E-09	0.05
Iron	None Specified	121,000		820,000		0.1	110,500		820,000		0.1
Manganese	Nervous	16,971		26,000		0.7	10,482		26,000		0.4
Thallium	None Specified	6.45		12		0.5	8.05		12		0.7
Vanadium	Dermal	468		5,800		0.08	441		5,800		0.08
PCBs (total)		0.09	0.94		9.4E-08		0.05	0.94		5.0E-08	
Benz[a]anthracene		0.31	21.0		1.5E-08		1.58	21.0		7.5E-08	
Benzo[a]pyrene	None Specified	0.60	2.10	220	2.8E-07	0.003	3.27	2.10	220	1.6E-06	0.01
Benzo[b]fluoranthene		0.52	21.0		2.5E-08		4.28	21.0		2.0E-07	
Dibenz[a,h]anthracene		0.13	2.10		6.3E-08		0.64	2.10		3.0E-07	
Naphthalene	Nervous; Respiratory	0.55	17.0	590	3.2E-08	0.0009	0.14	17.0	590	8.4E-09	0.0002
					5E-06	↓				4E-06	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	0
	None Specified	1

Table 22 - Parcel B13
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
		EPC mg/kg	Composite Worker				EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	90.5	3.00	480	3.0E-05	0.2	3.90	3.00	480	1.3E-06	0.008
Chromium VI	Respiratory	1.56	6.30	3,500	2.5E-07	0.0004	7.02	6.30	3,500	1.1E-06	0.002
Cobalt	None Specified	16.9	1,900	350	8.9E-09	0.05	7.38	1,900	350	3.9E-09	0.02
Iron	None Specified	177,200		820,000		0.2	147,800		820,000		0.2
Manganese	Nervous	28,607		26,000		1	19,667		26,000		0.8
Thallium	None Specified	9.17		12		0.8	10.06		12		0.8
Vanadium	Dermal	717		5,800		0.1	975		5,800		0.2
PCBs (total)		0.49	0.94		5.2E-07		0.96	0.94		1.0E-06	
Benz[a]anthracene		2.03	21.0		9.7E-08		10.09	21.0		4.8E-07	
Benzo[a]pyrene	None Specified	2.21	2.10	220	1.1E-06	0.01	8.64	2.10	220	4.1E-06	0.04
Benzo[b]fluoranthene		4.18	21.0		2.0E-07		12.4	21.0		5.9E-07	
Dibenz[a,h]anthracene		0.54	2.10		2.6E-07		1.58	2.10		7.5E-07	
Naphthalene	Nervous; Respiratory	0.34	17.0	590	2.0E-08	0.0006	0.22	17.0	590	1.3E-08	0.0004
					3E-05	↓				9E-06	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	1
	None Specified	1

Table 22 - Parcel B13
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Exposure Unit 5 (44.3 ac.)				
		EPC mg/kg	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	8.89	3.00	480	3.0E-06	0.02
Chromium VI	Respiratory	0.44	6.30	3,500	6.9E-08	0.0001
Cobalt	None Specified	5.10	1,900	350	2.7E-09	0.01
Iron	None Specified	131,100		820,000		0.2
Manganese	Nervous	9,676		26,000		0.4
Thallium	None Specified	9.30		12		0.8
Vanadium	Dermal	720		5,800		0.1
PCBs (total)		0.04	0.94		4.8E-08	
Benz[a]anthracene		4.70	21.0		2.2E-07	
Benzo[a]pyrene	None Specified	3.24	2.10	220	1.5E-06	0.01
Benzo[b]fluoranthene		5.89	21.0		2.8E-07	
Dibenz[a,h]anthracene		0.58	2.10		2.8E-07	
Naphthalene	Nervous; Respiratory	676	17.0	590	4.0E-05	1
					5E-05	↓

Bold indicates maximum values was used instead of UCL due to few detections
RSLs were obtained from the EPA Regional Screening Levels at
<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	1
	Nervous	2
	None Specified	1

**Table 23 - Parcel B13
Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	9.15	15.1	96.4	6.1E-07	0.09	8.33	15.1	96.5	5.5E-07	0.09
Chromium VI	Respiratory	1.24	21.6	801	5.7E-08	0.002	0.67	21.7	801	3.1E-08	0.0008
Cobalt	None Specified	13.0	5,041	955	2.6E-09	0.01	15.7	5,620	962	2.8E-09	0.02
Iron	None Specified	151,600		240,541		0.6	146,200		240,541		0.6
Manganese	Nervous	17,960		4,222		4	12,751		4,279		3
Thallium	None Specified	5.25		14		0.4	7.8		14		0.6
Vanadium	Dermal	514		1,603		0.3	281		1,607		0.2
PCBs (total)		0.09	5.42		1.6E-08		0.05	5.35		8.7E-09	
Benz[a]anthracene		0.33	154		2.1E-09		0.12	153		7.7E-10	
Benzo[a]pyrene	None Specified	0.28	17.3	9.06	1.6E-08	0.03	0.17	17.3	8.79	1.0E-08	0.02
Benzo[b]fluoranthene		0.53	173		3.1E-09		0.31	172		1.8E-09	
Dibenz[a,h]anthracene		0.09	17.8		5.0E-09		0.05	17.8		2.7E-09	
Naphthalene	Nervous; Respiratory	0.53	20.6	30	2.6E-08	0.02	0.24	19.9	29	1.2E-08	0.008
					7E-07	↓				6E-07	↓

Bold indicates maximum values was used instead of UCL due to few detections

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumption:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	4
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	3
	None Specified	1

**Table 23 - Parcel B13
Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	289	15.1	96.5	1.9E-05	3	3.83	15.1	96.5	2.5E-07	0.04
Chromium VI	Respiratory	1.60	21.6	801	7.4E-08	0.002	7.47	21.7	801	3.4E-07	0.009
Cobalt	None Specified	20.9	5,203	957	4.0E-09	0.02	9.06	5,546	961	1.6E-09	0.009
Iron	None Specified	177,300		240,541		0.7	165,500		240,541		0.7
Manganese	Nervous	30,907		4,239		7	21,713		4,272		5
Thallium	None Specified	12.4		14		0.9	9.13		14		0.7
Vanadium	Dermal	2,123		1,604		1	668		1,606		0.4
PCBs (total)		0.49	5.4		9.1E-08		0.96	5.36		1.8E-07	
Benz[a]anthracene		0.52	154		3.4E-09		9.32	153		6.1E-08	
Benzo[a]pyrene	None Specified	0.58	17.3	8.98	3.3E-08	0.06	8.47	17.3	8.82	4.9E-07	1.0
Benzo[b]fluoranthene		0.67	173		3.9E-09		10.65	172		6.2E-08	
Dibenz[a,h]anthracene		0.18	17.8		1.0E-08		1.50	17.8		8.4E-08	
Naphthalene	Nervous; Respiratory	0.37	20.4	29.7	1.8E-08	0.01	0.19	20	29.1	9.5E-09	0.007
					2E-05	↓				1E-06	↓

Bold indicates maximum values was used instead of UCL due to few detections

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumption:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

Total HI	Cardiovascular	3
	Dermal	4
	Respiratory	0
	Nervous	7
	None Specified	2

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	5
	None Specified	2

**Table 23 - Parcel B13
Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 5 (44.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	16.7	15.1	96.5	1.1E-06	0.2
Chromium VI	Respiratory	0.45	21.6	801	2.1E-08	0.0006
Cobalt	None Specified	4.21	5,087	956	8.3E-10	0.004
Iron	None Specified	209,400		240,541		0.9
Manganese	Nervous	11,176		4,227		3
Thallium	None Specified	6.75		14		0.5
Vanadium	Dermal	310		1,603		0.2
PCBs (total)		0.04	5.41		8.3E-09	
Benz[a]anthracene		8.87	154		5.8E-08	
Benzo[a]pyrene	None Specified	7.02	17.3	9.03	4.1E-07	0.8
Benzo[b]fluoranthene		10.98	173		6.4E-08	
Dibenz[a,h]anthracene		1.09	17.8		6.1E-08	
Naphthalene	Nervous; Respiratory	0.60	20.5	29.9	2.9E-08	0.02
					2E-06	↓

Bold indicates maximum values was used instead of UCL due to to few detections

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumption:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	3
	None Specified	2

**Table 24 - Parcel B13
Sub-Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	18.4	15.1	96.4	1.2E-06	0.2	5.79	15.1	96.5	3.8E-07	0.06
Chromium VI	Respiratory	0.42	21.6	801	1.9E-08	0.0005	0.39	21.7	801	1.8E-08	0.0005
Cobalt	None Specified	19.0	5,041	955	3.8E-09	0.02	21.6	5,620	962	3.8E-09	0.02
Iron	None Specified	110,000		240,541		0.5	86,231		240,541		0.4
Manganese	Nervous	26,366		4,222		6	10,952		4,279		3
Thallium	None Specified	8.85		14		0.6	8.77		14		0.6
Vanadium	Dermal	529		1,603		0.3	657		1,607		0.4
Benz[a]anthracene		0.22	154		1.4E-09		2.43	153		1.6E-08	
Benzo[a]pyrene	None Specified	0.82	17.3	9.06	4.8E-08	0.09	6.31	17.3	8.79	3.6E-07	0.7
Benzo[b]fluoranthene		0.46	173		2.7E-09		7.20	172		4.2E-08	
Dibenz[a,h]anthracene		0.08	17.8		4.2E-09		1.18	17.8		6.6E-08	
Naphthalene	Nervous; Respiratory	0.09	20.6	30	4.2E-09	0.003	0.11	19.9	29	5.3E-09	0.004
					1E-06	↓				9E-07	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumption:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Nervous	6
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	3
	None Specified	2

**Table 24 - Parcel B13
Sub-Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	13.6	15.1	96.5	9.0E-07	0.1	4.52	15.1	96.5	3.0E-07	0.05
Chromium VI	Respiratory	1.62	21.6	801	7.5E-08	0.002	10.58	21.7	801	4.9E-07	0.01
Cobalt	None Specified	20.5	5,203	957	3.9E-09	0.02	7.54	5,546	961	1.4E-09	0.008
Iron	None Specified	156,200		240,541		0.6	150,800		240,541		0.6
Manganese	Nervous	15,119		4,239		4	20,807		4,272		5
Thallium	None Specified	6.67		14		0.5	12.5		14		0.9
Vanadium	Dermal	530		1,604		0.3	1,621		1,606		1
Benz[a]anthracene		5.65	154		3.7E-08		16.5	153		1.1E-07	
Benzo[a]pyrene	None Specified	5.94	17.3	8.98	3.4E-07	0.7	13.4	17.3	8.82	7.8E-07	2
Benzo[b]fluoranthene		7.72	173		4.5E-08		15.2	172		8.8E-08	
Dibenz[a,h]anthracene		1.53	17.8		8.6E-08		2.60	17.8		1.5E-07	
Naphthalene	Nervous; Respiratory	0.48	20.4	29.7	2.3E-08	0.02	0.16	20	29.1	8.2E-09	0.006
					2E-06	↓				2E-06	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumption:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	4
	None Specified	2

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Nervous	5
	None Specified	3

**Table 24 - Parcel B13
Sub-Surface Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 5 (44.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	18.0	15.1	96.5	1.2E-06	0.2
Chromium VI	Respiratory	0.41	21.6	801	1.9E-08	0.0005
Cobalt	None Specified	7.78	5,087	956	1.5E-09	0.008
Iron	None Specified	109,600		240,541		0.5
Manganese	Nervous	9,627		4,227		2
Thallium	None Specified	12.5		14		0.9
Vanadium	Dermal	2,765		1,603		2
Benz[a]anthracene		0.21	154		1.3E-09	
Benzo[a]pyrene	None Specified	0.16	17.3	9.03	9.3E-09	0.02
Benzo[b]fluoranthene		0.36	173		2.1E-09	
Dibenz[a,h]anthracene		0.04	17.8		2.1E-09	
Naphthalene	Nervous; Respiratory	894	20.5	29.9	4.4E-05	30
					4E-05	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumption:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	2
	Respiratory	30
	Nervous	32
	None Specified	1

**Table 25 - Parcel B13
Pooled Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 1 (43.4 ac.)					Exposure Unit 2 (55.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	13.1	15.1	96.4	8.7E-07	0.1	6.37	15.1	96.5	4.2E-07	0.07
Chromium VI	Respiratory	0.59	21.6	801	2.8E-08	0.0007	0.52	21.7	801	2.4E-08	0.0006
Cobalt	None Specified	15.3	5,041	955	3.0E-09	0.02	16.4	5,620	962	2.9E-09	0.02
Iron	None Specified	121,000		240,541		0.5	110,500		240,541		0.5
Manganese	Nervous	16,971		4,222		4	10,482		4,279		2
Thallium	None Specified	6.45		14		0.5	8.05		14		0.6
Vanadium	Dermal	468		1,603		0.3	441		1,607		0.3
PCBs (total)		0.09	5.42		1.6E-08		0.05	5.35		8.7E-09	
Benz[a]anthracene		0.31	154		2.0E-09		1.58	153		1.0E-08	
Benzo[a]pyrene	None Specified	0.60	17.3	9.06	3.4E-08	0.07	3.27	17.3	8.79	1.9E-07	0.4
Benzo[b]fluoranthene		0.52	173		3.0E-09		4.28	172		2.5E-08	
Dibenz[a,h]anthracene		0.13	17.8		7.4E-09		0.64	17.8		3.6E-08	
Naphthalene	Nervous; Respiratory	0.55	20.6	30	2.7E-08	0.02	0.14	19.9	29	7.2E-09	0.005
					1E-06	↓				7E-07	↓

Bold indicates maximum values was used instead of UCL due to few detections

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002

Guidance Equation Input Assumption:

5 cars/day (2 tons/car)

5 trucks/day (20 tons/truck)

3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	4
	None Specified	1

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Nervous	2
	None Specified	1

**Table 25 - Parcel B13
Pooled Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 3 (46.6 ac.)					Exposure Unit 4 (53.7 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker				EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ		Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	90.5	15.1	96.5	6.0E-06	0.9	3.90	15.1	96.5	2.6E-07	0.04
Chromium VI	Respiratory	1.56	21.6	801	7.2E-08	0.002	7.02	21.7	801	3.2E-07	0.009
Cobalt	None Specified	16.9	5,203	957	3.3E-09	0.02	7.38	5,546	961	1.3E-09	0.008
Iron	None Specified	177,200		240,541		0.7	147,800		240,541		0.6
Manganese	Nervous	28,607		4,239		7	19,667		4,272		5
Thallium	None Specified	9.17		14		0.7	10.06		14		0.7
Vanadium	Dermal	717		1,604		0.4	975		1,606		0.6
PCBs (total)		0.49	5.4		9.1E-08		0.96	5.36		1.8E-07	
Benz[a]anthracene		2.03	154		1.3E-08		10.09	153		6.6E-08	
Benzo[a]pyrene	None Specified	2.21	17.3	8.98	1.3E-07	0.2	8.64	17.3	8.82	5.0E-07	1
Benzo[b]fluoranthene		4.18	173		2.4E-08		12.4	172		7.2E-08	
Dibenz[a,h]anthracene		0.54	17.8		3.0E-08		1.58	17.8		8.9E-08	
Naphthalene	Nervous; Respiratory	0.34	20.4	29.7	1.6E-08	0.01	0.22	20	29.1	1.1E-08	0.008
					6E-06	↓				1E-06	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumption:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	1
	Dermal	1
	Respiratory	0
	Nervous	7
	None Specified	2

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Nervous	5
	None Specified	2

**Table 25 - Parcel B13
Pooled Soils
Construction Worker Risk Ratios**

250 Day		Exposure Unit 5 (44.3 ac.)				
Parameter	Target Organs	EPC mg/kg	Construction Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	8.89	15.1	96.5	5.9E-07	0.09
Chromium VI	Respiratory	0.44	21.6	801	2.0E-08	0.0005
Cobalt	None Specified	5.10	5,087	956	1.0E-09	0.005
Iron	None Specified	131,100		240,541		0.5
Manganese	Nervous	9,676		4,227		2
Thallium	None Specified	9.30		14		0.7
Vanadium	Dermal	720		1,603		0.4
PCBs (total)		0.04	5.41		8.3E-09	
Benz[a]anthracene		4.70	154		3.1E-08	
Benzo[a]pyrene	None Specified	3.24	17.3	9.03	1.9E-07	0.4
Benzo[b]fluoranthene		5.89	173		3.4E-08	
Dibenz[a,h]anthracene		0.58	17.8		3.3E-08	
Naphthalene	Nervous; Respiratory	676	20.5	29.9	3.3E-05	23
					3E-05	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumption:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	23
	Nervous	25
	None Specified	2

APPENDIX A

Parcel B13 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Table 1 - Soil Samples

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth*	Analytical Parameters: Soil Samples
Southern Slag Pile Demolition Debris	REC 18, Finding 262	REC Location Map	According to the Phase I report, slag piles along the southern property boundary were observed during the site visit to also contain unknown quantities of demolition or other debris. Based on this information, the potential for a material release which may impact the environment is present.	3	B13-001 through B13- 003	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Oil Building/Oil House		Drawings 5003 and 5010	Investigate potential impacts related to oil storage buildings (potential leaks or releases).	4	B13-004 through B13- 007	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Diesel Fuel Tanks		Drawing 5017	Investigate potential impacts related to large diesel fuel tanks (potential leaks or releases).	2	B13-008 and B13-009	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Tank (Unknown contents)		Drawing 5103	Investigate potential impacts related to tanks with unknown contents (potential leaks or releases).	2	B13-010 and B13-011	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Thickener Tanks		Drawings 5010 and 5103	Investigate potential impacts related to thickener tanks (potential leaks or releases).	4	B13-012 through B13- 015	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Sump Pump		Drawing 5510	Investigate potential impacts related to sump pumps (potential leaks or releases).	2	B13-016 and B13-017	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Electric sub- station		Drawings 5003, 5010, and 5016	Investigate potential impacts related to electric sub-stations (potential leaks or releases).	6	B13-018 through B13- 023	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')

Parcel B13 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth*	Analytical Parameters: Soil Samples
Skulling Pit (old car dumper)		Drawing 5011	Investigate potential impacts related to skulling pits (potential leaks or releases).	2	B13-024 and B13-025	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Slag Pits		Drawings 5011 and 5017	Investigate potential impacts related to slag pits (potential leaks or releases).	12	B13-026 through B13- 037	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Parcel B13 Coverage			Investigate potential impacts related to any historical activities which may have occurred (potential leaks or releases).	45	B13-038 through B13- 082	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Total:				82				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)

No Engineered Barrier (>100 acres): 1 boring per 3 acres with no less than 40.

Engineered Barrier (1-15 acres): 0.5 boring per acre with no less than 2.

No Engineered Barrier (231 acres) = **77 borings required, 77 proposed**

Engineered Barrier (10 acres) = **5 borings required, 5 proposed**

Parking/Roads (10 acres)

Buildings (0 acres)

VOC - Volatile Organic Compounds (Target Compound List)

SVOCs - Semivolatile Organic Compounds (Target Compound List)

Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)

PCBs - Polychlorinated Biphenyls

DRO/GRO - Diesel Range Organics/Gasoline Range Organics

O&G - Oil and Grease

*VOCs are only collected if the PID reading exceeds 10 ppm

bgs - Below Ground Surface

Parcel B13 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Table 2 - Groundwater Samples

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	Condition of Existing Well	Number of Locations	Sample Locations	Boring Depth	Screen Interval	Analytical Parameters: Groundwater Samples†
Southern Slag Pile Demolition Debris	REC 18, Finding 262	REC Location Map	N/A	1	B13-001	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, Dissolved Metals, Total Cyanide, DRO/GRO, O&G
Oil House		Drawing 5010	N/A	1	B13-006	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, Dissolved Metals, Total Cyanide, DRO/GRO, O&G
Electric Sub- station		Drawing 5003	N/A	1	B13-021	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, Dissolved Metals, Total Cyanide, DRO/GRO, O&G
Parcel B13 Coverage			N/A	9	B13-042*, B13-045, B13-049, B13-059, B13-061, B13-066, B13-069, B13-076, B13-078	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, Dissolved Metals, Total Cyanide, DRO/GRO, O&G
Total:				12				

† Field measurements include pH, DO, ORP, conductivity, temperature.

Dissolved Metals include dissolved hexavalent chromium

* Location B13-042 replaces the originally proposed location B13-047

APPENDIX B



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, Sunny
 Northing (US ft) : 560941.161
 Easting (US ft) : 1460000.145

Boring ID: B13-001-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-001-SB-1	(0-20') GRAVEL and SAND-SIZED SLAG with trace silt, coarse sand through large subangular gravel, dense, light bluish gray and brownish gray, dry then moist at 9.5', saturated at 18', no plasticity, cohesion	GW-SW	Non-native fill material
56	62.0	-				
	102.2		B13-001-SB-4			
5	8.9					
	-					
	98.2					
64	51					
	22.5					
10	6.2		B13-001-SB-10			
	-					
54	-					
	-					
15	-					
	-					
50	-					Saturated at 18' + bgs
	-					
20	-			(20-25') SAND, Well Graded with trace gravel, medium to coarse grained, dense, light bluish gray, wet, no plasticity, no cohesion		
	-					
50	-				SW	
	-					
25	-					

Total Borehole Depth: 25' bgs.
 Boring terminated at 25' bgs due to water.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, Sunny
 Northing (US ft) : 561130.103
 Easting (US ft) : 1461285.63

Boring ID: B13-002-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		26.2	B13-002-SB-1	(0-20') Gravelly SILT with sand, soft, brown, dry, no plasticity, cohesive	ML	Metallic-type slag
		36.7				
90		237.1				
		83.1				
5		4.6				
		-				
		75.4				
70		117.8	B13-002-SB-8			
		89.1				
10		2.7	B13-002-SB-10			
		-				
		-				
50		24.0				
		61.8				
		8.4				
15		-				
		0.1				
80		0.3				
		0.9				
		8.3				
20						No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 70s, Sunny
 Northing (US ft) : 561036.832
 Easting (US ft) : 1460643.796

Boring ID: B13-003-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-003-SB-1	(0-15') GRAVEL and SAND with SLAG and trace silt, coarse sand through large subangular gravel, dense, light gray and dark reddish brown, dry then wet at 14.5', no plasticity, no cohesion	GW-SW	Non-native fill material
		0.4				
70		1.6				
		2.7				
		4.9	B13-003-SB-5			
5		-				
		1.1				
84		4.1				
		5.7				
		5.1	B13-003-SB-10			
10		-				
		-				
40		-				
		0.1				
		0.0				
15						Wet at 14.5' bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, Sunny
 Northing (US ft) : 560878.328
 Easting (US ft) : 1459261.775

Boring ID: B13-004-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-004-SB-1	(0-10') GRAVEL and SAND WITH SLAG, trace silt from 0-3', medium sand through large subangular gravel, dense, light blue-gray, dry, no plasticity, no cohesion	GW-SW	Non-native fill material
		1.5				
80		3.5				
		4.3	B13-004-SB-4			
5		<0.1				
		-				
		<0.2				
86		2.0				
		4.6				
10		5.0	B13-004-SB-10			No water encountered

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, Sunny
 Northing (US ft) : 560903.95
 Easting (US ft) : 1459257.619

Boring ID: B13-005-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-005-SB-1	(0-15') GRAVEL and SAND, trace slag and silt, coarse sand through large angular to subangular gravel, medium dense, light bluish gray to bluish gray, dry then moist 8-8.5', dry to 12.5, then wet to 15', no plasticity, no cohesion	GW-SW	Non-native fill material
	65	0.0				
		1.5				
		26.0	B13-005-SB-4			
		1.1				
5		-				
		0.6				
	83	6.4				
		27.1				
		29.1	B13-005-SB-10			
10		-				
		-				
	50	0.0				
		0.0				
		0.0				
15		0.0				

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, Sunny
 Northing (US ft) : 562509.031
 Easting (US ft) : 1461543.634

Boring ID: B13-006-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		13.4	B13-006-SB-1	(0-3') Silt with few gravel, soft, brown, dry, no plasticity, no cohesion	ML	Wet at 8' bgs
		217.3				
90		1094		(3-6') Silty SAND with gravel slag, loose, weak red, moist, no plasticity, no cohesion	SM	
		455.1	B13-006-SB-4			
5		214.2		(6-16') SLAG, gravel-sized with trace sand, loose, brown and gray, dry then wet at 8', no plasticity, no cohesion	GW	
		-				
50		153.3				
		134.6				
10		55.1				
		-				
40		-		(16-30') Gravelly SAND with silt, medium dense, brown and white, wet but dry in spots, no plasticity, no cohesion	SW/GW	Liners melted 20-30' bgs with poor recovery
		0.0				
15		0.0				
		-				
40		-				
		0.0				
20		0.0				
		-				
20		-		(30-32') No recovery		Wet at 29' + bgs GEOPROBE UNABLE TO RETRIEVE SAMPLES (30-32' bgs)
		-				
25		-				
		-				
20		-				
30		-				
		-				
35		-				
End of boring						

Total Borehole Depth: 32' bgs.
 Boring terminated at 32' bgs due to installation of piezometer with screen from 17-32' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, Sunny
 Northing (US ft) : 562437.275
 Easting (US ft) : 1461551.938

