PHASE II
INVESTIGATION REPORT

AREA B: PARCEL B17
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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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 B17 (the Site). Parcel B17 is comprised of 9.8 acres of the approximately 3,100-acre former steel making facility (**Figure 1**). The Site is bounded to the south by an off-site shipyard and to the north by an off-site sheet metal shop (both of which are located beyond the boundary of the Tradepoint Atlantic property), to the west by a series of piers and the adjoining surface waters of the Patapsco River, and to the east by a portion of the Tradepoint Atlantic property investigated as Parcel B1.

The Phase II Investigation was performed in accordance with procedures outlined in the approved Phase II Investigation Work Plan – Area B: Parcel B17. This Work Plan (Revision 1 dated July 10, 2017) was approved by the Maryland Department of the Environment (MDE) and the United States Environmental Protection Agency (USEPA) on July 19, 2017 in compliance with requirements pursuant to the following:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the MDE effective September 12, 2014; and
- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the USEPA effective November 25, 2014.

Parcel B17 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from the USEPA on September 12, 2014. Based on this agreement, the USEPA 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 USEPA's Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

An application to enter the full Tradepoint Atlantic property (3,100 acres) into the Maryland Department of the Environment Voluntary Cleanup Program (MDE-VCP) was submitted to the MDE and delivered on June 27, 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.

Several iron and steel work processes were completed within the boundary of Parcel B17. Parcel B17 was formerly occupied by a Machine Shop (Machine Shop No. 2). There is little information known about the specific processes conducted in the Machine Shop No. 2. The Site also included an Old Service Building, Old Blacksmith Shop, and a Heat Treating Plant.

The Machine Shop No. 2 was partially demolished by a service provider contracted by RG Steel during the RG Steel ownership period. The more valuable components of the building were salvaged, and the resulting debris was abandoned in numerous piles. During the Phase I Environmental Site Assessment (ESA) site visit conducted by Weaver Boos in February 2014, the Machine Shop No. 2 was observed to be demolished. Demolition material piles were observed where the Machine Shop No. 2 historically stood. Asbestos-containing debris was observed in the demolition piles at this time. Weaver Boos reported that the abandoned debris was the subject of a current enforcement action by the MDE to be remedied by the combined efforts of Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and MCM Management Corporation (MCM).

The environmental response by Tradepoint Atlantic and MCM in this area included, among other efforts, the removal of drums, cylinders, and other containers present in the Machine Shop No. 2 area, sampling and analysis of petroleum product remaining in surface pits (sampling results were reportedly provided to the MDE), and removal of free-phase product and contaminated water from pits/sumps. On January 2, 2014, prior to the Phase II Investigation, cleanup was completed for four exposed pits/sumps at the Site (designated as #10, 11, 12, and 17) which had evidence of oil staining and petroleum impacts. Free oil and visibly impacted materials were removed from the subgrade structures and the structures were steam cleaned prior to backfilling. A total of approximately 1,212 gallons of free-phase product and contaminated water were recovered and sent for off-site disposal. Oily pits/sumps were also identified in the Machine Shop No. 2 area within Weaver Boos' Phase I ESA. The referenced cleanup of the oily pits/sumps had already been conducted at the time of Weaver Boos' Phase I ESA. The demolition debris piles from the Machine Shop No. 2 (main building) were still on-site at the time of this cleanup work.

As documented in the Parcel B17 Phase II Investigation Work Plan, ARM conducted a site visit on June 1, 2016 to determine the current status of building demolition activities and debris piles. At the time of ARM's site visit, all of the buildings in Parcel B17 had been demolished, the concrete slabs remained on grade, and the debris piles had been removed. Prior to the June 2016 site visit, EAG had already conducted cleanup activities (as documented above) and all subgrade structures had been backfilled; there were no subgrade structures identified during ARM's site-walk of Parcel B17.

1.2. OBJECTIVES

The objective of this Phase II Investigation was to fully characterize the nature and extent of contamination at the Site. A summary table of the site investigation locations, including the boring identification numbers and the analyses performed, is provided as **Appendix A**. 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.

2.0 ENVIRONMENTAL SETTING

2.1. LAND USE AND SURFACE FEATURES

The Tradepoint Atlantic property consists of the former Sparrows Point steel mill. According to the Phase I 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 8 to 10 feet above mean sea level (amsl) in most areas. Elevations at the Site appear to be uniform across the entire parcel area. According to Figure B-2 of the Stormwater Pollution Prevention Plan (SWPPP) Revision 5 dated June 1, 2017, runoff waters from Parcel B17 are ultimately directed to the west through National Pollutant Discharge Elimination System (NPDES) permitted Outfall 013, which discharges to Bear Creek located just across the boundary of the Tradepoint Atlantic property.

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 overlie 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 approximately 20% natural soils and 80% 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 Environment and Infrastructure, dated January 1998).

In general, the encountered subsurface geology included non-native fill materials (slag and gravel) and natural soils, which included fine-grained sediments (clays and silts) and coarse-grained sediments (sands). Slag fill materials were encountered at depths of up to 15 feet below the ground surface (bgs). Shallow groundwater was observed in soil cores from 4 to 9.5 feet bgs across the Site; however, groundwater was not encountered at every boring location. Soil boring observation 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.

Groundwater was investigated across the Site during the Area B Groundwater Investigation and the Parcel B17 Phase II Investigation. One shallow hydrogeologic zone monitoring well from the Area B Groundwater Investigation (SW-026-MWS) is included in this Phase II Investigation Report. In addition to this monitoring well, six temporary groundwater sample collection points (commonly referred to as piezometers) were installed across the parcel to investigate shallow groundwater conditions. Boring location B17-018-SB was originally proposed to have a temporary piezometer installed, but shallow refusal was encountered at this location and a piezometer was installed at boring location B17-020-SB in lieu of B17-018-SB. The locations of the completed groundwater sampling points are indicated on **Figure 3**. The groundwater monitoring locations were surveyed by a Maryland-licensed surveyor. Supporting documentation from the surveys is included in **Appendix C**.

A synoptic round of groundwater level measurements was collected on February 12, 2018 from each of the groundwater monitoring locations installed for the Area B Groundwater Investigation or the Parcel B17 Phase II Investigation. 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.

Based on the field measurements, a groundwater potentiometric surface map was constructed for the shallow hydrogeologic zone. The localized potentiometric map for shallow groundwater has been included on **Figure 3**. As seen on **Figure 3**, shallow groundwater appears to flow from the eastern portion of the Site (maximum groundwater elevation of 2.66 feet amsl at B17-019-PZ) to the southwestern portion of the Site (groundwater elevation of 1.74 feet amsl at B17-016-PZ). The hydraulic gradient in the shallow zone appears to be relatively uniform across the Site, although groundwater elevations in the northern half of the Site are less defined.

3.0 SITE INVESTIGATION

A total of 38 soil samples (from 20 boring locations) and six groundwater samples were collected for analysis between September 18, 2017 and October 11, 2017 as part of the Parcel B17 Phase II Investigation. The permanent groundwater well SW-026-MWS was previously sampled on March 30, 2016 as part of the separate Area B Groundwater Investigation. This Phase II Investigation utilized methods and protocols that followed the procedures included in the Quality Assurance Project Plan (QAPP) dated April 5, 2016 which was 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 B17 Work Plan dated July 10, 2017, and the QAPP.

All site characterization activities were conducted under the property-wide 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 Geographic Information Systems (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 Environment and Infrastructure. The following RECs were identified in the Parcel B17 Work Plan: Machine Shop No. 2: Asbestos Piles (REC 14A, Finding 250) and Machine Shop No. 2: Stained Ground – Possible Oily Pits/Sumps (REC 14B, Finding 251). Additional information regarding these identified RECs is presented in the Parcel B17 Work Plan and summarized above in Section 1.1. There were no additional SWMUs or AOCs identified at the Site based on the DCC Report.

Four 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. A summary of the specific drawings covering the Site is presented in **Table 2**. Sampling target locations were identified if the historical drawings depicted industrial activities or a specific feature at a location that may have been a source of environmental contamination that potentially impacted the Site.

Based on the review of plant drawings and historical documents (or based on direct agency guidance), additional non-REC sampling targets were identified at the Site that included the following: Chesapeake Heavy Machine Service, Old Blacksmith Shop/Heat Treating Plant, Utility Drain, and Machine Shop No. 2 – Maintenance Floor. 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**. During the completion of fieldwork, it was necessary to shift some borings from the approved locations given in the Work Plan, due to utility conflicts and/or refusal. **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.

In addition to the borings which were shifted, boring B17-003-SB could not be completed during this investigation due to equipment refusal. Another attempt was made to complete this location via test pitting using a backhoe excavator (further described in Section 3.3), but intact concrete was observed in a 20-foot radius around the proposed boring location and the excavator was unable to dig past the concrete. This location was removed from the sampling plan following the test pitting refusal. Boring B17-003-SB targeted the Machine Shop No. 2: Asbestos Piles, which were covered by several additional soil borings throughout the parcel (even those which did not have the Asbestos Piles explicitly listed as the sampling plan target in **Appendix A**). Therefore, the removal of this boring from the sampling plan is not a significant data gap.

The density of soil borings met the requirements set forth in QAPP Worksheet 17 – Sampling Design and Rationale. Parcel B17 contained a total of 3.6 acres without engineered barriers and 6.2 acres with engineered barriers. Of the 6.2 acres with engineered barriers, 4.7 acres consisted of historical building slabs and 1.5 acres consisted of parking/roads. In accordance with the relevant sampling density requirements, a minimum of 4 soil borings were required to cover the areas without engineered barriers, and a minimum of 4 soil borings were required to cover the areas with engineered barriers. A total of 8 soil borings were required to meet the density specification; 20 soil borings were successfully completed during this Phase II Investigation to collect analytical soil samples.

3.2. SOIL INVESTIGATION

Continuous core soil borings were advanced at 20 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 20 continuous core soil borings were advanced to depths between 3 and 15 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). As described above, one soil boring (B17-003-SB) was not successfully installed due to equipment refusal, and no soil samples were collected at this location. Two locations (B17-007-SB and B17-021-SB) were revisited following the initial investigation to complete exploratory test pits using a backhoe excavator. These locations are highlighted on **Figure 4**, and the completed test pitting activities are further described in Section 3.3. At each of the 20 completed boring locations, each soil core was visually inspected and screened with a hand-held photoionization 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. If clean surface cover materials (such as paving or gravel) were present, the first 1 foot of fine-grained material beneath this layer was collected as the surface sample. One additional set of samples would also be collected from the 9 to 10 foot depth interval if groundwater had not been encountered (in accordance with the Work Plan); however, groundwater and/or equipment refusal was always encountered prior to reaching 10 feet bgs in Parcel B17. If the PID or other field observations indicated contamination to exist at a depth greater than 3 feet bgs but less than 9 feet bgs, and 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 Standard Operating Procedure (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.

Each soil sample collected during this investigation was submitted to Pace Analytical Services, Inc. (PACE) for analysis of Target Compound List (TCL) semi-volatile organic compounds (SVOCs) via USEPA Methods 8270D and 8270D SIM, Oil & Grease via USEPA Method 9071, total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO) via USEPA Methods 8015B and 8015D, Target Analyte List (TAL) Metals via USEPA Methods 6010C and 7471C, hexavalent chromium via USEPA Method 7196A, and cyanide via USEPA Method 9012. Samples from any depth interval with a sustained PID reading of greater than 10 ppm were also analyzed for TCL volatile organic compounds (VOCs) via USEPA Method 8260B. Additionally, the shallow soil samples collected across the Site from the 0 to 1 foot bgs (or field adjusted) interval were also analyzed for polychlorinated biphenyls (PCBs) via USEPA Method 8082.

Shallow soil samples from select boring locations (listed in **Appendix A**) were also designated to be analyzed for asbestos via USEPA Method 600/R-93/116. These locations were selected due to the former presence of the Machine Shop No. 2: Asbestos Piles (REC 14A) identified in the Work Plan. During field activities, if intact concrete was observed at the ground surface at a boring location proposed for collection and analysis of asbestos, the asbestos sample was not collected because the concrete provided a physical barrier to prevent the asbestos from contacting the underlying soil. In total, six samples were ultimately analyzed for asbestos. 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. TEST PIT INVESTIGATION

Following the initial investigation, and based on observations of non-aqueous phase liquid (NAPL) or elevated analytical soil detections of Oil & Grease, sample locations B17-007-SB and B17-021-SB were further investigated via the installation of test pits. Both of these soil borings targeted the Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps) defined as REC 14A in Weaver Boos' Phase I ESA. Boring B17-007-SB had observations of black NAPL in the soil core from 1.8 to 3 feet bgs (where refusal was encountered) and boring B17-021-SB had an elevated shallow soil detection of Oil & Grease (8,860 mg/kg) above the Project Action Limit (PAL) of 6,200 mg/kg.

Test pits were completed at these locations to investigate the potential presence of the historical Oily Pits/Sumps using a backhoe excavator on November 2, 2017. Aerial images showing the approximate locations of the historical subgrade structures were used in the field to guide the test pit investigation. The test pits were completed in accordance with **Field SOP Number 015**. Petroleum-impacted materials were observed at location B17-007-SB within a subgrade structure, and the structure was cleaned. These cleanup activities were conducted by Ace Environmental Services and ENRC. Solid and aqueous impacted materials were removed and disposed of as described in Section 3.5. Little to no visible petroleum impacts were observed in the field at location B17-021-SB; all excavated material was backfilled at this location. A photograph log of the completed test pitting activities is provided in **Appendix E**. The specific observations documented during the test pitting are further discussed in Section 4.3.

A third location (B17-003-SB) was also revisited with the backhoe excavator in an attempt to facilitate the collection of analytical soil samples. Three attempts had previously been made at this location using Geoprobe® equipment; however, refusal was encountered during each attempt at depths between 1 to 3 feet bgs. Intact concrete was observed surrounding B17-003-SB in a 20-foot radius, and the backhoe excavator was unable to successfully dig past the concrete pad. This location was removed from the sampling plan following the test pitting refusal.

3.4. GROUNDWATER INVESTIGATION

Parcel B17 is located within the study area investigated under the Area B Groundwater Investigation. One shallow monitoring well from the Area B Groundwater Investigation (SW-026-MWS) has been included in this Parcel B17 Phase II Investigation Report. Additionally, six temporary groundwater sample collection points (piezometers) were installed in the shallow hydrogeologic zone in Parcel B17 to supplement the data collected in the Area B Groundwater Investigation. The soil boring locations where shallow piezometers were installed during the investigation were B17-009-SB, B17-014-SB, B17-015-SB, B17-016-SB, B17-019-SB, and B17-020-SB. Boring location B17-018-SB was originally proposed to have a temporary piezometer installed to investigate shallow groundwater conditions. However, during the field investigation shallow refusal was encountered at B17-018-SB. A piezometer was installed at location B17-020-SB in lieu of B17-018-SB. B17-020-PZ is located approximately 75 feet to the east of the originally planned piezometer location. The shallow groundwater sampling locations are displayed on **Figure 3**. The groundwater sample collection point construction logs have been included as **Appendix F**.

Groundwater sample collection point installation activities were conducted in accordance with the procedures and methods referenced in **Field SOP Number 028**. The temporary sample collection points were installed at each location using the Geoprobe® DT22 Dual Tube sampling system. Each boring was advanced to a depth approximately 7 feet below where groundwater was identified in the associated soil core, 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 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 006** provided in Appendix A of the QAPP; which employed the use of laboratory supplied sample containers and preservatives, a peristaltic pump, dedicated polyethylene tubing, and a water quality multiparameter meter with a flow-through cell. Groundwater samples submitted for analysis of dissolved metals were filtered in the field with an in-line 0.45 micron filter. The sampling and purge logs have been included in **Appendix G**. Calibration of the multiparameter 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 multiparameter meter calibration has also been included in **Appendix G**.

Groundwater samples were submitted to PACE, and analyzed for TCL-VOCs via USEPA Method 8260B, TCL-SVOCs via USEPA Methods 8270D and 8270D SIM, TPH-DRO/GRO via USEPA Methods 8015B and 8015D, Oil & Grease via USEPA Method 1664A (piezometers only), TAL-Dissolved Metals via USEPA Methods 6010C and 7470A, dissolved hexavalent chromium via USEPA Method 7196A (piezometers only), available cyanide via USEPA Method OIA1677 (piezometers only), and total cyanide via USEPA Method 9012A. The agencies have specified the requirements for analysis of TPH-DRO/GRO and/or Oil & Grease throughout the investigation process. During the implementation of the Area B Groundwater Investigation Work Plan, Oil & Grease analysis was not required or completed. Similarly, SW-026-MWS was not sampled for available cyanide or dissolved hexavalent chromium. Based on the requirements of the Area B Groundwater Investigation, the permanent monitoring well SW-026-MWS was additionally analyzed for TAL-Total Metals via USEPA Methods 6010C and 7470A, total hexavalent chromium via USEPA Method 7196A, and PCBs via USEPA Method 680. Sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.5. 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 or the installation of the groundwater points;
- excavation spoils generated from test pitting activities at B17-007-SB;
- purged groundwater;
- decontamination fluids; and
- used personal protective equipment

Following the completion of field activities, a composite sample was gathered with aliquots from each of the Parcel B17 Phase II IDW soil drums for waste characterization. An additional waste characterization sample was collected from the excavation spoils generated during the test pit investigation at B17-007-SB. Following these analyses, the waste soil was characterized as non-hazardous, and the excavation spoils (approximately 30 cubic yards) were transported to Greys Landfill for disposal. A list of all results from the soil waste characterization procedure can be found in **Table 4**. IDW drums containing aqueous materials (including aqueous waste generated during the Parcel B17 Phase II Investigation) were characterized by preparing composite samples from randomly selected drums. Each composite sample included aliquots from several individual drums that were chosen as a subset of the aqueous drums being staged on-site at the date of

collection. Following the analysis of each sample, the aqueous waste was characterized as non-hazardous. A list of all results from the aqueous waste characterization procedure can be found in **Table 5**.

In addition, approximately 500 gallons of impacted aqueous waste was generated during the test pitting and cleanup activities at location B17-007-SB. This aqueous material was approved for disposal at the Humphrey Creek Waste Water Treatment Plant by Tradepoint Atlantic personnel. The excavation spoils generated from the test pitting investigation were properly disposed of at the on-site industrial landfill (Greys).

The parcel specific IDW drum log from the Phase II investigation is included as **Appendix H**. 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 PALs established in the property-wide QAPP (or other direct guidance from the agencies; i.e. TPH/Oil & Grease) to determine 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 **Table 6** (Organics) and **Table 7** (Inorganics). The asbestos results from the six relevant shallow soil samples are presented in **Table 8**. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (DVRs) have been included as electronic attachments. The DVRs 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 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. The PALs for relevant polynuclear aromatic hydrocarbons (PAHs) have been adjusted upward based on revised toxicity data published in the USEPA RSL Composite Worker Soil Table. Therefore, exceedances for PAHs are based on the adjusted PALs rather than those presented in the QAPP. Four SVOCs, all of which are PAHs, were detected above their respective PALs. These SVOCs were benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene. Benzo[a]pyrene was the most common PAL exceedance and was detected above the PAL in seven total samples, with a maximum detection of 32.8 mg/kg in sample B17-008-SB-1.5. Benz[a]anthracene, benzo[b]fluoranthene, and dibenz[a,h]anthracene exceeded their respective PALs in two samples each (B17-008-SB-1.5 and B17-016-SB-1). 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 analyzed for PCBs. If concrete or other clean surface materials were observed at the ground surface, the shallow sample was shifted to include the first 1-foot of the underlying soil. **Table 6** provides a summary of the PCBs detected above the laboratory's MDLs. There were only two samples which exceeded the PALs for PCBs. Aroclor 1254 and total PCBs exceeded their PALs in sample B17-019-SB-2 (with detections of 2.4 mg/kg for each) and sample B17-020-SB-1.5 (with detections of 2.3 mg/kg

for each). A summary of the PCB PAL exceedance locations and results has been provided on **Figure S-2**.

Table 6 provides a summary of the TPH/Oil & Grease detections above the laboratory's MDLs in the soil samples collected in the parcel. None of the detections of DRO or GRO exceeded the PAL of 6,200 mg/kg. Oil & Grease was detected above the PAL of 6,200 mg/kg in four soil samples (from three boring locations): B17-008-SB-1.5, B17-008-SB-7.5, B17-013-SB-1.5, and B17-021-SB-1.5. The maximum detection of Oil & Grease in the parcel was 28,100 mg/kg in sample B17-008-SB-7.5. A summary of the Oil & Grease PAL exceedance locations and results has been provided on **Figure S-3**. There were three additional boring locations where physical evidence of NAPL was identified in the soil cores (B17-007-SB, B17-011-SB, and B17-012-SB). These boring locations with evidence of NAPL are also highlighted on the exceedance figure, and the specific observations are discussed in greater detail in Section 4.3.

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. Three inorganic compounds (arsenic, lead, and manganese) were detected above their respective PALs. Arsenic was by far the most common inorganic exceedance and was detected above the PAL in 31 (approximately 82%) of the soil samples analyzed for this compound. In comparison, lead and manganese accounted for PAL exceedances in eight samples and two samples, respectively. The maximum detections of arsenic and lead were co-located in two samples collected from B17-014-SB and B17-019-SB, with arsenic detections of 218 mg/kg (B17-019-SB-4) and 204 mg/kg (B17-014-SB-5), and lead detections of 9,720 mg/kg (B17-014-SB-5) and 6,780 mg/kg (B17-019-SB-4). The maximum detection of manganese (52,800 mg/kg) was observed in sample B17-019-SB-2. A summary of the inorganic PAL exceedance locations and results has been provided on **Figure S-4**.

4.1.3. Soil Conditions: Asbestos

Shallow soil samples from select boring locations (listed in **Appendix A**) were designated to be analyzed for asbestos due to the former presence of the Machine Shop No. 2: Asbestos Piles (REC 14A). During field activities, if intact concrete was observed at the ground surface, the asbestos sample was not collected because the concrete provided a physical barrier to prevent the asbestos from contacting the underlying soil. **Table 8** provides a summary of the asbestos findings among these six shallow samples which were ultimately analyzed. There were three detections of chrysotile or amosite among the samples, all of which were reported as less than 1% asbestos. These detections were identified in samples B17-001-SB-1, B17-007-SB-1, and B17-015-SB-1. The detections of less than 1% indicate that asbestos was identified; however, it is not above the reporting limit provided by the analytical method. Since these three detections were less than 1%, they do not qualify the samples as asbestos containing materials (ACM). A summary of the asbestos results has been provided on **Figure S-5**. Only the samples which were analyzed for asbestos are shown on the figure.