Boring ID: B13-007-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-007-SB-1	(0-1.8') Silt with few gravel, soft, brown, dry, no plasticity, no cohesion	ML	
		248.2				
	90	81.7		(1.8-2') ASPHALT, loose, gray, dry, no plasticity, no cohesion	NA	
				(2-3.5') SLAG, gravel with some sand-sized, loose, grayish brown, very moist, no plasticity, no cohesion		
		8.3	B13-007-SB-4		GW/SW	
		1.1				
5		-				
		4.5		(6-15') SLAG, gravel-sized, loose, grayish brown, very moist then wet at 13.5', no plasticity, no cohesion		
	90	3.7				
		0.8				
		0.1	B13-007-SB-10			
10		-			GW	
		-				
	50	-				
		0.2				
		0.0				
15						

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, clear, breezy
 Northing (US ft) : 563519.61
 Easting (US ft) : 1462489.333

Boring ID: B13-008-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-008-SB-1	(0.0-2.8') Sandy SLAG, loose, dark grayish brown, dry to moist, no plasticity, no cohesion	SW	
1.9						
85		32.2		(2.8-20') SLAG, sand and gravel-sized, becomes sandier at depth, medium dense; pale brown, pale gray, dark gray, yellow-brown, and white; moist then saturated at 18.6', wet zones at 12 and 14', no plasticity, no cohesion	SW/GW	
81.1			B13-008-SB-4			
7.4						
5		-				
		5.6				
70		6.6				
		11.9				
10		8.0	B13-008-SB-10			
		-				
		-				
70		-				
		-				
15		-				
		-				
57		-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, clear, breezy
 Northing (US ft) : 563539.141
 Easting (US ft) : 1462483.326

Boring ID: B13-009-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-009-SB-1	(0-2') Sandy and gravelly SLAG, loose, dark grayish black, dry, no plasticity, no cohesion	SW/GW	
1.5				(2-20') Sandy and gravelly SLAG, loose, grayish, moist then very moist at 6', wet at 18.2', no plasticity, no cohesion		
103	76					
22.7			B13-009-SB-4			
4.5						
5						
80						Wet zone 8-9' bgs-possibly perched on cemented slag
9.8						
8.9						
5.2						
6.3			B13-009-SB-10			
10					SW/GW	
60						Wet zone 13-14' bgs-possibly perched on cemented slag
15						
58						
20						Saturated at 18.6' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 80s, clear, breezy
 Northing (US ft) : 563409.405
 Easting (US ft) : 1461601.192

Boring ID: B13-010-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-010-SB-1	(0-2.5') Sandy SLAG, loose, dark grayish brown, dry, no plasticity, no cohesion	SW/GW	Wet zone 8-9' bgs
0.4						
75		2.4		(2.5-4.1') SLAG, sand and gravel-sized, medium dense, mixed brown, grayish brown, and reddish brown; moist, no plasticity, no cohesion	SW/GW	
20.8						
5		27.1		(4.1-5') SLAG, sand and gravel-sized, medium dense, strong reddish brown, very moist, no plasticity, no cohesion	SW/GW	
5.6						
21.2				(5-10') SLAG, sand and gravel-sized, medium dense; mixed grayish brown, dark grayish brown, and blue-gray, with pale whitish at depth; moist, no plasticity, no cohesion	SW/GW	
93		78.0	B13-010-SB-8		SW/GW	
38.7						
10		1.3	B13-010-SB-10			
-				(10-20') SLAG, sand and gravel-sized, medium dense; mixed pale whitish-gray, reddish yellow, and brown; moist then very moist at 17.5', wet at 18.4', no plasticity, no cohesion		Wet zone 13-14' bgs
47						
-						
15					SW/GW	
-						
47						
20						

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 80s, sunny
 Northing (US ft) : 563370.225
 Easting (US ft) : 1461589.895

Boring ID: B13-011-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-011-SB-1	(0-9') Sandy SLAG, loose to medium dense; dark grayish brown; dry to moist, no plasticity, no cohesion	SW	No odors
	68	0.3				
		1.6				
		1.9				
5		1.4				
		0.3				
	83	6.0	B13-011-SB-8			
		109				
		73.4				
10		0.7	B13-011-SB-10	(9-12') SLAG, sand and gravel-sized, medium dense; pale whitish gray, whitish gray, and pale brownish blue; moist, no plasticity, no cohesion	SW/GW	
		-				
	33	-		(12-20') SLAG, sand and gravel-sized, medium dense; pale whitish, pale grayish, yellowish brown, and brown; moist then saturated at 18.5', no plasticity, no cohesion	SW/GW	Saturated at 18.5' =bgs
		-				
		-				
15		-				
	57	-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 80s, sunny
 Northing (US ft) : 562905.407
 Easting (US ft) : 1461519.019

Boring ID: B13-012-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-012-SB-1	(0-0.8') Sandy SLAG, loose, no cohesion, dark grayish black, dry, no plasticity	SW	20% gravel slag No odors
	80	0.4		(0.8-3.8') Sandy SLAG, medium dense; mixed dark reddish brown, dark grayish, and yellowish brown; dry, no plasticity, no cohesion	SW	
		46.1				
		24.4	B13-012-SB-4			
5		1.2		(3.8-12') SLAG, sand and gravel-sized, medium dense, dark grayish with little dark reddish brown at depth, moist, no plasticity, no cohesion		
	20	-			SW/GW	
		-				
		-				
10		0.0	B13-012-SB-10			
		-				
	40	-		(12-18.2') Sandy SLAG with pieces of metallic looking slag, medium dense, dark grayish and dark brownish, moist to very moist, no plasticity, no cohesion		
		-				
15		-			SW/GW	
		-				
	67	-				
		-				
20		-		(18.2-20') Silty SAND-Sandy SILT, soft, dark gray and very dark brown, very moist then wet at 19', no cohesion	SM/ML	Wet at 19' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 80s, clear, breezy

Northing (US ft) : 562964.474
 Easting (US ft) : 1461457.897

Boring ID: B13-013-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-013-SB-1	(0-3') Sandy SLAG, loose, very dark gray, dry, no plasticity, no cohesion	SW	
58		2.7				
		80.2		(3-12') SLAG, sand and gravel-sized, medium dense; mixed very dark gray, very dark red, reddish brown, pale yellowish brown; moist then wet at 12', no plasticity, no cohesion	SW/GW	Wet at 9' bgs
5		48.5	B13-013-SB-5			
53		16.4				
		46.5				
10		2.9	B13-013-SB-10			
13		-				Dense slag
		-				
End of boring						
15						

Total Borehole Depth: 12' bgs.
 Boring terminated at 12' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 80s, clear, breezy
 Northing (US ft) : 563386.928
 Easting (US ft) : 1461764.422

Boring ID: B13-014-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-014-SB-1	(0-0.8') SLAG, sand and gravel-sized, loose, medium grayish brown, dry, no plasticity, no cohesion	SW/GW	Recent fill? (0-0.8')
	77	2.0		(0.8-6') SLAG, sand and gravel-sized, medium dense; dark grayish brown and reddish brown grading to mixed brownish gray, pale gray, and pale whitish; moist, no plasticity, no cohesion	SW/GW	Slag fill (>0.8')
		2.1				
		6.5				
		5.1				
5		-		(6-20') SLAG, sand and gravel-sized, medium dense; mixed pale brown, grayish, olive-gray, and trace reddish; moist then very moist at 12.1', saturated at 18.7', no plasticity, no cohesion	SW/GW	Saturated at 18.7' bgs
	68	19.5				
		39.4	B13-014-SB-8			
		5.8				
10		0.5	B13-014-SB-10			
		-				
	60	-				
		-				
15		-				
		-				
	60	-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 90s, mostly clear
 Northing (US ft) : 563370.056
 Easting (US ft) : 1461635.957

Boring ID: B13-015-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.8	B13-015-SB-1	(0-0.7') SLAG, sand and gravel-sized, loose to med dense, medium grayish, dry, no plasticity, no cohesion	SW/GW	No odors
	87	2.9		(0.7-6.9') SLAG, sand and gravel-sized, medium dense, very dark grayish then grayish brown at depth, moist, no plasticity, no cohesion	SW/GW	
		5.3				
		10.7				
5		2.1				
		-				
		18.6				
	80	13.4		(6.9-12.2') SLAG, sand and gravel-sized, medium dense, mixed light grayish with apparent pale grayish brown and yellowish brown RMF, moist with saturation at base, no plasticity, no cohesion	SW/GW	
		141	B13-015-SB-9			
		21.7	B13-015-SB-10			
10		-				
		-				
	100	-		(12.2-16') SLAG, sand and gravel-sized, medium dense, pale whitish gray to whitish grading to pale brown and whitish, moist with saturated zone at 14-14.2', no plasticity, no cohesion	SW/GW	Wet at 12'-possible perching above cemented slag
		-				
15		-				
		-				
	50	-		(16-20') Sandy SLAG, medium dense; mixed medium grayish, light gray, brownish and pale whitish; very moist then saturated at 18.5', no plasticity, no cohesion	SW	Wet at 14.2'- possible perching above cemented slag
		-				
		-				Saturated at 18.5' + bgs
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 80s, mostly clear, humid
 Northing (US ft) : 562795.45
 Easting (US ft) : 1461309.536

Boring ID: B13-016-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-016-SB-1	(0-2.2') Sandy SLAG with roots/organics, loose, very dark gray, dry, no plasticity, no cohesion	SW	No odors
65	0.6	-		(2.2-4') Sandy SLAG, medium dense, pale grayish brown, dry, no plasticity, no cohesion	SW	
	3.2	-				
5	0.0	-		(4-4.7') SLAG, sand and gravel-sized, medium dense, dark grayish brown, slightly moist, no plasticity, no cohesion	SW/GW	
	-	-		(4.7-8.9') SLAG, sand and gravel-sized, medium dense, dark reddish gray, moist, no plasticity, no cohesion	SW/GW	
52	7.0	-	B13-016-SB-8			
	4.5	-				
10	0.1	-	B13-016-SB-10	(8.9-20') SLAG, sand and gravel-sized, medium dense, dark gray with whitish coloration at (9.8-10'), (14.7-15'), and (19.5-20'), moist then saturated at 18.5', no plasticity, no cohesion		
	-	-				
58	-	-				
15	-	-			SW/GW	
	-	-				
80	-	-				
	-	-				
20	-	-				Saturated at 18.5' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/25/2016
 Weather : 90s, sunny, breezy
 Northing (US ft) : 562786.458
 Easting (US ft) : 1461310.801

Boring ID: B13-017-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-017-SB-1	(0-0.7') Organic SILTY SAND, loose, very dark gray to black, dry, no plasticity, no cohesion	SM	No odors
				(0.7-1.2') Sandy SLAG, loose, medium gray, dry, no plasticity, no cohesion	SW	
	78	0.3		(1.2-2.2') SLAG, sand and gravel-sized, loose, dark gray, dry, no plasticity, no cohesion	SW/GW	
		1.4		(2.2-6') SLAG, sand and gravel-sized, loose, dark grayish red, dry, no plasticity, no cohesion	SW/GW	
		16.1	B13-017-SB-4		SW/GW	
		0.5				
5		-				
		-		(6-20') SLAG, sand and gravel-sized, medium dense, dark reddish gray, moist, no plasticity, no cohesion		
	68	2.0				
		5.1				
		1.4	B13-017-SB-10			
10		-				
		-				
	62	-			SW/GW	
		-				
15		-				
		-				
	58	-				
		-				
		-				
20		-				Wet at 18.5' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, mostly sunny
 Northing (US ft) : 563244.876
 Easting (US ft) : 1461212.414

Boring ID: B13-018-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-018-SB-1	(0-10') GRAVEL and SAND with few slag and silt, fine sand through large angular to subrounded gravel, dense; dark brown, light bluish gray, and light brown, dry then wet at 9', no plasticity, no cohesion	GW-SW	Non-native fill material
		0.7				
	76	1.9				
		0.8				
5		<0.5				
		-				
	74	10.4				
		24.4	B13-018-SB-9			
		0.6				Wet at 9' bgs
10						

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, mostly sunny
 Northing (US ft) : 563236.064
 Easting (US ft) : 1461175.241

Boring ID: B13-019-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-019-SB-1	(0-10') GRAVEL and SAND with few slag and trace silt, fine sand through large rounded gravel, dense; dark brown and gray, dry then wet at 9', no plasticity, no cohesion	GW-SW	Non-native fill material Rounded metal/slag gravel down to 1' bgs
		-				Concrete pieces 2-3' bgs
64		592.6				
		1431	B13-019-SB-4			
5		432.6				
		170.0				
100		12.1				
		29.2				
		190.4				
10		31.3				Wet at 9' bgs

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, clear
 Northing (US ft) : 560791.151
 Easting (US ft) : 1459231.659

Boring ID: B13-020-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.0	B13-020-SB-1	(0-0.9') Sandy SLAG, dense, light olive greenish, dry, no plasticity, no cohesion	SW	Moderate odor at 0-5' bgs
	80	4.6		(0.9-15') Sandy and gravelly SLAG, dense, dark reddish brown with pale olive then pale gray brown at 7' +, dry grading to moist, then wet at 14.5', no plasticity, no cohesion	SW/GW	Moderate to strong chemical odor at 8-10' bgs
		5.3				
		2.5				
		0.1				
5		0.0				
		8.2				
	87	10.1				
		72.6	B13-020-SB-9			
		1.5	B13-020-SB-10			
10		-				
		-				
	60	-				
		-				
		-				
15		-				

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, clear
 Northing (US ft) : 560689.277
 Easting (US ft) : 1459199.609

Boring ID: B13-021-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.0	B13-021-SB-1	(0-0.5') Sandy and gravelly SLAG, dense, olive green, dry, no plasticity, no cohesion	SW/GW	No odors noted
		2.1		(0.5-2.5') Sandy and gravelly SLAG, dense, reddish brown and olive brown, dry, no plasticity, no cohesion	SW/GW	Wood fragments at 6-8' bgs
88		0.9		(2.5-7') Sandy and gravelly SLAG, dense, light olive brown, dry, no plasticity, no cohesion		No odors noted
		9.2				
5		2.8			SW/GW	
		-				
		2.9				
75		9.3		(7-10') Sandy and gravelly SLAG, dense, reddish brown and olive brown, moist with some free water at 8', no plasticity, no cohesion		
		15.7	B13-021-SB-9		SW/GW	
		0.3	B13-021-SB-10			
10		-		(10-20') Sandy and gravelly SLAG, dense, pale reddish brown and olive gray, moist then wet at 14.5', no plasticity, no cohesion		
		-				
33		-				
		-				
15		-			SW/GW	Wet at 14.5' + bgs
		-				
20		-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and installation of piezometer with screen from 10-20'



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 562261.721
 Easting (US ft) : 1461445.189

Boring ID: B13-022-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-022-SB-1	(0-2') SLAG GRAVEL with SAND, loose, brown and gray, moist grading to wet, no plasticity, no cohesion	GW	
	80	156.2				
		157.7		(2-3.5') Silty GRAVEL, loose, brown and gray, wet, no plasticity, no cohesion	GP-GM	
		244.9	B13-022-SB-4	(3.5-5') SILT, soft, brown and black, dry, no plasticity, no cohesion	ML	
5		27.6				
		133.5		(5-10') Gravelly SAND, loose, brown and gray, dry then very moist 8-10', no plasticity, no cohesion		
	100	210.7				
		76.7			SW/GW	
		76.2				
		8.1	B13-022-SB-10			
10		-		(10-15') Silty SAND with GRAVEL, loose, brown and gray, wet, no plasticity, no cohesion		
		-				Moderate oxidation
	60	8.2				Wet at 12' + bgs
		2.3				
		3.2				
15		-			SM	
		-				
		-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 562176.261
 Easting (US ft) : 1461444.488

Boring ID: B13-023-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-023-SB-1	(0-0.7') Sandy SILT with GRAVEL, soft, brown, dry, no plasticity, no cohesion	ML	Moderate oxidation Wet at 12.5' + bgs
		1.0		(0.7-2') Gravelly SAND, loose, brown and gray, dry, no plasticity, no cohesion	GW/SW	
70		307.7		(2-6.3') SLAG, gravel and sand-sized, loose, brownish gray, dry, no plasticity, no cohesion	GW/SW	
		114.5	B13-023-SB-4			
5		4.1			GW/SW	
		-				
		-		(6.3-11') SLAG, gravel and sand-sized, loose, brownish gray, moist then wet at 10', no plasticity, no cohesion		
50		49.8			GW/SW	
		10.3				
10		2.5	B13-023-SB-10		SW/GW	
		-		(11-13.5') Gravelly SAND, loose, grayish brown, wet, no plasticity, no cohesion		
50		0.1				
		0.3		(13.5-14.9') Sandy SILT, medium dense, dark brown, wet, no plasticity, no cohesion		
15		0.4			ML	
		-		(14.9-16') GRAVEL, loose, light gray, dry, no plasticity, no cohesion	GP	
40		-		(16-20') Sandy GRAVEL, loose, brownish gray, wet, no plasticity, no cohesion	GW/SW	
		0.0				
20		0.0				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 70s, sunny
 Northing (US ft) : 563029.685
 Easting (US ft) : 1462288.229

Boring ID: B13-024-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.3	B13-024-SB-1	(0-20') SAND, Well Graded with trace silt and subrounded slag, fine to coarse sand, very dense; dark gray, black, and light gray; dry, no plasticity, no cohesion	SW	Non-native fill material
		0.4				
	96	0.8				
		0.5				
5		1.0				
		0.8				
		18.5	B13-024-SB-7			
	80	10.5				
		0.5				
		-	B13-024-SB-10			
10		0.2				
		0.5				
	100	0.2				
		0.5				
		0.4				
15		-				
		0.2				
	74	0.3				
		0.5				
		0.2				
20						No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 70s, sunny
 Northing (US ft) : 563020.559
 Easting (US ft) : 1462492.684

Boring ID: B13-025-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-025-SB-1	(0-20') SAND, Well Graded with some silt, slag, and metallic iron fragments, fine sand through subangular to subrounded cobbles, medium dense; dark gray, reddish brown, and light gray; dry to 20' but moist 13.5-14.5', no plasticity, no cohesion	GW/SW	Non-native fill material
	82	0.5				
		1.3				
		1.3				
5		0.1	B13-025-SB-5			
		-				
	68	3.6				
		5.1				
10		0.2	B13-025-SB-10			
		-				
	50	0.4				
		0.8				
15		26.4				
		-				
	50	-				
		1.2				
20		0.4				No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 90s, sunny
 Northing (US ft) : 563137.687
 Easting (US ft) : 1462064.046

Boring ID: B13-026-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-026-SB-1	(0-20') SAND, Well Graded with some silt and trace slag, fine to coarse grained with rounded cobble-sized gravel 5-20', dense; dark gray, black, brownish gray, and light gray; dry then wet at 19', no plasticity, no cohesion	GW/SW	Non-native fill material 0-1' likely stockpile material
	80	<0.2				
		0.5				
		0.5				
5		0.4	B13-026-SB-5			
		-				
	86	<0.3				
		0.4				
10		0.5	B13-026-SB-10			
		0.4				
	34	-				
		0.3				
15		<0.2				
		-				
	36	-				
		0.4				
20		0.2				
						Wet at 19' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 70s, sunny
 Northing (US ft) : 563245.943
 Easting (US ft) : 1463068.964

Boring ID: B13-027-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-027-SB-1	(0-20') SAND and GRAVEL, Well Graded with some silt 0-6' and significant slag, fine sand through subrounded to subangular cobbles, dense; dark gray and light gray; dry then wet at 19', no plasticity, no cohesion	GW/SW	Non-native fill material
	74	2.7				
		2.9				
		34.7	B13-027-SB-4			
5		1.8				
		-				
		-				
60		4.3				
		9.7				
10		71.8				
		-				
		-				
24		-				
		-				
15		1.1				
		-				
		-				
22		-				
		-				
		-				
20		<0.2				
						Wet at 19' bgs

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 70s, sunny
 Northing (US ft) : 563290.07
 Easting (US ft) : 1463420.775

Boring ID: B13-028-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-028-SB-1	(0-20') SAND and GRAVEL, Well Graded with trace silt 0-4' and significant slag, coarse sand through subangular cobbles, medium dense; light bluish gray, brown, and light gray; dry to 19', moist 14-15', then wet at 19', no plasticity, no cohesion	GW/SW	Non-native fill material Subangular
	68	1.9				
		0.4				
5		1.6	B13-028-SB-5			
		-				
	64	0.4				
		1.6				
10		9.0	B13-028-SB-10			
		-				
	24	-				
15		<0.1				
		-				
	24	-				
		-				
20		<0.1				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 70s, sunny
 Northing (US ft) : 563201.451
 Easting (US ft) : 1462552.602

Boring ID: B13-029-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		<0.2	B13-029-SB-1	(0-15') SAND and GRAVEL, Well Graded with trace silt, slag, and metallic material, fine sand through large subrounded gravel, very dense, brownish gray and dark gray, dry then wet at 14.5', no plasticity, no cohesion	GW/SW	Non-native fill material
	94	0.6				
	4.8	1.2				
	1.2	0.9				
5		-				
	10.4					
	82	26.6	B13-029-SB-8			
		25.0				
10		1.4	B13-029-SB-10			
		-				
	10	-				
		-				
		-				
15		0.2				Wet at 14.5' bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 90s, sunny
 Northing (US ft) : 563229.095
 Easting (US ft) : 1461927.602

Boring ID: B13-030-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		<0.2	B13-030-SB-1	(0-4') Silty SAND, fine to medium grained, dense; dark gray, dark brown, and black; dry, no plasticity, no cohesion	SM	Non-native fill material
	92	0.3				
		1.1				
		3.9				
5		1.1	B13-030-SB-5	(4-15') SAND and GRAVEL, Well Graded with some silt and trace gravel, fine sand through medium gravel, dense, light gray and brown, dry then wet at 14', no plasticity, no cohesion	GW/SW	Subrounded
	72	-				
		0.4				
		2.6				
10		0.2	B13-030-SB-10			
	30	-				
		-				
		-				
15		0.2				Wet at 14' bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, sunny
 Northing (US ft) : 563281.459
 Easting (US ft) : 1462495.442

Boring ID: B13-031-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		3.3	B13-031-SB-1	(0-20') SAND and GRAVEL, Well Graded with trace silt and slag, fine sand through medium subrounded gravel, medium dense; light gray, gray, and brownish gray; dry, no plasticity, no cohesion	GW/SW	Non-native fill material Metallic material throughout
		5.5				
94		23.1				
		1.2				
5		0.9	B13-031-SB-5			
		0.4				
		1.2				
100		1.4				
		1.3				
10		1.1	B13-031-SB-10			
		-				
		-				
56		0.3				
		0.5				
15		0.2				
		-				
		-				
42		-				
		0.4				
		0.5				
20						No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, sunny
 Northing (US ft) : 563331.357
 Easting (US ft) : 1463009.048

Boring ID: B13-032-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-032-SB-1	(0-20') SAND and GRAVEL, Well Graded with little silt and trace slag, fine sand through large subrounded gravel, very dense; light gray, gray, and dark brown; dry, no plasticity, no cohesion	GW/SW	Non-native fill material
	82	1.7				
		91.2				
		1.5				
5		1.4	B13-032-SB-5			
		-				
	82	1.2				
		2.4				
		<0.1				
10		<0.1	B13-032-SB-10			
		-				
		0.2				
	82	0.6				
		0.2				
15		0.3				
		-				
		<0.1				
	68	<0.1				
		<0.1				
20		<0.1				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, sunny
 Northing (US ft) : 563374.852
 Easting (US ft) : 1463414.633

Boring ID: B13-033-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-033-SB-1	(0-20') SAND and GRAVEL, Well Graded with some silt 0-5' and significant slag throughout, medium sand through subangular cobbles, medium dense, light gray and dark gray, dry then wet at 17.5', no plasticity, no cohesion	GW/SW	Non-native fill material
	66	2.8				
		3.6				
5		0.2				
		-				
	64	8.0	B13-033-SB-8			
		4.9				
10		<0.1	B13-033-SB-10			
		-				
	24	-				
15		<0.2				
		-				
	50	<0.1				
		<0.1				
20		<0.1				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, sunny
 Northing (US ft) : 563497.733
 Easting (US ft) : 1463662.522

Boring ID: B13-034-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-034-SB-1	(0-17') SLAG, sand and gravel-sized, medium dense; mixed grayish, pale yellowish brown, dark grayish brown, dark brown, dry to moist, no plasticity, no cohesion	SW/GW	No odors apparent 0-10' bgs
0.5						
72	49.7	169.5				
	40.9					
5	-					
	4.9					
70	67.7					
	366		B13-034-SB-9			
	61.3		B13-034-SB-10			
	-					
27	-					
	-					
15	-					
	-					
33	-			(17-20') Sandy SILT to silty SAND, medium to stiff, mixed strong yellowish brown and pale whitish, very moist to possibly saturated from 19-20', no plasticity, no cohesion	ML/SM	Possible saturation from 19' + bgs
	-					
20				End of boring		