4.1.4. 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 **Figure S-1** through **Figure S-4** present a summary of the soil sample results that exceeded the PALs. **Table 8** provides the results of the asbestos analysis for the six relevant shallow samples, and the results are presented graphically in **Figure S-5**. **Table 9** provides a summary of results for all PAL exceedances in soil, including maximum values and detection frequencies. **Table 10** indicates which soil impacts (PAL exceedances) are associated with the specific targets listed in the Parcel B17 Work Plan. There were no detections of VOCs above the applicable PALs, and these compounds are not considered to be significant contaminants in Parcel B17. The PAL exceedances in soil within Parcel B17 consisted of three inorganics (arsenic, lead, and manganese), four SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene), two PCB groups (Aroclor 1254 and total PCBs), and Oil & Grease. Asbestos was identified in three samples, but each of the detections was reported as less than 1% asbestos which indicates that the samples are not qualified as ACM.

Lead, PCBs, and TPH/Oil & Grease are subject to special requirements as designated by the agencies: lead results above 10,000 mg/kg are subject to additional delineation (and possible excavation), PCB results above 50 mg/kg are subject to delineation and excavation, and TPH/Oil & Grease results above 6,200 mg/kg should be evaluated for the potential presence and mobility of NAPL in any future development planning. Concentrations for lead and PCBs did not exceed the specified thresholds in any soil samples collected at the Site. None of the detections of DRO or GRO exceeded the PAL of 6,200 mg/kg. Oil & Grease was detected above the PAL of 6,200 mg/kg in three boring locations (and four total samples): B17-008-SB, B17-013-SB, and B17-021-SB. There were three additional boring locations where physical evidence of NAPL was identified in the soil cores (B17-007-SB, B17-011-SB, and B17-012-SB). Temporary NAPL screening piezometers were installed at B17-008-SB, B17-011-SB, and B17-012-SB to assess the presence or absence of mobile product. Locations B17-007-SB and B17-021-SB were further investigated via test pitting, and a piezometer installation was not warranted at location B17-013-SB (see Section 4.3). None of the screening piezometers, temporary groundwater sample collection points, or the groundwater monitoring well SW-026-MWS had any detections of NAPL. These observations are discussed in depth in Section 4.3.

4.2. GROUNDWATER CONDITIONS

The analytical results for the detected parameters in groundwater are summarized and compared to the PALs in **Table 11** (Organics) and **Table 12** (Inorganics). The laboratory Certificates of Analysis (including Chains of Custody) and DVRs have been included as electronic attachments. The DVRs 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 11**, acetone was the only VOC identified above the laboratory's MDLs in the groundwater samples collected from across the Site. There were no VOCs detected above their respective PALs. There were no detections of PCBs at location SW-026-MWS, the single location at which a sample was collected to be analyzed for this class of compounds.

Table 11 provides a summary of SVOCs identified in groundwater samples above the laboratory's MDLs. Similar to the evaluation of soil data, the PALs for relevant PAHs have been adjusted upward based on revised toxicity data published in the USEPA RSL Resident Tapwater Table. Six SVOCs, all of which are PAHs, were detected above their respective aqueous PALs. These SVOCs were benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-c,d]pyrene, and naphthalene. Indeno[1,2,3-c,d]pyrene was detected above the PAL in one sample (B17-016-PZ), and the remaining SVOC exceedances occurred in two or three groundwater samples each. The maximum detections of each listed SVOC, with the exception of naphthalene, were detected at location B17-016-PZ. A summary of the SVOC PAL exceedance locations and results has been provided on **Figure GW-1**.

Table 11 provides a summary of the TPH/Oil & Grease detections in groundwater at the Site. DRO was detected above its PAL in four total sample locations, with a maximum detection of 530 µg/L (flagged with the "J" qualifier indicating that it is an estimated value) at location SW-026-MWS. GRO and Oil & Grease were not detected above the PAL of 47 µg/L. A summary of the DRO PAL exceedance locations and results has been provided on **Figure GW-2**. Each location was checked for the potential presence of NAPL using an oil-water interface probe prior to sampling. During these checks, NAPL was not detected in any of the groundwater sampling locations, and no delineation or further action was warranted.

4.2.2. Groundwater Conditions: Inorganic Constituents

Table 12 provides a summary of inorganic constituents detected above the MDLs in the groundwater samples collected from across the Site. One inorganic compound (dissolved manganese) was detected above its PALs at four locations (B17-015-PZ, B17-016-PZ, B17-019-PZ, and B17-020-PZ). The maximum detection of dissolved manganese was 682 µg/L at location B17-016-PZ. A summary of the inorganic PAL exceedance locations and results has been provided on **Figure GW-3**.

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 (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.

None of the aqueous results exceeded the individual VI TCR or THQ criteria as specified by the VISL Calculator. Following the initial screening, a cumulative VI risk assessment 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 hazard. None of the cumulative VI cancer risks were greater than 1E-5, and there were no compounds that were identified above the 10% THQ level to be included in the cumulative VI evaluation for non-cancer hazard. The results of the cumulative VI comparisons are provided in **Table 13**.

The presence and absence of groundwater impacts within the Site boundaries have been adequately described. There were no concerns related to potential VI risks at the Site. Based on the relatively low-level analytical results identified during this investigation, there do not appear to be significant ongoing sources of groundwater contamination present.

4.3. NON-AQUEOUS PHASE LIQUID (NAPL)

Soil cores were screened for evidence of possible NAPL contamination during the completion of the Phase II soil borings. During the field screening, three locations (B17-007-SB, B17-011-SB, and B17-012-SB) had observations of physical evidence of NAPL in the soil cores. These locations are highlighted on **Figure S-3**. One additional boring (B17-008-SB) had observations of petroleum odors from 7.5 to 10 feet bgs; however, there was no visible NAPL or sheen observed in the soil core. The soil results from boring B17-008-SB exceeded the Oil & Grease PAL of 6,200 mg/kg in both the shallow and intermediate samples with detections of 26,000 mg/kg and 28,100 mg/kg, respectively. Two additional soil samples (B17-013-SB-1.5 and B17-021-SB-1.5) exceeded the Oil & Grease PAL with detections of 8,630 mg/kg and 8,860 mg/kg, respectively. TPH-DRO/GRO did not exceed the PAL in any soil samples. Each of these boring locations with elevated Oil & Grease detections and/or evidence of NAPL is described below:

- B17-007-SB: This location targeted the Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps). The boring had visible low to medium vicious black product in the soil core from 1.8 to 3 feet bgs which was noted on the boring log. A moderate odor was also detected accompanying the product. A shallow soil sample (B17-007-SB-1) was collected from the 0 to 1 foot bgs interval. Oil & Grease (detected at 347 mg/kg) was identified in the sample well below the PAL. An intermediate soil sample was not collected due to shallow refusal at 3 feet bgs. Due to the observed NAPL and based on the sampling plan target, a test pit was completed in the vicinity of B17-007-SB. During test pitting, a subgrade structure containing NAPL-impacted material was identified. All impacted debris, soil, and aqueous material was removed from the subgrade structure, and the

structure was cleaned prior to backfilling. The test pitting was documented in a photograph log (**Appendix E**). A temporary NAPL screening piezometer was not installed at this location since all impacted material was removed during test pitting.

- B17-008-SB: This boring targeted the Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps). The boring had a very light petroleum odor in the soil core from 7.5 to 10 feet bgs, however, there were no visible observations of NAPL or sheen in the soil core. Since an elevated detection of Oil & Grease (28,100 mg/kg) was noted in the intermediate depth soil sample (6.5 to 7.5 foot interval), a temporary NAPL screening piezometer was installed at B17-008-SB. Groundwater was observed at 7.5 feet bgs in the soil core.

- B17-011-SB: This boring targeted the Chesapeake Heavy Machine Service area. The boring had visible light amber NAPL with a light sheen in the soil core from 7 to 8 feet bgs. A shallow (0.5 to 1.5 foot interval) and intermediate (4 to 5 foot interval) soil sample were collected from this location. Oil & Grease detections in both soil samples were well below the PAL of 6,200 mg/kg with the highest detection of Oil & Grease (740 mg/kg) reported in the shallow soil sample. A temporary NAPL screening piezometer was installed at B17-011-SB. Groundwater was observed at 7 feet bgs in the soil core.

- B17-012-SB: This boring targeted the Old Blacksmith Shop/Heat Treating Plant. A very light sheen was noted in the soil core from 7 to 8 feet bgs. A shallow (0.5 to 1.5 foot interval) and intermediate (3 to 4 foot interval) soil sample were collected at this location. Oil & Grease detections in both soil samples were well below the PAL of 6,200 mg/kg with the highest detection of Oil & Grease (233 mg/kg) reported in the shallow soil sample. Refusal was encountered in B17-012-SB at 8 feet bgs. A temporary NAPL screening piezometer was installed at B17-012-SB. Groundwater was observed at 4 feet bgs in the soil core.

- B17-013-SB: This boring targeted the Old Blacksmith Shop/Heat Treating Plant. There were no visible observations of NAPL or sheen in the soil core, but Oil & Grease was detected at 8,630 mg/kg in the shallow sample (0.5 to 1.5 foot interval). An intermediate sample was also collected (3 to 4 foot interval), and the Oil & Grease detection was well below the PAL of 6,200 mg/kg with a detection of 152 mg/kg. Refusal was encountered in B17-013-SB at 8 feet bgs. A temporary NAPL screening piezometer was not installed at this location because there was no physical evidence of NAPL and the underlying intermediate soil data did not indicate that impacted material has migrated vertically downward. No additional action is proposed at this location.

- B17-021-SB: This boring targeted the Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps). There were no visible observations of NAPL or sheen in the soil core, but Oil & Grease was detected at 8,860 mg/kg in the shallow sample (0.5 to 1.5 foot interval).

The boring was successfully completed to 10 feet bgs with groundwater observed at 9.5 feet bgs. Due to the elevated analytical detection and based on the sampling plan target, a test pit was completed in the vicinity of B17-021-SB. During test pitting, little to no petroleum impacts were observed, and no subgrade structures/pits were encountered. The test pitting was documented in a photograph log (**Appendix E**). A temporary NAPL screening piezometer was not installed at B17-021-SB based on the field observations during the test pitting.

Based on the observations of NAPL and/or elevated analytical detections of Oil & Grease and in accordance with the Parcel B17 Work Plan, temporary NAPL screening piezometers were installed at locations B17-008-SB, B17-011-SB, and B17-012-SB. Locations B17-007-SB and B17-021-SB were further investigated via the completion of test pits, and a piezometer installation was not warranted at location B17-013-SB. Each screening piezometer was installed in accordance with standard specifications for temporary groundwater sample collection points. The piezometers were checked for the presence of NAPL using an oil-water interface probe immediately after installation, approximately 48 hours after installation, and again after at least 30 days. NAPL was not detected in any of the screening piezometers during any of the gauging checks, and no additional installations or delineation were warranted. The water level measurements from the gauging events completed through the final 30-day check have been provided in **Appendix I**. This attachment also includes the specific installation date of each of the screening piezometers, as well as relevant construction details (screen intervals, total depths, etc.). These three NAPL screening piezometers were abandoned in conjunction with six temporary groundwater sample points on November 1, 2018 in accordance with COMAR 26.04.04.34 through 36, as documented in the Abandonment Completion Letter for Parcel B17 dated December 20, 2018.

4.4. SUPPLEMENTAL LEAD AND ARSENIC DELINEATION

Following completion of the Phase II Investigation, elevated concentrations of lead and arsenic were identified in subsurface soil samples collected from borings B17-014-SB and B17-019-SB. Outside of the scope of this initial Phase II Investigation, a Work Plan for the Delineation/Characterization of Lead & Arsenic Impacted Soil at B17-014-SB and B17-019-SB was submitted to the MDE and the USEPA on February 16, 2018. Following review of the proposed sampling approach, the Work Plan was formally approved by the agencies on June 27, 2018. Delineation activities were completed between May 4, 2018 and July 16, 2018. The delineation results are presented in the Supplemental Investigation Report for Lead and Arsenic Impacted Soil at B17-014-SB and B17-019-SB dated August 7, 2019. No further investigation is expected at this time; however, the need for additional action in the future will be contingent on future development planning, as outlined in the Supplemental Investigation Report, and will be determined by risk assessments to be presented in associated Response and Development Work Plans.

5.0 DATA USABILITY ASSESSMENT

The approved property-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, asbestos, 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 PALs established in the QAPP (i.e., the most current USEPA RSLs) or based on other direct guidance from the agencies, to identify the presence of exceedances in each environmental medium.

Quality assurance and quality control (QA/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 QA/QC samples were submitted for analysis to support the data validation:

- Trip Blank – at a rate of one per cooler with VOC samples per day
  - 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, and hexavalent chromium
- 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 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 at the beginning of each day and re-checked as needed. The logs have been provided in **Appendix D** (PID calibration log) and **Appendix G** (multiparameter meter calibration logs).

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 Chains of Custody 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). The DVRs provided by EDQI have been included as electronic attachments.

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 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.

The PACE-Greensburg (PA) laboratory facility implements quality assurance and reporting requirements through the TNI certification program with the State of Pennsylvania; which is accepted by Maryland. Since late-January 2017, these requirements include the flagging of contaminants with a "B" qualifier when an analyte is detected in an associated laboratory method blank, regardless of the level of the contaminant detected in the sample. A method blank is analyzed at a rate of one blank for each 20 sample analytical batch. The USEPA has previously specified that results flagged with the "B" qualifier do not represent legitimate detections. They

have also specified that results flagged with a "JB" qualifier are invalid, and any such results should be revised to display the "B" qualifier only.

Although elevated sample results may be "B" qualified by the laboratory as non-detects due to low-level blank detections, EDQI corrects any erroneous "B" qualifiers during the data validation procedure to avoid under-reporting analytical detections. EDQI removes the "B" qualifiers for relevant samples according to the guidance given in the table below. Therefore, a result originally flagged with a "B" qualifier in the laboratory certificate may be reported as a legitimate detection without this qualifier. Likewise, a result originally flagged with a "JB" qualifier in the laboratory certificate may be reported as a "J" qualifier if the erroneous "B" qualifier can be eliminated, but would be reported as a "B" qualified non-detect result if the original "B" qualifier is legitimate.

Blank Result	Sample Result	Qualifying Action
Result less than RL	Result less than RL	Result is Qualified "B"
	Result greater than RL	Remove "B"
Result greater than RL	Result less than Blank Result	Result is Qualified "B"
	Result greater than Blank Result	Remove "B"

RL = Reporting Limit

As directed by EDQI, ARM has reviewed all non-validated laboratory reports (those which were not designated to be reviewed by EDQI), and applied the same validation corrections to any relevant "B" or "JB" qualified results. This review of the non-validated data ensures that any elevated detections of parameters, including those which may exceed the PALs, are not mistakenly reported as non-detect values simply because they did not undergo the formal validation procedure by EDQI. ARM has also revised the non-validated results to eliminate any laboratory-specific, non-standardized qualifiers (L2, 6c, ip, 4c, etc.), which are customarily removed by EDQI during the validation procedure.

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 DVRs 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 DVR 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 list of the analytical soil results that were rejected during data validation is provided as **Table 14**. A single aqueous result (acetone in sample SW-026-MWS) was rejected during validation. This rejected result from the prior Area B Groundwater Investigation is not provided in a supplemental table. A discussion of data completeness (the proportion of valid 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, 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 significant deviations from the QAPP were noted in the dataset.

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.

All groundwater compounds, with the exception of acetone, had completeness ratios of 100%. A single acetone result (from permanent well SW-026-MWS) was rejected during validation. This rejected result was obtained during the Area B Groundwater Investigation completed previously

in 2016 and does not represent a significant data gap. None of the groundwater results collected specifically for the Parcel B17 Phase II Investigation were rejected during validation.

The only soil compounds with overall completeness values below 90% were benzaldehyde and 1,4-dioxane. Benzaldehyde (71% completeness) had 13 soil detections among the validated dataset, but the maximum detection in soil at the Site (0.13 mg/kg) was significantly below the PAL of 120,000 mg/kg. All of the 1,4-dioxane soil results which underwent the validation process were rejected. The rejection of the soil results for 1,4-dioxane has not been uncommon for data obtained from the Tradepoint Atlantic property. In addition, 1,4-dioxane had a completeness ratio of 100% in groundwater with only two low-level detections out of the seven groundwater samples. Sufficient information is available in the groundwater dataset to evaluate the significance of 1,4-dioxane at 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 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 Phase II Investigation, a total of seven groundwater samples (including location SW-026-MWS which was sampled for the Area B Groundwater Investigation) and 38 soil samples (all locations/depths) were collected and analyzed to define the nature and extent of contamination in Parcel B17. 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, TPH-DRO/GRO, Oil & Grease, TAL-Metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot bgs) were additionally analyzed for PCBs and select shallow soil samples were analyzed for asbestos. Groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs, TPH-DRO/GRO, TAL-Dissolved Metals, and total cyanide. The temporary piezometers were also sampled for Oil & Grease, dissolved hexavalent chromium, and available cyanide. The permanent well SW-026-MWS was also sampled for TAL-Total Metals, total hexavalent chromium, and PCBs.

6.1. 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 below the levels that would warrant evaluation of a removal remedy. There were no locations sampled during the initial Phase II Investigation where detections of lead exceeded 10,000 mg/kg, the designated threshold at which delineation would be required. There were no concentrations of total PCBs identified above the mandatory delineation criterion of 50 mg/kg, indicating that further action is not needed. Asbestos was identified in three samples, but each of the detections of chrysotile or amosite was reported as less than 1% asbestos. The detections of less than 1% indicate that asbestos was identified; however, it is not above the reporting limit provided by the analytical method, and the samples are not classified as ACM.

There were no soil PAL exceedances for VOCs indicating that these compounds are not significant contaminants in soil at the Site. Exceedances of the PALs in soil within Parcel B17 consisted of three inorganics (arsenic, lead, and manganese), four SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene), two PCB groups (Aroclor 1254 and total PCBs), and Oil & Grease. Arsenic exceeded its PAL in the largest proportion of the samples analyzed site-wide. Arsenic was detected in 84% of the soil samples analyzed for this compound, with a maximum detection of 218 mg/kg in sample B17-019-SB-4. The remaining inorganic exceedances were less common in comparison. Lead and manganese exceeded their PALs in eight samples (maximum detection of lead at 9,720 mg/kg in B17-014-SB-5) and two samples (maximum detection of manganese at 52,800 mg/kg in B17-019-SB-2), respectively. Each of the

four listed SVOCs exceeded their respective PALs in the same two soil samples (B17-008-SB-1.5 and B17-016-SB-1). There were five additional benzo[a]pyrene PAL exceedances in soil throughout Parcel B17, although the two highest detections of benzo[a]pyrene were also found in samples B17-008-SB-1.5 and B17-016-SB-1. Total PCBs and Aroclor 1254 exceeded their respective PALs in B17-019-SB-2 and B17-020-SB-1.5. The detections of total PCBs (and Aroclor 1254) were equal to 2.4 mg/kg and 2.3 mg/kg in these two samples, respectively. Petroleum impacts, including a discussion of the analytical exceedances of the Oil & Grease PAL as well as borings with physical evidence of NAPL in the soil cores, are further discussed in Section 6.3.

6.2. GROUNDWATER

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

Exceedances of the aqueous PALs in groundwater below Parcel B17 consisted of one metal (dissolved manganese), six SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, indeno[1,2,3-c,d]anthracene, and naphthalene), and DRO. Dissolved manganese exceeded its aqueous PAL at four sample locations throughout the parcel, with a maximum detection of 682 µg/L at location B17-016-PZ. Indeno[1,2,3-c,d]pyrene was detected above the PAL in one sample (B17-016-PZ), and the remaining SVOC exceedances occurred in two or three groundwater samples each. The maximum detections of each listed SVOC, with the exception of naphthalene, were detected at location B17-016-PZ. The SVOCs generally appeared to be elevated in the western half of the Site; there were no PAL exceedances in the eastern locations. DRO was identified with four PAL exceedances. The maximum detection of DRO was 530 µg/L (flagged with the "J" qualifier) in the sample obtained from the permanent well SW-026-MWS, which was collected during the separate Area B Groundwater Investigation.

Each groundwater sample location was checked for the potential presence of NAPL using an oil-water interface probe prior to sampling. During these checks, NAPL was not detected in any of the groundwater sample locations in Parcel B17.

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. None of the individual sample results exceeded the VI TCR or THQ criteria. When the aqueous results were summed by sample location, none of the cumulative VI cancer risks were greater than or equal to 1E-5, and none of the cumulative VI non-cancer HI values exceeded 1. There were no concerns related to potential VI risks at the Site.

6.3. NON-AQUEOUS PHASE LIQUID

There were four soil samples (from three boring locations) with elevated detections of Oil & Grease reported above the PAL (6,200 mg/kg) at the Site. These elevated analytical detections could be indicative of potential NAPL impacts. Oil and Grease was detected above the PAL in three surface soil samples: B17-008-SB-1.5 at 26,000 mg/kg, B17-013-SB-1.5 at 8,630 mg/kg, and B17-021-SB-1.5 at 8,860 mg/kg. The fourth Oil & Grease PAL exceedance was detected in sample B17-008-SB-7.5 at 28,100 mg/kg. Boring B17-008-SB also had a very light petroleum-like odor (but no visible NAPL or sheen) in the soil core from 7.5 to 10 feet bgs and groundwater was encountered at 7.5 feet bgs. During field screening of the soil cores installed during this investigation, borings B17-007-SB, B17-011-SB, and B17-012-SB had visible observations of NAPL and/or sheen in the soil cores. Boring B17-007-SB had a visible low to medium vicious black product in the soil core from 1.8 to 3 feet bgs (refusal was encountered at 3 feet bgs), boring B17-011-SB had a light amber NAPL with a light sheen in the soil core 8.7 to 9.8 feet bgs, and boring B17-012-SB had a very light sheen in the soil core from 7 to 8 feet bgs. The specific observations of NAPL were discussed in detail in relation to the analytical Oil & Grease PAL exceedances in Section 4.3.

The potential mobility of NAPL to groundwater at the Site was investigated via the installation of three temporary NAPL piezometers: B17-008-PZ, B17-011-PZ, and B17-012-PZ. Locations B17-007-SB and B17-021-SB were further investigated via the completion of test pits, and a piezometer installation was not warranted at location B17-013-SB because there was no physical evidence of NAPL observed in the soil cores and the intermediate soil sample at this location suggested that the elevated Oil & Grease impacts were limited to the shallow soil. During test pitting at location B17-007-SB, a subgrade structure was identified containing NAPL-impacted material. All impacted debris, soil, and aqueous material was removed from the subgrade structure, and the structure was cleaned prior to backfilling. There was little to no evidence of petroleum impacts identified during the test pitting at location B17-021-SB.

Based on the 0-hour, 48-hour, and 30-day gauging measurements of each screening piezometer using an oil-water interface probe (see **Appendix I**), it was determined that mobile NAPL is not present in groundwater at quantities that are likely to migrate. In addition to the NAPL screening piezometers, none of the temporary groundwater sample collection points (or the permanent well SW-026-MWS) installed in Parcel B17 showed any evidence of NAPL during the mandatory checks prior to sampling. Since there was no NAPL detected in any groundwater location, no additional action is recommended at this time with respect to NAPL in Parcel B17. These three NAPL screening piezometers were abandoned in conjunction with six temporary groundwater sample points on November 1, 2018 in accordance with COMAR 26.04.04.34 through 36, as documented in the Abandonment Completion Letter for Parcel B17 dated December 20, 2018.