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 110s, sunny
 Northing (US ft) : 563414.462
 Easting (US ft) : 1462924.736

Boring ID: B13-035-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		1.1	B13-035-SB-1	(0-20') SAND and GRAVEL, Well Graded with trace silt 0-4' and significant slag 3-20', fine sand through small subangular gravel with large cobbles 8-10', dense; light bluish gray, brown, gray, and dark brown; dry then wet at 14.5', no plasticity, no cohesion	GW/SW	Non-native fill material
		9.2				
96		27.8				
		1.6				
5		0.6				
		-				
		-				
64		12.6	B13-035-SB-7			
		11.4				
10		5.2				
		-				
		-				
36		-				
		<0.1				
15		<0.1				
		-				
		<0.1				
68		<0.1				
		<0.1				
20		<0.1				
		<0.1				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/29/2016
 Weather : 100s, clear, breezy
 Northing (US ft) : 563326.096
 Easting (US ft) : 1462052.805

Boring ID: B13-036-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-036-SB-1	(0-1.8') Sandy SLAG, loose, dark grayish brown, dry, no plasticity, no cohesion	SW	No odors at 0-3' bgs
	77	2.3				
		6.1		(1.8-3') SLAG, sand and gravel-sized, medium dense, dark grayish brown with bluish gray slag fragments, moist, no plasticity, no cohesion	SW/GW	Moderate odors at 3-5' bgs
		5.7				
5		10.4	B13-036-SB-5	(3-14.2') Gravelly SLAG with some sand, medium dense; grayish, bluish gray, pale gray, and very pale yellowish brown; moist grading to very moist with saturated zones at 7 and 9.2', no plasticity, no cohesion		
		1.2				No odors 5' bgs to depth
	85	2.2				Possible perching on cement slag
		1.6				
		0.1			GW	Possible perching on cement slag
10		0.0	B13-036-SB-10			
		-				
	50	-				
		-				
		-				
15		-		(14.2-17.5') Sandy SLAG, medium dense, dark brown to pale brown with pale white, moist, no plasticity, no cohesion	SW	
		-				
	62	-				
		-				
		-		(17.5-20') Sandy SLAG, medium dense, pale whitish, wet, no plasticity, no cohesion	SW	Wet at 17.6' + bgs
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable drill depth.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, sunny
 Northing (US ft) : 563375.141
 Easting (US ft) : 1462510.329

Boring ID: B13-037-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-037-SB-1	(0-12') SAND and GRAVEL, Well Graded with some silt 0-3' and significant slag 3-12', medium sand through angular to subangular cobbles, medium dense; light bluish gray, light brown, and dark gray; dry then wet at 10.5', no plasticity, no cohesion	GW/SW	Non-native fill material
		-				
72	6.0					
		9.2	B13-037-SB-4			
		0.2				
5		-				
		0.2				
78	1.2					
		10.0				
		0.9	B13-037-SB-10			
10		0.4				
	95	0.2				Wet at 10.5' bgs
End of boring						
15						

Total Borehole Depth: 12' bgs.
 Boring terminated at 12' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, clear
 Northing (US ft) : 561614.307
 Easting (US ft) : 1462626.926

Boring ID: B13-038-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-038-SB-1	(0-8') SLAG, sand and gravel-sized, medium dense, dark brown with some dark reddish brown, dry then moist at 5', no plasticity, no cohesion	SW/GW	No odors apparent 0-10' bgs
	85	1.1				
		0.7				
		0.8				
5		0.4	B13-038-SB-5			
		0.2		(8-8.5') SLAG, dense, grayish, dry, no plasticity, no cohesion	GP	
		1.5				
		2.0				
	95	2.3		(8.5-10') SAND and GRAVEL, dense, pale grayish brown and pale brown, very moist to saturated at 9.6', no plasticity, no cohesion	SW/GW	Saturated from 9.5' + bgs
		5.8				
10						

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, overcast
 Northing (US ft) : 561497.7
 Easting (US ft) : 1462119.512

Boring ID: B13-039-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.1	B13-039-SB-1	(0-2.7') Sandy SLAG, loose to medium dense, dark grayish brown, dry to very moist, no plasticity, no cohesion	SW	No odors apparent 0-5' bgs
		0.6				
	95	1.2				
		4.4	B13-039-SB-4	(2.7-2.9') SLAG, sand and gravel-sized, dense, dark reddish gray, dry, no plasticity, no cohesion	SW/GW	Apparent cemented slag at 2.7-2.9' bgs
		0.2		(2.9-13.4') SAND and GRAVEL, medium dense, grayish brown, moist, no plasticity, no cohesion		
5		-				
		0.5				
	80	3.6			SW/GW	
		2.2				
		0.4	B13-039-SB-10			
10		-				
		-				
	33	-				
		-				
		-		(13.4-20') SLAG, sand and gravel-sized, dense; pale gray, pale brown, gray-brown, dark gray, moist then very moist at 18.5, wet at 19.3', no plasticity, no cohesion		
15		-				
		-			SW/GW	
	30	-				
		-				
		-				
20		-				Saturated from 19.3' + bgs, but possibly shallower

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561398.847
 Easting (US ft) : 1459508.946

Boring ID: B13-040-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-040-SB-1	(0-15') SAND and GRAVEL, Well Graded with little silt and slag throughout, medium sand through cobbles, medium dense; light bluish gray, red, light brown, and dark brown; dry then wet at 13.5', no plasticity, no cohesion	GW/SW	Non-native fill material
	76	<0.5				
		0.7				
		<0.5				
5		5.7	B13-040-SB-5			
		-				
		-				
	68	6.6				
		4.1				
10		9.1	B13-040-SB-10			
		-				
		-				
	30	-				
		-				
15		-				

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561421.463
 Easting (US ft) : 1459911.377

Boring ID: B13-041-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-041-SB-1	(0-10') SAND and GRAVEL, Well Graded with little silt and slag throughout, medium sand through angular to subrounded cobbles, loose; dark reddish brown and dark gray; dry then wet at 9.5', no plasticity, no cohesion	GW/SW	Non-native fill material
		2.9				
70		6.9				
		14.1	B13-041-SB-4			
		1.4				
5		-				Cobble-sized slag 4.5-5' bgs
		1.2				
72		1.6				Cobble-sized slag 8-8.5' bgs
		0.8				
		0.6				
10						Wet at 9.5' bgs

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 70s, sunny
 Northing (US ft) : 561629.074
 Easting (US ft) : 1461106.041

Boring ID: B13-042-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-042-SB-1	(0-20') SAND and GRAVEL, Well Graded with some silt and little slag throughout, medium sand through large subangular to well rounded gravel, very dense, light bluish gray and dark reddish brown, dry then moist at 9.5', wet 13' +, no plasticity, no cohesion	GW/SW	Non-native fill material
60	1.2					
	2.6					
5	<0.2					Small to large slag throughout
	-					
60	10.1					
	20.1		B13-042-SB-9			
10	9.5					Wet at 13' + bgs
	-					
	-					
15						
20						

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and installation of piezometer. Four borehole attempts completed to reach 10' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561849.493
 Easting (US ft) : 1461702.752

Boring ID: B13-043-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		4.8	B13-043-SB-1	(0-2') SILT with little gravel, soft, brown, dry, no plasticity, no cohesion	ML	Metallic-type grains with trace sand
		73.8				
90		247.3		(2-3.5') Gravelly SILT, soft, brown with white gravel, dry, no plasticity, no cohesion	ML	Trace oxidation 3.5-8' bgs
		916.1	B13-043-SB-4	(3.5-5.8') SLAG GRAVEL, loose, brown, moist, no plasticity, no cohesion	GW	
5		4.8				
		167.5		(5.8-9') Silty SAND with GRAVEL SLAG, loose, brown, dry then moist from 7.5-8', very moist 8-9', no plasticity, no cohesion	SM	
70		576.4				
		210.7				
10		1.9	B13-043-SB-10	(9-11.8') SLAG GRAVEL, loose, brown and gray, very moist, no plasticity, no cohesion	GW	
		-				
		-				
40		-		(11.8-15') Gravelly SAND, loose, brown, wet, no plasticity, no cohesion	SW/GW	
		4.2				Wet at 13.5' + bgs
15		1.1				

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 80s, overcast breezy
 : light rain
 Northing (US ft) : 562029.841
 Easting (US ft) : 1462777.329

Boring ID: B13-044-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-044-SB-1	(0-2') SLAG, sand and gravel-sized with gravel increasing in size with depth, medium dense, dark grayish, moist, no plasticity, no cohesion	SW/GW	Slag gravels increase in size with depth
	75	4.1		(2-13') Gravelly SLAG, 20% sand, dense; mixed pale yellow, dark gray to pale gray with pale yellow; moist, no plasticity, no cohesion		
		8.3				
		65.4	B13-044-SB-4			
5		1.4				
		-				
	57	0.2			GW	
		0.1				
10		0.1	B13-044-SB-10			
		-				
	57	-				
		-				
15		-		(13-20') SANDY SLAG, dense; mixed pale yellow, dark gray to pale brown, and gray; moist, no plasticity, no cohesion	SW	Saturated zone at 15' bgs; drier below
	42	-				No saturation encountered
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, clear, humid

Northing (US ft) : 561978.989
 Easting (US ft) : 1462301.983

Boring ID: B13-045-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-045-SB-1	(0-2.4') Sandy SLAG, loose, very dark brown and black grading to very dark reddish brown then brownish yellow, dry, no plasticity, no cohesion	SW	Moderate chemical odor 2.5-3.5' bgs
	78	0.4				
		6.4		(2.4-31.5') SLAG, sand and gravel-sized, medium dense, gray to brown-gray, moist, no plasticity, no cohesion		No odors from 5' + bgs
		198	B13-045-SB-4			
5		35.3				
		-		(31.5-40') SLAG, sand and gravel-sized, dense, pale gray and dark gray to light gray, saturated, no plasticity, no cohesion	SW/GW	Wet zone at 7.5-8' bgs *
	77	12.1				
		17.8				
10		30.5	B13-045-SB-10			
		2.9				
	53	-		Saturated at 29.2' + bgs		Wet zone at 9.7-10' bgs *
		-				
15		-				
	46	-				
		-				
20		-				
	65	-				
		-				
25		-		Saturated at 29.2' + bgs	SW/GW	Saturated at 29.2' + bgs
	35	-				
		-				
30		-				
	37	-				
	40	-		Saturated at 29.2' + bgs		Saturated at 29.2' + bgs
35		-				
	40	-		Saturated at 29.2' + bgs		Saturated at 29.2' + bgs
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.

*Possibly perched on cemented slag zone



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 80s, sunny
 Northing (US ft) : 562154.122
 Easting (US ft) : 1461082.251

Boring ID: B13-046-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0				(0-4') SAND and GRAVEL, Well Graded with trace silt and slag 0-2.5' then weathered concrete 2.5-4', fine sand through medium subrounded gravel, very dense, dark gray to 2.5' then light gray, dry then wet at 9.5', no plasticity, no cohesion	GW/SW	Non-native fill material
0.4		B13-046-SB-1				
1						
1.3						
2						
2.9	100					
3						
3.6						No water encountered
4				End of boring		
5						

Total Borehole Depth: 4' bgs.
 Boring terminated at 4' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 80s, sunny
 Northing (US ft) : 561923.292
 Easting (US ft) : 1460828.673

Boring ID: B13-047-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-047-SB-1	(0-15') SAND and GRAVEL, Well Graded with little silt and significant slag throughout, medium sand through subrounded to angular cobbles, very dense, dark brown and light bluish gray, dry then moist at 8', no plasticity, no cohesion	GW/SW	Non-native fill material
1		2.9				
2	70	44.8				
3		49.1	B13-047-SB-4			
4		4.4				
5		0.4				
6		3.8				
7	92	23.8				
8		25.2				
9		19.2	B13-047-SB-10			
10		-				
11		-				
12	60	0.2				
13		0.9				
14		6.2				
15				No water encountered		

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561677.516
 Easting (US ft) : 1460264.04

Boring ID: B13-048-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0				(0-9') SAND and GRAVEL, Well Graded with slag throughout and some silt, fine sand through subrounded to subangular cobbles, dense, reddish brown and dark bluish gray, dry then wet at 9', no plasticity, no cohesion	GW/SW	Non-native fill material
1		-	B13-048-SB-1			
2		-				
3	64	12.0				
4		1.6				
5		57.6				
6		38.3				
7	83	518.6	B13-048-SB-7			
8		113.2				
9		1.6				
10				End of boring		Slag cobbles 8.5-9' bgs

Total Borehole Depth: 9' bgs.
 Boring terminated at 9' bgs due to refusal and water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561827.608
 Easting (US ft) : 1459623.251

Boring ID: B13-049-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-049-SB-1	(0-19.5') SAND and GRAVEL, Well Graded with some slag, metallic fragments, and little silt, medium sand through large subrounded to angular gravel, dense; dark reddish brown, dark gray, and light bluish gray, dry then moist at 4', wet at 18', no plasticity, no cohesion	GW/SW	Non-native fill material to 19.5'
1		-				
2	66	1.0				
3		2.0				
4		9.4	B13-049-SB-5			
5		-				
6		-				
7	62	0.8				
8		2.8				
9		5.3	B13-049-SB-10			
10		-		Saturated at 18' + bgs		
11		-				
12	30	-				
13		<0.4				
14		<0.4				
15		-				
16		-				
17	30	-				
18		-				
19		-				
20		-		(19.5-25') SAND, Well Graded with gravel and trace silt and small gravel, fine to coarse subangular grained, loose, light bluish gray, wet, no plasticity, no cohesion	SW	
21	36	-				
22		-				
23		-				
24		-				
25		-				

Total Borehole Depth: 25' bgs.
 Boring terminated at 25' bgs due to water and piezometer installation.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 562065.815
 Easting (US ft) : 1460008.094

Boring ID: B13-050-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		<0.3	B13-050-SB-1	(0-19.5') SAND and GRAVEL, Well Graded with some slag throughout and little silt, fine sand through subangular cobbles, very dense; dark reddish brown and light gray, dry then moist at 6', wet at 9.5', no plasticity, no cohesion	GW/SW	Non-native fill material Metallic fragments 0-3'
1		0.9				
2	96	3.1				
3		7.6				
4		3.7	B13-050-SB-5			
5		<0.3				
6		0.5				
7	94	1.7				
8		1.3				
9		2.7				
10						Wet at 9.5' bgs

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, mostly clear, breezy
 Northing (US ft) : 562432.068
 Easting (US ft) : 1460695.8

Boring ID: B13-051-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-051-SB-1	(0-8') SLAG, sand and gravel-sized, loose to medium dense; mixed grayish brown, reddish brown, dark grayish brown with whitish coatings/concretions below 4', dry then moist at 6', no plasticity, no cohesion	SW/GW	
12.7						
78	3.1					
5	0.5					
			B13-051-SB-7	(8-8.7') Sandy SLAG, dense, dark reddish brown, moist, no plasticity, no cohesion	SW	
80	3.3					
			B13-051-SB-10	(8.7-20') SLAG, sand and gravel-sized, medium dense; mixed grayish brown, reddish brown, and dark grayish brown with whitish coatings/concretions, some pale gray and red gray clay coatings on slag from 12-15'; very moist, saturated at 19.2', no plasticity, no cohesion	SW/GW	Saturated at 19.2' + bgs
10	0.9					
60	-					
15	-					
40	-					
20	-					

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, overcast
 Northing (US ft) : 562248.965
 Easting (US ft) : 1461966.014

Boring ID: B13-052-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.9	B13-052-SB-1	(0-2') SLAG, sand and gravel-sized, medium dense, dark gray and reddish gray, dry, no plasticity, no cohesion	SW/GW	
		8.8				
	82	6.4		(2-2.3') Sandy SLAG, medium dense, pale brown, dry, no plasticity, no cohesion	SW	
		0.3		(2.3-5.2') SLAG, very dense, dark reddish with light gray at depth, dry, no plasticity, no cohesion	SW/GW	Possibly cemented
		0.8				
5		5.1		(5.2-6') Sandy SLAG, medium dense, very dark gray, moist, no plasticity, no cohesion	SW	Very dense and hard advancement with rig from 5-13' bgs
		8.3				
	100	12.0	B13-052-SB-7	(6-20') SLAG, sand and gravel-sized, very densebut less dense below 13'; pale grayish, pale brown, yellowish brown, and light gray; moist, no plasticity, no cohesion		
		8.7				
		0.3	B13-052-SB-10			
10		-				
		-				
	60	-			SW/GW	
		-				
		-				
15		-				
		-				
	55	-				
		-				
		-				
20		-				No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain
 Northing (US ft) : 562480.432
 Easting (US ft) : 1462974.723

Boring ID: B13-053-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-053-SB-1	(0-14.5') GRAVEL, Well Graded with some silt 0-8', small gravel to angular cobbles, medium dense; dark gray, brown, and light gray; dry then wet at 14', no plasticity, no cohesion	GW	Non-native fill material 75% slag throughout
1		1.0				
2	70	6.4				
3		12.2	B13-053-SB-4			
4		19				
5		0.6				
6		1.3				
7	94	3.8				
8		4.4				
9		14.4	B13-053-SB-10			
10		-				
11		-				
12	40	-				
13		-				
14		<0.1				
14		<0.1				
15	End of boring					

Total Borehole Depth: 14.5' bgs.
 Boring terminated at 14.5' bgs due to refusal and water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, sunny
 Northing (US ft) : 562383.501
 Easting (US ft) : 1463707.79

Boring ID: B13-054-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-054-SB-1	(0-10') SAND and GRAVEL, Well Graded with trace silt 0-3' and significant slag throughout, fine sand through subrounded to subangular cobbles, very dense; light bluish gray, brown, and light gray; dry, no plasticity, no cohesion	GW/SW	Non-native fill material
1		0.2				
2	64	0.6				
3		1.2				
4		0.8	B13-054-SB-5			
5		-				
6		-				
7	26	-				
8		-				
9		<0.2	B13-054-SB-10			
10						No water encountered

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, mostly clear
 Northing (US ft) : 562323.581
 Easting (US ft) : 1459484.15

Boring ID: B13-055-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		3.5	B13-055-SB-1	(0-9.2') SLAG, sand and gravel-sized, loose to medium dense, dark grayish brown to grayish brown, and brown, dry, no plasticity, no cohesion	SW/GW	No odors from 0-5' bgs
	97	69				
		49				
		45				
5		35				
		-				Apparent sewage odor from 6-9.2' bgs
	70	14.2				
		31				
		116	B13-055-SB-9			
10		-		(9.2-11') GRAVEL SLAG, coarse, dense, grayish, dry, no plasticity, no cohesion	GW	No 10' sample collected due to large slag
		-				
	60	-		(11-20') SLAG, sand and gravel-sized, dense, mixed pale gray/brown and gray brown, moist with a thin wet zone at 13.7', then wet at 18.5' + bgs, no plasticity, no cohesion		
		-				
15		-			SW/GW	
		-				
	100	-				
		-				
20		-				No water encountered

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, clear, breezy

Northing (US ft) : 562464.791
 Easting (US ft) : 1460087.919

Boring ID: B13-056-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.1	B13-056-SB-1	(0-0.9) Sandy SLAG, loose, grayish black, dry, no plasticity, no cohesion	SW	
		0.1		(0.9-3.9') Sandy SLAG, medium dense, dark grayish, moist, no plasticity, no cohesion	SW	
87		0.6				
		0.1				
5		53.1	B13-056-SB-5	(3.9-20') SLAG, sand and gravel-sized, medium dense to dense; mixed medium grayish, brownish, and dark grayish; moist then wet at 18.6', no plasticity, no cohesion		Wet zone at 3.8' bgs Chemical odor 3.9-5' bgs No odor 5-19' bgs
		0.2				
		0.7				
85		1.0				
		1.1				
10		0.6	B13-056-SB-10			
		-				
		-				
70		-			SW/GW	
		-				
15		-				
		-				
100		-				
		-				
20		-				Saturated at 18.6' + bgs Chemical odor-possibly sewage odor

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water and maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain
 Northing (US ft) : 562571.533
 Easting (US ft) : 1461085.283

Boring ID: B13-057-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-057-SB-1	(0-14.5') SAND and GRAVEL, Well Graded with some silt 0-4' and 30% slag throughout, fine sand through large subangular gravel, medium dense; light gray, dark brown, and dark gray; dry then moist at 14', no plasticity, no cohesion	GW/SW	Non-native fill material
1		1.1				
2	78	0.9				
3		10.8				
4		16.8	B13-057-SB-5			
5		-				
6		-				
7	60	-				
8		0.4				
9		0.3	B13-057-SB-10			
10		0.4				
11		-				
12	67	0.2				
13		<0.1				
14		<0.1				
15	End of boring					

Total Borehole Depth: 14.5' bgs.
 Boring terminated at 14.5' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 90s, mostly clear, breezy

Northing (US ft) : 563052.39
 Easting (US ft) : 1460891.081

Boring ID: B13-058-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0			B13-058-SB-1	(0-5.5') SLAG, sand and gravel-sized, medium dense; mixed grayish, brown-gray, and pale olive gray, dry to moist, no plasticity, no cohesion		No odors throughout
	77	5.1				
		92			SW/GW	
		400				
		41.6				
5		-		(5.5-8.2') Sandy SLAG, medium dense, dark grayish then dark reddish brown and dark grayish red from 6.3' +, dry, no plasticity, no cohesion		
		536.0	B13-058-SB-7		SW	
	83	12.5				
		4.4		(8.2-11') SLAG, sand and gravel-sized, medium dense; mixed grayish, brown-gray, and pale olive-gray; moist, no plasticity, no cohesion		
10		0.6	B13-058-SB-10		SW/GW	
		-				
	60	-		(11-15') SLAG, sand and gravel-sized, medium dense to dense; mixed pale yellowish brown, bluish gray, gray, and whitish; very moist then wet at 13.9', no plasticity, no cohesion		
		-			SW/GW	
		-				
15						Wet at 13.9' + bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative: W. Mader/N. Kurtz
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 90s, clear, breezy

Northing (US ft) : 563601.954
 Easting (US ft) : 1464146.162

Boring ID: B13-059-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-059-SB-1	(0-3') SLAG, sand and gravel-sized, loose to medium dense, dark grayish, dry, no plasticity, no cohesion	SW	No odors throughout
80		0.5				
		24.6				
5		11.6	B13-059-SB-4	(3-12') SLAG, sand and gravel-sized, medium dense, light grayish and grayish green to yellow brown with some whitish coatings, moist, no plasticity, no cohesion		
		6.3				
57		-			SW/GW	Probable hard slag fragments lacking wetness inside
		-				
10		0.2				
		1.4				
		8.6	B13-058-SB-10			
33		-		(12-13.5') Silty SAND and GRAVEL, medium dense, whitish, wet, no plasticity, no cohesion	SM/GM	Wet zone 13-13.5' bgs
		-				
15		-		(13.5-16') SLAG, sand and gravel-sized, dense; dark gray, yellowish brown, and whitish; dry, no plasticity, no cohesion, appears to perch overlying water	SW/GW	
		-				
50		-		(16-25') SLAG, sand and gravel-sized, medium dense; mixed light grayish, greenish gray, brownish, whitish; very moist		Wet zone at 18.2-19' bgs Dry zone at 18.8-20' bgs (Possible cemented zone)
		-			SW/GW	
20		-				
		-				
60		-				Probable water table at 18.2' bgs
		-				
25		-		(25-35') Same as above except saturated		
		-				
60		-				
		-				
30		-			SW/GW	
		-				
60		-				
		-				
35		-		(35-39.5') SAND, loose, dark gray, saturated, no plasticity, no cohesion		
		-			SW	
100		-				
		-				
40		-		(39.5-40') Sandy CLAY, stiff, dark gray, wet, med plasticity, cohesive	CI	

Total Borehole Depth: 40' bgs.

Boring terminated at 40' bgs due to water ajnd installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 90s, overcast, breezy
 Northing (US ft) : 562341.341
 Easting (US ft) : 1462479.173

Boring ID: B13-060-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	87	0.3	B13-060-SB-1	(0.0-6.5') SLAG, sand and gravel-sized, loose to medium dense; mixed black and dark reddish to gray-brown, then dark gray and pale gray to gray-white from 2.5-3.5', then gray-white to pale white with pale white clay films from 3.5-6.5', dry to moist, no plasticity, no cohesion	SW/GW	
		13.7				
		66.8				
		18.9	B13-060-SB-4			
5		0.3		(6.5-11.5') SLAG, sand and gravel-sized, dense; darl grayish black, minor whitish, and yellowish brown; moist, no plasticity, no cohesion	SM	
	38	-				
	9.0					
10		3.8	B13-060-SB-10	(11.5-20') Sandy silty SLAG, dense, pale whitish to grayish olive and very pale whitish and gray, interlayered pale brown from 15-20', very moist, no plasticity, no cohesion, slag is somewhat sticky/cohesive, 30% gravel	SM	Wet at 13.9' + bgs
	55	-				
	-	-				
15		-				
	40	-				
	-	-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G./N. Kurtz
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 70s, sunny
 Northing (US ft) : 562790.137
 Easting (US ft) : 1462731.888

Boring ID: B13-061-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-061-SB-1	(0-25') SAND and GRAVEL, Well Graded with some silt 0-4' and significant slag 0-18.5', quartz sand from 8-9' and 19-20', medium grained sand though large subangular gravel, dense; dark gray, light gray, light brown, and dark brown; dry then wet at 18.5', no plasticity, no cohesion	GW/SW	Non-native fill material
1		0.2				
2	74	1.7				
3		1.7				
4		25.8	B13-061-SB-4			
5		1.7				
6		-				
7		-				
8	64	21.3				
9		13.7				
10		2.4	B13-061-SB-10			
11		-		(25-31.5') SLAG, coarse sand and gravel-sized, loose at top then firm at depth, reddish brown then white 29-31.5', and greenish gray 31.5-40', wet, no plasticity, no cohesion	SW/GW	Mothball-like odor 31.5-40' bgs
12		-				
13	44	-				
14		<0.1				
15		<0.1				
16		-				
17		-				
18	70	-				
19		-				
20		-				
21		-		Wet at 18' + bgs		
22		-				
23	66	-				
24		-				
25		-				
26		0.0				
27		0.0				
28	60	0.0				
29		0.0				
30		0.0				
31		-				
32		-				
33	80	-				
34		-				
35		-				
36		-				
37		-				
38	60	-				
39		-				
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to installation of piezometer screened from (25-40') bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple P.G.
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain
 Northing (US ft) : 562808.954
 Easting (US ft) : 1461891.93

Boring ID: B13-062-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		15.2	B13-062-SB-1	(0-13') SAND and GRAVEL, Well Graded with some silt , metallic fragment, and 70% slag throughout, fine sand through coarse subangular gravel, very dense; light gray, dark brown, and dark gray; dry then moist at 13', no plasticity, no cohesion	GW/SW	Non-native fill material
	96	3.9				
		0.6				
		0.4				
5		<0.3	B13-062-SB-5			
		-				
		-				
60		0.3				
		0.2				
10		0.3	B13-062-SB-10			
	93	0.2				
		0.4				
		0.3				
End of boring						
15						No water encountered

Total Borehole Depth: 13' bgs.
 Boring terminated at 13' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 80s, Overcast, partly cloudy
 Northing (US ft) : 562637.742
 Easting (US ft) : 1462237.234

Boring ID: B13-063-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.4	B13-063-SB-1	(0.0-1.7') Sandy SLAG, loose, dark grayish black, moist, no plasticity, no cohesion	SW	No odors 0-5' bgs
		1.1				
	88	1.1		(1.7-4') Sandy SLAG, loose, pale grayish then grayish black 2.2-4', dry, no plasticity, no cohesion	SW	Moderate chemical odor 6.5-10' bgs
		1.5				
5		15.7		(4-9.5') SLAG, sand and gravel-sized, dense, pale grayish brown then dark brown 6.5-9.5', moist, no plasticity, no cohesion		
		-			SW/GW	
	67	5.9				
		8.4				
		22.8	B13-063-SB-9			
		10.7	B13-063-SB-10	(9.5-12') WOOD FRAGMENTS		No odors detected 10-20' bgs
10		-			-	
		-				
	20	-		(12-20') SLAG, sand and gravel-sized, dense, pale grayish, moist, no plasticity, no cohesion		No water encountered
		-				
		-				
15		-			SW/GW	
		-				
	27	-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, sunny
 Northing (US ft) : 561110.63
 Easting (US ft) : 1459574.899

Boring ID: B13-064-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-064-SB-1	(0-15') SAND and GRAVEL, Well Graded with trace silt 0-3' and some slag throughout, coarse sand through large angular to subangular gravel, dense, light bluish gray, moist 0-2', dry 2-11', then wet at 11', no plasticity, no cohesion	GW/SW	Non-native fill material
70	10.9	-				
	6.8	-				
5	2.1		B13-064-SB-5			
	-	-				
60	0.1	-				
	0.0	-				
10	0.6		B13-064-SB-10			
	-	-				
30	-	-				
15		-				Wet at 11' bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 80s, sunny
 Northing (US ft) : 560782.248
 Easting (US ft) : 1460300.153

Boring ID: B13-065-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-065-SB-1	(0-5.3') SLAG, sand and gravel-sized, medium dense; brown to dark brown then light olive gray from 3-3.3' then dark brown and gray-brown from 3.3-5', dry, no plasticity, no cohesion	SW/GW	
	77	1.1				
		7.7				
		17.9				
5		9.1		(5.3-20') SLAG, sand and gravel-sized, medium dense, dark grayish brown with some light olive and pale yellowish brown zones, thin strong reddish zones with brick from 10-15', moist then very moist at 18.5', no plasticity, no cohesion		Petroleum odor at 9-10' bgs
		3.1				
	90	16.8	B13-065-SB-8			
		17.0				
10		66.1	B13-065-SB-10			
	72	-			SW/GW	
		-				
		-				
15		-				
		-				
	100	-				
		-				
		-				No groundwater encountered
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, clear, breezy, humid
 Northing (US ft) : 561276.365
 Easting (US ft) : 1462951.385

Boring ID: B13-066-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-066-SB-1	(0-4.7') SLAG, sand and gravel-sized, medium dense; brown, gray, and dark brown; dry then moist from 2.7-4.7', no plasticity, no cohesion	SW/GW	Slag (0-10.5' bgs)
	80	2.4				
		17.0				
		11.9	B13-066-SB-4			
5		0.4		(4.7-10.5') Gravelly SLAG, medium dense, dark gray grading to pale gray with light gray coatings on slag, wet, no plasticity, no cohesion	GW	Wet at 4.7' + bgs
	50	-				
		-				
10		-		(10.5-13') Clayey SILT, soft dark gray and black from 10.5-10.7', then dark olive gray, very moist to wet, low plasticity, cohesive	ML	Native alluvium (10.5-13' bgs)
		-				
100		-				

Total Borehole Depth: 13' bgs.
 Boring terminated at 13' bgs due to groundwater and piezometer screened from 3-13' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, overcast, rainy
 Northing (US ft) : 561110.232
 Easting (US ft) : 1462679.138

Boring ID: B13-067-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-067-SB-1	(0-3') GRAVEL SLAG, medium dense, dark grayish brown, moist to very moist, no plasticity, no cohesion	GW	Slag 0-3' bgs
	75	0.2				
		0.9		(3-8.7') Silty CLAY, medium stiff, pale yellowish with pale brown clay coatings, very moist, med plasticity, cohesive	CL	Fill 3-8.7' bgs
		1.0				
		0.3	B13-067-SB-5			
5		-		(8.7-9.3') Mixed silty CLAY and SLAG GRAVEL, medium dense, grayish and pale brown, wet, low plasticity, cohesive	CL/GC	Wet at 8.7' + bgs
	33	-				
		3.4				
		0.5		(9.3-10) SLAG GRAVEL, dense, dark grayish, saturated, no plasticity, no cohesion	GW	
10						

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to groundwater.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, overcast, rainy
 Northing (US ft) : 560999.418
 Easting (US ft) : 1461873.45

Boring ID: B13-068-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-068-SB-1	(0-12.5') SLAG, sand and gravel-sized, loose to medium dense, dark grayish with some medium gray and grayish brown, dry to moist then all moist at 5' +, no plasticity, no cohesion	SW/GW	Slag 0-17.3' bgs No odors
	80	5.0				
		33.1				
		67.7	B13-068-SB-4			
5		0.7				
		-				
	80	4.8				
		19.5				
		13.6				
		11.3	B13-068-SB-10			
10		-		(12.5-17.3') SLAG, sand and gravel-sized, dense, pale grayish with trace yellowish, moist, no plasticity, no cohesion	SW/GW	Wet at 8.7' + bgs
		-				
	73	-				
		-				
		-				
		-				
15		-		(17.3-20') Clayey SILT, soft, dark grayish black grading to mixed grayish black and gray-olive, very moist, low plasticity, cohesive	ML	Native alluvium 17.3' + bgs
		-				
	60	-				
		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable drill depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, sunny
 Northing (US ft) : 560943.082
 Easting (US ft) : 1461272.293

Boring ID: B13-069-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.0	B13-069-SB-1	(0-1.9') SLAG, sand and gravel-sized, loose, strong brown and light gray, dry, no plasticity, no cohesion	SW/GW	
	85	0.6		(1.9-22.7') SLAG, sand and gravel-sized, medium dense, pale grayish brown and dark gray, moist to very moist, no plasticity, no cohesion	SW/GW	20% bluish-gray slag 5-10' bgs
		1.1				
		6.3				
5		1.2				
		0.3				
		2.7				
	92	6.4				
		13.7	B13-069-SB-9			
		60.1	B13-069-SB-10			
10		-				
		19.5				
	67	23.0				
		5.0				
		0.1				
15		-				
		-				
	58	-				
		-				
		-				
20		-				
		-				
	47	-				
		-				
		-				
25		-		(22.7-25') Sandy and silty sandy SLAG, medium dense, pale grayish with some pale yellow, saturated, no plasticity, no cohesion	SW/SM	Saturated at 19' + bgs

Total Borehole Depth: 25' bgs.
 Boring terminated at 25' bgs due to groundwater and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 70s, sunny
 Northing (US ft) : 561188.764
 Easting (US ft) : 1460242.362

Boring ID: B13-070-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-070-SB-1	(0-6') SAND and GRAVEL, Well Graded with little silt and some slag throughout, fine sand through large gravel, dense; light reddish gray, dark gray, and light bluish gray; dry, no plasticity, no cohesion	GW/SW	Non-native fill material Rounded to subangular gravel
		0.2				
	77	0.4				
		4.7				
		43.3	B13-070-SB-5			
5		<0.2				No water encountered
End of boring						
10						

Total Borehole Depth: 6' bgs.
 Boring terminated at 6' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 80s, sunny
 Northing (US ft) : 561462.402
 Easting (US ft) : 1461481.741

Boring ID: B13-071-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-071-SB-1	(0-5) SLAG, sand and gravel-sized with SAND, brown and light gray, dry then moist 4-5', no plasticity, no cohesion	SW/GW	
70	16.4					
	8.1					
5		0.2	B13-071-SB-6	(5-6.5') Silty SAND with GRAVEL, loose, brown and gray, dry, no plasticity, no cohesion	SM	
100		165.4		(6.5-11.3') SLAG, sand and gravel-sized, loose, gray, very moist, no plasticity, no cohesion	SW/GW	
	23.5					
10		40.2	B13-071-SB-10	(11.3-17') SLAG and BRICK, sand and gravel-sized, loose, gray and red, moist then wet 14.5-15', no plasticity, no cohesion	SW/GW	
	24.9					
50	0.4					
15		4.4		(17-20') SLAG, sand and gravel-sized, loose, gray, dry to moist, no plasticity, no cohesion	SW/GW	No water encountered
	1.9					
40		-				
20		-				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 70s, sunny
 Northing (US ft) : 563525.248
 Easting (US ft) : 1463271.826

Boring ID: B13-072-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-072-SB-1	(0-20') SAND and GRAVEL, Well Graded with some silt 0-4' and significant slag throughout, medium sand through cobbles, medium dense; brown, dark gray, and light bluish gray; dry then wet at 19', moist from 14-15', no plasticity, no cohesion	GW/SW	Non-native fill material Subangular gravel
	74	2.3				
		3.7				
		4.2	B13-072-SB-4			
5		<0.1				
		-				
	72	0.2				
		0.9				
		0.5				
10		0.5	B13-072-SB-10			
	54	<0.2				
		<0.2				
15		<0.2				
		-				
	24	-				
		-				
20		<0.1				

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS/N. Kurtz
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/30/2016
 Weather : 80s, clear
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		5.3	B13-073-SB-1	(0-2.5') SLAG, sand and gravel-sized, loose to medium dense, dark to medium grayish, no plasticity, no cohesion	SW/GW	Strong chemical/mothball-like odor from 2.5-0-15' bgs with liquid in places that appear to be water
	88	20.7		(2.5-3.5') Fine sandy SILT, medium stiff, very dark gray to black, very moist, low plasticity, cohesive	ML/SM	
		41.7		(3.5-5.5') SLAG, sand and gravel-sized, medium dense, grayish to yellowish, very moist, no plasticity, no cohesion	SW/GW	
5		266				
		257				
		-	B13-073-SB-7	(5.5-11.5') SLAG, sand and gravel-sized, medium dense, mixed yellow-brown and olive green, very moist with wetness from 6-7' and 8-9', no plasticity, no cohesion	SW/GW	
	75	633				
		337				
		228				
		73	B13-073-SB-10			
10		-		(11.5-16.5') SLAG, sand and gravel-sized, medium dense; mixed brown, gray, and very dark gray; very moist to saturated, no plasticity, no cohesion	SW/GW	Wet zone at 13-13.5' bgs-clear *
	37	-				Wet zone at 14.5-15' bgs-clear *
		-				Groundwater saturation 15' + bgs with possible product; saturated slag does not show sheen but has greasy feel
15		-		(16.5-21.5) SLAG, sand and gravel-sized, medium dense; mixed yellowish brown, grayish brown, and pale brown; saturated, no plasticity, no cohesion, strong chemical odor throughout	SW/GW	Very strong chemical odor throughout from 20-35' bgs
	27	-				
		-				
		-				
		-				
		-		(21.5-35) SLAG, sand and gravel-sized, medium dense; mixed yellowish brown, brown, and grayish brown changing to greenish gray from 33.5-35'; saturated, no plasticity, no cohesion, trace amber colored product from 25-26'		
20		-				
	50	-				
		-				
		-				
		-				
		102.1				
	50	166.3			SW/GW	
		160.1				
		167.5				
30		-				
	60	198.4				
		190.1				
		61.8				
		63.0				
		0.0				
		0.0		(35-40) SLAG, coarse sand and gravel-sized, loose to medium dense, greenish gray, saturated, no plasticity, no cohesion	SW/GW	
	100	0.0				
		0.0				
		0.0				
40		0.0				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.

* Zones for water or clear product-slag has somewhat greasy feel with strong odor



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 70s, sunny
 Northing (US ft) : 563063.988
 Easting (US ft) : 1463713.917

Boring ID: B13-074-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0				(0-2.5') SAND and GRAVEL, Well Graded with some silt, fine sand to medium gravel, very dense; light gray; dry, no plasticity, no cohesion		Non-native fill material Subangular gravel
		-	B13-074-SB-1			
1						
	60	<0.2			GW/SW	
2						
				End of boring		
3						

Total Borehole Depth: 2.5' bgs.
 Boring terminated at 2.5' bgs due to refusal.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain, cloudy

Northing (US ft) : 562251.833
 Easting (US ft) : 1463218.295

Boring ID: B13-075-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-075-SB-1	(0-10') GRAVEL, Well Graded, small through cobble-sized, medium dense, light and dark gray, dry then wet at 9', no plasticity, no cohesion	GW	Non-native fill material Angular gravel 90% slag
		-				
64	0.8					
	8.0					
5	3.0					
	2.0					
100	4.9					
	11.1		B13-077-SB-9			
	2.5					
10						Wet at 9' bgs

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 80s, clear
 Northing (US ft) : 562738.07
 Easting (US ft) : 1460511.175

Boring ID: B13-076-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		28.0	B13-076-SB-1	(0-2.2) Sandy and gravelly SLAG with metal fragments, medium dense, dark grayish black with pale grayish brown at depth, dry, no plasticity, no cohesion	SW/GW	No odors from 0-20' bgs
		55				
92		54		(2.2-5.7') Sandy and gravelly SLAG, medium dense, medium reddish brown to brown with whitish colorations, dry, no plasticity, no cohesion	SW/GW	
		8.5				
5		1.0				
		-				
		26.0	B13-076-SB-7	(5.7-10.7') SLAG, sand and gravel-sized, medium dense, grayish brown and dark reddish brown, moist with very damp zone from 7-8', no plasticity, no cohesion	SW/GW	
74		25.5				
		16.9				
		0.5	B13-076-SB-10			
10		-		(10.7-16') SLAG, sand and gravel-sized, medium dense; pale grayish brown, reddish brown, and whitish gray with dark gray at depth; moist then saturated at 13.7', no plasticity, no cohesion	SW/GW	Wet at 13.7' + bgs
		-				
72		-				
		-				
15		-				
		-				
		-		(16-19.2') SLAG, sand and gravel-sized, medium dense, reddish brown to strong red, wet, no plasticity, no cohesion	SW/GW	
60		-				
		-				
		-				
20		-		(19.2-20') Sandy SLAG, medium dense, pale reddish olive to olive-gray, wet, no plasticity, no cohesion	SW	

Total Borehole Depth: 20' bgs.
 Boring terminated at 20' bgs due to maximum allowable depth and piezometer installed with screen from 10-20' bgs



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain
 Northing (US ft) : 562927.614
 Easting (US ft) : 1463160.241

Boring ID: B13-077-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		1.2	B13-077-SB-1	(0-14') SAND and GRAVEL, Well Graded with some silt 0-6', medium sand through medium gravel, very dense, no cohesion, dark gray, dry, moist at 9' then wet at 12', no plasticity	GW/SW	Non-native fill material Subrounded to angular 40% slag
		2.9				
	92	51.8				
		11.3				
		1.1				
5		-				
		2.1				
	76	5.6				
		14.2	B13-077-SB-9			
		0.7	B13-077-SB-10			
10		-				
		-				
	55	4.6				
		0.8				
15				End of boring		Wet at 12' bgs

Total Borehole Depth: 14' bgs.
 Boring terminated at 14' bgs due to refusal and water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/31/2016
 Weather : 80s, mostly clear, hazy
 Northing (US ft) : 562747.154
 Easting (US ft) : 1463953.691

Boring ID: B13-078-SB

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-078-SB-1	(0-7') SLAG, sand and gravel-sized, loose to medium dense; gray to dark gray, moist and very dark gray 4-5', very moist and medium gray 5-7'; dry, 0-4', no plasticity, no cohesion	SW/GW	Slight chemical odor at 5-7' bgs
83	16.7					
5	29.1					
71	35.4					
	3.0			(7-11.5') SLAG, sand and gravel-sized, dense, medium grayish, moist, no plasticity, no cohesion	SW/GW	
100	31.0					
	15.6			(11.5-20') SLAG, sand and gravel-sized, dense; mixed very light gray, dark grayish brown, brownish gray, pale yellowish brown, and pale whitish with colors in 1-3" bands; very moist, no plasticity, no cohesion	SW/GW	Thin wet zone at 14' bgs
10	24.4					
47	45.6	B13-078-SB-9				
15	6.5	B13-078-SB-10				
	-			(20-35') SLAG, sand and gravel-sized, dense; pale gray, pale brownish gray, and gray; wet, no plasticity, no cohesion	SW/GW	Wet zone at 18.5-19.5' bgs Dry zone at 19.5-19.7' bgs Wet zone at 19.7-20' bgs Possible weak chemical odor Saturated at 20' + bgs
50	-					
20	-					
63	-					
	-			(35-40') No recovery due to jammed sleeve in casing, PVC sleeve saturated	SW/GW	Strong pungent mothball-like odors 28-35' bgs
25	-					
68	257.9					
30	414.4					
	732.9					
20	-					
	29.3					
35	178.0					
	-					
0	-					
40	-					
	-					

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yapple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/24/2016
 Weather : 70s, sunny
 Northing (US ft) : 561448.076
 Easting (US ft) : 1460642.057

Boring ID: B13-079-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-079-SB-1	(0-12.5') SAND and GRAVEL, Well Graded with some silt and slag throughout, medium sand through cobbles, loose, dark reddish brown and light bluish gray, dry then moist at 6' then wet at 9.5', no plasticity, no cohesion	GW/SW	Non-native fill material 0-12.5' bgs Wellrounded to subangular gravel
	76	1.5				
		4.0				
		5.9				
5		1.7	B13-079-SB-5			
		-				
		-				
	62	1.3				
		2.8				
10		<0.3				Wet at 9.5' bgs
		-				
	36	-				
		-		(12.5-15') GRAVEL, Well Graded with trace coarse sand, small through large gravel, loose, light bluish gray, wet, no plasticity, no cohesion	GW	Subangular gravel
		-				
15		-				

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 9/1/2016
 Weather : 70s, rain
 Northing (US ft) : 562665.618
 Easting (US ft) : 1463408.328

Boring ID: B13-080-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-080-SB-1	(0-15') SAND and GRAVEL, Well Graded with some silt 0-4', fine grained, dense, brown and light gray, dry then wet at 13', no plasticity, no cohesion	GW/SW	Non-native fill material Subangular gravel 76% slag
	86	1.6				
		2.3				
		0.8				
		4.8				
5		1.3				
		4.5				
	94	7.4				
		68.2	B13-080-SB-9			
		68.8	B13-080-SB-10			
10		-				
		-				
	46	-				
		1.5				
		0.7				
15						Wet at 13' bgs

Total Borehole Depth: 15' bgs.
 Boring terminated at 15' bgs due to water.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : J. Yaple
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 8/26/2016
 Weather : 80s, sunny
 Northing (US ft) : 562119.762
 Easting (US ft) : 1460498.307

Boring ID: B13-081-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	B13-081-SB-1	(0-10') GRAVEL, Well Graded with some slag throughout, small to cobble-sized, dense, gray, dry but moist at 2-4', then wet at 9.5', no plasticity, no cohesion	GW	Non-native fill material Subangular gravel
		4.8				
76		3.3				
		0.3				
5		0.0				
		-				
	64	108.2				
		140.1	B13-081-SB-9			
		19.6				
10						Wet at 9.5' bgs No sample at 10' due to large cobble slag

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : W. Mader P.G., CPSS
 Checked by : W. Mader P.G., CPSS
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumprey
 Drilling Equipment : Geoprobe 7822DT

Date : 8/23/2016
 Weather : 80s, clear
 Northing (US ft) : 560710.101
 Easting (US ft) : 1459550.881

Boring ID: B13-082-SB

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		0.3	B13-082-SB-1	(0-0.9') Sandy SLAG, loose, dark reddish brown, dry, no plasticity, no cohesion	SW	
		0.4		(0.9-2.3') Sandy SLAG, loose, dark reddish gray, dry, no plasticity, no cohesion	SW	
	95	0.7		(2.3-10') SLAG, sand and gravel-sized, medium dense, dark grayish brown then pale brownish gray and blue-gray from 4.3-10' with reddish brown strong oxidation from 8.5-10', moist then wet at 8.6', no plasticity, no cohesion	SW/GW	
		1.0				
		0.2	B13-082-SB-5			
5		-				
		-				
	60	1.5				Wet at 8.6' + bgs
		1.5				
		0.5				
10						

Total Borehole Depth: 10' bgs.
 Boring terminated at 10' bgs due to water.

APPENDIX C

March 27, 2017

Mr. James Calenda
EnviroAnalytis Group, LLC
1650 Des Peres Road, Suite 303
St. Louis, MO 63131

Re: Sparrows Point Well Survey
Sparrows Point, MD
Triad Engineering Job No. 03-15-0343

Mr. Calenda:

Below are the specified surveyed wells, date of last field work completed on March 15, 2017. The coordinate values shown were derived from G.P.S. observations based on National Geodetic Surveys stations "GIS 1", PID AC7684 and "GIS 2", PID AC7685 which purport to be on NAD83(2011) Maryland Grid coordinate system with NAVD88 (AMSL) elevations.

DESCRIPTION	NORTHING	EASTING	TOP CASING ELEVATION	GROUND AT WELL/PIEZOMETER ELEVATION
PARCEL B13				
B13-001-PZ	560936.2674	1460000.2729	19.75	16.40
B13-006-PZ	562506.3763	1461543.4343	31.63	28.46
B13-021-PZ	560689.5244	1459204.2529	14.31	13.89
B13-045-PZ	561975.0129	1462301.9331	32.18	28.99
B13-047-PZ	561825.2250	1459624.3050	20.13	16.85
B13-049-PZ	563598.9106	1464146.2354	28.92	28.69
B13-059-PZ	NOT FOUND			
B13-061-PZ	562789.0596	1462730.5838	31.61	29.21
B13-066-PZ	561271.9325	1462954.2130	6.60	4.13
B13-069-PZ	560938.0568	1461274.2935	23.33	19.52
B13-076-PZ	562732.0035	1460510.5915	17.09	14.19
B13-078-PZ	562741.3618	1463955.1826	30.68	27.19
PARCEL B18				
B18-007-PZ	563152.5601	1456556.5282	16.82	14.12
B18-046-PZ	563301.2512	1456053.7155	17.00	13.81
B18-061-PZ	563243.8731	1456297.9748	16.17	13.29
B18-070-PZ	563864.9161	1458116.9032	14.63	11.74
B18-071-PZ	563752.9641	1458120.8073	14.75	11.93

B18-072-PZ	563629.2464	1458125.9132	14.28	11.53
B18-074-PZ	563204.9798	1458049.2716	15.74	12.87
B18-075-PZ	563168.4935	1457705.4134	16.07	13.24
B18-076-PZ	563171.2410	1457422.0494	15.34	12.55
PARCEL A11				
A11-017-PZ	573821.3684	1460309.3275	14.03*	14.38
A11-037-PZ	574358.3308	1460163.4768	16.50	12.91
A11-042-PZ	575385.6435	1457912.2853	17.58	17.21
A11-043-PZ	573298.6554	1459210.0123	15.81	13.78
A11-046-PZ	575095.8745	1458532.2633	20.74	17.55
LF-01S	574700.9366	1459427.0602	16.03	13.28
LF-02	573967.6721	1459785.1435	16.38	13.65
LF-03S	573887.3520	1460825.2310	14.99	12.40
LF-04S	573450.8072	1460662.0720	19.51	16.64
LF-05	573266.4891	1460029.7495	15.82	13.07
SG01-PDP000	574837.9297	1458962.8367	18.28	16.14

*NOTE: TOP OF CASING BELOW SURFACE OF EXISTING GROUND.