Although no additional action is proposed at this time, the proximity of all NAPL/Oil & Grease-impacted borings to proposed utilities should be evaluated in any future development planning for Parcel B17. 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 these impacts.

6.4. RECOMMENDATIONS

Sufficient remedial investigation data has been collected to present this evaluation of the nature and extent of possible constituents of concern in Parcel B17. The presence and absence of soil and groundwater impacts within Parcel B17 have been adequately described and further site-wide investigation is not warranted to characterize overall conditions. Recommendations for the Site are as follows:

- The maximum detections of lead and arsenic identified in soil during this Phase II Investigation were co-located in two samples: B17-014-SB-5 (lead detection of 9,720 mg/kg and arsenic detection of 204 mg/kg) and B17-019-SB-4 (lead detection of 6,780 mg/kg and arsenic detection of 218 mg/kg). These soil results are elevated in comparison to most lead and arsenic results collected at the Tradepoint Atlantic property to date, and delineation activities have been completed at these two locations outside of the scope of this initial Phase II Investigation under a separate approved Work Plan. The delineation results are presented in the Supplemental Investigation Report for Lead and Arsenic Impacted Soil at B17-014-SB and B17-019-SB dated August 7, 2019. No further investigation is expected at this time; however, the need for additional action in the future will be contingent on future development planning, as outlined in the Supplemental Investigation Report, and will be determined by risk assessments to be presented in associated Response and Development Work Plans.

- The boring locations with physical observations of NAPL and/or elevated detections of Oil & Grease in the associated soil cores (B17-007-SB, B17-008-SB, B17-011-SB, B17-012-SB, B17-013-SB, and B17-021-SB) should be considered for proximity to proposed utilities in any future development plans. If future utilities are proposed in the vicinity of these borings, appropriate protocols for the mitigation of potential product (NAPL) mobility should be specified in a Response and Development Work Plan.

7.0 REFERENCES

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FIGURES

Site Boundary

Parcel Boundaries

Private Property

Parcel A9
Parcel A5
Parcel A13
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A2
Parcel A15
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A4
Parcel A10
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B22
Parcel B16
Parcel B21
Parcel B15
Parcel B24
Parcel B23
Parcel B25
Parcel B7
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12

Tradepoint Atlantic
Area A and Area B Parcels

March 1, 2018

Figure 1

N

ARM Group Inc.
Earth Resource Engineers and Consultants

0 500 1,000 2,000 Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

Area A: Project 150298M
Area B: Project 150300M
Development: Project 160443M

Site Boundary

Parcel Boundaries

1916 Shoreline:

Land

Marsh

Water

Parcel A9

Parcel A5

Parcel A13

Parcel A7

Parcel A14

Greys Creek

Bear Creek

Parcel A11

Parcel A8

Parcel A12

Parcel A2

Parcel A15

Parcel A17

Parcel A18

Parcel A16

Parcel A6

Parcel A3

Parcel A4

Parcel A10

Parcel A1

Parcel B6

Humphrey Creek

Parcel B8

Parcel B14

Parcel B21

Parcel B22

Parcel B16

Parcel B15

Parcel B24

Parcel B23

Parcel B25

Old Road Bay

Block House Cove

Parcel B7

Jones Creek

Parcel B1

Parcel B2

Parcel B3

Parcel B17

Parcel B19

Parcel B4

Parcel B5

Parcel B9

Parcel B18

Parcel B10

Parcel B13

Parcel B20

Parcel B11

Parcel B12

Patapsco River

Approximate Shoreline 1916

March 1, 2018

Adapted from Figure 2-20 of the Description of Current Conditions Report prepared by Rust Environmental and Infrastructure, dated January 1998

Figure 2

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Earth Resource Engineers and Consultants

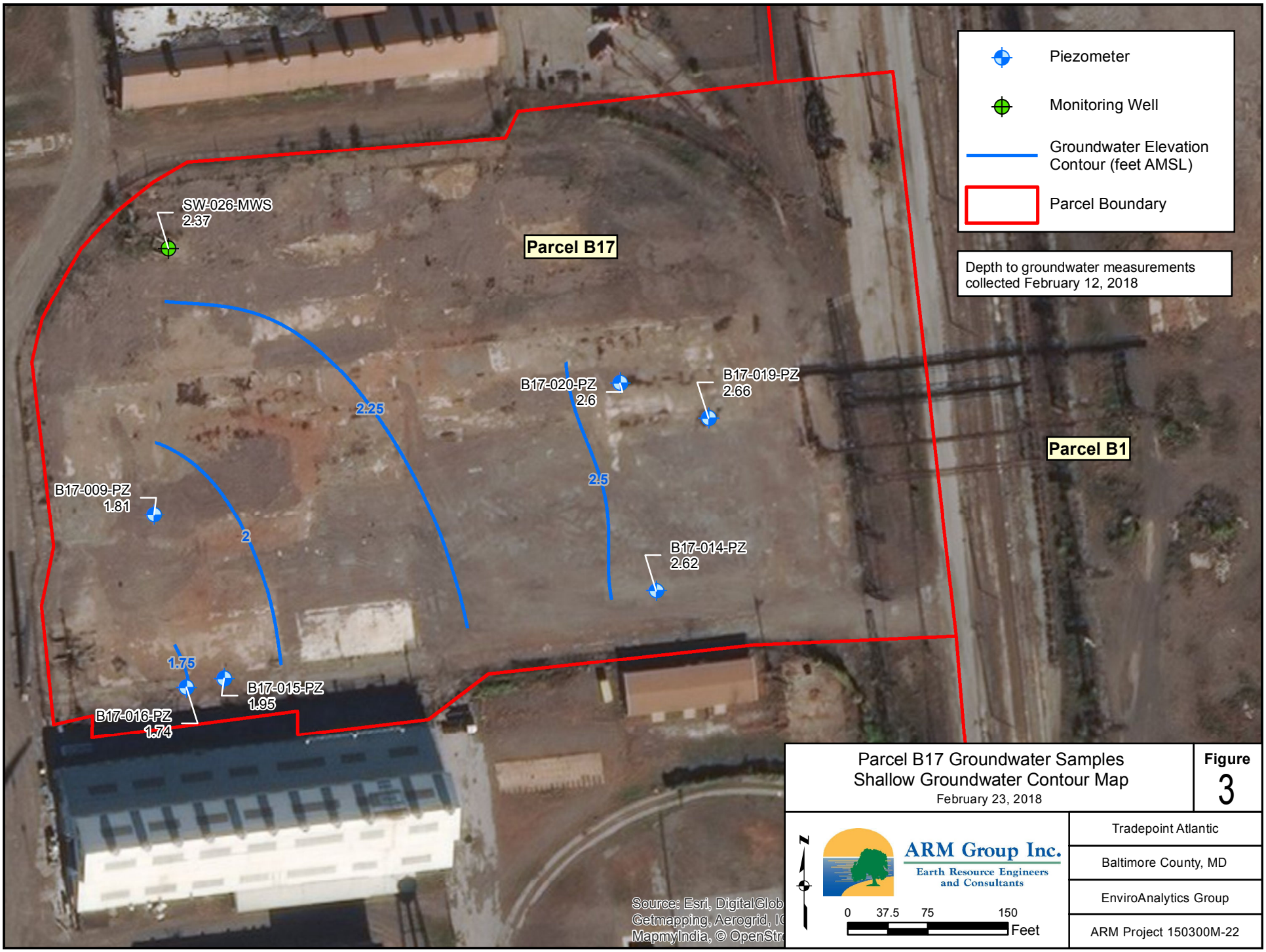
0 500 1,000 2,000 Feet

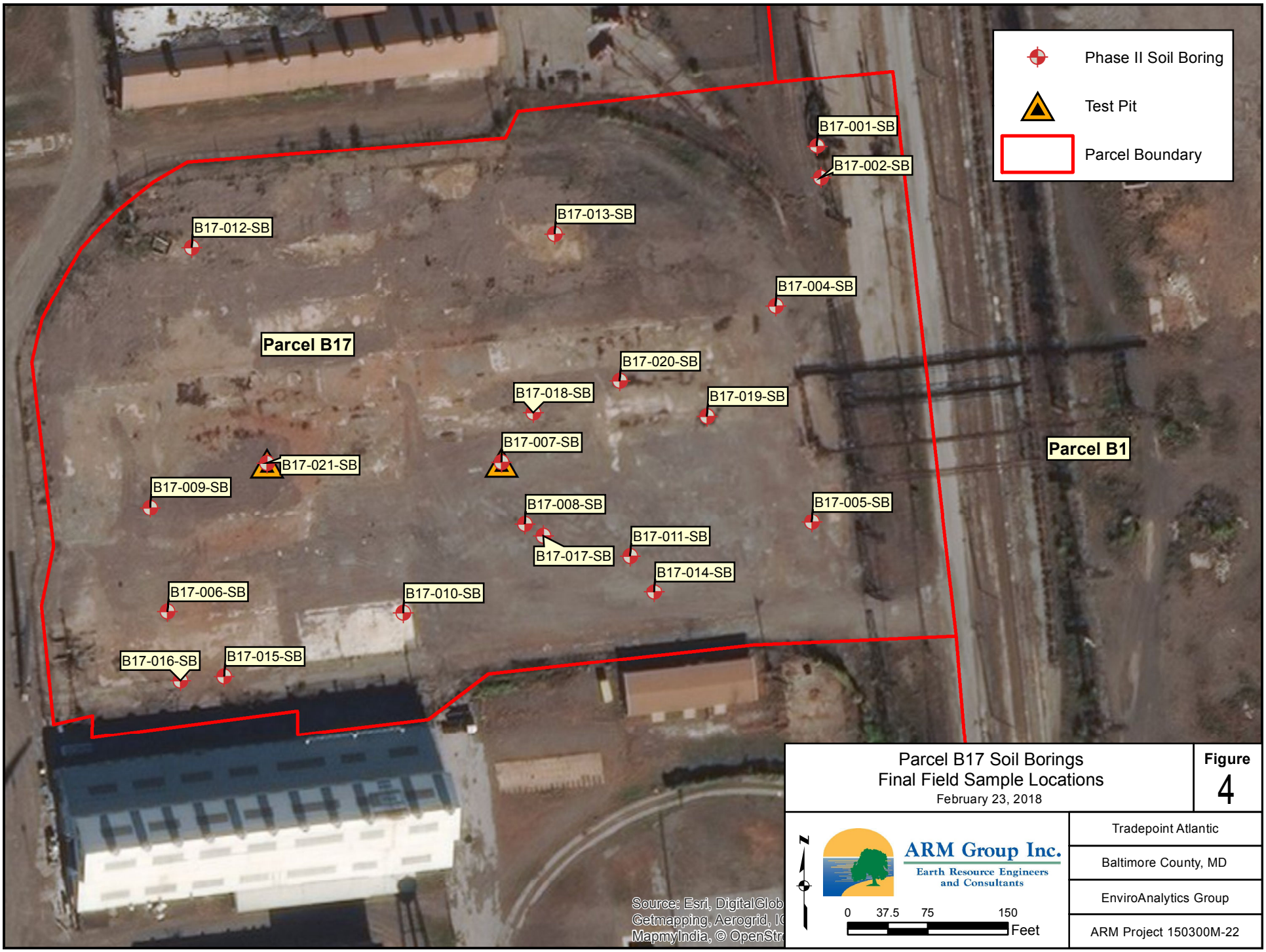
Tradepoint Atlantic

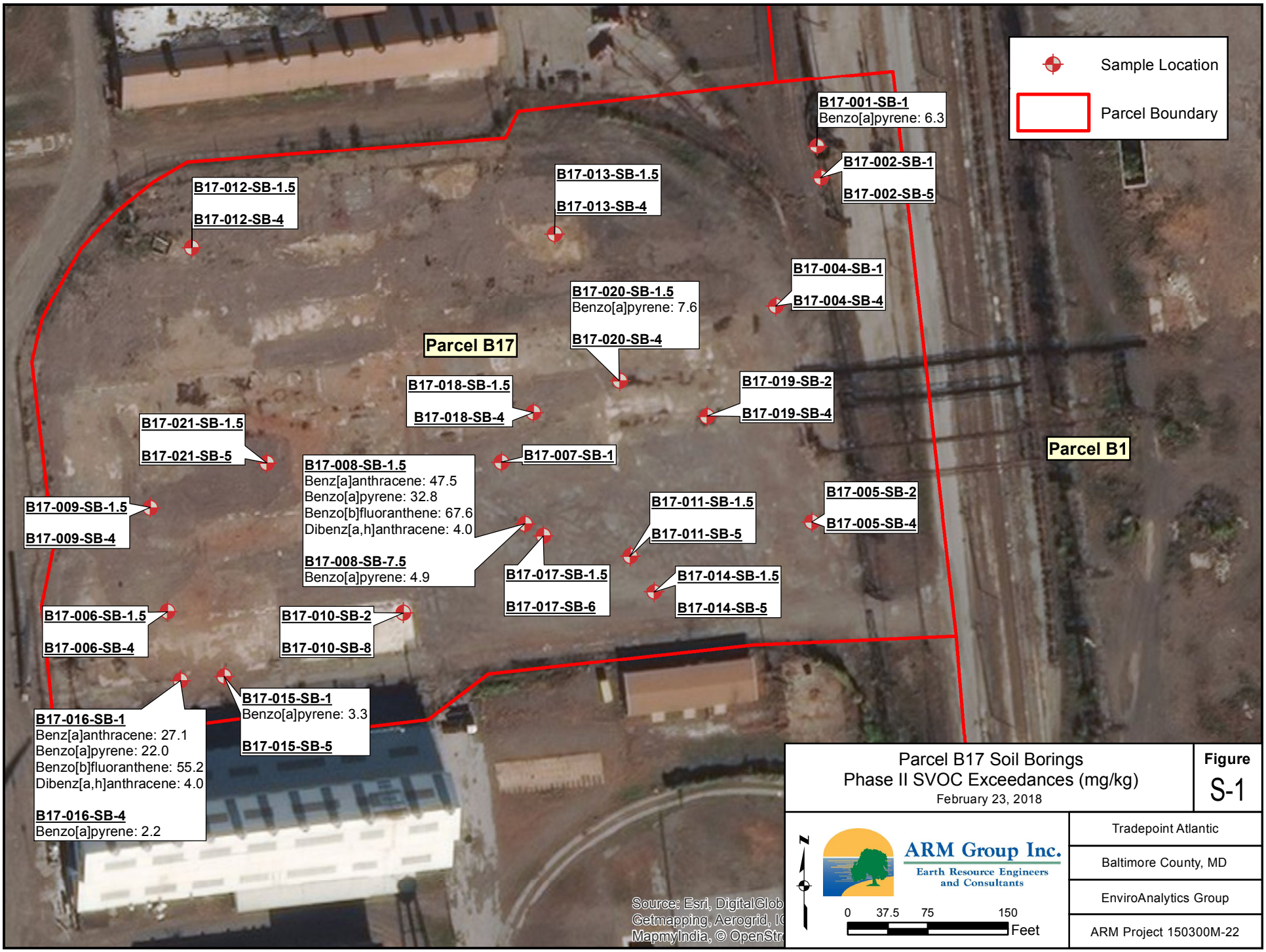
Baltimore County, MD

EnviroAnalytics Group

Area A: Project 150298M
Area B: Project 150300M
Development: Project 160443M


Piezometer
Monitoring Well
Groundwater Elevation Contour (feet AMSL)
Parcel Boundary
Depth to groundwater measurements collected February 12, 2018
Parcel B17
Parcel B1
SW-026-MWS
2.37
B17-020-PZ
2.6
B17-019-PZ
2.66
B17-009-PZ
1.81
B17-014-PZ
2.62
B17-015-PZ
1.95
B17-016-PZ
1.74
2.25
2.5
2
1.75
Source: Esri, DigitalGlob
Getmapping, Aerogrid, I
MapmyIndia, © OpenStr
Parcel B17 Groundwater Samples
Shallow Groundwater Contour Map
February 23, 2018
Figure
3
ARM Group Inc.
Earth Resource Engineers and Consultants
0 37.5 75 150
Feet
Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22

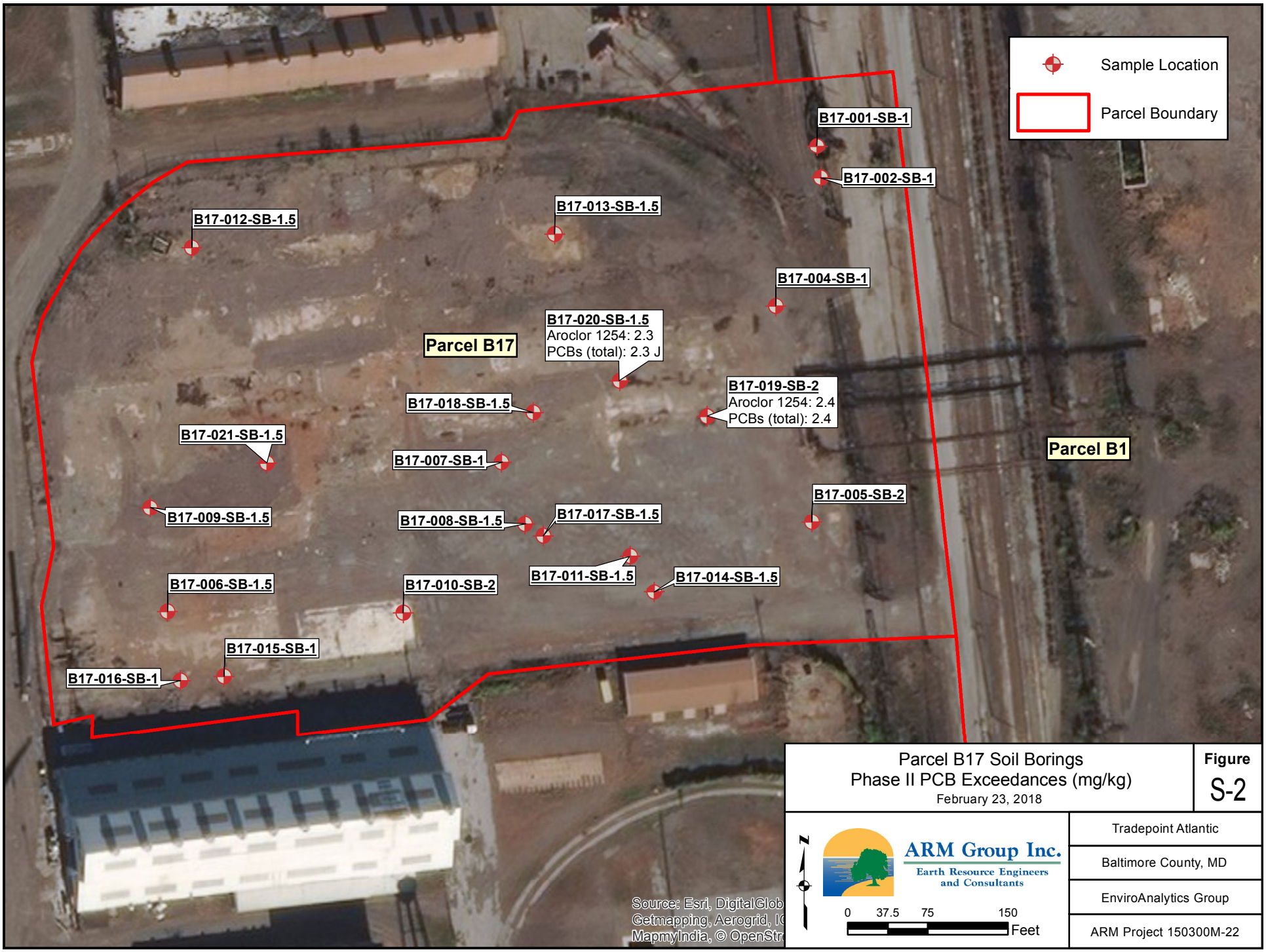

Phase II Soil Boring
Test Pit
Parcel Boundary
B17-001-SB
B17-002-SB
B17-012-SB
B17-013-SB
B17-004-SB
Parcel B17
B17-020-SB
B17-018-SB
B17-019-SB
B17-007-SB
B17-021-SB
Parcel B1
B17-009-SB
B17-008-SB
B17-005-SB
B17-011-SB
B17-017-SB
B17-014-SB
B17-006-SB
B17-010-SB
B17-016-SB
B17-015-SB
Source: Esri, DigitalGlob
Getmapping, Aerogrid, I
MapmyIndia, © OpenStr
Parcel B17 Soil Borings
Final Field Sample Locations
February 23, 2018
Figure
4
ARM Group Inc.
Earth Resource Engineers and Consultants
0 37.5 75 150
Feet
Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22