APPENDIX D

APPENDIX E



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-001-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/23/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Don Marchese

Drilling Company : Green Services, Inc
TOC Elevation : 19.75'
0-Hr DTW : 19.40' TOC
48-Hr DTW : 19.32' TOC
ARM Representative : J. Yapple, PG

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 3.00' Riser Amount: 18'		<p>Northing (US ft):560936.267 Easting (US ft):1460000.273</p> <p>No NAPL encountered</p>
1				
2				
3		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
4				
5				
6		Sand Pack: Top: 13' bgs Bottom: 25' bgs Grain Size: WG #2		
7				
8				
9				
10				
11		Bentonite Seal: Top: 0 (surface) Bottom: 13' bgs Grain Size: granular (30-50 mesh)		
12				
13		(0-13') granular		
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Total Depth: 25'



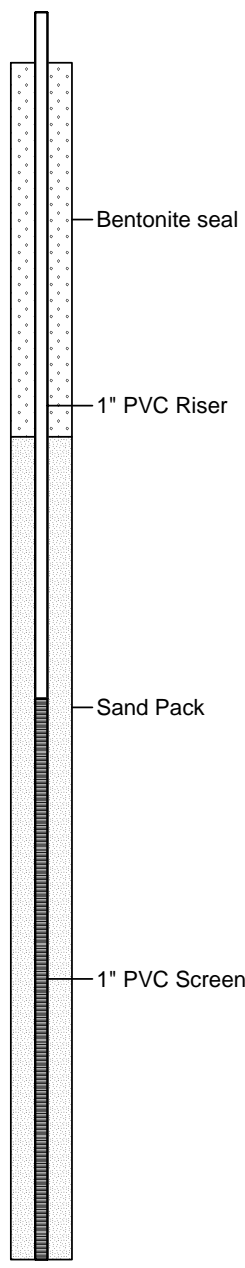
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-006-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/24/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 31.63'
0-Hr DTW : 31.15' TOC
48-Hr DTW : 31.13' TOC
ARM Representative : L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 2.90' Riser Amount: 20'		Northing (US ft):562509.031 Easting (US ft):1461543.634 No NAPL encountered
1				
2				
3		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"		
4				
5				
6		Sand Pack: Top: 10' bgs Bottom: 32' bgs Grain Size: See note		
7				
8				
9				
10		Hole material collapsed in from 10-32' before sand could be placed		
11		Bentonite Seal: Top: 0 (surface) Bottom: 10' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
12				
13				
14		(0-2') granular (2-9') chips (9-10') granular		
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				



Total Depth: 32'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-021-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/23/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 14.31'
0-Hr DTW : 17.3' TOC
48-Hr DTW : 17.19' TOC
ARM Representative : W. Mader PSS, P.G.

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 3.1' Riser Amount: 13.1'		<p>Northing (US ft):560689.524 Easting (US ft):1459204.253</p> <p>No NAPL encountered</p>
1		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
2				
3				
4				
5				
6		Sand Pack: Top: 8' bgs Bottom: 20' bgs Grain Size: Filpro #2		
7				
8				
9				
10				
11		Bentonite Seal: Top: 0 (surface) Bottom: 10' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
12				
13		(0-1') granular		
14		(1-7') chips		
15		(7-8') granular		
16				
17				
18				
19				
20				

Total Depth: 20'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-042-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/26/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Don Marchese

Drilling Company : Green Services, Inc
TOC Elevation : NA*
0-Hr DTW : 14.01' TOC
48-Hr DTW : 14.13' TOC
ARM Representative : J. Yapple P.G.

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 3.0' Riser Amount: 12.5'		<p>Northing (US ft):561629.074 Easting (US ft):1461106.041</p> <p>No NAPL encountered</p>
1				
2				
3		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
4				
5		Sand Pack: Top: 8' bgs Bottom: 20' bgs Grain Size: WG #2		
6				
7				
8		Bentonite Seal: Top: 0 (surface) Bottom: 8' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
9				
10		(0-2') chips (2-8') granular		
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Total Depth: 20'

* Piezometer was destroyed prior to survey completion.



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-045-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/31/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 32.18'
0-Hr DTW : 32.40' TOC
48-Hr DTW : 32.39' TOC
ARM Representative : W. Mader

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC		Northing (US ft):561978.989 Easting (US ft):1462301.983 No NAPL encountered
1		Riser Diameter: 1 inch		
2		Riser Stickup: 3.3'		
3		Riser Amount: 27.9'		
4		Screen Type: PVC		
5		Screen Diameter: 1 inch		
6		Screen Amount: 15 feet		
7		Slot Size: 0.010"		
8		Sand Pack:		
9		Top: 22.6' bgs		
10		Bottom: 39.6' bgs		
11		Grain Size: WG #2		
12		Bentonite Seal:		
13		Top: 0 (surface)		
14		Bottom: 22.6' bgs		
15		Grain Size: 3/8' chips/granular (30-50 mesh)		
16		(0-1') granular		
17		(1-19') chips		
18		(19-22.6') granular		
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				

Total Depth: 39.6'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-049-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/24/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Don Marchese

Drilling Company : Green Services, Inc
TOC Elevation : 20.13'
0-Hr DTW : 19.6' TOC
48-Hr DTW : 19.59' TOC
ARM Representative : J. Yapple P.G.

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 3.0' Riser Amount: 17.9'		<p>Northing (US ft):561827.608 Easting (US ft):1459623.251</p> <p>No NAPL encountered</p>
1				
2				
3		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
4				
5		Sand Pack: Top: 13' bgs Bottom: 25' bgs Grain Size: WG #2		
6				
7				
8		Bentonite Seal: Top: 0 (surface) Bottom: 13' bgs Grain Size: granular (30-50 mesh)		
9				
10		(0-13') granular		
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Total Depth: 25'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-059-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 9/2/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 28.92'
0-Hr DTW : 30.96' TOC
48-Hr DTW : 29.91' TOC
ARM Representative : N. Kurtz

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC		<p>Northing (US ft):563601.954 Easting (US ft):1464146.162</p> <p>No NAPL encountered</p>
1		Riser Diameter: 1 inch		
2		Riser Stickup: 3.09'		
3		Riser Amount: 27.8'		
4		Screen Type: PVC		
5		Screen Diameter: 1 inch		
6		Screen Amount: 15 feet		
7		Slot Size: 0.010"		
8		Sand Pack:		
9		Top: 23' bgs		
10		Bottom: 40' bgs		
11		Grain Size: WG #2		
12		Bentonite Seal:		
13		Top: 0 (surface)		
14		Bottom: 23' bgs		
15		Grain Size: 3/8' chips/granular (30-50 mesh)		
16		(0-1') granular		
17		(1-22') chips		
18		(22-23') granular		
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Total Depth: 40'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-061-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 9/2/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 31.61'
0-Hr DTW : 31.03' TOC
48-Hr DTW : 30.62' TOC
ARM Representative : N. Kurtz

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC		Northing (US ft):562790.137 Easting (US ft):1462731.888 No NAPL encountered
1		Riser Diameter: 1 inch		
2		Riser Stickup: 2.46'		
3		Riser Amount: 27.0'		
4		Screen Type: PVC		
5		Screen Diameter: 1 inch		
6		Screen Amount: 15 feet		
7		Slot Size: 0.010"		
8		Sand Pack:		
9		Top: 23' bgs		
10		Bottom: 40' bgs		
11		Grain Size: WG #2		
12		Bentonite Seal:		
13		Top: 0 (surface)		
14		Bottom: 23' bgs		
15		Grain Size: 3/8' chips/granular (30-50 mesh)		
16		(0-1') granular		
17		(1-22') chips		
18		(22-23') granular		
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Total Depth: 40'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-066-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/31/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 6.60'
0-Hr DTW : 6.04' TOC
48-Hr DTW : 6.24' TOC
ARM Representative : W. Mader

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 2.1' Riser Amount: 5'		Northing (US ft):561276.365 Easting (US ft):1462951.385 No NAPL encountered
1				
2				
3				
4		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
5				
6				
7				
8		Sand Pack: Top: 2' bgs Bottom: 13' bgs Grain Size: WG #2		
9				
10				
11				
12		Bentonite Seal: Top: 0 (surface) Bottom: 2' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
13		(0-0.5') granular (0.5-1.5') chips (1.5-2') granular		

Total Depth: 13'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-069-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/23/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 23.33'
0-Hr DTW : 22.95' TOC
48-Hr DTW : 22.88' TOC
ARM Representative : W. Mader PSS, P.G.

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 18.2' Riser Amount: 3.7'		Northing (US ft):560938.057 Easting (US ft):1461274.294 No NAPL encountered
1				
2				
3		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
4				
5				
6		Sand Pack: Top: 12' bgs Bottom: 24.5' bgs Grain Size: Filpro #2		
7				
8				
9				
10				
11		Bentonite Seal: Top: 0 (surface) Bottom: 12' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
12				
13				
14		(0-1') granular (1-10') chips (10-12') granular		
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Total Depth: 25'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-073-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 9/2/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Don Marchese

Drilling Company : Green Services, Inc
TOC Elevation : ---
0-Hr DTW : 32.98' TOC
48-Hr DTW : 32.60' TOC
ARM Representative : N. Kurtz

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC		Northing (US ft):563286.995 Easting (US ft):1463842.99 No NAPL encountered
1		Riser Diameter: 1 inch		
2		Riser Stickup: 2.8'		
3		Riser Amount: 27.60'		
4		Screen Type: PVC		
5		Screen Diameter: 1 inch		
6		Screen Amount: 15 feet		
7		Slot Size: 0.010"		
8		Sand Pack:		
9		Top: 23' bgs		
10		Bottom: 40' bgs		
11		Grain Size: WG #2		
12		Bentonite Seal:		
13		Top: 0 (surface)		
14		Bottom: 23' bgs		
15		Grain Size: 3/8' chips/granular (30-50 mesh)		
16		(0-2') granular		
17		(2-21') chips		
18		(21-23') granular		
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Total Depth: 40'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-076-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 8/26/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 17.09'
0-Hr DTW : 16.63' TOC
48-Hr DTW : 16.72' TOC
ARM Representative : W. Mader

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 3.1' Riser Amount: 12.80'	<p style="font-size: small;">Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p>	Northing (US ft): 562738.07 Easting (US ft): 1460511.175 No NAPL encountered
1		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 10 feet Slot Size: 0.010"		
2		Sand Pack: Top: 8' bgs Bottom: 20' bgs Grain Size: WG #2		
3		Bentonite Seal: Top: 0 (surface) Bottom: 8' bgs Grain Size: 3/8' chips/granular (30-50 mesh)		
4		(0-2') granular (2-6.5') chips (6.5-8') granular		
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Total Depth: 20'



LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B13-078-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B13
Sparrows Point, MD
ARM Project No.: 150300M-13-3
Page 1 of 1

Date Installed : 9/2/16
Casing/Riser Type : PVC
Borehole Diameter : 2.25"
Drilling Method : 7822DT Geoprobe
Driller : Kevin Pumphrey

Drilling Company : Green Services, Inc
TOC Elevation : 30.68'
0-Hr DTW : 30.50' TOC
48-Hr DTW : 29.70' TOC
ARM Representative : N. Kurtz

Depth in Feet	Surf. Elev.	DESCRIPTION		REMARKS
0		Riser Type: PVC		<p>Northing (US ft):562747.154 Easting (US ft):1463953.691</p> <p>No NAPL encountered</p>
1		Riser Diameter: 1 inch		
2		Riser Stickup: 2.71'		
3		Riser Amount: 27.6'		
4		Screen Type: PVC		
5		Screen Diameter: 1 inch		
6		Screen Amount: 15 feet		
7		Slot Size: 0.010"		
8		Sand Pack:		
9		Top: 23' bgs		
10		Bottom: 40' bgs		
11		Grain Size: WG #2		
12		Bentonite Seal:		
13		Top: 0 (surface)		
14		Bottom: 23' bgs		
15		Grain Size: 3/8' chips/granular (30-50 mesh)		
16		(0-2') granular		
17		(2-21') chips		
18		(21-23') granular		
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
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34				
35				
36				
37				
38				
39				
40				

Total Depth: 40'

APPENDIX F

**Low Flow Sampling
Temporary Piezometers**



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-13-3

Piezometer Number: B13-001-P2

Date: 9/12/16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): NONE

QED Controller Settings:

Depth to Water (ft): 19.47

Flow Rate (mL/min) 275

Product Thickness (ft): —

Length of time Purged (min)

Depth to Bottom (ft): 27.70

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
<u>0930</u>	<u>0.5</u>	<u>19.55</u>	<u>19.27</u>	<u>11.53</u>	<u>3.763</u>	<u>7.00</u>	<u>-162.4</u>	<u>9.96</u>	
<u>0935</u>	<u>0.9</u>	<u>19.47</u>	<u>19.36</u>	<u>11.55</u>	<u>3.772</u>	<u>6.96</u>	<u>-135.7</u>	<u>7.68</u>	
<u>0940</u>	<u>1.4</u>	<u>19.47</u>	<u>19.39</u>	<u>11.55</u>	<u>3.774</u>	<u>7.23</u>	<u>-183.8</u>	<u>4.33</u>	
<u>0945</u>	<u>1.9</u>	<u>19.47</u>	<u>19.39</u>	<u>11.53</u>	<u>3.774</u>	<u>7.00</u>	<u>-186.7</u>	<u>3.20</u>	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
<u>B13-001-P2</u>	<u>0950</u>	TCL-VOCs	3 - 40 mL VOA	HCl	<input checked="" type="checkbox"/>
		TPH-GRO	3 - 40 mL VOA	HCl	<input checked="" type="checkbox"/>
		TPH-DRO	2 - 1 L Amber	none	<input checked="" type="checkbox"/>
		TCL-SVOCs	2 - 1 L Amber	none	<input checked="" type="checkbox"/>
		Oil & Grease	2 - 1 L Amber	HCl	<input checked="" type="checkbox"/>
		Total Cyanide	1 - 250 mL Plastic	NaOH	<input checked="" type="checkbox"/>
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	<input checked="" type="checkbox"/>
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	<input checked="" type="checkbox"/>		

Matrix Spike

Duplicate

Sampled By: LMU

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
_____ ft x _____ gal/ft = _____ (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: <u>Parcel B13 Phase II</u>	Project Number: <u>150300M-13-3</u>
Piezometer Number: <u>B13-006-PZ</u>	Date: <u>9/9/16</u>
Piezometer Diameter (in): <u>1</u>	One Well Volume (gal):
Depth to Product (ft): <u>ndre</u>	QED Controller Settings:
Depth to Water (ft): <u>30.84</u>	Flow Rate (mL/min) <u>200 N 100</u>
Product Thickness (ft): <u>—</u>	Length of time Purged (min)
Depth to Bottom (ft): <u>34.81</u>	

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1238	0.1	30.84	28.78	11.55	2.746	1.47	-331.6	52.0	cloudy
1241	0.2	30.84	28.18	11.61	2.737	2.65	-342.8	49.27	
1244	0.3	30.84	27.67	11.48	2.732	2.72	-340.0	53.5	
1247	0.4	30.84	27.12	11.44	2.726	2.85	-333.5	52.9	
1250	0.5	30.84	26.77	11.44	2.721	3.09	-329.8	48.2	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B13-006-PZ	1255	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	1 - 1 L Amber	none	
		TCL-SVOCs	1 - 1 L Amber	none	
		Oil & Grease	1 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
		Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	
Matrix Spike					
Duplicate					

Sampled By: UMG

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
ft x gal/ft = (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Area B Parcel B13 Phase II

Project Number: 1503004-13-3

Piezometer Number: B13-021-PZ

Date: 9/7/16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): none

QED Controller Settings:

Depth to Water (ft): 16.50

Flow Rate (mL/min) 300

Product Thickness (ft): -

Length of time Purged (min)

Depth to Bottom (ft): 23.24

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1103	1.0	16.50	18.06	11.47	3.002	0.78	-155.2	1.44	
1108	1.4	16.50	18.20	11.47	2.999	0.79	-157.3	0.71	
1113	1.8	16.50	18.05	11.47	3.003	0.84	-158.1	0.93	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Preservative	Collected?
B13-021-PZ	1118	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	↓
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None			

Matrix Spike yes
Duplicate

Sampled By: LMG

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
_____ ft x _____ gal/ft = _____ (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-13-3

Piezometer Number: B13-042-PZ

Date: 9-12-16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): none

QED Controller Settings:

Depth to Water (ft): 14.10

Flow Rate (mL/min) 300

Product Thickness (ft):

Length of time Purged (min)

Depth to Bottom (ft): 22.52

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
0824	0.5	14.1	17.53	11.63	2.596	13.75	-140.1	13.73	
0829	1.0	14.1	17.56	11.71	2.617	12.76	-202.1	6.92	
0831	1.5	14.1	17.42	11.75	2.622	9.94	-219.7	4.77	
0839	1.9	14.1	17.47	11.77	2.625	10.12	-229.5	2.71	
0844	2.3	14.1	17.50	11.78	2.630	10.35	-231.7	0.63	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B13-042-PZ	0849	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None			

Matrix Spike

Duplicate

Sampled By: MLU

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
_____ ft x _____ gal/ft = _____ (gal)

**Low Flow Sampling
Temporary Piezometers**



ARM Group Inc.

Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-B-3

Piezometer Number: B13-045-PZ

Date: 9/9/16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): none

QED Controller Settings:

Depth to Water (ft): 31.96

Flow Rate (mL/min) 205

Product Thickness (ft):

Length of time Purged (min)

Depth to Bottom (ft): 42.11

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1000	0.2	31.96	22.54	11.85	3.659	0.93	-187.1	13.6	very clear
1005	0.35	31.96	21.96	11.77	3.644	0.96	-192.8	9.75	
1010	0.5	31.96	21.76	11.73	3.642	1.04	-195.3	7.9	
1015	0.65	31.96	21.70	11.74	3.642	1.00	-198.5	6.25	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B13-045-PZ	1020	TCL-VOCs	3 - 40 mL VOA	HCl	✓
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
		Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	

Matrix Spike

Duplicate

Sampled By: UMG

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
ft x gal/ft = (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Area B Parcel B13 Phase II

Project Number: 50300M-13-3

Piezometer Number: B13-049-P2

Date: 9-7-16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): ND

QED Controller Settings:

Depth to Water (ft): 18.87

Flow Rate (mL/min) 300

Product Thickness (ft): —

Length of time Purged (min)

Depth to Bottom (ft): 27.80

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1325	0.3	18.87	19.41	11.35	2.468	0.74	-150.1	4.29	
1330	0.75	18.87	19.32	11.36	2.466	0.73	-153.0	2.55	
1335	1.2	18.87	19.53	11.39	2.463	0.71	-154.3	1.80	
1340	1.6	18.87	19.43	11.44	2.469	0.73	-157.6	0.88	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B13-049-P2	1345	TCL-VOCs	3 - 40 mL VOA	HCl	✓
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
		Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	

Matrix Spike

Duplicate

Sampled By: UMG

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
 _____ ft x _____ gal/ft = _____ (gal)

**Low Flow Sampling
Temporary Piezometers**



ARM Group Inc.

Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-13-3

Piezometer Number: B13-059-PZ

Date: 9-8-16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft):

QED Controller Settings:

Depth to Water (ft): 29.91

Flow Rate (mL/min) 200

Product Thickness (ft):

Length of time Purged (min)

Depth to Bottom (ft): 42.64

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
0930	0.25	—	23.72	11.29	0.955	4.01	139.8	22.8	
0935	0.5	—	23.54	11.35	0.951	4.35	128.9	15.1	
0940	0.65	—	23.37	11.36	0.950	4.05	122.7	11.3	
0945	0.75	—	23.24	11.37	0.945	3.85	116.5	8.75	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
<u>B13-059-PZ</u>	<u>0950</u>	TCL-VOCs	3 - 40 mL VOA	HCl	<u>y</u>
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
		Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	

Matrix Spike

Duplicate

Sampled By: LMG

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
ft x gal/ft = (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.

Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-13-3

Piezometer Number: B13-061-PZ

Date: 9/9/16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): none

QED Controller Settings:

Depth to Water (ft): 30.62

Flow Rate (mL/min) 200

Product Thickness (ft): —

Length of time Purged (min)

Depth to Bottom (ft): 42.16

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
0735	0.25	30.62	21.77	12.11	4.109	0.61	-211.8	25.3	very clear
0740	0.4	30.62	21.91	12.14	4.140	0.46	-256.16	13.4	
0745	0.55	30.62	22.04	12.14	4.139	0.43	-266.6	13.21	
0750	0.7	30.62	22.16	12.14	4.139	0.33	-275.6	9.44	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Preservative	Collected?
B13-061-PZ	0755	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO ₃	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None			

Matrix Spike

Duplicate

Sampled By: lmb

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
ft x gal/ft = (gal)

**Low Flow Sampling
Temporary Piezometers**



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: <u>Parcel B13 Phase II</u>	Project Number: <u>150300M-13-3</u>
Piezometer Number: <u>B13-066-P2</u>	Date: <u>9/12/16</u>
Piezometer Diameter (in): <u>1</u>	One Well Volume (gal):
Depth to Product (ft): <u>none</u>	QED Controller Settings:
Depth to Water (ft): <u>6.21</u>	Flow Rate (mL/min) <u>300</u>
Product Thickness (ft): <u>—</u>	Length of time Purged (min)
Depth to Bottom (ft): <u>14.94</u>	

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1230	0.4	6.21	23.42	12.11	6.827	4.03	-161.3	15.7	
1235	0.8	6.21	23.42	12.12	6.317	4.44	-192.7	9.80	
1240	1.25	6.21	23.44	12.11	6.070	4.79	-201.2	4.54	
1245	1.65	6.21	23.46	12.09	5.902	5.12	-207.1	3.42	
1250	2.1	6.21	23.47	12.09	5.895	5.30	-211.2	3.46	
1255	2.5	6.21	23.48	12.06	5.860	5.50	-214.8	3.14	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
<u>B13-066-P2</u>	<u>1300</u>	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	Y
		TPH-DRO	2 - 1 L Amber	none	Y
		TCL-SVOCs	2 - 1 L Amber	none	Y
		Oil & Grease	2 - 1 L Amber	HCl	Y
		Total Cyanide	1 - 250 mL Plastic	NaOH	Y
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	Y
		Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	Y
Matrix Spike					
Duplicate					

Sampled By: [Signature]

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
ft x gal/ft = (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150 300 M-13-3

Piezometer Number: B13-069-PZ

Date: 9/12/16

Piezometer Diameter (in): 1

One Well Volume (gal):

Depth to Product (ft): none

QED Controller Settings:

Depth to Water (ft): 23.04

Flow Rate (mL/min) 300

Product Thickness (ft):

Length of time Purged (min)

Depth to Bottom (ft): 28.12

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1049	0.5	23.04	19.15	12.32	8.366	3.67	-207.6	4.48	
1054	1.0	23.04	19.16	12.36	8.357	3.58	-212.5	3.54	
1059	1.4	23.04	18.95	12.36	8.381	3.46	-217.6	2.28	
1104	1.8	23.04	19.19	12.33	8.375	3.66	-214.0	1.14	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
<u>B13-069-PZ</u>	<u>1109</u>	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None			

Matrix Spike

Duplicate

Sampled By: LMW

Comments:

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
_____ ft x _____ gal/ft = _____ (gal)

Low Flow Sampling Temporary Piezometers



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: <u>Area B Parcel B13 Drossett</u>	Project Number: <u>150300M-13-3</u>
Piezometer Number: <u>B13-076-PZ</u>	Date: <u>9/7/16</u>
Piezometer Diameter (in): <u>1</u>	One Well Volume (gal): _____
Depth to Product (ft): <u>none</u>	QED Controller Settings: _____
Depth to Water (ft): <u>16.01</u>	Flow Rate (mL/min) <u>300 mL/min</u>
Product Thickness (ft): _____	Length of time Purged (min): _____
Depth to Bottom (ft): <u>22.74</u>	

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
<u>0914</u>	<u>0.5</u>	<u>16.01</u>	<u>17.79</u>	<u>11.72</u>	<u>2,453</u>	<u>0.88</u>	<u>-196.0</u>	<u>8.19</u>	
<u>0919</u>	<u>0.9</u>	<u>16.01</u>	<u>17.84</u>	<u>11.75</u>	<u>2,426</u>	<u>0.95</u>	<u>-202.9</u>	<u>4.723</u>	
<u>0924</u>	<u>1.3</u>	<u>16.01</u>	<u>17.89</u>	<u>11.80</u>	<u>2,472</u>	<u>0.92</u>	<u>-204.9</u>	<u>2.48</u>	
<u>0927</u>	<u>1.5</u>	<u>16.01</u>	<u>17.78</u>	<u>11.82</u>	<u>2,478</u>	<u>0.97</u>	<u>-207.8</u>	<u>1.94</u>	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
<u>B13-076-PZ</u>	<u>0932</u>	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury -- (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None	↓		
Matrix Spike					
Duplicate <u>Y/S</u>					

Sampled By: LMG Comments: _____

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.653 gal/ft - 6" I.D. = 1.47 gal/ft
_____ ft x _____ gal/ft = _____ (gal)

**Low Flow Sampling
Temporary Piezometers**



ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Parcel B13 Phase II

Project Number: 150300M-13-3

Piezometer Number: B13-078-PZ

Date: 9/8/16

Piezometer Diameter (in):

One Well Volume (gal):

Depth to Product (ft):

QED Controller Settings:

Depth to Water (ft): 29.92

Flow Rate (mL/min) 200

Product Thickness (ft):

Length of time Purged (min)

Depth to Bottom (ft): 42.26

PURGING RECORD

Time	Volume Purged (gallons)	DTW (feet)	Temp (°C)	pH (s.u.) ± 0.1	Specific Conductance (ms/cm) ± 3%	Dissolved Oxygen (mg/L) ± 0.3	ORP (mV) ± 10	Turbidity (NTU) ± 10% or < 5	Comments
1235	0.5	29.92	26.93	10.75	2.513	1.62	-102.6	658 AU	cloudy
1240	0.65	29.92	27.24	10.74	2.517	0.84	-112.4	1200 AU	
1245	0.8	29.92	26.43	10.83	2.527	1.09	-142.5	76	
1250	0.95	29.92	27.53	10.89	2.573	1.33	-171.1	40	
1255	1.1	29.92	28.57	10.93	2.578	1.05	-189.3	87	
1300	1.25	29.92	25.36	11.10	2.566	1.47	-237.4	669 AU	
1305	1.4	29.92	24.25	11.20	2.593	0.84	-254.5	728 AU	
1310	1.55	29.92	23.20	11.30	2.604	0.56	-264.4	768 AU	
1315	1.7	29.92	23.34	11.37	2.614	0.68	-276.5	726 AU	
1320	1.85	29.92	22.92	11.38	2.689	0.39	-279.1	716 AU	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B13-078-PZ	1325	TCL-VOCs	3 - 40 mL VOA	HCl	Y
		TPH-GRO	3 - 40 mL VOA	HCl	
		TPH-DRO	2 - 1 L Amber	none	
		TCL-SVOCs	2 - 1 L Amber	none	
		Oil & Grease	2 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) Field Filtered	1 - 250 mL Plastic	HNO3	
Hexavalent Chromium (Dissolved) Field Filtered	1 - 250 mL Plastic	None			

Matrix Spike

Duplicate

Sampled By: LMG

Comments:

very turbid/cloudy cleared during sample

Casing Volume: 1" I.D. = 0.041 gal/ft - 2" I.D. = 0.163 gal/ft - 4" I.D. = 0.633 gal/ft - 6" I.D. = 1.47 gal/ft
ft x _____ gal/ft = _____ (gal)

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel B13 Phase II 150300M-13 Date 9/12/16
 Weather Sunny, 60s
 Calibrated by LMG Instrument YSI 650 MDS and Lamotte 2020we
 Serial Number YSI: 07A1480AE (Pine No. 11403)
Lamotte: 1844 - 0412

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1 1.413 mS/cm	1.614 [‡]	65 °F	1.555 [‡]	80 °F (estimate)
pH (7)	7.00		-	
pH (4)	4.00		4.21	
pH(10)	10.00		-	
ORP Zobel Solution 240.0	240.0		235.4	
Dissolved Oxygen 100% water saturated air mg/L	9.59		6.35 [‡]	
Barometric Pressure mm Hg	768.10		768.60	
Turbidity #1 (0 NTU)	0.00		0.11 [‡]	
Turbidity #2 (1 NTU)	1.00		1.11 [‡]	
Turbidity Standard #3 (10 NTU)	10.00		9.96	

[‡]Specific conductance, DO, and turbidity are outside of the post-calibration acceptance criteria. Specific conductance is outside of the calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel B13 Phase II 150300M-13 Date 9/7/16
 Weather Sunny, 70s
 Calibrated by LMG Instrument YSI 650 MDS and Lamotte 2020we
 Serial Number YSI: 07A1480AE (Pine No. 11403)
Lamotte: 1844 - 0412

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1 1.413 mS/cm	1.539 [‡]	74 °F	1.513 [‡]	85 °F
pH (7)	7.00		-	
pH (4)	4.00		4.24	
pH(10)	10.00		-	
ORP Zobel Solution 240.0	240.1		235.4	
Dissolved Oxygen 100% water saturated air mg/L	8.46		7.60 [‡]	
Barometric Pressure mm Hg	763.52		763.02	
Turbidity #1 (0 NTU)	0.00		0.17 [‡]	
Turbidity #2 (1 NTU)	1.00		1.04	
Turbidity Standard #3 (10 NTU)	10.00		9.37 [‡]	

[‡]Specific conductance, turbidity, and DO are outside of the post-calibration acceptance criteria. Specific conductance is outside of the calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel B13 Phase II 150300M-13 Date 9/8/16
 Weather Overcast, 80s
 Calibrated by LMG Instrument YSI 650 MDS and Lamotte 2020we
 Serial Number YSI: 07A1480AE (Pine No. 11403)
Lamotte: 1844 - 0412

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1 1.413 mS/cm	1.500 [‡]	77 °F	1.478	98 °F
pH (7)	7.00		-	
pH (4)	4.00		3.93	
pH(10)	10.00		-	
ORP Zobel Solution 240.0	240.1		232.2	
Dissolved Oxygen 100% water saturated air mg/L	8.42		9.29 [‡]	
Barometric Pressure mm Hg	760.98		759.71	
Turbidity #1 (0 NTU)	0.00		0.25 [‡]	
Turbidity #2 (1 NTU)	1.00		1.33 [‡]	
Turbidity Standard #3 (10 NTU)	10.00		11.02 [‡]	

[‡]Turbidity, and DO are outside of the post-calibration acceptance criteria. Specific conductance is outside of the calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel B13 Phase II 150300M-13 Date 9/9/16
 Weather Cloudy, 80s
 Calibrated by LMG Instrument YSI 650 MDS and Lamotte 2020we
 Serial Number YSI: 07A1480AE (Pine No. 11403)
Lamotte: 1844 - 0412

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1 1.413 mS/cm	1.517 [‡]	82 °F	1.515 [‡]	92 °F
pH (7)	7.00		-	
pH (4)	4.00		4.12	
pH(10)	9.97		-	
ORP Zobel Solution 240.0	240.0		236.8	
Dissolved Oxygen 100% water saturated air mg/L	8.47 [‡]		8.14 [‡]	
Barometric Pressure mm Hg	759.97		760.98	
Turbidity #1 (0 NTU)	0.00		0.23 [‡]	
Turbidity #2 (1 NTU)	1.00		1.16 [‡]	
Turbidity Standard #3 (10 NTU)	10.00		10.61 [‡]	

[‡]Specific conductance, turbidity, and DO are outside of the post-calibration acceptance criteria. DO and specific conductance are outside of the calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

APPENDIX G

Parcel B13 - IDW Drum Log

Drum Identification Number	Designation	Activity/Phase	Parcel	Contents	Open Date
707-PPE-8/23/16-B13	Non-Haz	B13	B13	PPE	8/23/2016
708-Liners-8/23/16-B13	Non-Haz	B13	B13	Geoprobe Liners	8/23/2016
709-Nitric-8/23/16-B13	Non-Haz	B13	B13	Nitric Acid	8/23/2016
710-Soil-8/23/16-B13	Non-Haz	B13	B13	Soil Cuttings	8/23/2016
711-Decon Water-8/23/16-B13	Non-Haz	B13	B13	Decon Water	8/23/2016
712-Liners-8/26/16-B13	Non-Haz	B13	B13	Geoprobe Liners	8/26/2016
713-Soil-8/26/16-B13	Non-Haz	B13	B13	Soil	8/26/2016
714-Soil-8/29/16-B13	Non-Haz	B13	B13	Soil	8/29/2016
715-Liners-8/30/16-B13	Non-Haz	B13	B13	Liners	8/30/2016
716-PPE-8/30/16-B13	Non-Haz	B13	B13	PPE	8/30/2016
718-GW-9/7/16-B13	Non-Haz	B13 Phase II	B13	GW	9/7/2016
719-Liners-9/2/16-B13	Non-Haz	B13	B13	Liners	9/2/2016
720-Soil-9/2/16-B13	Non-Haz	B13	B13	Soil	9/2/2016
773-Soil-1/12/17-B13	Non-Haz	B13 Phase II	B13	Soil	1/12/2017
774-PPE-1/17/17-B13	Non-Haz	B13 Phase II	B13	PPE	1/17/2017

APPENDIX H



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Cloudy, windy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073A-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-2') SLAG, SAND and GRAVEL-sized, medium dense, brown, gray, brownish gray, dry, no plasticity, no cohesion	SW/GW	
	66	190.6		(2-3') SAND, fine to medium grained, with SLAG GRAVEL, medium dense, grayish brown, dry, no plasticity, no cohesion	SW	
		141.6		(3-6') SLAG, SAND and GRAVEL-sized, medium dense, light gray, brownish gray, black, yellowish red, dry, no plasticity, no cohesion	SW/GW	Light oxidation (4.8-5' bgs)
5		127.3				
		-		(6-11') SLAG, SAND and GRAVEL-sized, medium dense, alternating gray and yellowish brown, very moist grading to dry, no plasticity, no cohesion	SW/GW	Moist zone at 7.5-8.5' bgs-sheen in water, strong sweet odor
	52	295.0				
		241.2				
		145.0				
10		-				
		-		(11-15') SLAG, SAND and GRAVEL-sized, dense, gray brown and yellowish red, very moist, no plasticity, no cohesion	SW/GW	Light odor
	64	-				
		212.5				
		356.0				
15		-				
		22.6		(15-20') SLAG, SAND and GRAVEL-sized, medium dense to dense, gray, yellowish brown, and light brown, wet, no plasticity, no cohesion	SW/GW	Wet at 16' bgs, strong sweet odor (15-20' bgs)
	80	82.1				
		272.8				
		672.0				
20						

Total Borehole Depth: 40' bgs.

Å



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Cloudy, windy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073A-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-		(20-35) SLAG, SAND and GRAVEL-sized, medium dense, yellow, wet, no plasticity, no cohesion	SW/GW	Trace to very light product (20-35' bgs), light amber, light viscosity, strong sweet odor
50		-				
25		-				
60		-				
30		-				
70		-		(35-40) SLAG or BRICK, medium SAND to very small GRAVEL-sized, dense to medium dense, gray and light gray, wet, no plasticity, no cohesion	SW	No product visible (36-40' bgs)
35		-				
80		-				
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/13/17
 Weather : Sunny, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073B-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-9.4') SLAG, SAND-sized, medium to very coarse, with few SLAG. GRAVEL-sized, medium dense, white and light grayish brown, dry to moist, no plasticity, no cohesion		
66	7.8	14.8				
5	0.9	-			SW	
50	32.8	15.7				
10	2.0	-		(9.4-10') SAND with few SLAG GRAVEL, loose, brown and gray, moist, no plasticity, no cohesion	SW	Trace oxidation, few smooth rounded brown gravel
40	1.3	-		(10-22') SLAG, SAND and GRAVEL-sized, medium dense, dark brown, white and light gray, dry to moist, wet at 19'		
15	5.3	18.5			SW/GW	Wet zone (13-13.5' bgs)
	108.2					Wet zone (14.5-14.7' bgs)
100	978					Strong sweet odor (16-20' bgs)
	51.9					
20	399.2					Wet at 19' bgs

Total Borehole Depth: 40' bgs.

Å



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/13/17
 Weather : Sunny, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073B-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20	-	-			SW/GW	
				(22-24.8') SLAG, SAND and GRAVEL-sized, medium dense, very pale brown to yellow, wet, no plasticity, no cohesion	SW/GW	
25	60	129.6 636.4		(24.8-34') SLAG, SAND and GRAVEL-sized, medium dense to dense, very pale brown to yellow, wet, no plasticity, no cohesion	SW/GW	Light product (24.8-30' bgs), amber, strong odor
30					SW/GW	Moderate to heavy product, amber, strong odor, light viscosity (30-34' bgs)
35				(34-35') SLAG GRAVEL, dense, gray, wet, no plasticity, no cohesion	GW	Light product (34-35' bgs)
				(35-40') SLAG or BRICK, SAND and GRAVEL-sized, dense, greenish gray to gray, wet, no plasticity, no cohesion	SW/GW	Trace product (35-35.5' bgs)
40						

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Sunny, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073C-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-3.5') SLAG, SAND-sized with SLAG, GRAVEL-sized, dense, light brownish gray, dry, no plasticity, no cohesion	SW	
40	20.7	24.8		(3.5-4.5') SLAG, SAND and GRAVEL-sized, dense, yellow, wet, no plasticity, no cohesion	SW/GW	Wet zone (3.8-4.5' bgs), light sheen, clear, trace product, light odor
5		289.7		(4.5-6') GRAVELLY SAND, dense, black, moist, no plasticity, no cohesion	SW/GW	Tar-like appearance, moderate chemical odor
50		112.6		(6-11') SLAG, SAND and GRAVEL-sized, medium dense, brown, reddish yellow and gray, dry, no plasticity, no cohesion	SW/GW	
10		144.5				
50		243.9		(11-18') SLAG, SAND and GRAVEL-sized, medium dense, brown and gray, wet, no plasticity, no cohesion	SW/GW	Wet at 12.5' Trace product (12.5-15' bgs), greasy feel in water, trace sheen, strong odor
15		646.6				
80		-				Trace product (17-19' bgs), greasy feel, amber
		-		(18-19') SILTY SAND with trace GRAVEL, medium dense, yellow, wet, no plasticity, no cohesion	SM	Strong odor (16'30' bgs)
20		-		(19-20') SLAG, SAND and GRAVEL-sized, medium dense, brown and gray, wet, no plasticity, no cohesion	SW/GW	Trace product at 19.8' bgs

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Sunny, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073C-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-		(20-36') SLAG, SAND and GRAVEL-sized, medium dense, pale brown to yellow, wet, no plasticity, no cohesion	SW/GW	Light product (27-30' bgs)
80		-				
25		-				
70		-				
30		-		(36-40) SLAG or BRICK, SAND-sized, medium to very coarse grained with few very small GRAVEL, dense, greenish gray, wet, no plasticity, no cohesion	SW	Moderate to heavy product (31-35' bgs), amber, strong odor
80		-				
35		-				
100		-				
40		-				Trace product (36-38' bgs)

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Cloudy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073D-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-2.5') SLAG, SAND and GRAVEL-sized, medium dense, brown, light gray, and strong brown, dry, no plasticity, no cohesion	SW/GW	non-native Wet zone (7.5-8' bgs), strong sweet odor, clear Wet zone (9.7-10' bgs) Strong sweet odor, clear Wet at 11.5' bgs, trace product Trace product (13-14' bgs), light amber, light viscosity
60	179.4	214.1		(2.5-4') SILTY SAND, medium dense, brown grading to grayish brown, dry, no plasticity, no cohesion	SM	
5	155.5	-		(4-6') SLAG, SAND and GRAVEL-sized, medium dense, brown, light gray, and strong brown, dry, no plasticity, no cohesion	SW/GW	
50	-	733.8		(6-10.5') SLAG, SAND and GRAVEL-sized, gray, very pale brown, strong brown, and dark gray, dry with few wet zones, no plasticity, no cohesion	SW/GW	
10	367.8	669.0		(10.5-12.4') SLAG, SAND and GRAVEL-sized, gray, yellow, wet, no plasticity, no cohesion	SW/GW	
70	-	-		(12.4-13') SANDY SILT, soft, yellow, wet, low plasticity, cohesive	ML	
15	-	-		(13-16') SLAG, SAND and GRAVEL-sized, dense, light gray and very pale brown, wet, no plasticity, no cohesion	SW/GW	
56	-	-		(16-20') SLAG, SAND and GRAVEL-sized, dense, light gray and very pale brown, wet, no plasticity, no cohesion	SW/GW	
20	-	-				

Total Borehole Depth: 35' bgs.

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ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Date : 1/12/17
 Weather : Cloudy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073D-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-		(20-30') SLAG, SAND and GRAVEL-sized, dense, white, light grayish brown, and very pale brown, wet, no plasticity, no cohesion		
80		-				
25		-			SW/GW	Strong odor (10-35')
60		-				
30		-		(30-34.5') SLAG, SAND and GRAVEL-sized, dense, white, light grayish brown, and very pale brown, wet, no plasticity, no cohesion	SW/GW	
50		-				Trace to light product (33-34.5' bgs), amber, light viscosity
35		-		(34.5-35') SLAG or BRICK, coarse to very coarse grained, dense, gray and white, wet, no plasticity, no cohesion	SW/GW	
40		-				

Total Borehole Depth: 35' bgs.
 Boring terminated at 35' bgs due to refusal and installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/16/17
 Weather : Cloudy, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073E-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-5.5') SLAG, SAND-sized with few GRAVEL, medium dense, light grayish brown then grayish brown from 4-5' bgs, no plasticity, no cohesion	SW	
70	122.1	16.1				
5		12.5				
50	22.6	19.0		(5.5-10.5') SLAG, SAND and GRAVEL-sized, medium dense, dark gray then very pale brown from 9-10' bgs, dry, no plasticity, no cohesion	SW/GW	
10		6.8				
78	32.2	20.4		(10.5-16') SLAG, SILT to coarse SAND-sized with few SLAG GRAVEL, medium dense to dense, greenish gray, yellow, very pale brown, and white, moist to very moist, no plasticity, no cohesion	ML/SW	
15		10.8				
70		-		(16-21') SLAG and BRICK, SAND and GRAVEL-sized, medium dense to dense, very pale brown, white, brown, and light gray, very moist then wet at 19', no plasticity, no cohesion	SW/GW	
20		-				Wet at 19'

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/16/17
 Weather : Cloudy, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073E-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-			SW/GW	
60		-		(21-29.3') SLAG and BRICK, SAND and GRAVEL-sized, dense, very pale brown and gray, wet, no plasticity, no cohesion		
25		-			SW/GW	Light product with moderate odor (23-33.5' bgs)
62		-				
30		-		(29.3-34.6') SLAG, SAND and GRAVEL-sized, dense, very pale brown and gray, wet, no plasticity, no cohesion	SW/GW	
60		-				
35		-		(34.6-36') SLAG or BRICK, medium to very coarse SAND, dense, gray and white, wet, no plasticity, no cohesion	SW	Moderate product and strong odor (33.5-34.6' bgs)
70		-		(36-39') SLAG GRAVEL, medium dense, gray, wet, no plasticity, no cohesion	GW	Heavy product, strong odor, dark amber
40		-		(39-40') SLAG or BRICK, medium to very coarse SAND, dense, gray and white, wet, no plasticity, no cohesion	SW	Moderate to light product (39-40' bgs)

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/17/17
 Weather : Cloudy, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073F-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-6') SLAG, SAND and GRAVEL-sized with SILT, medium dense, very pale brown, dark brown, and light grayish brown, dry then moist at 4', no plasticity, no cohesion		
60	5.7	7.9			SW/ GW-GM	Light chemical odor (3-5' bgs)
5		32.4				
50		-		(6-9') SLAG, SAND and GRAVEL-sized, with SILT, medium dense, gray with yellow coating, very moist to wet, no plasticity, no cohesion	SW/ GW-GM	
		170.9				
		322.5				
10		60.7		(9-11.5') BRICK and SLAG, SAND and GRAVEL-sized, with SILT, medium dense, yellow, very moist to wet, no plasticity, no cohesion	SW/ GW-GM	
		-				
40		-		(11.5-14') SLAG, GRAVEL-sized, medium to loose, gray with yellow coating, wet, no plasticity, no cohesion	GW	Wet at 13' bgs
		-				Moderate to heavy product (13-14' bgs), dark amber, strong sweet odor
15		-		(14-16.5') SILT with GRAVEL, trace SAND, with gray mottling, very moist, no plasticity, no cohesion	ML	
		-				
50		-		(16.5-34') SLAG, SAND and GRAVEL-sized, with SILT, medium dense to dense, gray and yellowish brown, wet, no plasticity, no cohesion	SW/ GW-GM	Trace product, light odor (14-19' bgs)
		-				Light to moderate product (19-20' bgs)
20		-				

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/17/17
 Weather : Cloudy, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073F-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
60		-				
25		-				Trace to very light product, moderate odor (23.5-25' bgs)
50		-			SW/ GW-GM	Light product (27.5-30' bgs)
30		-				
48		-				
35		-		(34-40') SLAG or BRICK, SAND-sized, medium to very coarse grained, dense, white, gray, light gray, and pale brown, wet, no plasticity, no cohesion		
60		-			SW	Trace product (38-38.1' bgs)
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/17/17
 Weather : Cloudy, drizzle, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073G-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-7.5') SLAG, SAND and GRAVEL-sized, medium dense, gray, pale brown, and light gray with trace yellow, dry then moist at 4-5' bgs, no plasticity, no cohesion		
	76	146.2				
		78.4				
		140.7				
5		604.6			SW/GW	
		-				
	70	350.2		(7.5-8.3') SANDY SILT, dense, gray and light gray, moist, no plasticity, no cohesion	ML	Light product (8.3-8.4' bgs)
		37.9				
		42.7		(8.3-11') BRICK and SLAG, SAND and GRAVEL-sized, medium dense to dense, yellow and gray, very moist, no plasticity, no cohesion	SW/GW	
10		-				
		-				
	40	-		(11-15.5') SLAG, SAND and GRAVEL-sized, medium dense, gray, light gray and white, moist, no plasticity, no cohesion	SW/GW	Trace chemical odor (10-20' bgs)
		-				
15		105.9				
		41.7				
		-				
	76	-		(15.5-26') SLAG, SAND and GRAVEL-sized, with SILT, medium to dense, light gray, white, and very pale brown, wet, no plasticity, no cohesion	SW/GW-GM	Wet at 16.2' bgs
		-				
		-				
20		-				

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Green Services, Inc
 Driller : Kevin Pumphrey
 Drilling Equipment : Geoprobe 7822DT

Date : 1/17/17
 Weather : Cloudy, drizzle, 40s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073G-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
80		-			SW/ GW-GM	Moderate chemical odor (20-25' bgs)
25		-				
60		-		(26-31') SLAG, SAND and GRAVEL-sized, with SILT, dense, light gray, white, and very pale brown, wet, no plasticity, no cohesion	SW/ GW-GM	
30		-				
30		-		(31-35.5') SLAG, GRAVEL-sized, with SAND and SILT, dense, very pale brown and light gray, wet, no plasticity, no cohesion	SW/ GW-GM	Very light product and odor (34-35' bgs)
35		-				
80		-		(35.5-40') SLAG or BRICK, SAND-sized, medium to very coarse grained, dense, grayish green, wet, no plasticity, no cohesion		
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/21/17
 Weather : Cloudy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073H-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-6') SAND and SLAG GRAVEL, loose to medium dense, grayish brown, brown, and light gray, dry, no plasticity, no cohesion	SW/GW	Non-native
50	2.2	11.6	Trace brick			
5	0.5	-				
24	-	14.4		(6-11.5') SLAG, SAND and GRAVEL-sized, dense, light gray, yellow, and light grayish brown, moist no plasticity, no cohesion	SW/GW	Trace brick
10	5.4	-				
54	-	8.6		(11.5-24') SLAG, SILTY SAND-sized, with GRAVEL, dense, white, light gray, and very light brown, very moist, then wet at 17.2' bgs, no plasticity, no cohesion	SW-SM/ GW	Wet at 17.2' bgs
15	0.2	0.1				
56	-	0.0				
20	0.0	0.0				

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/21/17
 Weather : Cloudy, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073H-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
30		-			SW-SM/ GW	
25		1.9		(24-24.5') GRAVEL, angular, very dark gray to black, moist, no plasticity, no cohesion	GP	
54		6.4		(24.5-36') SLAG, SILTY SAND-sized, with GRAVEL, dense, white, light gray, and very light brown, wet, no plasticity, no cohesion		
30		0.0			SW-SM/ GW	
50		5.3				Light product, moderate to strong sweet odor, amber to reddish yellow, low viscosity (33-35' bgs)
35		4.4				
60		-		(36-40') SLAG or BRICK, dense, grayish green, wet, no plasticity, no cohesion		Trace product (37-37.5' bgs)
40		-				Trace sheen (38-39' bgs)

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/21/17
 Weather : Sunny, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073I-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-9.5') SAND with SLAG GRAVEL, medium dense to dense, brown and gray, dry, then wet from 8.5'-9.5' bgs, no plasticity, no cohesion	SW/GW	Non-native
38	76.6	4.6				
5		29.9		(9.5-16') SLAG, GRAVEL-sized, with SAND and SILT, medium dense to dense, light gray, white, and very light brown, dry with moist to wet patches, no plasticity, no cohesion	GW/ SW-SM	
52	43.7	4.3				
10		1.8				
68	0.0			(16-21') SLAG GRAVEL with SAND and SILT, medium dense to dense, brown 17.5-19.2' bgs, then white, light gray, and very pale brown, wet, no plasticity, no cohesion	GW/ SW-SM	Wet at 17.5' bgs
15		0.0				
50	1.7					
20		1.2				
		0.0				

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/21/17
 Weather : Sunny, 50s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073I-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-		(21-36') SLAG, SAND and GRAVEL-sized, dense, white, light gray and very pale brown, wet, no plasticity, no cohesion	GW/ SW-SM	
	56	0.0				
		0.0				
25		0.0				
		-				
	50	0.0				
		0.0				
		0.0				
30		-				
	56	1.2				
		0.7		SW/GW	Very light to light product (32.2-35' bgs)	
		0.5				
35		-		(36-40') SLAG or BRICK, GRAVEL-sized, dense, greenish gray, wet, no plasticity, no cohesion	GP	Very light product (36.5-39' bgs)
	70	-				
		-				
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Mike Garvine
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073J-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-6.5') SLAG, SAND and GRAVEL-sized, medium dense to dense, brown and light gray, dry, no plasticity, no cohesion		
60	0.3	0.0			SW/GW	
5		0.0				
70	0.0	0.0		(6.5-8') Coarse SAND and GRAVEL, medium dense, black, dry, no plasticity, no cohesion	SW/GW	Non-native
10		0.0		(8-13') SLAG, SAND and GRAVEL-sized, medium dense to dense, brown and light gray, dry with trace intermittent wet areas, no plasticity, no cohesion		
46	0.0	0.0			SW/GW	
15		0.0		(13-14.5') BRICK, GRAVELLY SAND, medium dense, yellow, very moist, no plasticity, no cohesion	SW/GW	
64	0.0	0.0		(14.5-16') SLAG GRAVEL, large, loose, gray, moist, no plasticity, no cohesion	GP	Moderate sweet odor (15-20' bgs)
20	0.0	0.0		(16-30') SLAG, SILT to GRAVEL-sized, dense, white, very light gray, and very pale brown, moist then wet at 17' bgs, no plasticity, no cohesion	SW/GW-GM	Wet at 17' bgs

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Mike Garvine
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073J-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
	50	0.0				Very light sweet odor (20-25' bgs)
		0.0				
		0.0				
25		0.0				
		-			SW/ GW-GM	
		-				
	54	0.0				
		0.0				
		0.0				
30		-		(30-34.5') SLAG, SAND and GRAVEL-sized, dense, very pale brown, wet, no plasticity, no cohesion		
		-				
	52	-			SW/GW	Very light grading to light product (31.4-34.5' bgs)
		0.0				
		0.0				
35		-		(34.5-40') SLAG or BRICK, dense, grayish green, wet, no plasticity, no cohesion		
		-				
	80	-			SW/GW	
		-				
		-				
40		-				

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073K-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-7') SLAG, SILT to GRAVEL-sized, medium dense to dense, light gray, light grayish brown, and light brown, dry, no plasticity, no cohesion	SW/ GW-GM	
32		-				
		8.5				
5		5.5				
		-				
42		0.1		(7-13') SANDY SILT, very fine to fine, soft, dark brown, very moist, no plasticity, no cohesion	ML/SW	
		1.7				
10		0.0				
48		0.1		(13-35.5') SLAG, SILT to GRAVEL-sized, medium dense to dense, light gray, light grayish brown, and light brown, dry to moist, then wet at 23', no plasticity, no cohesion	SW/GW	
		0.0				
15		0.0				
		-				
50		6.4				
		7.0				
20		0.6				

Total Borehole Depth: 40' bgs.