Parcel B17 Soil Borings
Phase II SVOC Exceedances (mg/kg)
February 23, 2018

Figure
S-1

Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22



Parcel B17 Soil Borings
Phase II PCB Exceedances (mg/kg)
February 23, 2018

Figure
S-2

ARM Group Inc.
Earth Resource Engineers and Consultants

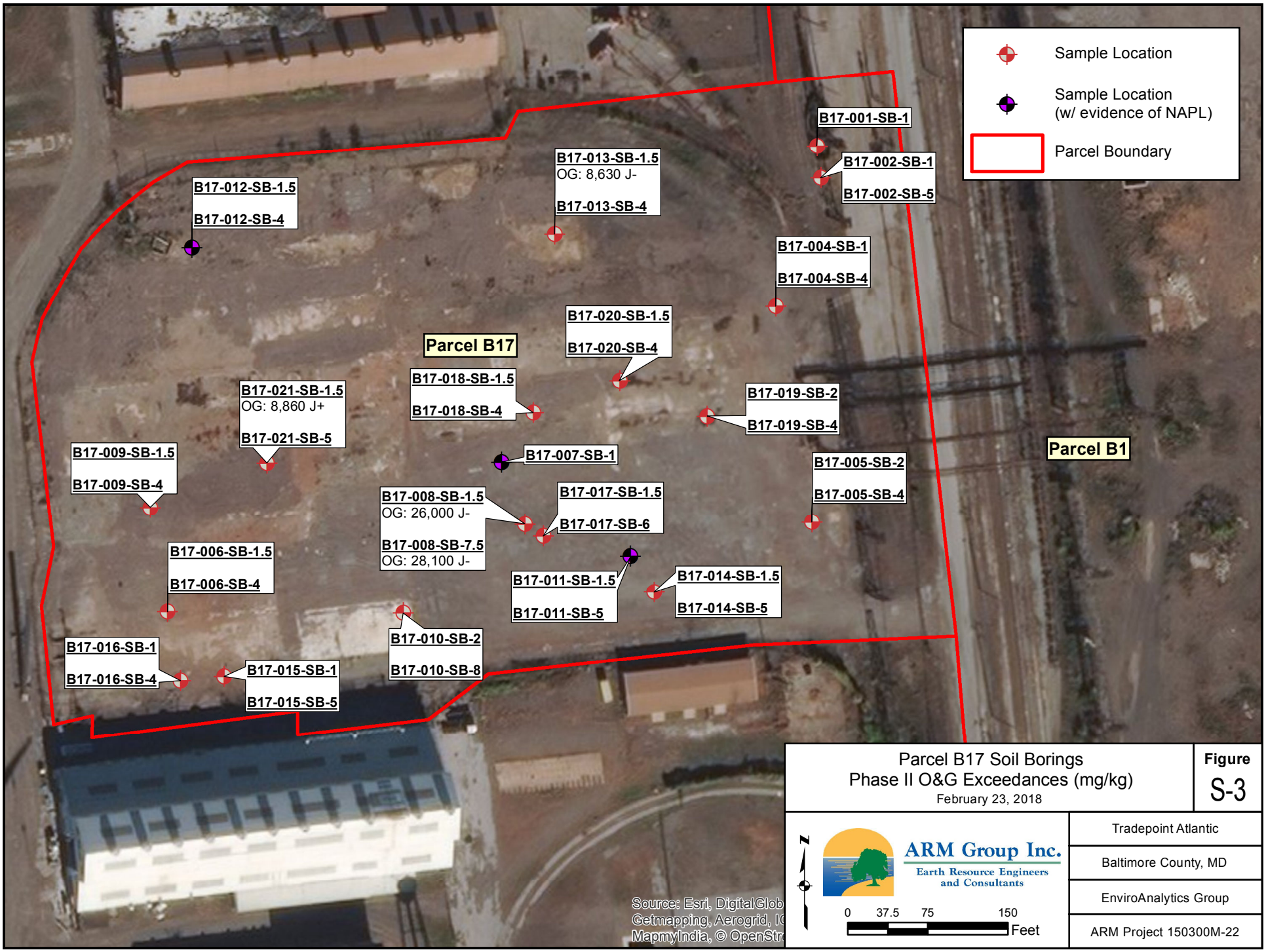
0 37.5 75 150 Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

ARM Project 150300M-22

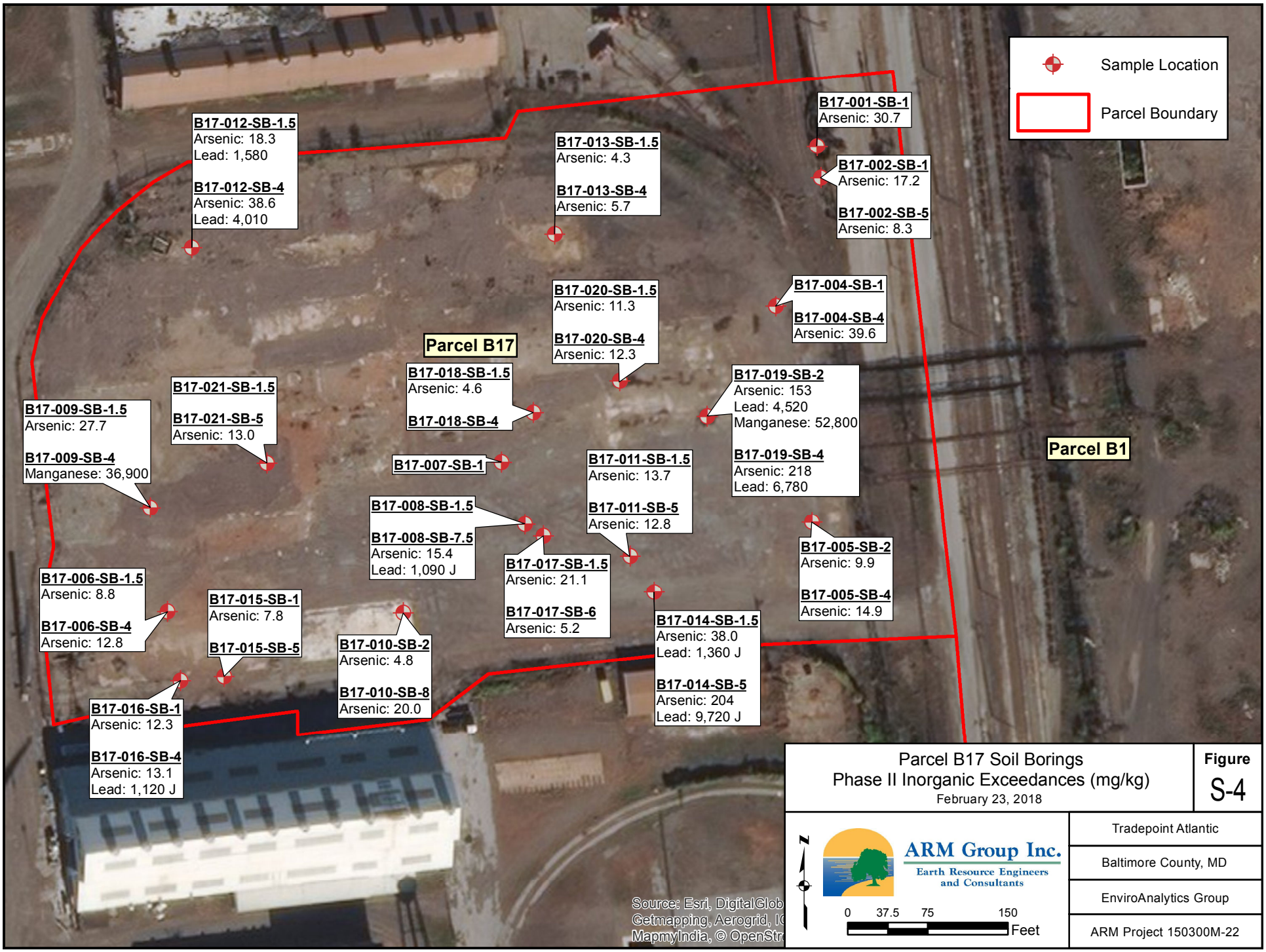


Parcel B17 Soil Borings
Phase II O&G Exceedances (mg/kg)
February 23, 2018

Figure
S-3

ARM Group Inc.
Earth Resource Engineers and Consultants

Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22



Parcel B17 Soil Borings
Phase II Inorganic Exceedances (mg/kg)
February 23, 2018

Figure
S-4

ARM Group Inc.
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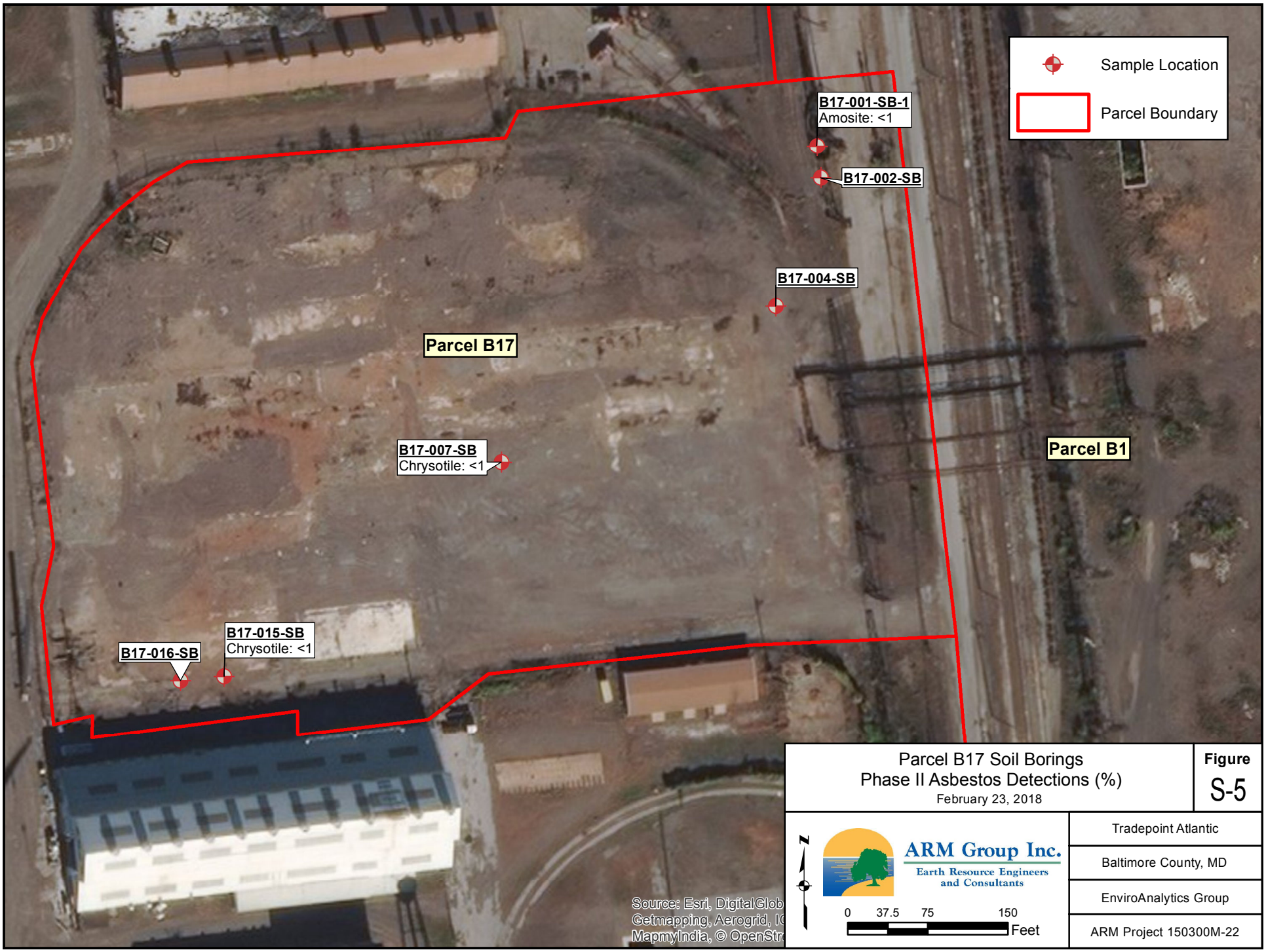
Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22



Parcel B17 Soil Borings
Phase II Asbestos Detections (%)
February 23, 2018

Figure
S-5

ARM Group Inc.
Earth Resource Engineers and Consultants

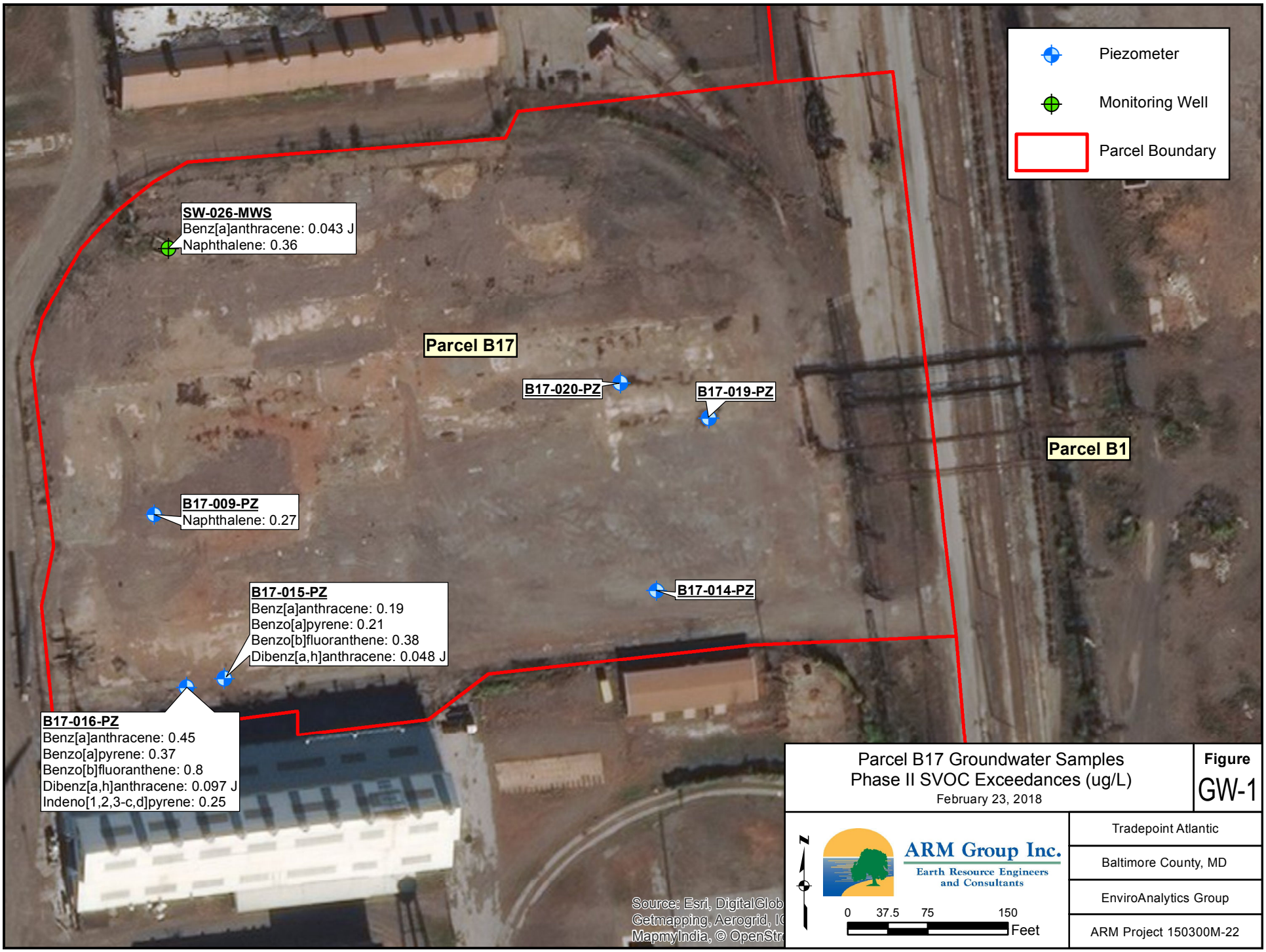
0 37.5 75 150 Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

ARM Project 150300M-22

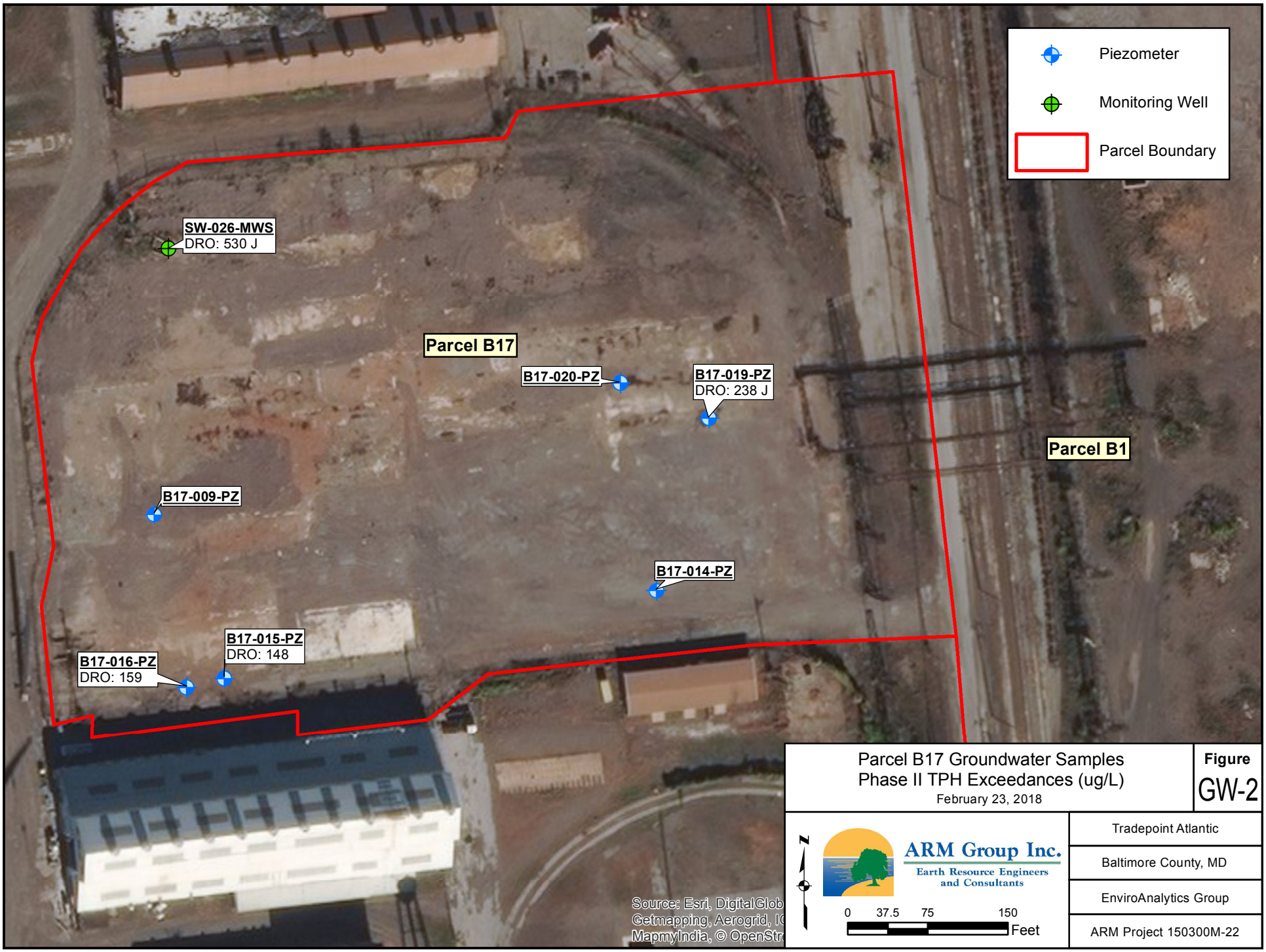


Parcel B17 Groundwater Samples
Phase II SVOC Exceedances (ug/L)
February 23, 2018

Figure
GW-1

ARM Group Inc.
Earth Resource Engineers and Consultants

Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22



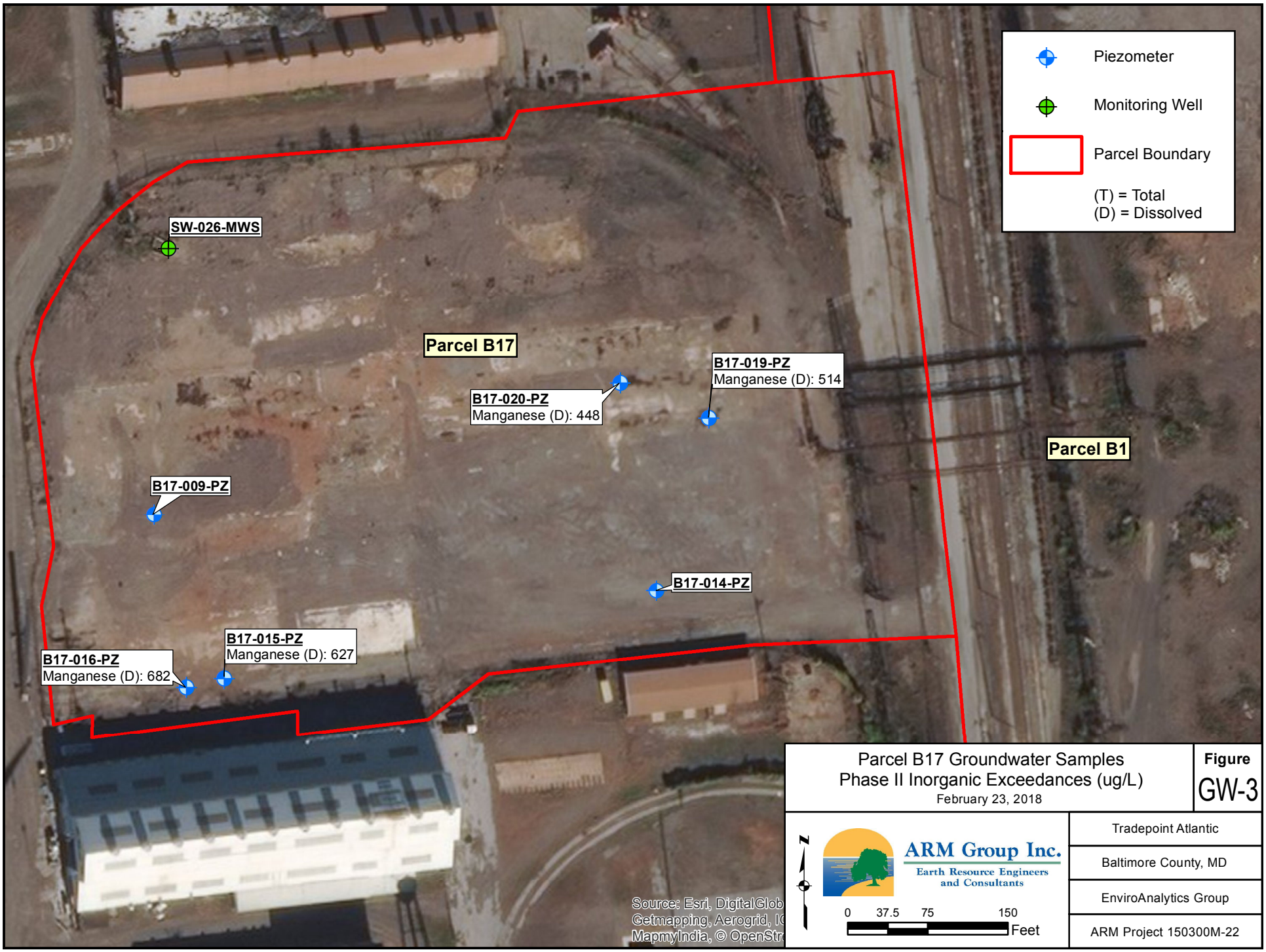
Parcel B17 Groundwater Samples
Phase II TPH Exceedances (ug/L)
February 23, 2018

Figure
GW-2

ARM Group Inc.
Earth Resource Engineers and Consultants

0 37.5 75 150
Feet

Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22


Piezometer
Monitoring Well
Parcel Boundary
(T) = Total
(D) = Dissolved
SW-026-MWS
Parcel B17
B17-019-PZ
Manganese (D): 514
B17-020-PZ
Manganese (D): 448
Parcel B1
B17-009-PZ
B17-014-PZ
B17-015-PZ
Manganese (D): 627
B17-016-PZ
Manganese (D): 682
Source: Esri, DigitalGlob
Getmapping, Aerogrid, I
MapmyIndia, © OpenStr
Parcel B17 Groundwater Samples
Phase II Inorganic Exceedances (ug/L)
February 23, 2018
Figure
GW-3
ARM Group Inc.
Earth Resource Engineers and Consultants
0 37.5 75 150
Feet
Tradepoint Atlantic
Baltimore County, MD
EnviroAnalytics Group
ARM Project 150300M-22