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Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073K-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
	54	0.7				
		0.0				
25		0.0				
		-				
		-				
	50	0.0			SW/GW	
		0.0				
		0.0				
30		-				
		-				
	70	0.0				
		0.0				
		0.0				
35		0.0				
				(35.5-40') SLAG or BRICK, SAND and GRAVEL-sized, dense, grayish green, wet, no plasticity, no cohesion		
					SW/GW	Trace odor (36-40' bgs)
40						

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.



ARM Group Inc.
Earth Resource Engineers
and Consultants

Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073L-SB

(page 1 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-3') SLAG, SAND and GRAVEL-sized, medium dense, grayish brown, dry, no plasticity, no cohesion	SW/GW	Non-native Possible cinder ballast
58	0.0			(3-4.6') SAND with GRAVEL, medium dense, dark brown, dry, no plasticity, no cohesion	SW/GW	
		0.4				
		0.9				
5		-		(4.6-6') SLAG, SAND and GRAVEL-sized, medium dense, white, wet, no plasticity, no cohesion	SW/GW	
		0.0				
		0.0				
		0.0			SW/ GW-GM	
		0.0				
		0.0				
		0.0		(13-14.5') SAND, medium dense, white and yellow, very moist, no plasticity, no cohesion	SP	Non-native Possible brick, coarse to very coarse
		0.0				
15		-		(14.5-30') SLAG, SILT to GRAVEL-sized, medium dense to dense, white, very pale brown, and light gray, very moist then wet at 23', no plasticity, no cohesion		
		-				
		0.0			SW/ GW-GM	
		0.0				
		0.0				
54	34.5					
		0.0				
		0.0				
20						

Total Borehole Depth: 40' bgs.



Client : EnviroAnalytics Group
 ARM Project No. : 150300M-13-3
 Project Description : Sparrows Point - Parcel B13
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : L. Glumac
 Drilling Company : Allied
 Driller : Rick Miller
 Drilling Equipment : Geoprobe 7822DT

Date : 3/22/17
 Weather : Sunny, very windy, 30s
 Northing (US ft) : 563286.995
 Easting (US ft) : 1463842.99

Boring ID: B13-073L-SB

(page 2 of 2)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
20		-				
	58	0.1				
		0.1				
25		0.3			SW/ GW-GM	Wet at 23' bgs
		-				
	70	6.4				
		6.1				
		9.5				
30		42.3		(30-37') SLAG, SAND and GRAVEL-sized, medium dense, grayish brown, wet, no plasticity, no cohesion		Moderate odor (28-35' bgs)
		-				
	40	-			SW/GW	
		11.3				
35		105.6				
		-				
	80	-		(37-40') SLAG or BRICK, SAND and GRAVEL-sized, dense, grayish green, wet, no plasticity, no cohesion		
		0.8			SW/GW	Trace product (38-39.5' bgs)
		0.4				Very light product (39.5-40' bgs)
40						

Total Borehole Depth: 40' bgs.
 Boring terminated at 40' bgs due to water and installation of piezometer.

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APPENDIX I

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NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	9/2/2016				9/7/2016				9/8/2016				10/11/2016			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	-	32.98	-	NA	-	32.60	-	NA	32.50	33.41	0.91	NA	32.78	32.80	0.02	NA
B13-073A-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073B-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073C-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073D-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073E-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073F-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073G-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073H-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073I-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073J-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073K-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073L-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	11/3/2016				11/11/2016				11/18/2016				12/16/2016			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	33.07	34.75	1.68	NA	33.11	33.35	0.24	NA	33.36	34.08	0.72	NA	33.50	34.37	0.87	NA
B13-073A-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073B-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073C-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073D-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073E-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073F-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073G-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073H-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073I-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073J-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073K-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073L-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	12/22/2016				12/29/2016				1/12/2017				1/13/2017			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	34.60	35.01	0.41	NA	33.56	34.80	1.24	NA	NM	NM	NA	NM	NM	NM	NM	NA
B13-073A-PZ	NA	NA	NA	NA	NA	NA	NA	NA	trace	33.60	trace	NA	33.78	33.93	0.15	NA
B13-073B-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	trace	33.73	trace	NA
B13-073C-PZ	NA	NA	NA	NA	NA	NA	NA	NA	trace	33.40	trace	NA	trace	33.44	trace	NA
B13-073D-PZ	NA	NA	NA	NA	NA	NA	NA	NA	-	34.34	-	NA	-	34.27	-	NA
B13-073E-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073F-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073G-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073H-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073I-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073J-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073K-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073L-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	1/16/2017				1/17/2017				1/19/2017				1/25/2017			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.06	35.50	2.44	NA
B13-073A-PZ	-	33.88	-	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	33.29	-	NA
B13-073B-PZ	-	33.80	-	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.16	35.95	2.79	NA
B13-073C-PZ	33.50	34.65	1.15	NA	NM	NM	NM	NA	NM	NM	NM	NA	32.88	34.33	1.45	NA
B13-073D-PZ	-	34.38	-	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	33.70	-	NA
B13-073E-PZ	NA	NA	NA	NA	-	31.40	-	NA	-	31.90	-	NA	-	33.04	-	NA
B13-073F-PZ	NA	NA	NA	NA	-	33.13	-	NA	-	33.08	-	NA	-	32.50	-	NA
B13-073G-PZ	NA	NA	NA	NA	-	33.43	-	NA	-	33.39	-	NA	-	32.86	-	NA
B13-073H-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073I-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073J-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073K-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13-073L-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	2/8/2017				2/23/2017				3/21/2017				3/22/2017			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	33.55	34.30	0.75	NA	33.45	34.90	1.45	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073A-PZ	-	33.75	-	NA	33.65	33.94	0.29	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073B-PZ	33.70	38.30	4.60	NA	33.54	37.75	4.21	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073C-PZ	33.36	35.60	2.24	NA	33.26	38.42	5.16	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073D-PZ	34.26	34.40	0.14	NA	trace	34.15	trace	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073E-PZ	-	32.08	-	NA	-	32.29	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073F-PZ	-	33.02	-	NA	-	32.89	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073G-PZ	-	33.33	-	NA	-	33.25	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
B13-073H-PZ	NA	NA	NA	NA	NA	NA	NA	NA	-	35.25	-	NA	NM	NM	NM	NA
B13-073I-PZ	NA	NA	NA	NA	NA	NA	NA	NA	-	35.08	-	NA	NM	NM	NM	NA
B13-073J-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	34.15	-	NA
B13-073K-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	33.71	-	NA
B13-073L-PZ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	3/23/2017				3/24/2017				3/27/2017				3/29/2017			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.61	33.90	0.29	NA
B13-073A-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.81	33.86	0.05	NA
B13-073B-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.70	37.30	3.60	NA
B13-073C-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	33.50	36.05	2.55	NA
B13-073D-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	34.32	34.55	0.23	NA
B13-073E-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	32.20	-	NA
B13-073F-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	33.06	-	NA
B13-073G-PZ	NM	NM	NM	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	33.41	-	NA
B13-073H-PZ	-	35.05	-	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	34.82	-	NA
B13-073I-PZ	-	34.92	-	NA	NM	NM	NM	NA	NM	NM	NM	NA	-	34.70	-	NA
B13-073J-PZ	NM	NM	NM	NA	-	34.11	-	NA	NM	NM	NM	NA	-	33.92	-	NA
B13-073K-PZ	NM	NM	NM	NA	trace	32.64	trace	NA	NM	NM	NM	NA	trace	32.45	trace	NA
B13-073L-PZ	-	32.01	-	NA	NM	NM	NM	NA	-	33.97	-	NA	-	33.28	-	NA

NA = Not Applicable

NM = Not Measured

RED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel B13
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	4/5/2017				4/13/2017			
	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet)	Depth to Water (Feet)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
B13-073-PZ	32.76	33.20	0.44	NA	32.97	33.40	0.43	NA
B13-073A-PZ	32.95	33.04	0.09	NA	33.15	33.21	0.06	NA
B13-073B-PZ	32.85	33.95	1.10	NA	33.10	34.60	1.50	NA
B13-073C-PZ	-	32.57	-	NA	32.80	33.45	0.65	NA
B13-073D-PZ	-	33.47	-	NA	trace	33.62	trace	NA
B13-073E-PZ	-	31.73	-	NA	-	31.59	-	NA
B13-073F-PZ	-	32.16	-	NA	-	32.47	-	NA
B13-073G-PZ	-	32.54	-	NA	-	32.74	-	NA
B13-073H-PZ	-	33.98	-	NA	34.13	34.50	0.37	NA
B13-073I-PZ	-	33.86	-	NA	-	34.00	-	NA
B13-073J-PZ	-	33.05	-	NA	-	33.21	-	NA
B13-073K-PZ	-	31.61	-	NA	31.80	32.15	0.35	NA
B13-073L-PZ	-	33.28	-	NA	-	31.98	-	NA

NA = Not Applicable
NM = Not Measured
RED = NAPL Detection

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APPENDIX J

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QA/QC Tracking Log - Soil

<u>Trip</u> Blank:	<u>Date:</u>	Sample IDs		
	8/23/2016	1)	B13-020-SB-1	
TB-1		2)	B13-020-SB-9	
		3)	B13-020-SB-10	
		4)	B13-021-SB-1	
TB-1		5)	B13-021-SB-9	
		6)	B13-021-SB-10	
		7)	B13-082-SB-1	Duplicate: B13-021-SB-1
		8)	B13-082-SB-5	Date: 8/23/2016
		9)	B13-065-SB-1	MS/MSD: B13-082-SB-1
TB-1		10)	B13-065-SB-8	Date: 8/23/2016
TB-1		11)	B13-065-SB-10	Field Blank:
		12)	B13-069-SB-1	Date: 8/23/2016
TB-1		13)	B13-069-SB-9	Eq. Blank:
TB-1		14)	B13-069-SB-10	Date: 8/23/2016
TB-1	8/24/2016	15)	B13-002-SB-1	
TB-1		16)	B13-002-SB-8	
		17)	B13-002-SB-10	
TB-1		18)	B13-071-SB-1	
TB-1		19)	B13-071-SB-6	
		20)	B13-071-SB-10	

<u>Trip</u> Blank:	<u>Date:</u>	Sample IDs		
TB-1	8/26/2016	1)	B13-076-SB-1	
TB-1		2)	B13-076-SB-7	
		3)	B13-076-SB-10	
		4)	B13-056-SB-1	
TB-1		5)	B13-056-SB-5	
		6)	B13-056-SB-10	
		7)	B13-055-SB-1	Duplicate: B13-076-SB-1
TB-1		8)	B13-055-SB-9	Date: 8/26/2016
TB-1		9)	B13-051-SB-1	MS/MSD: B13-058-SB-1
		10)	B13-051-SB-7	Date: 8/26/2016
		11)	B13-051-SB-10	Field Blank:
		12)	B13-058-SB-1	Date: 8/26/2016
TB-1		13)	B13-058-SB-7	Eq. Blank:
		14)	B13-058-SB-10	Date: 8/26/2016
	8/29/2016	15)	B13-012-SB-1	
TB-1		16)	B13-012-SB-4	
		17)	B13-012-SB-10	
		18)	B13-013-SB-1	
TB-1		19)	B13-013-SB-5	
		20)	B13-013-SB-10	

	8/24/2016	1)	B13-043-SB-1	
TB-1		2)	B13-043-SB-4	
		3)	B13-043-SB-10	
		4)	B13-023-SB-1	
TB-1		5)	B13-023-SB-4	
		6)	B13-023-SB-10	
TB-1		7)	B13-022-SB-1	Duplicate: B13-016-SB-8
TB-1		8)	B13-022-SB-4	Date: 8/26/2016
		9)	B13-022-SB-10	MS/MSD: B13-016-SB-1
TB-1		10)	B13-007-SB-1	Date: 8/26/2016
		11)	B13-007-SB-4	Field Blank:
		12)	B13-007-SB-10	Date: 8/24/2016
TB-1		13)	B13-006-SB-1	Eq. Blank:
TB-1		14)	B13-006-SB-4	Date: 8/24/2016
	8/25/2016	15)	B13-017-SB-1	
TB-1		16)	B13-017-SB-4	
		17)	B13-017-SB-10	
	8/26/2016	18)	B13-016-SB-1	
		19)	B13-016-SB-8	
		20)	B13-016-SB-10	

	8/29/2016	1)	B13-011-SB-1	
TB-1		2)	B13-011-SB-8	
		3)	B13-011-SB-10	
		4)	B13-010-SB-1	
TB-1		5)	B13-010-SB-8	
		6)	B13-010-SB-10	
		7)	B13-015-SB-1	Duplicate: B13-011-SB-1
TB-1		8)	B13-015-SB-9	Date: 8/29/2016
TB-1		9)	B13-015-SB-10	MS/MSD: B13-011-SB-8
		10)	B13-014-SB-1	Date: 8/29/2016
TB-1		11)	B13-014-SB-8	Field Blank:
		12)	B13-014-SB-10	Date: 8/29/2016
		13)	B13-036-SB-1	Eq. Blank:
TB-1		14)	B13-036-SB-5	Date: 8/29/2016
	8/30/2016	15)	B13-036-SB-10	
		16)	B13-008-SB-1	
TB-1		17)	B13-008-SB-4	
		18)	B13-008-SB-10	
		19)	B13-009-SB-1	
TB-1		20)	B13-009-SB-4	

Samples intervals with PID readings of 10 ppm or higher were collected for VOCs. VOC and GRO samples were placed in a cooler with a trip blank.

QA/QC Tracking Log - Soil

Trip Blank:	Date:	Sample IDs	
	8/30/2016	1) B13-009-SB-10	
		2) B13-059-SB-1	
TB-1		3) B13-059-SB-4	
		4) B13-059-SB-10	
		5) B13-034-SB-1	
TB-1		6) B13-034-SB-9	
TB-1		7) B13-034-SB-10	Duplicate: B13-059-SB-1
		8) B13-073-SB-1	Date: 8/30/2016
TB-1		9) B13-073-SB-7	MS/MSD: B13-078-SB-9
TB-1		10) B13-073-SB-10	Date: 8/31/2016
TB-1	8/31/2016	11) B13-078-SB-1	Field Blank:
TB-1		12) B13-078-SB-9	Date: 8/30/2016
		13) B13-078-SB-10	Eq. Blank:
		14) B13-045-SB-1	Date: 8/30/2016
TB-1		15) B13-045-SB-4	
		16) B13-045-SB-10	
		17) B13-066-SB-1	
TB-1		18) B13-066-SB-4	
		19) B13-038-SB-1	
		20) B13-038-SB-5	

Trip Blank:	Date:	Sample IDs	
		1)	
		2)	
		3)	
		4)	
		5)	
		6)	
		7)	Duplicate:
		8)	Date:
		9)	MS/MSD:
		10)	Date:
		11)	Field Blank:
		12)	Date:
		13)	Eq. Blank:
		14)	Date:
		15)	
		16)	
		17)	
		18)	
		19)	
		20)	

		1) B13-068-SB-1	
TB-1		2) B13-068-SB-4	
TB-1		3) B13-068-SB-10	
		4) B13-067-SB-1	
		5) B13-067-SB-5	
		6) B13-039-SB-1	
		7) B13-039-SB-4	Duplicate: B13-067-SB-5
		8) B13-039-SB-10	Date: 9/1/2016
		9) B13-052-SB-1	MS/MSD: B13-068-SB-4
TB-1	9/1/2016	10) B13-052-SB-8	Date: 9/1/2016
		11) B13-052-SB-10	Field Blank:
		12) B13-060-SB-1	Date: 9/1/2016
TB-1		13) B13-060-SB-4	Eq. Blank:
		14) B13-060-SB-10	Date: 9/1/2016
		15) B13-044-SB-1	
TB-1		16) B13-044-SB-4	
		17) B13-044-SB-10	
TB-1		18) B13-063-SB-1	
TB-1		19) B13-063-SB-9	
	20) B13-063-SB-10		

		1)	
		2)	
		3)	
		4)	
		5)	
		6)	
		7)	Duplicate:
		8)	Date:
		9)	MS/MSD:
		10)	Date:
		11)	Field Blank:
		12)	Date:
		13)	Eq. Blank:
		14)	Date:
		15)	
		16)	
		17)	
		18)	
		19)	
		20)	

Samples intervals with PID readings of 10 ppm or higher were collected for VOCs. VOC and GRO samples were placed in a cooler with a trip blank.

QA/QC Tracking Log - Groundwater

<u>Trip</u> <u>Blank:</u>	<u>Date:</u>	<u>Sample IDs</u>		
9/7/2016		1) B13-076-PZ		
		2) B13-021-PZ		
		3) B13-049-PZ		
9/8/2016*		4) B13-059-PZ		
		5) B13-078-PZ		
9/9/2016*		6) B13-061-PZ		
		7) B13-045-PZ		Duplicate: B13-076-PZ
		8) B13-006-PZ		Date: 9/7/2016
9/12/2016		9) B13-042-PZ		MS/MSD: B13-021-PZ
		10) B13-001-PZ		Date: 9/7/2016
		11) B13-069-PZ		Field Blank:
		12) B13-066-PZ		Date: 9/7/2016
		13)		Eq. Blank:
		14)		Date: 9/9/2016 *
		15)		
		16)		
		17)		
		18)		
		19)		
		20)		

<u>Trip</u> <u>Blank:</u>	<u>Date:</u>	<u>Sample IDs</u>		
		1)		
		2)		
		3)		
		4)		
		5)		
		6)		
		7)		Duplicate:
		8)		Date:
		9)		MS/MSD:
		10)		Date:
		11)		Field Blank:
		12)		Date:
		13)		Eq. Blank:
		14)		Date:
		15)		
		16)		
		17)		
		18)		
		19)		
		20)		

1)		
2)		
3)		
4)		
5)		
6)		
7)		Duplicate:
8)		Date:
9)		MS/MSD:
10)		Date:
11)		Field Blank:
12)		Date:
13)		Eq. Blank:
14)		Date:
15)		
16)		
17)		
18)		
19)		
20)		

1)		
2)		
3)		
4)		
5)		
6)		
7)		Duplicate:
8)		Date:
9)		MS/MSD:
10)		Date:
11)		Field Blank:
12)		Date:
13)		Eq. Blank:
14)		Date:
15)		
16)		
17)		
18)		
19)		
20)		

* Gray highlight indicates samples associated with the Equipment Blank

APPENDIX K

Evaluation of Data Completeness
Percentage of Non-rejected Results vs. Total Results
(Only data which underwent validation are included)

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Cyanide	CN	Soil	mg/kg	99	96	0	99	100.00%
Aluminum	Metal	Soil	mg/kg	99	99	0	99	100.00%
Antimony	Metal	Soil	mg/kg	99	1	0	99	100.00%
Arsenic	Metal	Soil	mg/kg	110	71	0	110	100.00%
Barium	Metal	Soil	mg/kg	99	99	0	99	100.00%
Beryllium	Metal	Soil	mg/kg	99	85	0	99	100.00%
Cadmium	Metal	Soil	mg/kg	99	99	0	99	100.00%
Chromium	Metal	Soil	mg/kg	99	99	0	99	100.00%
Chromium VI	Metal	Soil	mg/kg	99	97	0	99	100.00%
Cobalt	Metal	Soil	mg/kg	99	87	0	99	100.00%
Copper	Metal	Soil	mg/kg	99	99	0	99	100.00%
Iron	Metal	Soil	mg/kg	99	99	0	99	100.00%
Lead	Metal	Soil	mg/kg	99	95	0	99	100.00%
Manganese	Metal	Soil	mg/kg	99	99	0	99	100.00%
Mercury	Metal	Soil	mg/kg	99	65	5	94	94.95%
Nickel	Metal	Soil	mg/kg	99	97	0	99	100.00%
Selenium	Metal	Soil	mg/kg	99	34	0	99	100.00%
Silver	Metal	Soil	mg/kg	99	33	0	99	100.00%
Thallium	Metal	Soil	mg/kg	99	20	0	99	100.00%
Vanadium	Metal	Soil	mg/kg	99	99	0	99	100.00%
Zinc	Metal	Soil	mg/kg	99	95	0	99	100.00%
Aroclor 1016	PCB	Soil	mg/kg	50	0	0	50	100.00%
Aroclor 1221	PCB	Soil	mg/kg	50	0	0	50	100.00%
Aroclor 1232	PCB	Soil	mg/kg	50	0	0	50	100.00%
Aroclor 1242	PCB	Soil	mg/kg	50	3	0	50	100.00%
Aroclor 1248	PCB	Soil	mg/kg	50	1	0	50	100.00%
Aroclor 1254	PCB	Soil	mg/kg	50	1	0	50	100.00%
Aroclor 1260	PCB	Soil	mg/kg	50	1	0	50	100.00%
Aroclor 1262	PCB	Soil	mg/kg	50	1	0	50	100.00%
Aroclor 1268	PCB	Soil	mg/kg	50	1	0	50	100.00%
PCBs (total)	PCB	Soil	mg/kg	50	7	0	50	100.00%
1,1-Biphenyl	SVOC	Soil	mg/kg	99	29	0	99	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Soil	mg/kg	99	2	0	99	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Soil	mg/kg	99	0	37	62	62.63%
2,4,5-Trichlorophenol	SVOC	Soil	mg/kg	99	0	36	63	63.64%
2,4,6-Trichlorophenol	SVOC	Soil	mg/kg	99	0	36	63	63.64%
2,4-Dichlorophenol	SVOC	Soil	mg/kg	99	0	36	63	63.64%
2,4-Dimethylphenol	SVOC	Soil	mg/kg	99	2	36	63	63.64%
2,4-Dinitrophenol	SVOC	Soil	mg/kg	99	0	43	56	56.57%
2,4-Dinitrotoluene	SVOC	Soil	mg/kg	99	0	0	99	100.00%
2,6-Dinitrotoluene	SVOC	Soil	mg/kg	99	0	0	99	100.00%
2-Chloronaphthalene	SVOC	Soil	mg/kg	99	3	0	99	100.00%
2-Chlorophenol	SVOC	Soil	mg/kg	99	0	36	63	63.64%
2-Methylnaphthalene	SVOC	Soil	mg/kg	100	84	0	100	100.00%
2-Methylphenol	SVOC	Soil	mg/kg	99	1	36	63	63.64%
2-Nitroaniline	SVOC	Soil	mg/kg	99	0	0	99	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Soil	mg/kg	99	5	36	63	63.64%
3,3'-Dichlorobenzidine	SVOC	Soil	mg/kg	99	0	0	99	100.00%
4-Chloroaniline	SVOC	Soil	mg/kg	99	0	0	99	100.00%
4-Nitroaniline	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Acenaphthene	SVOC	Soil	mg/kg	100	85	0	100	100.00%
Acenaphthylene	SVOC	Soil	mg/kg	100	82	0	100	100.00%
Acetophenone	SVOC	Soil	mg/kg	99	3	0	99	100.00%
Anthracene	SVOC	Soil	mg/kg	100	89	0	100	100.00%
Benzaldehyde	SVOC	Soil	mg/kg	99	21	71	28	28.28%
Benz[a]anthracene	SVOC	Soil	mg/kg	100	92	0	100	100.00%
Benzo[a]pyrene	SVOC	Soil	mg/kg	104	91	0	104	100.00%
Benzo[b]fluoranthene	SVOC	Soil	mg/kg	100	97	0	100	100.00%