TABLES

TABLE 1 GROUNDWATER ELEVATION DATA				
Location Name	TOC Elevation (feet AMSL)	Ground Elevation (feet AMSL)	Measured DTW (feet)	Groundwater Elevation (feet AMSL)
B17-009-PZ	11.74	8.85	9.93	**1.81**
B17-014-PZ	11.44	8.41	8.82	**2.62**
B17-015-PZ	11.19	8.52	9.24	**1.95**
B17-016-PZ	11.61	8.81	9.87	**1.74**
B17-019-PZ	11.49	8.88	8.83	**2.66**
B17-020-PZ	11.42	8.78	8.82	**2.60**
SW-026-MWS	11.51	8.61	9.14	**2.37**

DTW = Depth to water
TOC = Top of casing
AMSL = Above mean sea level

TABLE 2
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.)	5025	*Unknown*	3/11/1982
		5026	6/24/1958	3/11/1982
		5031	*Unknown*	3/11/1982
		5032	9/1/1958	3/11/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5125	*Unknown*	7/8/2008
		5126	*Unknown*	9/27/2010
		5131	*Unknown*	7/9/2008
		5132	*Unknown*	8/15/2008
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5525	8/11/1959	3/6/1964
		5526	8/24/1959	3/19/1992
		5531	2/12/1960	2/12/1960
		5532	*Unknown*	6/1/1976
Drip Legs	Coke Oven Gas Drip Legs Locations	5886B	*Unknown*	Sept. 1988

TABLE 3
FIELD SHIFTED BORING LOCATIONS

Location ID	Sample Target	Proposed Location¥		Final Location¥		Relocation Distance & Direction	
		Northing	Easting	Northing	Easting		
B17-007-SB	Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps)	566,456	1,455,827	566,449	1,455,826	7	SW
B17-008-SB	Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps)	566,391	1,455,832	566,391	1,455,848	16	W
B17-010-SB	Chesapeake Heavy Machine Service	566,313	1,455,724	566,308	1,455,734	12	SE
B17-011-SB	Chesapeake Heavy Machine Service	566,375	1,455,975	566,361	1,455,947	31	SW
B17-015-SB	Utility Drain	566,262	1,455,572	566,248	1,455,566	15	SW
B17-019-SB	Machine Shop No. 2 Maintenance Floor	566,512	1,455,998	566,492	1,456,019	29	SE
B17-020-SB	Machine Shop No. 2 Maintenance Floor	566,504	1,455,929	566,525	1,455,937	22	NE

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

TABLE 4
CHARACTERIZATION RESULTS FOR SOLID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LLQ (mg/L)
B17 Waste Diposal (12/4/2017)	1,1-Dichloroethene	0.007	0.7	no	U	0.007
	1,2-Dichloroethane	0.007	0.5	no	U	0.007
	1,4-Dichlorobenzene	0.007	7.5	no	U	0.007
	2,4,5-Trichlorophenol	0.1	400	no	U	0.1
	2,4,6-Trichlorophenol	0.1	2	no	U	0.1
	2,4-Dinitrotoluene	0.1	0.13	no	U	0.1
	2-Butanone (MEK)	0.014	200	no	U	0.014
	2-Methylphenol	0.1	200	no	U	0.1
	3&4-Methylphenol(m&p Cresol)	0.2	200	no	U	0.2
	Arsenic	0.5	5	no	U	0.5
	Barium	10	100	no	U	10
	Benzene	0.007	0.5	no	U	0.007
	Cadmium	0.1	1	no	U	0.1
	Carbon tetrachloride	0.007	0.5	no	U	0.007
	Chlorobenzene	0.007	100	no	U	0.007
	Chloroform	0.007	6	no	U	0.007
	Chromium	0.5	5	no	U	0.5
	Hexachlorobenzene	0.1	0.13	no	U	0.1
	Hexachlorobutadiene	0.1	0.5	no	U	0.1
	Hexachloroethane	0.1	3	no	U	0.1
	Lead	0.5	5	no	U	0.5
	Mercury	0.02	0.2	no	U	0.02
	Nitrobenzene	0.1	2	no	U	0.1
	Pentachlorophenol	0.5	100	no	U	0.5
	Pyridine	0.1	5	no	U	0.1
	Selenium	0.1	1	no	U	0.1
	Silver	0.5	5	no	U	0.5
	Tetrachloroethene	0.007	0.7	no	U	0.007
	Trichloroethene	0.007	0.5	no	U	0.007
	Vinyl Chloride	0.007	0.2	no	U	0.007

U: The analyte was not detected in the sample. The numeric value represents the sample LLQ.
TCLP: Toxicity Characteristic Leaching Procedure
LLQ: Lowest Level of Quantiation - analyzed by Caliber Analytical Services

TABLE 4
CHARACTERIZATION RESULTS FOR SOLID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
B17-007-TP Waste (11/6/2017)	1,1-Dichloroethene	0.05	0.7	no	U	0.05
	1,2-Dichloroethane	0.05	0.5	no	U	0.05
	1,4-Dichlorobenzene	0.1	7.5	no	U	0.1
	2,4,5-Trichlorophenol	0.25	400	no	U	0.25
	2,4,6-Trichlorophenol	0.1	2	no	U	0.1
	2,4-Dinitrotoluene	0.1	0.13	no	U	0.1
	2-Butanone (MEK)	0.1	200	no	U	0.1
	2-Methylphenol	0.1	200	no	U	0.1
	3&4-Methylphenol(m&p Cresol)	0.2	200	no	U	0.2
	Arsenic	0.025	5	no	U	0.025
	Barium	0.11	100	no		0.05
	Benzene	0.05	0.5	no	U	0.05
	Cadmium	0.015	1	no	U	0.015
	Carbon tetrachloride	0.05	0.5	no	U	0.05
	Chlorobenzene	0.05	100	no	U	0.05
	Chloroform	0.0177	6	no	B	0.05
	Chromium	0.025	5	no	U	0.025
	Hexachlorobenzene	0.1	0.13	no	U	0.1
	Hexachloroethane	0.1	3	no	U	0.1
	Lead	0.12	5	no	U	0.12
	Mercury	0.001	0.2	no	U	0.001
	Nitrobenzene	0.1	2	no	U	0.1
	Pentachlorophenol	0.25	100	no	U	0.25
	Selenium	0.04	1	no	U	0.04
	Silver	0.03	5	no	U	0.03
	Tetrachloroethene	0.05	0.7	no	U	0.05
	Trichloroethene	0.05	0.5	no	U	0.05
	Vinyl chloride	0.05	0.2	no	U	0.05

U: The analyte was not detected in the sample. The numeric value represents the sample LOQ.
B: This analyte was detected in the associated method blank.
TCLP: Toxicity Characteristic Leaching Procedure
LOQ: Limit of Quantitation - analyzed by Pace Analytical

TABLE 4 CHARACTERIZATION RESULTS FOR SOLID IDW						
Sample ID	Parameter	Result (mg/kg)	TSCA Limit (mg/kg)	TSCA Exceedance	Laboratory Flag	Laboratory LOQ (mg/kg)
B17-007-TP Waste (11/6/2017)	Aroclor 1016	0.21	-	no	U	0.21
	Aroclor 1221	0.21	-	no	U	0.21
	Aroclor 1232	0.21	-	no	U	0.21
	Aroclor 1242	0.21	-	no	U	0.21
	Aroclor 1248	0.21	-	no	U	0.21
	Aroclor 1254	2.1	-	no		0.21
	Aroclor 1260	0.21	-	no	U	0.21
	Aroclor 1262	0.21	-	no	U	0.21
	Aroclor 1268	0.21	-	no	U	0.21
	Total PCBs	2.1	50	no		1.8

U: The analyte was not detected in the sample. The numeric value represents the sample LOQ.
TSCA: Toxic Substances Control Act
LOQ: Limit of Quantitation - analyzed by Pace Analytical

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LLQ (mg/L)
Waste Disposal (12/4/2017)	1,1,1-Trichloroethane	0.005		no	U	0.005
	1,1,2,2-Tetrachloroethane	0.005		no	U	0.005
	1,1,2-Trichloroethane	0.005		no	U	0.005
	1,1,2-Trichlorotrifluoroethane	0.005		no	U	0.005
	1,1-Dichloroethane	0.005		no	U	0.005
	1,1-Dichloroethene	0.005	0.7	no	U	0.005
	1,2,4-Trichlorobenzene	0.005		no	U	0.005
	1,2-Dibromo-3-chloropropane	0.005		no	U	0.005
	1,2-Dibromoethane	0.005		no	U	0.005
	1,2-Dichlorobenzene	0.005		no	U	0.005
	1,2-Dichloroethane	0.005	0.5	no	U	0.005
	1,2-Dichloropropane	0.005		no	U	0.005
	1,3-Dichlorobenzene	0.005		no	U	0.005
	1,4-Dichlorobenzene	0.005	7.5	no	U	0.005
	2-Butanone (MEK)	0.025	200	no	U	0.025
	2-Hexanone (MBK)	0.025		no	U	0.025
	4-Methyl-2-pentanone (MIBK)	0.025		no	U	0.025
	Acetone	0.025		no	U	0.025
	Antimony	0.005		no	U	0.005
	Aroclor 1016	0.0005		no	U	0.0005
	Aroclor 1221	0.0005		no	U	0.0005
	Aroclor 1232	0.0005		no	U	0.0005
	Aroclor 1242	0.0005		no	U	0.0005
	Aroclor 1248	0.0005		no	U	0.0005
	Aroclor 1254	0.0005		no	U	0.0005
	Aroclor 1260	0.0005		no	U	0.0005
	Arsenic	0.005	5	no	U	0.005
	Benzene	0.007	0.5	no		0.001
	Beryllium	0.004		no	U	0.004
	Bromodichloromethane	0.005		no	U	0.005
	Bromoform	0.005		no	U	0.005
	Bromomethane	0.005		no	U	0.005
	Cadmium	0.005	1	no	U	0.005
	Carbon disulfide	0.005		no	U	0.005
	Carbon tetrachloride	0.005	0.5	no	U	0.005
	Chlorobenzene	0.005	100	no	U	0.005

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LLQ (mg/L)
Waste Disposal (12/4/2017)	Chloroethane	0.005		no	U	0.005
	Chloroform	0.005	6	no	U	0.005
	Chloromethane	0.005		no	U	0.005
	Chromium	0.005	5	no	U	0.005
	cis-1,2-Dichloroethene	0.005		no	U	0.005
	cis-1,3-Dichloropropene	0.005		no	U	0.005
	Copper	0.005		no	U	0.005
	Cyclohexane	0.005		no	U	0.005
	Dibromochloromethane	0.005		no	U	0.005
	Dichlorodifluoromethane	0.005		no	U	0.005
	Diisopropyl ether (DIPE)	0.025		no	U	0.025
	Ethyl t-butyl ether (ETBE)	0.025		no	U	0.025
	Ethylbenzene	0.001		no	U	0.001
	Isopropylbenzene	0.005		no	U	0.005
	Lead	0.0072	5	no		0.005
	m&p-Xylene	0.005		no	U	0.005
	Mercury	0.001	0.2	no	U	0.001
	Methyl acetate	0.005		no	U	0.005
	Methyl t-butyl ether (MTBE)	0.005		no	U	0.005
	Methylcyclohexane	0.005		no	U	0.005
	Methylene chloride	0.01		no	U	0.01
	Naphthalene	0.01		no	U	0.01
	Nickel	0.024		no		0.005
	o-Xylene	0.005		no	U	0.005
	Selenium	0.013	1	no		0.005
	Silver	0.005	5	no	U	0.005
	Styrene	0.005		no	U	0.005
	tert-Amyl alcohol (TAA)	0.025		no	U	0.025
	tert-Amyl ethyl ether (TAEE)	0.025		no	U	0.025
	tert-Amyl methyl ether (TAME)	0.025		no	U	0.025
	tert-Butanol (TBA)	0.025		no	U	0.025
	Tetrachloroethene	0.005	0.7	no	U	0.005
	Thallium	0.002		no	U	0.002
	Toluene	0.001		no	U	0.001
	trans-1,2-Dichloroethene	0.005		no	U	0.005
	trans-1,3-Dichloropropene	0.005		no	U	0.005
	Trichloroethene	0.005	0.5	no	U	0.005
	Trichlorofluoromethane	0.005		no	U	0.005
	Vinyl chloride	0.001	0.2	no	U	0.001
	Zinc	0.32		no		0.005

U: The analyte was not detected in the sample. The numeric value represents the sample LLQ.
TCLP: Toxicity Characteristic Leaching Procedure
LLQ: Lowest Level Quantitation - analyzed by Caliber Analytical Services

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 1 (3/22/2016)	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	0.0338	100	no		0.01
	Benzene	0.001	0.5	no	U	0.001
	Cadmium	0.0006	1	no	J	0.003
	Carbon tetrachloride	0.001	0.5	no	U	0.001
	Chlorobenzene	0.001	100	no	U	0.001
	Chloroform	0.001	6	no	U	0.001
	Chromium	0.0016	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
Water Disposal 2 (3/22/2016)	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	0.0811	100	no		0.01
	Benzene	0.001	0.5	no	U	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	0.0029	6	no		0.001
	Chromium	0.0012	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

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 3 (3/22/2016)	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	0.0051	100	no	J	0.01
	Benzene	0.001	0.5	no	U	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	0.0016	6	no		0.001
	Chromium	0.00085	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
Water Disposal 4 (3/22/2016)	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	0.0094	5	no		0.005
	Barium	0.101	100	no		0.01
	Benzene	0.001	0.5	no	U	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	0.0024	6	no		0.001
	Chromium	0.0012	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

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 5 (3/22/2016)	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	0.398	100	no		0.01
	Benzene	0.001	0.5	no	U	0.001
	Cadmium	0.00058	1	no	J	0.003
	Carbon tetrachloride	0.001	0.5	no	U	0.001
	Chlorobenzene	0.001	100	no	U	0.001
	Chloroform	0.0039	6	no		0.001
	Chromium	0.0012	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
Water Disposal 6 (3/22/2016)	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	2.14	100	no		0.01
	Benzene	0.001	0.5	no	U	0.001
	Cadmium	0.001	1	no	J	0.003
	Carbon tetrachloride	0.001	0.5	no	U	0.001
	Chlorobenzene	0.001	100	no	U	0.001
	Chloroform	0.00058	6	no	J	0.001
	Chromium	0.005	5	no	U	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

TABLE 5
CHARACTERIZATION RESULTS FOR LIQUID IDW

Sample ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 7 (3/22/2016)	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	0.0889	100	no		0.01
	Benzene	0.001	0.5	no	U	0.001
	Cadmium	0.00067	1	no	J	0.003
	Carbon tetrachloride	0.001	0.5	no	U	0.001
	Chlorobenzene	0.001	100	no	U	0.001
	Chloroform	0.00075	6	no	J	0.001
	Chromium	0.005	5	no	U	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	0.00065	0.5	no	J	0.001
	Vinyl chloride	0.001	0.2	no	U	0.001
Water Disposal 8 (3/22/2016)	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	0.01	100	no	J	0.01
	Benzene	0.001	0.5	no	U	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	0.001	6	no	U	0.001
	Chromium	0.005	5	no	U	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

U: The analyte was not detected in the sample. The numeric value represents the LOQ.
J: The positive result for this analyte is a quantitative estimate below the laboratory LOQ.
TCLP: Toxcity Characteristic Leaching Procedure
LOQ: Limit of Quantitation - analyzed by Pace Analytical

Table 6
Summary of Organics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-001-SB-1	B17-002-SB-1	B17-002-SB-5	B17-004-SB-1	B17-004-SB-4	B17-005-SB-2	B17-005-SB-4	B17-006-SB-1.5	B17-006-SB-4	B17-007-SB-1*	B17-008-SB-1.5	B17-008-SB-7.5	B17-009-SB-1.5
Volatile Organic Compounds															
2-Butanone (MEK)	mg/kg	190,000	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	0.015 U	N/A	0.016 U	N/A	0.012 U	0.013 U	N/A
2-Hexanone	mg/kg	1,300	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	**0.0021 J**	N/A	0.016 U	N/A	0.012 U	0.013 U	N/A
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	N/A	N/A	0.011 U	N/A	0.012 U	0.015 U	0.015 U	N/A	0.016 U	N/A	0.012 U	0.013 U	N/A
Acetone	mg/kg	670,000	N/A	N/A	**0.023**	N/A	0.012 U	**0.043**	0.015 U	N/A	0.016 U	N/A	**0.18**	**0.13**	N/A
Benzene	mg/kg	5.1	N/A	N/A	0.0055 U	N/A	0.0061 U	**0.023**	**0.0047 J**	N/A	0.0082 U	N/A	0.0059 U	0.0064 U	N/A
Carbon disulfide	mg/kg	3,500	N/A	N/A	0.0055 U	N/A	0.0061 UJ	0.0073 UJ	0.0076 U	N/A	0.0082 UJ	N/A	0.0059 U	0.0064 U	N/A
Cyclohexane	mg/kg	27,000	N/A	N/A	0.011 UJ	N/A	0.012 UJ	**0.0037 J**	0.015 U	N/A	0.016 UJ	N/A	0.012 U	0.013 U	N/A
Toluene	mg/kg	47,000	N/A	N/A	0.0055 U	N/A	0.0061 U	**0.0031 J**	0.0076 U	N/A	0.0082 U	N/A	0.0059 U	0.0064 U	N/A
Semi-Volatile Organic Compounds^															
1,1-Biphenyl	mg/kg	200	1.4 U	**0.019 J**	0.078 U	0.071 U	0.072 U	**0.016 J**	0.077 U	0.072 U	**0.021 J**	1.5 U	**2**	1.4 U	**0.057 J**
2,4-Dimethylphenol	mg/kg	16,000	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	0.079 U
2,4-Dinitrophenol	mg/kg	1,600	3.6 U	0.18 U	0.2 U	0.18 R	0.18 U	0.18 R	0.19 U	0.18 U	**0.067 J**	3.8 U	3.8 U	3.6 U	0.2 U
2-Chloronaphthalene	mg/kg	60,000	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	**0.15**
2-Methylnaphthalene	mg/kg	3,000	**0.83**	**0.087**	**0.051**	**0.0035 J**	**0.021**	**0.16**	**0.0083**	**0.069 J**	**0.32**	**0.015 J**	**11.9**	**2.3**	**0.22**
2-Methylphenol	mg/kg	41,000	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	0.079 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	2.9 U	0.14 U	0.16 U	0.14 R	0.14 U	0.14 R	0.15 U	0.14 U	0.16 U	3 U	3 U	2.9 U	0.16 U
Acenaphthene	mg/kg	45,000	**0.083**	**0.0052 J**	**0.0035 J**	0.0071 U	**0.0028 J**	**0.014**	**0.0053 J**	**0.0087 J**	**0.012**	**0.013 J**	**11.4**	**1.3**	**0.026 J**
Acenaphthylene	mg/kg	45,000	**4.4**	**0.075**	**0.019**	**0.0011 J**	**0.0028 J**	**0.022**	**0.0023 J**	**0.041 J**	**0.024**	**0.0061 J**	**0.88**	**0.32 J**	**0.059 J**
Acetophenone	mg/kg	120,000	1.4 U	**0.023 J**	**0.028 J**	0.071 U	**0.028 J**	**0.027 J**	0.077 U	0.072 U	**0.037 J**	1.5 U	1.5 U	1.4 U	**0.046 J**
Anthracene	mg/kg	230,000	**1.5**	**0.046 J**	**0.014**	**0.0024 J**	**0.0057 J**	**0.082**	**0.00099 J**	**0.041 J**	**0.022**	**0.046 J**	**29.7**	**4**	**0.079**
Benz[a]anthracene	mg/kg	21	**6.7**	**0.31**	**0.06**	**0.0077**	**0.025**	**0.33**	**0.004 J**	**0.32**	**0.36**	**0.076**	**47.5**	**8.4**	**0.56**
Benzaldehyde	mg/kg	120,000	1.4 U	0.072 U	**0.02 J**	0.071 R	**0.018 J**	0.07 R	0.077 R	**0.017 J**	**0.042 J**	1.5 U	1.5 R	1.4 R	**0.072 J**
Benzo[a]pyrene	mg/kg	2.1	**6.3**	**0.32**	**0.062**	**0.0055 J**	**0.026**	**0.29**	**0.0034 J**	**0.31**	**0.39**	**0.034 J**	**32.8**	**4.9**	**0.39**
Benzo[b]fluoranthene	mg/kg	21	**14.2**	**0.73**	**0.13**	**0.016**	**0.052**	**0.61**	**0.0091**	**0.66**	**0.99**	**0.1**	**67.6**	**12.6**	**1.4**
Benzo[g,h,i]perylene	mg/kg		**3.5**	**0.2**	**0.043**	**0.0045 J**	**0.019**	**0.18**	**0.0045 J**	**0.18**	**0.21**	**0.03 J**	**6.4**	**0.83**	**0.35**
Benzo[k]fluoranthene	mg/kg	210	**8.9**	**0.51**	**0.092**	**0.011**	**0.036**	**0.46**	**0.0064 J**	**0.46**	**0.66**	**0.071 J**	**47.4**	**9.4**	**0.96**
bis(2-Ethylhexyl)phthalate	mg/kg	160	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	0.079 U
Caprolactam	mg/kg	400,000	3.6 U	**0.029 J**	0.2 U	0.18 U	0.18 U	**0.057 J**	0.19 U	0.18 U	0.21 U	3.8 U	3.8 U	3.6 U	**0.2**
Carbazole	mg/kg		**0.7 J**	**0.063 J**	0.078 U	0.071 U	0.072 U	**0.12**	0.077 U	**0.034 J**	**0.02 J**	1.5 U	**9.4**	**0.87 J**	**0.033 J**
Chrysene	mg/kg	2,100	**5.4**	**0.32**	**0.064**	**0.009**	**0.036**	**0.34**	**0.0077**	**0.33**	**0.38**	**0.075**	**39.6**	**7.2**	**0.73**
Dibenz[a,h]anthracene	mg/kg	2.1	**1.4**	**0.07 J**	**0.016**	0.0071 U	**0.0064 J**	**0.067**	**0.0016 J**	**0.077**	**0.093**	0.075 U	**4**	**0.52**	**0.14**
Fluoranthene	mg/kg	30,000	**11.1**	**0.46**	**0.091**	**0.02**	**0.038**	**0.55**	**0.012**	**0.43**	**0.47**	**0.31**	**108**	**20.7**	**1.2**
Fluorene	mg/kg	30,000	**0.33**	**0.0058 J**	**0.0059 J**	0.0071 U	**0.0052 J**	**0.02**	**0.0035 J**	**0.0089 J**	**0.011**	**0.024 J**	**12.1**	**1**	**0.024 J**
Hexachloroethane	mg/kg	8	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	**0.027 J**	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	0.079 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**3.5**	**0.19**	**0.041**	**0.0038 J**	**0.016**	**0.14**	**0.0029 J**	**0.17**	**0.24**	**0.028 J**	**8.4**	**1.1**	**0.32**
Naphthalene	mg/kg	17	**1.6**	**0.076**	**0.041**	**0.0051 J**	**0.018**	**0.14**	**0.015**	**0.074**	**0.21**	0.075 U	**15.1**	**2.4**	**0.19**
N-Nitrosodiphenylamine	mg/kg	470	1.4 U	0.072 U	0.078 U	0.071 U	0.072 U	0.07 U	0.077 U	0.072 U	0.083 U	1.5 U	1.5 U	1.4 U	0.079 U
Phenanthrene	mg/kg		**3.8**	**0.16**	**0.07**	**0.016**	**0.05**	**0.59**	**0.022**	**0.23**	**0.35**	**0.25**	**121**	**20.7**	**0.97**
Phenol	mg/kg	250,000	1.4 U	0.072 U	0.078 U	0.071 R	0.072 U	0.07 R	0.077 U	0.072 U	0.083 U	1.5 U	**0.74 J**	**0.46 J**	0.079 U
Pyrene	mg/kg	23,000	**9**	**0.39**	**0.081**	**0.016**	**0.03**	**0.4**	**0.0079**	**0.37**	**0.41**	**0.21**	**80.4**	**15.4**	**1.5**
PCBs															
Aroclor 1254	mg/kg	0.97	0.018 U	0.018 U	N/A	0.018 U	N/A	0.018 U	N/A	0.018 U	N/A	**0.095**	0.019 U	N/A	0.02 U
Aroclor 1260	mg/kg	0.99	0.018 U	0.018 U	N/A	0.018 UJ	N/A	0.018 UJ	N/A	0.018 UJ	N/A	0.019 U	0.019 UJ	N/A	0.02 UJ
Aroclor 1268	mg/kg		0.018 U	0.018 U	N/A	0.018 UJ	N/A	0.018 U	N/A	0.018 UJ	N/A	0.019 U	0.019 U	N/A	0.02 UJ
PCBs (total)	mg/kg	0.97	0.16 U	0.16 U	N/A	0.12 U	N/A	0.12 U	N/A	0.12 U	N/A	**0.095 J**	0.13 U	N/A	0.14 U
TPH/Oil and Grease															
Diesel Range Organics	mg/kg	6,200	**445 J**	**32.9 J**	**23.5 J**	**20.9 J**	**27.6 J**	**75.6 J**	**70.3 J**	**34.7 J**	**34.1 J**	**128**	**3,540 J**	**2,610 J**	**85.9 J**
Gasoline Range Organics	mg/kg	6,200	5.6 B	3 B	2.5 B	10.9 U	6.5 B	**19.8 J**	**30**	4.6 B	6.7 B	9.4 U	**7.7 J**	**4.2 J**	2.1 B
Oil and Grease	mg/kg	6,200	**5,320 J+**	**146 J+**	**77.8 J+**	**170 J-**	**137 J-**	**150 J-**	**170 J-**	**192 J-**	**262 J-**	**347**	**26,000 J-**	**28,100 J-**	**245 J-**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
* indicates non-validated data
^ PAH compounds were analyzed via SIM

N/A indicates that the parameter was not analzyed for this sample
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 actual quantitation/detection limit may be higher than reported.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyteiñ the sample.

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

Table 6
Summary of Organics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-009-SB-4	B17-010-SB-2	B17-010-SB-8	B17-011-SB-1.5	B17-011-SB-5	B17-012-SB-1.5	B17-012-SB-4	B17-013-SB-1.5	B17-013-SB-4	B17-014-SB-1.5	B17-014-SB-5	B17-015-SB-1	B17-015-SB-5
Volatile Organic Compounds															
2-Butanone (MEK)	mg/kg	190,000	0.011 U	N/A	**0.012 J**	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U	0.014 U	N/A	N/A
2-Hexanone	mg/kg	1,300	0.011 U	N/A	0.016 U	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U	0.014 U	N/A	N/A
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.011 U	N/A	0.016 U	N/A	N/A	N/A	N/A	0.012 U	0.011 U	0.012 U	0.014 U	N/A	N/A
Acetone	mg/kg	670,000	0.0099 B	N/A	**0.11 J**	N/A	N/A	N/A	N/A	0.012 U	0.011 U	**0.046**	**0.052**	N/A	N/A
Benzene	mg/kg	5.1	0.0056 U	N/A	0.0082 U	N/A	N/A	N/A	N/A	0.0061 U	0.0056 U	0.0061 U	0.0069 U	N/A	N/A
Carbon disulfide	mg/kg	3,500	0.0056 UJ	N/A	**0.029 J**	N/A	N/A	N/A	N/A	0.0061 UJ	0.0056 UJ	0.0061 U	0.0069 U	N/A	N/A
Cyclohexane	mg/kg	27,000	0.011 UJ	N/A	0.016 UJ	N/A	N/A	N/A	N/A	0.012 UJ	0.011 UJ	0.012 U	0.014 U	N/A	N/A
Toluene	mg/kg	47,000	0.0056 U	N/A	0.0082 U	N/A	N/A	N/A	N/A	0.0061 U	0.0056 U	0.0061 U	0.0069 U	N/A	N/A
Semi-Volatile Organic Compounds^															
1,1-Biphenyl	mg/kg	200	0.076 U	0.078 U	**0.047 J**	**0.029 J**	**0.054 J**	**0.016 J**	**0.042 J**	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
2,4-Dimethylphenol	mg/kg	16,000	0.076 U	0.078 U	0.082 U	0.076 UJ	**0.02 J**	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
2,4-Dinitrophenol	mg/kg	1,600	0.19 U	0.19 U	0.21 U	0.19 UJ	0.19 U	0.18 U	0.19 U	3.8 U	0.2 U	3.8 U	0.19 U	3.8 U	0.19 UJ
2-Chloronaphthalene	mg/kg	60,000	0.076 U	0.078 U	0.082 U	**0.078**	**0.25**	0.073 U	**0.13**	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
2-Methylnaphthalene	mg/kg	3,000	**0.024**	**0.033**	**0.21**	**0.16**	**0.11**	**0.043 J**	**0.092**	**0.11**	**0.016**	**0.58**	**0.015**	**0.12**	**0.0035 J**
2-Methylphenol	mg/kg	41,000	0.076 U	0.078 U	0.082 U	0.076 UJ	**0.026 J**	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.15 U	0.15 U	0.16 U	0.15 UJ	**0.046 J**	0.15 U	0.15 U	3 U	0.16 U	3 U	0.15 U	3 U	0.15 U
Acenaphthene	mg/kg	45,000	**0.0035 J**	**0.0041 J**	**0.017**	**0.0098 J**	**0.0021 J**	**0.027 J**	**0.0037 J**	**0.029 J**	**0.0015 J**	**0.01 J**	0.0077 U	**0.027 J**	0.0076 U
Acenaphthylene	mg/kg	45,000	**0.0057 J**	**0.022**	**0.027**	**0.038 J**	**0.011**	**0.012 J**	**0.035**	**0.023 J**	**0.0046 J**	**0.039 J**	0.0077 U	**1**	**0.013**
Acetophenone	mg/kg	120,000	0.076 U	0.078 U	**0.057 J**	**0.05 J**	**0.069 J**	**0.02 J**	**0.053 J**	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Anthracene	mg/kg	230,000	**0.0099**	**0.025**	**0.074**	**0.094**	**0.024**	**0.13**	**0.044**	**0.087**	**0.0055 J**	**0.15**	**0.0027 J**	**0.4**	**0.0035 J**
Benz[a]anthracene	mg/kg	21	**0.068**	**0.14**	**0.23**	**0.42**	**0.065**	**0.34**	**0.26**	**0.3**	**0.034**	**0.58**	**0.045**	**3**	**0.06**
Benzaldehyde	mg/kg	120,000	**0.021 J**	0.078 U	**0.12 J**	**0.093 J**	**0.085 J**	**0.022 J**	**0.13 J**	1.5 U	0.078 U	1.5 R	0.075 R	1.5 U	0.076 U
Benzo[a]pyrene	mg/kg	2.1	**0.052**	**0.17**	**0.21**	**0.56**	**0.054**	**0.31**	**0.24**	**0.27**	**0.033**	**0.65**	**0.055**	**3.3**	**0.078**
Benzo[b]fluoranthene	mg/kg	21	**0.19**	**0.31**	**0.52**	**1.2**	**0.13**	**0.64**	**0.58**	**0.6**	**0.069**	**1.5**	**0.11**	**8.4**	**0.18**
Benzo[g,h,i]perylene	mg/kg		**0.048**	**0.13**	**0.14**	**0.43**	**0.042**	**0.18**	**0.15**	**0.11**	**0.019**	**0.55**	**0.041**	**1.7**	**0.063**
Benzo[k]fluoranthene	mg/kg	210	**0.13**	**0.22**	**0.33**	**0.81**	**0.089**	**0.45**	**0.37**	**0.42**	**0.048**	**1.1**	**0.08**	**5.4**	**0.13**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.076 U	0.078 U	0.082 U	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Caprolactam	mg/kg	400,000	0.027 B	0.19 U	**0.19 J**	0.19 U	**0.05 J**	0.035 B	0.19 U	3.8 U	0.2 U	3.8 U	0.19 U	3.8 U	0.19 U
Carbazole	mg/kg		0.076 U	0.078 U	**0.023 J**	**0.084**	**0.021 J**	**0.017 J**	**0.037 J**	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Chrysene	mg/kg	2,100	**0.1**	**0.14**	**0.49**	**0.54**	**0.13**	**0.37**	**0.37**	**0.39**	**0.039**	**0.84**	**0.046**	**2.7**	**0.063**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.021**	**0.038**	**0.073**	**0.13**	**0.02**	**0.068 J**	**0.064**	**0.049 J**	**0.0076 J**	**0.21**	**0.012**	**0.69**	**0.022**
Fluoranthene	mg/kg	30,000	**0.13**	**0.21**	**0.37**	**0.46**	**0.079**	**0.66**	**0.45**	**0.54**	**0.054**	**0.82**	**0.037**	**3.7**	**0.056**
Fluorene	mg/kg	30,000	**0.0037 J**	**0.0054 J**	**0.034**	**0.015 J**	**0.01**	**0.038 J**	**0.012**	**0.032 J**	**0.0019 J**	**0.022 J**	0.0077 U	**0.082**	0.0076 U
Hexachloroethane	mg/kg	8	0.076 U	0.078 U	**0.019 J**	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.042**	**0.12**	**0.12**	**0.38**	**0.03**	**0.17**	**0.15**	**0.11**	**0.018**	**0.48**	**0.036**	**2**	**0.057**
Naphthalene	mg/kg	17	**0.014**	**0.029**	**0.17**	**0.15**	**0.058**	**0.057 J**	**0.062**	**0.078**	**0.0081**	**1.9**	**0.044**	**0.15**	**0.0033 J**
N-Nitrosodiphenylamine	mg/kg	470	0.076 U	0.078 U	**0.021 J**	0.076 U	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Phenanthrene	mg/kg		**0.099**	**0.12**	**0.68**	**0.91**	**0.28**	**0.51**	**0.52**	**0.45**	**0.039**	**1.3**	**0.025**	**1.5**	**0.014**
Phenol	mg/kg	250,000	0.076 U	0.078 U	0.082 U	0.076 UJ	0.076 U	0.073 U	0.075 U	1.5 U	0.078 U	1.5 U	0.075 U	1.5 U	0.076 U
Pyrene	mg/kg	23,000	**0.2**	**0.19**	**0.31**	**0.42**	**0.071**	**0.51**	**0.33**	**0.45**	**0.046**	**0.64**	**0.035**	**3.2**	**0.051**
PCBs															
Aroclor 1254	mg/kg	0.97	N/A	0.019 U	N/A	0.019 U	N/A	0.018 U	N/A	0.019 U	N/A	0.019 U	N/A	0.037 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	0.019 U	N/A	0.019 UJ	N/A	0.018 UJ	N/A	0.019 UJ	N/A	0.019 UJ	N/A	**0.48 J**	N/A
Aroclor 1268	mg/kg		N/A	0.019 U	N/A	0.019 U	N/A	**0.22 J**	N/A	**0.31 J**	N/A	0.019 U	N/A	0.037 U	N/A
PCBs (total)	mg/kg	0.97	N/A	0.17 U	N/A	0.13 U	N/A	**0.22**	N/A	**0.31**	N/A	0.13 U	N/A	**0.48**	N/A
TPH/Oil and Grease															
Diesel Range Organics	mg/kg	6,200	**17 J**	**97.8 J**	**75.5 J**	**158 J**	**89.8 J**	**51.9 J**	**27.6 J**	**129 J**	7.7 B	**144 J**	**9.4 J**	**113 J**	**11.3 J**
Gasoline Range Organics	mg/kg	6,200	3.5 B	20.2 U	4.4 B	**6 J**	24.4 U	5 B	4.2 B	4.1 B	4.2 B	**2.7 J**	14.3 U	4 B	18.3 U
Oil and Grease	mg/kg	6,200	**166 J-**	**236 J+**	**75.2 J+**	**740 J-**	**156 J-**	**233 J-**	**172 J-**	**8,630 J-**	**152 J-**	**207 J-**	**163 J-**	**864 J+**	**133 J+**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
* indicates non-validated data
^ PAH compounds were analyzed via SIM

N/A indicates that the parameter was not analzyed for this sample
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 actual quantitation/detection limit may be higher than reported.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analytein the sample.

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

Table 6
Summary of Organics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-016-SB-1	B17-016-SB-4	B17-017-SB-1.5	B17-017-SB-6	B17-018-SB-1.5*	B17-018-SB-4*	B17-019-SB-2*	B17-019-SB-4*	B17-020-SB-1.5*	B17-020-SB-4*	B17-021-SB-1.5	B17-021-SB-5
Volatile Organic Compounds														
2-Butanone (MEK)	mg/kg	190,000	N/A	0.017 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	0.014 U	N/A	0.021 U	**0.063**	0.019 U
2-Hexanone	mg/kg	1,300	N/A	0.017 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	0.014 U	N/A	0.021 U	**0.014**	0.019 U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	N/A	0.017 U	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	0.014 U	N/A	0.021 U	**0.0054 J**	0.019 U
Acetone	mg/kg	670,000	N/A	0.017 U	**0.065**	**0.096**	**0.027**	0.014 U	**0.033**	0.014 U	N/A	**0.11**	**0.26 J**	**0.023**
Benzene	mg/kg	5.1	N/A	0.0085 U	0.0086 U	**0.002 J**	0.006 U	0.0072 U	0.0069 U	0.0071 U	N/A	**0.011**	0.0049 U	0.0096 U
Carbon disulfide	mg/kg	3,500	N/A	0.0085 U	0.0086 U	**0.025**	**0.0084**	**0.004 J**	**0.0089**	0.0071 U	N/A	0.011 U	**0.042 J**	0.0096 U
Cyclohexane	mg/kg	27,000	N/A	0.017 UJ	0.017 U	0.012 U	0.012 U	0.014 U	0.014 U	0.014 U	N/A	0.021 U	0.0098 UJ	0.019 UJ
Toluene	mg/kg	47,000	N/A	0.0085 U	**0.0028 J**	**0.0036 J**	0.006 U	0.0072 U	0.0069 U	0.0071 U	N/A	0.011 U	0.0049 U	0.0096 U
Semi-Volatile Organic Compounds^														
1,1-Biphenyl	mg/kg	200	1.5 U	0.77 U	1.5 U	1.5 U	**0.059 J**	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	**4.9**	**0.035 J**
2,4-Dimethylphenol	mg/kg	16,000	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 R	0.074 U
2,4-Dinitrophenol	mg/kg	1,600	3.8 U	1.9 U	3.8 U	3.7 U	0.18 U	0.2 U	0.2 U	0.2 U	3.8 U	3.9 U	0.18 R	0.18 U
2-Chloronaphthalene	mg/kg	60,000	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
2-Methylnaphthalene	mg/kg	3,000	**0.39**	**0.27**	**2.2**	**0.41**	**0.27**	**0.02**	**0.018**	**0.014**	**0.22**	**0.13**	**14.5**	**0.44**
2-Methylphenol	mg/kg	41,000	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 R	0.074 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	3 U	1.5 U	3.1 U	3 U	0.15 U	0.16 U	0.16 U	0.16 U	3 U	3.1 U	0.14 R	0.15 U
Acenaphthene	mg/kg	45,000	**0.12**	**0.019 J**	**0.22**	**0.11**	**0.093**	**0.0054 J**	**0.0029 J**	**0.0018 J**	**0.54**	**0.072 J**	**5.8**	**0.3**
Acenaphthylene	mg/kg	45,000	**6.9**	**0.71**	**0.048 J**	**0.028 J**	**0.011**	**0.00056 J**	**0.008**	**0.0011 J**	**0.13 J**	**0.035 J**	**0.39**	**0.11**
Acetophenone	mg/kg	120,000	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	**0.029 J**	**0.021 J**
Anthracene	mg/kg	230,000	**5.4**	**0.88**	**0.19**	**0.065 J**	**0.027**	**0.0021 J**	**0.023**	**0.0088**	**2.4**	**0.27**	**4**	**1.1**
Benz[a]anthracene	mg/kg	21	**27.1**	**3.1**	**0.51**	**0.34**	**0.12**	**0.007 J**	**0.059**	**0.027**	**10**	**0.85**	**5.4**	**2.3**
Benzaldehyde	mg/kg	120,000	1.5 U	0.77 U	1.5 R	1.5 R	0.073 U	0.078 U	**0.029 J**	**0.028 J**	1.5 U	1.5 U	**0.019 J**	**0.037 J**
Benzo[a]pyrene	mg/kg	2.1	**22**	**2.2**	**0.31**	**0.23**	**0.012**	0.0078 U	**0.048**	**0.022**	**7.6**	**0.73**	**1.6**	**1.6**
Benzo[b]fluoranthene	mg/kg	21	**55.2**	**6.1**	**0.79**	**0.58**	**0.2**	**0.01**	**0.13**	**0.065**	**18.6**	**1.5**	**7.3**	**3.6**
Benzo[g,h,i]perylene	mg/kg		**10.2**	**1.6**	**0.2**	**0.12**	**0.026**	**0.0014 J**	**0.037**	**0.021**	**1.6**	**0.24**	**0.87**	**0.95**
Benzo[k]fluoranthene	mg/kg	210	**38.3**	**3.8**	**0.55**	**0.4**	**0.14**	**0.0072 J**	**0.091**	**0.045**	**12.3 i**	**1.1**	**4.8**	**2.5**
bis(2-Ethylhexyl)phthalate	mg/kg	160	1.5 U	0.77 U	1.5 U	1.5 U	**0.065 J**	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 UJ	0.074 U
Caprolactam	mg/kg	400,000	3.8 U	1.9 U	3.8 U	3.7 U	0.18 U	0.2 U	0.2 U	0.2 U	3.8 U	3.9 U	0.18 U	**0.042 J**
Carbazole	mg/kg		**0.72 J**	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	**5.5**	1.5 U	0.07 U	**0.028 J**
Chrysene	mg/kg	2,100	**22.5**	**2.7**	**0.84**	**0.41**	**0.2**	**0.01**	**0.11**	**0.071**	**8.8**	**0.81**	**5.5**	**2.2**
Dibenz[a,h]anthracene	mg/kg	2.1	**4**	**0.57**	**0.11**	**0.05 J**	**0.011**	0.0078 U	**0.018**	**0.012**	**0.82**	**0.1**	**0.44**	**0.39**
Fluoranthene	mg/kg	30,000	**62.4**	**7.5**	**1.5**	**1**	**1.1**	**0.046**	**0.18**	**0.056**	**17.8**	**2**	**32.9**	**4.9**
Fluorene	mg/kg	30,000	**0.11**	**0.041 J**	**0.15**	**0.07 J**	**0.012**	**0.00077 J**	**0.0071 J**	**0.0027 J**	**0.38 J**	**0.074 J**	**5.4**	**0.39**
Hexachloroethane	mg/kg	8	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**12.1**	**1.7**	**0.15**	**0.12**	**0.03**	**0.0016 J**	**0.024**	**0.0098**	**1.8**	**0.25**	**1**	**0.93**
Naphthalene	mg/kg	17	**0.97**	**0.67**	**1.5**	**0.48**	**0.1**	**0.01**	**0.018**	**0.011**	**0.2**	**0.15**	**8.8**	**0.44**
N-Nitrosodiphenylamine	mg/kg	470	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	0.07 U	0.074 U
Phenanthrene	mg/kg		**42**	**5.5**	**4**	**1.6**	**2.9**	**0.13**	**0.15**	**0.079**	**9.5**	**1.5**	**62.6**	**4.8**
Phenol	mg/kg	250,000	1.5 U	0.77 U	1.5 U	1.5 U	0.073 U	0.078 U	0.078 U	0.08 U	1.5 U	1.5 U	**0.045 J**	0.074 U
Pyrene	mg/kg	23,000	**44.6**	**5**	**1.1**	**0.9**	**0.74**	**0.031**	**0.16**	**0.06**	**14.6**	**1.6**	**25**	**3.6**
PCBs														
Aroclor 1254	mg/kg	0.97	0.019 U	N/A	0.019 U	N/A	0.018 U	N/A	**2.4**	N/A	**2.3**	N/A	0.18 U	N/A
Aroclor 1260	mg/kg	0.99	0.019 U	N/A	0.019 UJ	N/A	0.018 U	N/A	0.19 U	N/A	0.38 U	N/A	0.18 U	N/A
Aroclor 1268	mg/kg		0.019 U	N/A	0.019 U	N/A	0.018 U	N/A	0.19 U	N/A	0.38 U	N/A	0.18 U	N/A
PCBs (total)	mg/kg	0.97	0.17 U	N/A	0.13 U	N/A	0.13 U	N/A	**2.4**	N/A	**2.3 J**	N/A	1.6 U	N/A
TPH/Oil and Grease														
Diesel Range Organics	mg/kg	6,200	**192 J**	**92.2 J**	**746 J**	**515 J**	**168**	**26.9**	**98**	**42.9**	**483**	**171**	**3,320 J**	**93.5 J**
Gasoline Range Organics	mg/kg	6,200	14.4 U	4.9 B	**31.8**	**7.7 J**	**5.5 J**	17.2 U	14.6 U	18.8 U	**4.9 J**	**3.4 J**	2.6 B	13.8 U
Oil and Grease	mg/kg	6,200	**3,790 J+**	**355 J+**	**1,650 J-**	**1,490 J-**	**559**	**195**	**76.4 J**	**83 J**	**2,050**	**1,660**	**8,860 J+**	**123 J+**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
* indicates non-validated data
^ PAH compounds were analyzed via SIM

N/A indicates that the parameter was not analzyed for this sample
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 actual quantitation/detection limit may be higher than reported.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
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J-: The positive result reported for this analyte is a quantitative esitmate but may be biased low.