Evaluation of Data Completeness
Percentage of Non-rejected Results vs. Total Results
(Only data which underwent validation are included)

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Benzo[g,h,i]perylene	SVOC	Soil	mg/kg	100	85	0	100	100.00%
Benzo[k]fluoranthene	SVOC	Soil	mg/kg	100	88	0	100	100.00%
bis(2-chloroethoxy)methane	SVOC	Soil	mg/kg	99	0	0	99	100.00%
bis(2-Chloroethyl)ether	SVOC	Soil	mg/kg	99	0	0	99	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Soil	mg/kg	99	0	0	99	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Soil	mg/kg	99	17	0	99	100.00%
Caprolactam	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Carbazole	SVOC	Soil	mg/kg	99	25	0	99	100.00%
Chrysene	SVOC	Soil	mg/kg	100	95	0	100	100.00%
Dibenz[a,h]anthracene	SVOC	Soil	mg/kg	100	81	0	100	100.00%
Diethylphthalate	SVOC	Soil	mg/kg	99	2	0	99	100.00%
Di-n-butylphthalate	SVOC	Soil	mg/kg	99	2	0	99	100.00%
Di-n-ocylphthalate	SVOC	Soil	mg/kg	99	1	0	99	100.00%
Fluoranthene	SVOC	Soil	mg/kg	100	98	0	100	100.00%
Fluorene	SVOC	Soil	mg/kg	100	81	0	100	100.00%
Hexachlorobenzene	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Hexachlorobutadiene	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Hexachlorocyclopentadiene	SVOC	Soil	mg/kg	99	0	1	98	98.99%
Hexachloroethane	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Soil	mg/kg	100	83	0	100	100.00%
Isophorone	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Naphthalene	SVOC	Soil	mg/kg	100	90	0	100	100.00%
Nitrobenzene	SVOC	Soil	mg/kg	99	0	0	99	100.00%
N-Nitroso-di-n-propylamine	SVOC	Soil	mg/kg	99	0	0	99	100.00%
N-Nitrosodiphenylamine	SVOC	Soil	mg/kg	99	0	0	99	100.00%
Pentachlorophenol	SVOC	Soil	mg/kg	99	0	38	61	61.62%
Phenanthrene	SVOC	Soil	mg/kg	100	100	0	100	100.00%
Phenol	SVOC	Soil	mg/kg	99	5	36	63	63.64%
Pyrene	SVOC	Soil	mg/kg	100	95	0	100	100.00%
Diesel Range Organics	TPH	Soil	mg/kg	100	98	0	100	100.00%
Gasoline Range Organics	TPH	Soil	mg/kg	99	3	0	99	100.00%
Oil and Grease	TPH	Soil	mg/kg	99	99	0	99	100.00%
1,1,1-Trichloroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,1,2,2-Tetrachloroethane	VOC	Soil	mg/kg	32	0	3	29	90.63%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,1,2-Trichloroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,1-Dichloroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,1-Dichloroethene	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2,3-Trichlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2,4-Trichlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dibromo-3-chloropropane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dibromoethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dichlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dichloroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dichloroethene (Total)	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,2-Dichloropropane	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,3-Dichlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
1,4-Dichlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
2-Butanone (MEK)	VOC	Soil	mg/kg	32	3	0	32	100.00%
2-Hexanone	VOC	Soil	mg/kg	32	0	0	32	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Soil	mg/kg	32	0	0	32	100.00%
Acetone	VOC	Soil	mg/kg	32	25	0	32	100.00%
Benzene	VOC	Soil	mg/kg	32	4	0	32	100.00%
Bromodichloromethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Bromoform	VOC	Soil	mg/kg	32	0	0	32	100.00%
Bromomethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Carbon disulfide	VOC	Soil	mg/kg	32	0	0	32	100.00%
Carbon tetrachloride	VOC	Soil	mg/kg	32	0	0	32	100.00%

Evaluation of Data Completeness
Percentage of Non-rejected Results vs. Total Results
(Only data which underwent validation are included)

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Chlorobenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Chloroethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Chloroform	VOC	Soil	mg/kg	32	0	0	32	100.00%
Chloromethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
cis-1,2-Dichloroethene	VOC	Soil	mg/kg	32	0	0	32	100.00%
cis-1,3-Dichloropropene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Cyclohexane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Dibromochloromethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Dichlorodifluoromethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Ethylbenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Isopropylbenzene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Methyl Acetate	VOC	Soil	mg/kg	32	0	27	5	15.63%
Methyl tert-butyl ether (MTBE)	VOC	Soil	mg/kg	32	0	0	32	100.00%
Methylene Chloride	VOC	Soil	mg/kg	32	0	0	32	100.00%
Styrene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Tetrachloroethene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Toluene	VOC	Soil	mg/kg	32	4	0	32	100.00%
trans-1,2-Dichloroethene	VOC	Soil	mg/kg	32	0	0	32	100.00%
trans-1,3-Dichloropropene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Trichloroethene	VOC	Soil	mg/kg	32	0	0	32	100.00%
Trichlorofluoromethane	VOC	Soil	mg/kg	32	0	0	32	100.00%
Vinyl chloride	VOC	Soil	mg/kg	32	0	0	32	100.00%
Xylenes	VOC	Soil	mg/kg	32	2	0	32	100.00%
1,4-Dioxane	VOC/SVOC	Soil	mg/kg	32	0	32	0	0.00%
Cyanide	CN	Water	ug/L	8	7	0	8	100.00%
Aluminum	Metal	Water	ug/L	8	8	0	8	100.00%
Antimony	Metal	Water	ug/L	8	0	0	8	100.00%
Arsenic	Metal	Water	ug/L	8	1	0	8	100.00%
Barium	Metal	Water	ug/L	8	8	0	8	100.00%
Beryllium	Metal	Water	ug/L	8	0	0	8	100.00%
Cadmium	Metal	Water	ug/L	8	0	0	8	100.00%
Chromium	Metal	Water	ug/L	8	7	0	8	100.00%
Chromium VI	Metal	Water	ug/L	8	8	0	8	100.00%
Cobalt	Metal	Water	ug/L	8	0	0	8	100.00%
Copper	Metal	Water	ug/L	8	0	0	8	100.00%
Iron	Metal	Water	ug/L	8	1	0	8	100.00%
Lead	Metal	Water	ug/L	8	1	0	8	100.00%
Manganese	Metal	Water	ug/L	8	7	0	8	100.00%
Mercury	Metal	Water	ug/L	8	0	0	8	100.00%
Nickel	Metal	Water	ug/L	8	4	0	8	100.00%
Selenium	Metal	Water	ug/L	8	6	0	8	100.00%
Silver	Metal	Water	ug/L	8	0	0	8	100.00%
Thallium	Metal	Water	ug/L	8	1	0	8	100.00%
Vanadium	Metal	Water	ug/L	8	8	0	8	100.00%
Zinc	Metal	Water	ug/L	8	8	0	8	100.00%
1,1-Biphenyl	SVOC	Water	ug/L	8	1	0	8	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Water	ug/L	8	0	0	8	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4,5-Trichlorophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4,6-Trichlorophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4-Dichlorophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4-Dimethylphenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4-Dinitrophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2,4-Dinitrotoluene	SVOC	Water	ug/L	8	0	0	8	100.00%
2,6-Dinitrotoluene	SVOC	Water	ug/L	8	0	0	8	100.00%
2-Chloronaphthalene	SVOC	Water	ug/L	8	0	0	8	100.00%
2-Chlorophenol	SVOC	Water	ug/L	8	0	0	8	100.00%
2-Methylnaphthalene	SVOC	Water	ug/L	8	7	0	8	100.00%

Evaluation of Data Completeness
Percentage of Non-rejected Results vs. Total Results
(Only data which underwent validation are included)

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
2-Methylphenol	SVOC	Water	ug/L	8	2	0	8	100.00%
2-Nitroaniline	SVOC	Water	ug/L	8	0	0	8	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Water	ug/L	8	2	0	8	100.00%
3,3'-Dichlorobenzidine	SVOC	Water	ug/L	8	0	1	7	87.50%
4-Chloroaniline	SVOC	Water	ug/L	8	0	0	8	100.00%
4-Nitroaniline	SVOC	Water	ug/L	8	0	0	8	100.00%
Acenaphthene	SVOC	Water	ug/L	8	7	0	8	100.00%
Acenaphthylene	SVOC	Water	ug/L	8	6	0	8	100.00%
Acetophenone	SVOC	Water	ug/L	8	2	0	8	100.00%
Anthracene	SVOC	Water	ug/L	8	6	0	8	100.00%
Benzaldehyde	SVOC	Water	ug/L	8	0	0	8	100.00%
Benz[a]anthracene	SVOC	Water	ug/L	8	1	0	8	100.00%
Benzo[a]pyrene	SVOC	Water	ug/L	8	1	0	8	100.00%
Benzo[b]fluoranthene	SVOC	Water	ug/L	8	1	0	8	100.00%
Benzo[g,h,i]perylene	SVOC	Water	ug/L	8	1	0	8	100.00%
Benzo[k]fluoranthene	SVOC	Water	ug/L	8	1	0	8	100.00%
bis(2-chloroethoxy)methane	SVOC	Water	ug/L	8	0	0	8	100.00%
bis(2-Chloroethyl)ether	SVOC	Water	ug/L	8	0	0	8	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Water	ug/L	8	0	0	8	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Water	ug/L	8	1	0	8	100.00%
Caprolactam	SVOC	Water	ug/L	8	0	0	8	100.00%
Carbazole	SVOC	Water	ug/L	8	3	0	8	100.00%
Chrysene	SVOC	Water	ug/L	8	3	0	8	100.00%
Dibenz[a,h]anthracene	SVOC	Water	ug/L	8	0	0	8	100.00%
Diethylphthalate	SVOC	Water	ug/L	8	0	0	8	100.00%
Di-n-butylphthalate	SVOC	Water	ug/L	8	0	0	8	100.00%
Di-n-octylphthalate	SVOC	Water	ug/L	8	0	0	8	100.00%
Fluoranthene	SVOC	Water	ug/L	8	7	0	8	100.00%
Fluorene	SVOC	Water	ug/L	8	7	0	8	100.00%
Hexachlorobenzene	SVOC	Water	ug/L	8	0	0	8	100.00%
Hexachlorobutadiene	SVOC	Water	ug/L	8	0	0	8	100.00%
Hexachlorocyclopentadiene	SVOC	Water	ug/L	8	0	0	8	100.00%
Hexachloroethane	SVOC	Water	ug/L	8	0	0	8	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Water	ug/L	8	1	0	8	100.00%
Isophorone	SVOC	Water	ug/L	8	0	0	8	100.00%
Naphthalene	SVOC	Water	ug/L	8	8	0	8	100.00%
Nitrobenzene	SVOC	Water	ug/L	8	0	0	8	100.00%
N-Nitroso-di-n-propylamine	SVOC	Water	ug/L	8	0	0	8	100.00%
N-Nitrosodiphenylamine	SVOC	Water	ug/L	8	0	0	8	100.00%
Pentachlorophenol	SVOC	Water	ug/L	8	4	0	8	100.00%
Phenanthrene	SVOC	Water	ug/L	8	7	0	8	100.00%
Phenol	SVOC	Water	ug/L	8	2	0	8	100.00%
Pyrene	SVOC	Water	ug/L	8	7	0	8	100.00%
Diesel Range Organics	TPH	Water	ug/L	8	7	0	8	100.00%
Gasoline Range Organics	TPH	Water	ug/L	8	3	0	8	100.00%
Oil and Grease	TPH	Water	ug/L	8	5	0	8	100.00%
1,1,1-Trichloroethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,1,2,2-Tetrachloroethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,1,2-Trichloroethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,1-Dichloroethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,1-Dichloroethene	VOC	Water	ug/L	8	0	0	8	100.00%
1,2,3-Trichlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
1,2,4-Trichlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
1,2-Dibromo-3-chloropropane	VOC	Water	ug/L	8	0	0	8	100.00%
1,2-Dibromoethane	VOC	Water	ug/L	8	0	0	8	100.00%
1,2-Dichlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
1,2-Dichloroethane	VOC	Water	ug/L	8	0	0	8	100.00%

Evaluation of Data Completeness
Percentage of Non-rejected Results vs. Total Results
(Only data which underwent validation are included)

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
1,2-Dichloroethene (Total)	VOC	Water	ug/L	8	0	0	8	100.00%
1,2-Dichloropropane	VOC	Water	ug/L	8	0	0	8	100.00%
1,3-Dichlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
1,4-Dichlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
2-Butanone (MEK)	VOC	Water	ug/L	8	0	0	8	100.00%
2-Hexanone	VOC	Water	ug/L	8	0	0	8	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Water	ug/L	8	0	0	8	100.00%
Acetone	VOC	Water	ug/L	8	0	0	8	100.00%
Benzene	VOC	Water	ug/L	8	3	0	8	100.00%
Bromodichloromethane	VOC	Water	ug/L	8	1	0	8	100.00%
Bromoform	VOC	Water	ug/L	8	0	0	8	100.00%
Bromomethane	VOC	Water	ug/L	8	0	0	8	100.00%
Carbon disulfide	VOC	Water	ug/L	8	7	0	8	100.00%
Carbon tetrachloride	VOC	Water	ug/L	8	0	0	8	100.00%
Chlorobenzene	VOC	Water	ug/L	8	0	0	8	100.00%
Chloroethane	VOC	Water	ug/L	8	0	0	8	100.00%
Chloroform	VOC	Water	ug/L	8	1	0	8	100.00%
Chloromethane	VOC	Water	ug/L	8	0	0	8	100.00%
cis-1,2-Dichloroethene	VOC	Water	ug/L	8	0	0	8	100.00%
cis-1,3-Dichloropropene	VOC	Water	ug/L	8	0	0	8	100.00%
Cyclohexane	VOC	Water	ug/L	8	0	0	8	100.00%
Dibromochloromethane	VOC	Water	ug/L	8	0	0	8	100.00%
Dichlorodifluoromethane	VOC	Water	ug/L	8	0	0	8	100.00%
Ethylbenzene	VOC	Water	ug/L	8	1	0	8	100.00%
Isopropylbenzene	VOC	Water	ug/L	8	1	0	8	100.00%
Methyl Acetate	VOC	Water	ug/L	8	0	0	8	100.00%
Methyl tert-butyl ether (MTBE)	VOC	Water	ug/L	8	0	0	8	100.00%
Methylene Chloride	VOC	Water	ug/L	8	0	0	8	100.00%
Styrene	VOC	Water	ug/L	8	0	0	8	100.00%
Tetrachloroethene	VOC	Water	ug/L	8	0	0	8	100.00%
Toluene	VOC	Water	ug/L	8	8	0	8	100.00%
trans-1,2-Dichloroethene	VOC	Water	ug/L	8	0	0	8	100.00%
trans-1,3-Dichloropropene	VOC	Water	ug/L	8	0	0	8	100.00%
Trichloroethene	VOC	Water	ug/L	8	0	0	8	100.00%
Trichlorofluoromethane	VOC	Water	ug/L	8	0	0	8	100.00%
Vinyl chloride	VOC	Water	ug/L	8	0	0	8	100.00%
Xylenes	VOC	Water	ug/L	8	4	0	8	100.00%
1,4-Dioxane	VOC/SVOC	Water	ug/L	8	7	0	8	100.00%

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APPENDIX L

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**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm ²)	AF	0.3
Skin surface exposed (cm ²)	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm ³)	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Area of site (ac)	Ac	43.4
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	13.7
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	175,634
Length (km)	LR	419
Distance traveled (km)	ΣVKT	1,048
Particulate emission factor (m3/kg)	PEFsc	147,968,211
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	6.72
Total time of construction (s)	Tcv	7,200,000

- Exposure Unit 1
- Exposure Unit 2
- Exposure Unit 3
- Exposure Unit 4
- Exposure Unit 5

- Input
- Calculation

Chemical	Toxicity Criteria Source	[^] Ingestion SF (mg/kg-day) ⁻¹	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[^] Dia	[^] Diw	[^] Henry's Law Constant (unitless)	[^] Kd	[^] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.15	10,550	15.1	97.4	9,722	96.4
Chromium(VI)	A/N/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.52	540	21.6	804.4	194,430	801
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					5,041	5,041	1,031	12,962	955
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	32,405	4,222
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	64,810	1,603
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.66E+4	8.72	14	5.42			
Benzo[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.22E+5	178.24	1,133	154.0			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.18E+6	17.82	599	17.31	76.4	10	9.06
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.07E+6	178.24	5,408	172.6			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.83E+6	17.82	75,612	17.82			
Naphthalene	C/I/P	-	3.40E-05	6.00E-01	3.00E-03	1	6.00E-01	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	2.28E+3		21	20.6	152,780	30	30.0

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris> or IRIS 2017 Recent Additions at <https://www.epa.gov/iris/iris-recent-additions> ; in addition, PAH compounds were adjusted based on the relative potency factor

C: chemical specific parameters found in Cal EPA at <https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf>

A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf

P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhpprtv.ornl.gov/quickview/pprtv.php>

N: chemical specific parameters found in NJDEP

**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Area of site (ac)	Ac	55.3
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	13.5
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	223,791
Length (km)	LR	473
Distance traveled (km)	ΣVKT	1,183
Particulate emission factor (m3/kg)	PEFsc	164,956,970
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	6.48
Total time of construction (s)	Tcv	7,200,000

- Exposure Unit 1
- Exposure Unit 2
- Exposure Unit 3
- Exposure Unit 4
- Exposure Unit 5

Input
Calculation

Chemical	Toxicity Criteria Source	[^] Ingestion SF (mg/kg-day) ⁻¹	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[^] Dia	[^] Diw	[^] Henry's Law Constant (unitless)	[^] Kd	[^] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.15	11,762	15.1	97.4	10,838	96.5
Chromium(VI)	A/N/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.52	602	21.7	804.4	216,753	801
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					5,620	5,620	1,031	14,450	962
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	36,126	4,279
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	72,251	1,607
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.57E+4	8.72	14	5.35			
Benzo[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.14E+5	178.24	1,094	153.3			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.14E+6	17.82	579	17.29	76.4	10	8.79
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.03E+6	178.24	5,227	172.4			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.73E+6	17.82	84,293	17.82			
Naphthalene	C/I/P	-	3.40E-05	6.00E-01	3.00E-03	1	6.00E-01	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	2.20E+3		20	19.9	152,780	29	29.0

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris> or IRIS 2017 Recent Additions at <https://www.epa.gov/iris/iris-recent-additions> ; in addition, PAH compounds were adjusted based on the relative potency factor

C: chemical specific parameters found in Cal EPA at <https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf>

A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf

P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhpprtv.ornl.gov/quickview/pprtv.php>

N: chemical specific parameters found in NJDEP

**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Area of site (ac)	Ac	46.6
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	13.6
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	188,584
Length (km)	LR	434
Distance traveled (km)	ΣVKT	1,086
Particulate emission factor (m3/kg)	PEFsc	152,740,040
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	6.65
Total time of construction (s)	Tcv	7,200,000

- Exposure Unit 1
- Exposure Unit 2
- Exposure Unit 3
- Exposure Unit 4
- Exposure Unit 5

Input
Calculation

Chemical	Toxicity Criteria Source	[^] Ingestion SF (mg/kg-day) ⁻¹	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[^] Dia	[^] Diw	[^] Henry's Law Constant (unitless)	[^] Kd	[^] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.15	10,891	15.1	97.4	10,035	96.5
Chromium(VI)	A/N/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.52	558	21.6	804.4	200,700	801
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					5,203	5,203	1,031	13,380	957
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	33,450	4,239
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	66,900	1,604
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.64E+4	8.72	14	5.40			
Benzo[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.20E+5	178.24	1,121	153.8			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.17E+6	17.82	593	17.30	76.4	10	8.98
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.06E+6	178.24	5,354	172.5			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.80E+6	17.82	78,050	17.82			
Naphthalene	C/I/P	-	3.40E-05	6.00E-01	3.00E-03	1	6.00E-01	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	2.26E+3		20	20.4	152,780	30	29.7

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris> or IRIS 2017 Recent Additions at <https://www.epa.gov/iris/iris-recent-additions> ; in addition, PAH compounds were adjusted based on the relative potency factor

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A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf

P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhpprtv.ornl.gov/quickview/pprtv.php>

N: chemical specific parameters found in NJDEP

**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Area of site (ac)	Ac	53.7
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	13.5
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	217,316
Length (km)	LR	466
Distance traveled (km)	ΣVKT	1,165
Particulate emission factor (m3/kg)	PEFsc	162,784,698
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	6.51
Total time of construction (s)	Tcv	7,200,000

- Exposure Unit 1
- Exposure Unit 2
- Exposure Unit 3
- Exposure Unit 4
- Exposure Unit 5

Input
Calculation

Chemical	Toxicity Criteria Source	[^] Ingestion SF (mg/kg-day) ⁻¹	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[^] Dia	[^] Diw	[^] Henry's Law Constant (unitless)	[^] Kd	[^] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.15	11,607	15.1	97.4	10,695	96.5
Chromium(VI)	A/N/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.52	594	21.7	804.4	213,899	801
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					5,546	5,546	1,031	14,260	961
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	35,650	4,272
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	71,300	1,606
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.58E+4	8.72	14	5.36			
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.15E+5	178.24	1,099	153.4			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.15E+6	17.82	582	17.29	76.4	10	8.82
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.03E+6	178.24	5,249	172.4			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.74E+6	17.82	83,183	17.82			
Naphthalene	C/I/P	-	3.40E-05	6.00E-01	3.00E-03	1	6.00E-01	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	2.21E+3		20	20.0	152,780	29	29.1

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris> or IRIS 2017 Recent Additions at <https://www.epa.gov/iris/iris-recent-additions> ; in addition, PAH compounds were adjusted based on the relative potency factor

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A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf

P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhpprtv.ornl.gov/quickview/pprtv.php>

N: chemical specific parameters found in NJDEP

**Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel B13**

Area of site (ac)	Ac	44.3
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	13.6
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	179,276
Length (km)	LR	423
Distance traveled (km)	ΣVKT	1,059
Particulate emission factor (m3/kg)	PEFsc	149,327,281
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	6.70
Total time of construction (s)	Tcv	7,200,000

- Exposure Unit 1
- Exposure Unit 2
- Exposure Unit 3
- Exposure Unit 4
- Exposure Unit 5

Input
Calculation

Chemical	Toxicity Criteria Source	[^] Ingestion SF (mg/kg-day) ⁻¹	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[^] Dia	[^] Diw	[^] Henry's Law Constant (unitless)	[^] Kd	[^] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.15	10,647	15.1	97.4	9,811	96.5
Chromium(VI)	A/N/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.52	545	21.6	804.4	196,216	801
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					5,087	5,087	1,031	13,081	956
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	32,703	4,227
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	65,405	1,603
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	2.66E+4	8.72	14	5.41			
Benzo[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.21E+5	178.24	1,129	153.9			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.18E+6	17.82	598	17.31	76.4	10	9.03
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.06E+6	178.24	5,393	172.5			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	2.82E+6	17.82	76,306	17.82			
Naphthalene	C/I/P	-	3.40E-05	6.00E-01	3.00E-03	1	6.00E-01	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	2.28E+3		21	20.5	152,780	30	29.9

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>

[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

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