Table 7
Summary of Inorganics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-001-SB-1	B17-002-SB-1	B17-002-SB-5	B17-004-SB-1	B17-004-SB-4	B17-005-SB-2	B17-005-SB-4	B17-006-SB-1.5
Metal										
Aluminum	mg/kg	1,100,000	**16,700**	**25,800**	**17,400**	**14,600**	**22,600**	**17,500**	**9,290**	**15,000**
Antimony	mg/kg	470	2.6 UJ	2.4 UJ	2.8 UJ	2.5 UJ	**5.7 J**	**1.4 J**	**5.3 J**	2.4 UJ
Arsenic	mg/kg	3	**30.7**	**17.2**	**8.3**	2.1 U	**39.6**	**9.9**	**14.9**	**8.8**
Barium	mg/kg	220,000	**226 J**	**432 J**	**228 J**	**79.1**	**681**	**204 J**	**303 J**	**151**
Beryllium	mg/kg	2,300	**1.6**	**2.2**	**0.93**	0.85 U	**1.2**	**1.4**	**0.49 J**	**1.1**
Cadmium	mg/kg	980	**9.3**	**1.7**	**0.68 J**	**0.66 J**	**0.62 J**	1.3 U	1.4 U	1.2 U
Chromium	mg/kg	120,000	**181 J**	**75.6 J**	**314 J**	**894**	**698**	**69.6 J**	**29.5 J**	**32.4**
Chromium VI	mg/kg	6.3	0.58 B	0.44 B	0.65 B	**3.5 J-**	0.49 B	0.55 B	0.74 B	0.64 B
Cobalt	mg/kg	350	**180**	**11.2**	**15.4**	**3 J**	**8.2**	**18.4**	**28.7**	**8.6**
Copper	mg/kg	47,000	**290**	**110**	**62.4**	**46 J**	**281 J**	**109 J**	**203 J**	**142 J**
Iron	mg/kg	820,000	**246,000**	**93,000**	**40,700**	**249,000**	**139,000**	**146,000**	**248,000**	**80,900**
Lead	mg/kg	800	**387 J**	**140 J**	**74.2 J**	**7.5**	**468**	**34.4 J**	**23.7 J**	**46.4**
Manganese	mg/kg	26,000	**6,050**	**7,580**	**14,700**	**20,800**	**25,800**	**4,860**	**6,740**	**3,900**
Mercury	mg/kg	350	**4.9**	**0.053 J**	**0.031 J**	**0.0065 J**	**0.0084 J**	**0.008 J**	**0.016 J**	**0.078 J**
Nickel	mg/kg	22,000	**94.1**	**22.4**	**96.9**	**23.6 J**	**12.6 J**	**32.6**	**19.9**	**11.6 J**
Selenium	mg/kg	5,800	**6.2**	2.2 B	3.7 U	3.4 U	3.4 U	**2 J**	**3.4 J**	**2.3 J**
Silver	mg/kg	5,800	**12.4**	**17.9**	**7.3**	**19.9**	**24.3**	**12.9 J**	**11 J**	**11.1**
Vanadium	mg/kg	5,800	**449**	**201**	**49.1**	**465**	**153**	**65.8 J**	**99.3 J**	**55.8**
Zinc	mg/kg	350,000	**1,610 J**	**331 J**	**145 J**	**165**	**221**	**117 J**	**147 J**	**90.2**
Other										
Cyanide	mg/kg	150	**1.4 J-**	**0.44 J-**	**1.7 J-**	1.1 UJ	**0.88 J-**	**0.21 J-**	**0.34 J-**	**1 J-**

Detections in bold

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

* indicates non-validated data

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 actual quantitation/detection limit may be higher than reported.

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.

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

Table 7
Summary of Inorganics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-006-SB-4	B17-007-SB-1*	B17-008-SB-1.5	B17-008-SB-7.5	B17-009-SB-1.5	B17-009-SB-4	B17-010-SB-2	B17-010-SB-8
Metal										
Aluminum	mg/kg	1,100,000	**15,600**	**25,500**	**7,340**	**8,080**	**14,500**	**38,500**	**53,700**	**4,770**
Antimony	mg/kg	470	2.8 UJ	2.6 U	2.7 UJ	2.6 UJ	**5.3 J**	**34.2 J**	2.8 UJ	2.9 UJ
Arsenic	mg/kg	3	**12.8**	2.2 U	**2.7**	**15.4**	**27.7**	2.2 U	**4.8**	**20**
Barium	mg/kg	220,000	**148**	**66.5**	**81.3 J**	**287 J**	**159**	**304**	**609 J**	**103 J**
Beryllium	mg/kg	2,300	**1.3**	0.86 U	**0.25 J**	**0.66 J**	**1.5**	**2.1**	**2.5**	**0.71 J**
Cadmium	mg/kg	980	**0.73 J**	**0.63 J**	**1.7**	**1.7**	**0.67 J**	**0.69 J**	**0.9 J**	**1.2 J**
Chromium	mg/kg	120,000	**16**	**1,070**	**159 J**	**41.5 J**	**1,430**	**11,200**	**388 J**	**13.9 J**
Chromium VI	mg/kg	6.3	0.61 B	**2.6**	1.1 B	1 B	3.5 B	0.89 B	0.7 B	0.56 B
Cobalt	mg/kg	350	**10.1**	**2 J**	**5.1**	**7.6**	**13.6**	**15.5**	**14.3**	**6.1**
Copper	mg/kg	47,000	**116 J**	**33.2**	**80.6 J**	**133 J**	**82.9 J**	**99.9 J**	**72.2**	**72**
Iron	mg/kg	820,000	**65,500**	**198,000**	**44,500**	**59,000**	**30,100**	**119,000**	**27,500**	**11,100**
Lead	mg/kg	800	**95.4**	**12.7**	**154 J**	**1,090 J**	**145**	**44.1**	**135 J**	**372 J**
Manganese	mg/kg	26,000	**6,140**	**25,400**	**3,640**	**3,920**	**11,400**	**36,900**	**4,630**	**123**
Mercury	mg/kg	350	**0.019 J**	**0.0044 J**	**0.065 J**	**0.07 J**	**0.13**	**0.005 J**	**0.06 J**	**0.06 J**
Nickel	mg/kg	22,000	**11.9 J**	**15.9**	**16.4**	**21.4**	**67.5 J**	**43.6 J**	**94.8**	**19.3**
Selenium	mg/kg	5,800	3.7 U	3.4 U	3.5 U	3.5 U	3.6 U	3.5 U	**4.7**	3.9 U
Silver	mg/kg	5,800	**8.6**	**20.4**	**5.9 J**	**6 J**	**15.7**	**84**	**25.6**	**2.7 J**
Vanadium	mg/kg	5,800	**32.5**	**522**	**75.5 J**	**32.1 J**	**80.8**	**417**	**42.9**	**19.1**
Zinc	mg/kg	350,000	**425**	**133**	**327 J**	**801 J**	**249**	**139**	**174 J**	**217 J**
Other										
Cyanide	mg/kg	150	**1 J-**	**0.13 J**	1 UJ	1.1 UJ	**3.2 J-**	**0.68 J-**	**7 J-**	1.3 UJ

Detections in bold
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Table 7
Summary of Inorganics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-011-SB-1.5	B17-011-SB-5	B17-012-SB-1.5	B17-012-SB-4	B17-013-SB-1.5	B17-013-SB-4	B17-014-SB-1.5	B17-014-SB-5
Metal										
Aluminum	mg/kg	1,100,000	**14,200**	**4,900**	**15,500**	**14,800**	**27,900**	**14,900**	**3,570**	**3,790**
Antimony	mg/kg	470	2.6 UJ	2.7 UJ	2.6 UJ	2.6 UJ	2.6 UJ	**1.6 J**	**5.5 J**	**30 J**
Arsenic	mg/kg	3	**13.7**	**12.8**	**18.3**	**38.6**	**4.3**	**5.7**	**38**	**204**
Barium	mg/kg	220,000	**215 J**	**60.3 J**	**217**	**399**	**613**	**62.2**	**175 J**	**382 J**
Beryllium	mg/kg	2,300	**0.93**	**0.45 J**	**1.1**	**1.4**	**2.2**	**0.59 J**	**0.36 J**	**0.56 J**
Cadmium	mg/kg	980	**1.1 J**	1.4 U	**5.2**	**11.8**	**1.5**	**4**	**1 J**	**4**
Chromium	mg/kg	120,000	**29.1 J**	**9.9 J**	**50.5**	**18**	**93.9**	**28.4**	**6.1 J**	**7.9 J**
Chromium VI	mg/kg	6.3	0.57 B	0.63 B	0.55 B	0.56 B	0.6 B	0.95 B	0.74 B	0.73 B
Cobalt	mg/kg	350	**4.7**	**5.2**	**11**	**11.9**	**19.4**	**5.4**	**10.1**	**35.1**
Copper	mg/kg	47,000	**83.4 J**	**50.6 J**	**199 J**	**251 J**	**84.5 J**	**18.6 J**	**169 J**	**708 J**
Iron	mg/kg	820,000	**40,500**	**17,600**	**105,000**	**153,000**	**27,200**	**25,500**	**83,500**	**375,000**
Lead	mg/kg	800	**559 J**	**55.6 J**	**1,580**	**4,010**	**472**	**22.3**	**1,360 J**	**9,720 J**
Manganese	mg/kg	26,000	**7,490**	**159**	**11,600**	**7,970**	**4,280**	**413**	**1,170**	**3,270**
Mercury	mg/kg	350	**0.015 J**	**0.04 J**	**0.036 J**	**0.039 J**	**0.062 J**	**0.046 J**	**0.3**	**0.0076 J**
Nickel	mg/kg	22,000	**10.5**	**12.8**	**32.1 J**	**14.7 J**	**28.7 J**	**16.5 J**	**11.7**	**19.4**
Selenium	mg/kg	5,800	3.5 U	3.6 U	3.5 U	**2.6 J**	**1.8 J**	3.7 U	**2.4 J**	**3.1 J**
Silver	mg/kg	5,800	**12.7 J**	**2.7 J**	**17.8**	**15.3**	**19.7**	**3.5**	**2.9 J**	**7.9 J**
Vanadium	mg/kg	5,800	**107 J**	**12.9 J**	**114**	**70.3**	**99.3**	**29.2**	**14 J**	**43.4 J**
Zinc	mg/kg	350,000	**743 J**	**64.2 J**	**2,040**	**7,040**	**210**	**461**	**580 J**	**6,300 J**
Other										
Cyanide	mg/kg	150	**0.27 J-**	1.1 UJ	**0.8 J-**	**1.3 J-**	**1.8 J-**	**0.33 J-**	**0.54 J-**	1.1 UJ

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
* indicates non-validated data
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 actual quantitation/detection limit may be higher than reported.
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.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 7
Summary of Inorganics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-015-SB-1	B17-015-SB-5	B17-016-SB-1	B17-016-SB-4	B17-017-SB-1.5	B17-017-SB-6	B17-018-SB-1.5*	B17-018-SB-4*
Metal										
Aluminum	mg/kg	1,100,000	**17,000**	**37,900**	**19,500**	**12,300**	**13,900**	**15,800**	**42,000**	**45,000**
Antimony	mg/kg	470	2.6 UJ	2.7 UJ	2.6 UJ	2.6 UJ	**1.2 J**	2.7 UJ	2.5 U	2.8 U
Arsenic	mg/kg	3	**7.8**	2.2 U	**12.3**	**13.1**	**21.1**	**5.2**	**4.6**	2.3 U
Barium	mg/kg	220,000	**273 J**	**284 J**	**296 J**	**560 J**	**138 J**	**176 J**	**578**	**600**
Beryllium	mg/kg	2,300	**1.9**	**6.8**	**1.2**	**0.98**	**1.6**	**1.6**	**2.8**	**2.6**
Cadmium	mg/kg	980	**2.9**	1.3 U	**1.4**	**4.5**	**0.76 J**	**0.76 J**	1.3 U	1.4 U
Chromium	mg/kg	120,000	**68.9 J**	**10 J**	**80.9 J**	**259 J**	**15.1 J**	**146 J**	**11.3**	**2.8**
Chromium VI	mg/kg	6.3	0.57 B	0.62 B	0.67 B	0.62 B	0.53 B	0.84 B	0.65 B	0.62 B
Cobalt	mg/kg	350	**9.3**	**0.5 J**	**9.6**	**15**	**15**	**5.4**	**4 J**	**2.1 J**
Copper	mg/kg	47,000	**169**	**2.1 J**	**302**	**663**	**159 J**	**66.9 J**	**56.3**	**38.1**
Iron	mg/kg	820,000	**42,200**	**5,210**	**56,600**	**59,500**	**86,500**	**66,200**	**46,600**	**10,400**
Lead	mg/kg	800	**749 J**	**10.6 J**	**454 J**	**1,120 J**	**344 J**	**172 J**	**31.6**	2.3 U
Manganese	mg/kg	26,000	**2,240**	**2,260**	**1,630**	**1,450**	**2,670**	**4,820**	**4,280**	**3,350**
Mercury	mg/kg	350	**0.21**	**0.0045 J**	**0.26**	**0.31**	**0.0049 J**	**0.024 J**	**0.032 J**	0.11 U
Nickel	mg/kg	22,000	**32.8**	**1.6 J**	**37.6**	**89.1**	**14.3**	**9.4**	**7.6 J**	**4.5 J**
Selenium	mg/kg	5,800	3.5 U	2.5 B	1.9 B	2.2 B	**2.3 J**	3.6 U	**4.4**	**8.2**
Silver	mg/kg	5,800	**7.7**	**7.5**	**7.4**	**5.2**	**6.4 J**	**7.7 J**	**11**	**11.6**
Vanadium	mg/kg	5,800	**29.4**	**8.4**	**36.9**	**24.8**	**23.8 J**	**79.1 J**	**20.6**	**13.8**
Zinc	mg/kg	350,000	**864 J**	**13.6 J**	**396 J**	**1,020 J**	**540 J**	**486 J**	**33.8**	**69.1**
Other										
Cyanide	mg/kg	150	**2.3 J-**	**0.42 J-**	**1.7 J-**	**2.3 J-**	**0.96 J-**	**1.4 J-**	**0.55 J**	**0.14 J**

Detections in bold

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

* indicates non-validated data

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 actual quantitation/detection limit may be higher than reported.

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.

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

Table 7
Summary of Inorganics Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-019-SB-2*	B17-019-SB-4*	B17-020-SB-1.5*	B17-020-SB-4*	B17-021-SB-1.5	B17-021-SB-5
Metal								
Aluminum	mg/kg	1,100,000	**12,400**	**5,790**	**32,400**	**20,800**	**15,200**	**5,040**
Antimony	mg/kg	470	**7.8**	**12.1**	**2.4 J**	**1.2 J**	2.5 UJ	2.5 UJ
Arsenic	mg/kg	3	**153**	**218**	**11.3**	**12.3**	2 U	**13**
Barium	mg/kg	220,000	**919**	**968**	**569**	**435**	**137 J**	**130 J**
Beryllium	mg/kg	2,300	**1**	**0.56 J**	**1.8**	**1.8**	**0.71 J**	**0.5 J**
Cadmium	mg/kg	980	**5.1**	**4.1**	**2.4**	**1.5**	**3.9**	**1.4**
Chromium	mg/kg	120,000	**13.9**	**6.2**	**669**	**80.7**	**3,310 J**	**36.3 J**
Chromium VI	mg/kg	6.3	0.43 B	0.72 B	0.67 B	0.59 B	0.62 B	0.57 B
Cobalt	mg/kg	350	**20.5**	**26.8**	**38.7**	**8.2**	**73.1**	**12.3**
Copper	mg/kg	47,000	**502**	**786**	**487**	**189**	**162**	**197**
Iron	mg/kg	820,000	**275,000**	**327,000**	**105,000**	**60,100**	**85,700**	**59,600**
Lead	mg/kg	800	**4,520**	**6,780**	**580**	**614**	**188 J**	**274 J**
Manganese	mg/kg	26,000	**52,800**	**4,360**	**3,910**	**9,380**	**12,200**	**2,920**
Mercury	mg/kg	350	**0.013 J**	**0.012 J**	**0.056 J**	**0.28**	**0.025 J**	**0.62**
Nickel	mg/kg	22,000	**21.7**	**21**	**337**	**12**	**491**	**25.3**
Selenium	mg/kg	5,800	3.6 U	3.8 U	2.3 B	3.6 U	3.3 U	1.7 B
Silver	mg/kg	5,800	**17.1**	**2.3 J**	**9.9**	**10.6**	**20.6**	**4.3**
Vanadium	mg/kg	5,800	**22**	**30.1**	**41.5**	**48.9**	**149**	**30**
Zinc	mg/kg	350,000	**2,200**	**2,170**	**839**	**762**	**358 J**	**359 J**
Other								
Cyanide	mg/kg	150	1.1 U	**0.24 J**	**0.43 J**	**1.9**	**0.43 J-**	**0.93 J-**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
* indicates non-validated data
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 actual quantitation/detection limit may be higher than reported.
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.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 8
Summary of Asbestos Detected in Soil
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	Asbestos Content	Other Fibrous Non-Asbestos Content
B17-001-SB-1	**Amosite <1%**	Cellulose <1%
B17-002-SB-1	ND	Cellulose <1%
B17-004-SB-1	ND	Cellulose <1%
B17-007-SB-1	**Chrysotile <1%**	Cellulose <1%
B17-015-SB-1	**Chrysotile <1%**	Cellulose <1% Glass Fibers <1%
B17-016-SB-1	ND	Cellulose <1%

Bolded sample detections of fibrous materials were less than 1% asbestos
ND indicates a Non-Detect
All asbestos results are non-validated

TABLE 9
SUMMARY OF SOIL PAL EXCEEDANCES

Parameter	CAS#	Frequency of Detections (%)	Sample ID of Max Result	Max Result	PAL Solid	Units
Aroclor 1254	11097-69-1	15	B17-019-SB-2	2.4	0.97	mg/kg
Arsenic	7440-38-2	84	B17-019-SB-4	218	3	mg/kg
Benz[a]anthracene	56-55-3	100	B17-008-SB-1.5	47.5	21	mg/kg
Benzo[a]pyrene	50-32-8	97	B17-008-SB-1.5	32.8	2.1	mg/kg
Benzo[b]fluoranthene	205-99-2	100	B17-008-SB-1.5	67.6	21	mg/kg
Dibenz[a,h]anthracene	53-70-3	92	B17-008-SB-1.5 & B17-016-SB-1	4	2.1	mg/kg
Lead	7439-92-1	97	B17-014-SB-5	9,720	800	mg/kg
Manganese	7439-96-5	100	B17-019-SB-2	52,800	26,000	mg/kg
Oil & Grease	O&G	100	B17-008-SB-7.5	28,100	6,200	mg/kg
PCBs (total)	1336-36-3	30	B17-019-SB-2	2.4	0.97	mg/kg

TABLE 10
SOIL PAL EXCEEDANCES FOR SPECIFIC TARGETS

Target Feature	Boring ID	Sample Depth (ft)	Parameter	PAL	Result (mg/kg)	Final Flag
Drip Legs	B17-001-SB	1	Arsenic	3	30.7	
		1	Benzo[a]pyrene	2.1	6.3	
	B17-002-SB	1	Arsenic	3	17.2	
		5	Arsenic	3	8.3	
Machine Shop No. 2 Asbestos Piles	B17-004-SB	4	Arsenic	3	39.6	
	B17-005-SB	2	Arsenic	3	9.9	
		4	Arsenic	3	14.9	
	B17-006-SB	1.5	Arsenic	3	8.8	
		4	Arsenic	3	12.8	
Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps)	B17-008-SB	1.5	Benz[a]anthracene	21	47.5	
		1.5	Benzo[a]pyrene	2.1	32.8	
		1.5	Benzo[b]fluoranthene	21	67.6	
		1.5	Dibenz[a,h]anthracene	2.1	4	
		1.5	Oil & Grease	6,200	26,000	J-
		7.5	Arsenic	3	15.4	
		7.5	Benzo[a]pyrene	2.1	4.9	
		7.5	Lead	800	1,090	J
		7.5	Oil & Grease	6,200	28,100	J-
	B17-009-SB	1.5	Arsenic	3	27.7	
		4	Manganese	26,000	36,900	
	B17-021-SB	1.5	Oil & Grease	6,200	8,860	J+
		5	Arsenic	3	13	
Chesapeake Heavy Machine Service	B17-010-SB	2	Arsenic	3	4.8	
		8	Arsenic	3	20	
	B17-011-SB	1.5	Arsenic	3	13.7	
		5	Arsenic	3	12.8	
Old Blacksmith Shop/Heat Treating Plant	B17-012-SB	1.5	Arsenic	3	18.3	
		1.5	Lead	800	1,580	
		4	Arsenic	3	38.6	
		4	Lead	800	4,010	
	B17-013-SB	1.5	Arsenic	3	4.3	
		1.5	Oil & Grease	6,200	8,630	J-
		4	Arsenic	3	5.7	

TABLE 10
SOIL PAL EXCEEDANCES FOR SPECIFIC TARGETS

Target Feature	Boring ID	Sample Depth (ft)	Parameter	PAL	Result (mg/kg)	Final Flag
Utility Drain	B17-014-SB	1.5	Arsenic	3	38	
		1.5	Lead	800	1,360	J
		5	Arsenic	3	204	
		5	Lead	800	9,720	J
	B17-015-SB	1	Arsenic	3	7.8	
		1	Benzo[a]pyrene	2.1	3.3	
	B17-016-SB	1	Arsenic	3	12.3	
		1	Benz[a]anthracene	21	27.1	
		1	Benzo[a]pyrene	2.1	22	
		1	Benzo[b]fluoranthene	21	55.2	
		1	Dibenz[a,h]anthracene	2.1	4	
		4	Arsenic	3	13.1	
		4	Benzo[a]pyrene	2.1	2.2	
		4	Lead	800	1,120	J
Machine Shop No. 2 Maintenance Floor	B17-017-SB	1.5	Arsenic	3	21.1	
		6	Arsenic	3	5.2	
	B17-018-SB	1.5	Arsenic	3	4.6	
	B17-019-SB	2	Aroclor 1254	0.97	2.4	
		2	Arsenic	3	153	
		2	Lead	800	4,520	
		2	Manganese	26,000	52,800	
		2	PCBs (total)	0.97	2.4	
		4	Arsenic	3	218	
		4	Lead	800	6,780	
	B17-020-SB	1.5	Aroclor 1254	0.97	2.3	
		1.5	Arsenic	3	11.3	
		1.5	Benzo[a]pyrene	2.1	7.6	
		1.5	PCBs (total)	0.97	2.3	J
		4	Arsenic	3	12.3	

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

Table 11
Summary of Organics Detected in Groundwater
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-009-PZ	B17-014-PZ*	B17-015-PZ*	B17-016-PZ*	B17-019-PZ	B17-020-PZ	SW-026-MWS
Volatile Organic Compounds									
Acetone	µg/L	14,000	10 UJ	**4.8 J**	**3.8 J**	**3.8 J**	8 B	5.5 B	10 R
Semi-Volatile Organic Compounds^									
1,4-Dioxane	µg/L	0.46	0.1 U	0.1 U	0.1 U	**0.03 J**	**0.032 J**	0.1 U	0.1 U
2-Methylnaphthalene	µg/L	36	**0.06 J**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	**0.97**
Acenaphthene	µg/L	530	**0.056 J**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	**0.12**
Acenaphthylene	µg/L	530	**0.077 J**	0.1 U	**0.04 J**	**0.037 J**	0.098 U	0.1 U	**0.02 J**
Anthracene	µg/L	1,800	**0.084 J**	0.1 U	**0.085 J**	**0.18**	0.098 U	0.1 U	**0.15**
Benz[a]anthracene	µg/L	0.03	0.1 U	0.1 U	**0.19**	**0.45**	0.098 U	0.1 U	**0.043 J**
Benzo[a]pyrene	µg/L	0.2	0.1 U	0.1 U	**0.21**	**0.37**	0.098 U	0.1 U	0.1 U
Benzo[b]fluoranthene	µg/L	0.25	0.1 U	0.1 U	**0.38**	**0.8**	0.098 U	0.1 U	0.1 U
Benzo[g,h,i]perylene	µg/L		0.1 U	0.1 U	**0.18**	**0.27**	0.098 U	0.1 U	0.1 U
Benzo[k]fluoranthene	µg/L	2.5	0.1 U	0.1 U	**0.36**	**0.76**	0.098 U	0.1 U	0.1 U
bis(2-Ethylhexyl)phthalate	µg/L	6	1 U	1 U	1 U	1 U	0.98 U	1 U	**0.21 J**
Chrysene	µg/L	25	0.1 U	0.1 U	**0.19**	**0.5**	0.098 U	0.1 U	**0.021 J**
Dibenz[a,h]anthracene	µg/L	0.025	0.1 U	0.1 U	**0.048 J**	**0.097 J**	0.098 U	0.1 U	0.1 U
Fluoranthene	µg/L	800	**0.075 J**	0.1 U	**0.31**	**0.88**	**0.07 J**	0.1 U	**0.051 J**
Fluorene	µg/L	290	**0.11**	0.1 U	0.1 U	0.1 U	0.098 U	0.1 U	**0.2**
Indeno[1,2,3-c,d]pyrene	µg/L	0.25	0.1 U	0.1 U	**0.15**	**0.25**	0.098 U	0.1 U	0.1 U
Naphthalene	µg/L	0.17	**0.27**	0.1 U	0.1 U	**0.11**	0.098 U	0.1 U	**0.36**
Phenanthrene	µg/L		**0.23**	0.1 U	**0.11**	**0.59**	0.098 U	0.1 U	**0.7**
Pyrene	µg/L	120	0.1 U	0.1 U	**0.29**	**0.66**	**0.065 J**	0.1 U	**0.09 J**
TPH/Oil and Grease									
Diesel Range Organics	µg/L	47	77.1 B	84.4 B	**148**	**159**	**238 J**	75.5 B	**530 J**

Detections in bold
Values in red indicate an exceedace of the Project Action Limit (PAL)
* indicates non-validated data
^ PAH compounds were analyzed via SIM
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 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.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in the sample.

Table 12
Summary of Inorganics Detected in Groundwater
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B17-009-PZ	B17-014-PZ*	B17-015-PZ*	B17-016-PZ*	B17-019-PZ	B17-020-PZ	SW-026-MWS
Total Metals									
Aluminum	µg/L	20,000	N/A	N/A	N/A	N/A	N/A	N/A	**726**
Barium	µg/L	2,000	N/A	N/A	N/A	N/A	N/A	N/A	**54.9**
Chromium	µg/L	100	N/A	N/A	N/A	N/A	N/A	N/A	**1.1 J**
Manganese	µg/L	430	N/A	N/A	N/A	N/A	N/A	N/A	**11.2**
Zinc	µg/L	6,000	N/A	N/A	N/A	N/A	N/A	N/A	**1.5 J**
Dissolved Metals									
Aluminum, Dissolved	µg/L	20,000	50 U	**21.1 J**	50 U	50 U	**34.6 J**	**27.2 J**	**582**
Arsenic, Dissolved	µg/L	10	5 U	**6.8**	5 U	**2.9 J**	5 U	5 U	5 U
Barium, Dissolved	µg/L	2,000	**23.3**	**58.9**	**79.9**	**76.9**	**111**	**112**	**52.2**
Iron, Dissolved	µg/L	14,000	**12.7 J**	**311**	**284**	**643**	**516**	**153**	**21.3 J**
Manganese, Dissolved	µg/L	430	**309**	**389**	**627**	**682**	**514**	**448**	1.4 B
Vanadium, Dissolved	µg/L	86	**0.78 J**	**0.64 J**	5 U	5 U	5 U	5 U	5 U
Zinc, Dissolved	µg/L	6,000	10 U	**1.6 J**	**2.5 J**	**2.9 J**	1.1 B	10 U	10 U
Other									
Available Cyanide	µg/L	200	**0.92 J**	**2.4**	2 U	**0.57 J**	**1.6 J**	**1.9 J**	N/A
Total Cyanide	µg/L	200	10 U	**3.5 J**	10 U	10 U	**6.6 J+**	**4.9 J+**	10 U

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
* indicates non-validated data
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
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 high.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 13
Cumulative Vapor Intrusion Criteria Comparison

				B17-009-PZ		B17-014-PZ		B17-015-PZ		B17-016-PZ	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk											
1,4-Dioxane	SVOC		130,000	0.1 U	0	0.1 U	0	0.1 U	0	0.03	2.3E-12
Naphthalene	SVOC		200	0.27	1.4E-08	0.1 U	0	0.1 U	0	0.11	5.5E-09
Cumulative Vapor Intrusion Cancer Risk					1E-08		0E+00		0E+00		6E-09
Non-Cancer Hazard											
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		0		0

				B17-019-PZ		B17-020-PZ		SW-026-MWS	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk									
1,4-Dioxane	SVOC		130,000	0.032	2.5E-12	0.1 U	0	0.1 U	0
Naphthalene	SVOC		200	0.098 U	0	0.1 U	0	0.36	1.8E-08
Cumulative Vapor Intrusion Cancer Risk					2E-12		0E+00		2E-08
Non-Cancer Hazard									
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		0

Highlighted values indicate exceedances of the cumulative vapor intrusion criteria:
TCR>1E-05
THI>1
Conc. = Concentration

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

EnviroAnalytics Group

Parcel B17 - Table 14

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: *B17-002-SB-5*					
1,4-Dioxane	0.11	mg/kg	24	no	R
Sample: *B17-004-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: *B17-004-SB-4*					
1,4-Dioxane	0.12	mg/kg	24	no	R
Sample: *B17-005-SB-2*					
1,4-Dioxane	0.15	mg/kg	24	no	R
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

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***B17-005-SB-2***				
Benzaldehyde	0.07	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.07	mg/kg	250,000	no	R
Sample:	***B17-005-SB-4***				
1,4-Dioxane	0.15	mg/kg	24	no	R
Benzaldehyde	0.077	mg/kg	120,000	no	R
Sample:	***B17-006-SB-4***				
1,4-Dioxane	0.16	mg/kg	24	no	R
Sample:	***B17-008-SB-1.5***				
1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	1.5	mg/kg	120,000	no	R
Sample:	***B17-008-SB-7.5***				
1,4-Dioxane	0.13	mg/kg	24	no	R
Benzaldehyde	1.4	mg/kg	120,000	no	R
Sample:	***B17-009-SB-4***				
1,4-Dioxane	0.11	mg/kg	24	no	R
Sample:	***B17-010-SB-8***				
1,4-Dioxane	0.16	mg/kg	24	no	R
Sample:	***B17-013-SB-1.5***				
1,4-Dioxane	0.12	mg/kg	24	no	R
Sample:	***B17-013-SB-4***				
1,4-Dioxane	0.11	mg/kg	24	no	R
Sample:	***B17-014-SB-1.5***				
1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	1.5	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***B17-014-SB-5***				
1,4-Dioxane	0.14	mg/kg	24	no	R
Benzaldehyde	0.075	mg/kg	120,000	no	R
Sample:	***B17-016-SB-4***				
1,4-Dioxane	0.17	mg/kg	24	no	R
Sample:	***B17-017-SB-1.5***				
1,4-Dioxane	0.17	mg/kg	24	no	R
Benzaldehyde	1.5	mg/kg	120,000	no	R
Sample:	***B17-017-SB-6***				
1,4-Dioxane	0.12	mg/kg	24	no	R
Benzaldehyde	1.5	mg/kg	120,000	no	R
Sample:	***B17-021-SB-1.5***				
1,4-Dioxane	0.098	mg/kg	24	no	R
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
Sample:	***B17-021-SB-5***				
1,4-Dioxane	0.19	mg/kg	24	no	R

APPENDIX A

Parcel B17 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
Drip Legs		Drip Legs Drawings 5885B	Coke oven gas condensate was removed from the gas pipelines at drip legs located throughout the distribution system. The condensate was typically discharged to drums, although it is possible some spilled out of the drums and on to the ground.	2	B17-001 and B17-002	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')
Machine Shop No. 2 Asbestos Piles ^	REC 14A, Finding 250	REC Location Map/ DCC Figure	During the Phase I ESA site visit conducted by Weaver Boos, the Machine Shop No. 2 was observed to be demolished. Demolition material piles were observed where the Machine Shop No. 2 historically stood. Asbestos-containing debris was observed in demolition piles during this time . During an ARM site visit, conducted on June 1, 2016, there were no demolition stock piles present within the Site.	4	B17-003 through B17-006	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'), Asbestos (0-1')
Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps)	REC 14B, Finding 251	REC Location Map/ DCC Figure	During the Phase I ESA site visit, oily pits/sumps were observed in the Machine Shop No. 2 area. Due to safety reasons, Weaver Boos did not conduct further field investigation. Little information is known about this oily materials extent. During an ARM Site visit, conducted on June 1, 2016, the oily pits and sumps were not present at the Site.	4	B17-007 through B17-009; B17-021	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'), Asbestos (0-1')
Chesapeake Heavy Machine Service		Drawings 5025 and 5026	Investigate potential impacts related to the Machine Shop and Industiral Eng. Off. (potential leaks or releases).	2	B17-010 and B17-011	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'), Asbestos (0-1')

Parcel B17 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
Old Blacksmith Shop/Heat Treating Plant		Drawings 5031 and 5032	Investigate potential impacts related to the Old Blacksmith Shop (potential leaks or releases).	2	B17-012 and B17-013	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'), Asbestos (0-1')
(MDE Request) Utility Drain		Drawings 5525 and 5526	Investigate potential impacts related to underground utility drains (potential leaks or releases).	3	B17-014 through B17-016	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'), Asbestos (0-1')
(MDE Request) Machine Shop No. 2 Maintance Floor		Drawing 5526	Investigate potential impacts related to the Machine Shop No. 2 Maintance Floor (potential leaks or releases).	4	B17-017 through B17-020	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'), Asbestos (0-1')
			Total	21				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
No Engineered Barrier (1-15 acres): 1 boring per acre with no less than 3.
Engineered Barrier (1-15 acres): 0.5 boring per acre with no less than 2.
No Engineered Barrier (3.6 acres) = **4 borings required, 4 proposed**
Engineered Barrier (6.2 acres) = **4 borings required, 17 proposed**
Parking/Roads (1.5 acres)
Buildings (4.7 acres)

VOC - Volatile Organic Compounds (Target Compound List)
SVOCs - Semivolatile Organic Compounds (Target Compound List)
Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)
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

^ All proposed samples located in the REC 14A-14B area will be analyzed for asbestos (0-1') due to previous asbestos piles in the No. 2 Machine demolition area.

Parcel B17 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†
(MDE Request) Machine Shop No. 2 Stained Ground (Possible Oily Pits/Sumps)	REC 14B, Finding 251	REC Location Map/ DCC Figure	*N/A*	1	B17-009-PZ	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, Available Cyanide, Oil & Grease, DRO/GRO
(MDE Request) Utility Drain		Drawings 5525 and 5526	*N/A*	3	B17-014-PZ through B17-016-PZ	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, Available Cyanide, Oil & Grease, DRO/GRO
(MDE Request) Machine Shop No. 2 Maintance Floor		Drawing 5526	*N/A*	2	B17-018-PZ** and B17-019-PZ	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, Available Cyanide, Oil & Grease, DRO/GRO
Area B Groundwater Well (will not be resampled)			See Area B Groundwater Investigation Report	1	SW-026-MWS	See Area B Groundwater Investigation Report	See Area B Groundwater Investigation Report	See Area B Groundwater Investigation Report
			Total:	7				

Field measurements include pH, DO, ORP, conductivity, temperature.
Dissolved Metals include dissolved hexavalent chromium.
Area B Groundwater wells were sampled for hexavalent chromium (total).
**Location B17-018-PZ was replaced by B17-020-PZ

APPENDIX B

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-001-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566745.74
Easting (US ft)	: 1456121.93

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-	B17-001-SB-1	(0-1') Non-native SAND with some SLAG GRAVEL, very fine to medium grained, medium dense, dark brown, dry, no plasticity, no cohesion	SW	
		-		(1-8.5') SLAG, SAND and GRAVEL-sized, medium dense, gray and light gray, wet at 4.5' bgs, no plasticity, no cohesion		
	60	4.5				
		3.5				
		1.4			SW/GW	Wet at 4.5' bgs
5						
		-				
		-				
	54	0.6				
		1.3		(8.5-10') SLAG, SAND-sized to fine GRAVEL-sized, medium dense, dark brown with traces of yellow, wet, no plasticity, no cohesion		
		1.5			SW/GW	
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-002-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566715.71
Easting (US ft)	: 1456125.26

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-	B17-002-SB-1	(0-8') SLAG, SAND and GRAVEL-sized, with some large CLAY lenses, medium dense, dark grayish brown and brown, dry, no plasticity, no cohesion		
		-				
	56	1.3				
		8.7			SW/GW	
		21.7	B17-002-SB-5			
5						
		-				
		-				
	50	2.4				
		5.2		(8-9.5') SLAG GRAVEL, fine grained, medium dense, very dark brown, moist then wet at 8.5' bgs, no plasticity, no cohesion	GP	Wet at 8.5' bgs
		0.3		(9.5-10') Non-native SAND, fine to medium grained, medium dense, very dark brown, wet, no plasticity, no cohesion	SW/GW	
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-004-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/20/17
Weather	: Sunny, 80s
Northing (US ft)	: 566595.43
Easting (US ft)	: 1456083.15

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
	80	-	B17-004-SB-1	(0-10') Non-native SAND with SLAG GRAVEL, fine to coarse grained, dark brown with some yellow and gray, dry, then moist from 7.3-8' bgs, then wet at 8' bgs, no plasticity, no cohesion	SW/GW	
		0.4				
		0.5				
		33.1	B17-004-SB-4			
		0.0				
5		-				
		-				
	54	10.2				Wet at 8' bgs
		8.2				
		8.5				
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-005-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/18/17
Weather	: Cloudy, 70s
Northing (US ft)	: 566392.71
Easting (US ft)	: 1456117.20

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-0.8') CONCRETE	NA	Drilled using star bit through concrete
		-	B17-005-SB-2	(0.8-10') Non-native SAND and SLAG GRAVEL, medium dense, dark brown, brown, light brown, and reddish yellow, dry then wet at 6.5' bgs, no plasticity, no cohesion		
	80	166.2				Metallic gravel 2-4' bgs and 10' bgs Coal-like granules present throughout
		15,000	B17-005-SB-4			
		61.3				
5					SW/GP	
		-				
		-				Wet at 6.5' bgs
	70	-				
		-				
		-				
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-006-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/20/17
Weather	: Sunny, 80s
Northing (US ft)	: 566308.85
Easting (US ft)	: 1455513.18

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-0.5') CONCRETE, very pale brown	NA	
			B17-006-SB-1.5	(0.5-8.5') Non-native SAND and SLAG GRAVEL and SAND-sized, medium dense, dark brown and gray with red, dry then wet at 8' bgs, no plasticity, no cohesion		
		0.1				
	90	3.2				
		42.7	B17-006-SB-4			
		40.8			SW/GW	
5						
		-				
		-				
	56	2.2				Wet at 8' bgs
		5.4		(8.5-10') SLAG GRAVEL, fine, dense to medium dense at 9' bgs, gray to dark brown and reddish yellow at 9' bgs, wet, no plasticity, no cohesion		
		1.2			GP	
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-007-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/19/17
Weather	: Partly cloudy, 70s
Northing (US ft)	: 566,449.00
Easting (US ft)	: 1,455,826.00

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		1.0	B17-007-SB-1	(0-1.8') Non-native SAND and SLAG, GRAVEL and SAND-sized, medium dense, dark brown and gray with red, dry then wet at 8' bgs, no plasticity, no cohesion	SW/GW	
1						
	83	2.8				
				(1.8-3') SLAG GRAVEL, fine, dense, gray, wet, no plasticity, no cohesion		Plastic liner above impacted material and 3" of fibrous absorbent material below Black, light to medium viscous NAPL present 1.8-3' bgs; moderate odor
2					GP	
		6.0				No water encountered.
3				End of boring		
4						

Total Borehole Depth: 3' bgs.
Boring terminated at 3' bgs due to refusal.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-008-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/18/17
Weather	: Cloudy, 80s
Northing (US ft)	: 566,391.00
Easting (US ft)	: 1,455,848.00

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.5') CONCRETE	NA	Drilled using star bit through concrete
		-	B17-008-SB-1.5	(0.5-2') SAND and SLAG GRAVEL, medium dense, dark brown and gray, moist, no plasticity, no cohesion	SW/GW	
		-				
	50	-		(2-3') BRICK GRAVEL with SAND, medium dense, yellow and reddish yellow, moist, no plasticity, no cohesion	GW/SW	
		11.6		(3-3.7') CONCRETE GRAVEL, medium dense, very pale brown, dry, no plasticity, no cohesion	NA	
		10.3		(3.7-7.5') Non-native SAND and GRAVEL, medium dense, brown with reddish yellow and gray, moist, no plasticity, no cohesion		
5		-			SW/GW	
		-	B17-008-SB-7.5			
	60	50.2				Wet at 7.5' bgs
		47.3		(7.5-12.5') SLAG GRAVEL with SAND and SILT, medium dense, very dark brown and very dark gray to black with some yellowish red, wet, no plasticity, no cohesion		Very light petroleum-like odor; no visible product from 7.5-10' bgs
		88.6				
10		-			GW-GM	
		-				
	20	-		(12.5-15') SAND, fine to coarse, with some SILT and trace fine GRAVEL, medium dense to loose, dark brown, wet, no plasticity, no cohesion		
		-				
		0.7				
15				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-009-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/20/17
Weather	: Sunny, 80s
Northing (US ft)	: 566406.76
Easting (US ft)	: 1455496.94

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.5') CONCRETE, loose, very pale brown, dry, no plasticity, no cohesion	NA	
		-	B17-009-SB-1.5	(0.5-4') Non-native SAND with SLAG and BRICK GRAVEL, medium dense, dark brown, very pale brown, and yellowish red, dry, no plasticity, no cohesion		
		8.4				
	80	110.7			SW/GW	
		86.5	B17-009-SB-4			
		2.8		(4-4.5') SLAG, SAND and GRAVEL-sized, medium dense, light gray and gray, dry, no plasticity, no cohesion	GW/SW	Abundant metallic fine grains 4.5-10' bgs
5		-		(4.5-14') SLAG GRAVEL, fine, medium dense, dark brown, reddish brown, and yellowish red, then gray and black at depth, dry then wet at 7' bgs, no plasticity, no cohesion		
		23.5				Wet at 7' bgs
	80	56.7				
		2.1				
		2.6			GP	
10		-				
		-				
	63					Fish-like odor 12-13.7' bgs
		-				Petroleum-like odor 13.7-14' bgs
		-				
				End of boring		
15						

Total Borehole Depth: 14' bgs.
Boring terminated at 14' bgs due to water and piezometer installation.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-010-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566,308.72
Easting (US ft)	: 1,455,734.94

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-1') CONCRETE SLAB, very pale brown	NA	
		-	B17-010-SB-2	(1-3.5') SAND, fine to coarse grained, medium dense, very pale brown, moist, no plasticity, no cohesion	SW	
	40	-				
		7.5		(3.5-7.5') SLAG, SAND and GRAVEL-sized, medium dense to dense, grayish brown and gray, dry, no plasticity, no cohesion	SW/GW	
		0.1				
5		-				
		23.5				
	60	14.8	B17-010-SB-8	(7.5-10') SLAG and BRICK GRAVEL, fine, dense, dark brown with red, moist then wet at 8' bgs, no plasticity, no cohesion	GP	Wet at 8' bgs
		3.8				
		0.2				
10				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-011-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/18/17
Weather	: Partly cloudy, 70s
Northing (US ft)	: 566,361.00
Easting (US ft)	: 1,455,947.00

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-0.7') CONCRETE	NA	Drilled using star bit through concrete
			B17-011-SB-1.5	(0.7-8.7') GRAVEL, fine, with SAND, medium dense, brown with trace yellow, dry grading to moist, then wet at 7' bgs, no plasticity, no cohesion		Gravel size increases with depth and coal-like granules present throughout 0.7-8.7' bgs
	54	-				
		8.7				
		0.2	B17-011-SB-5		GP/SW	
5		-				
		-				Wet at 7' bgs
	60	0.8				
		3.8				
		5.3		(8.7-9.8') SLAG and BRICK GRAVEL with some SAND-sized SLAG, medium dense, gray, wet, no plasticity, no cohesion	GP	Very light amber colored NAPL with light sheen 8.7-9.8' bgs
10				(9.8-11') CLAYEY SAND with some SLAG GRAVEL, medium dense, grayish brown, wet, no plasticity, no cohesion	SC	
	40					
				(11-15') SAND, fine to coarse grained, medium dense, yellowish brown, wet, no plasticity, no cohesion	SW	
15				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-012-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/20/17
Weather	: Sunny, 80s
Northing (US ft)	: 566650.63
Easting (US ft)	: 1455535.82

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-0.6') BRICK GRAVEL with CONCRETE, loose, very pale brown, dry, no plasticity, no cohesion	NA	
			B17-012-SB-1.5	(1.8-2.1') Non-native SAND with some SLAG GRAVEL and trace CLAY lenses, medium dense, dark brown, dry, no plasticity, no cohesion	SW	
		0.4				
2						
	70	1.2		(2.1-4') SLAG, SAND and GRAVEL-sized, medium dense to dense, brown and light gray, dry, no plasticity, no cohesion	SW/GW	
		9.6	B17-012-SB-4			
4						Wet at 4' bgs
		0.2		(4-4.8') SAND with SILT, very fine to medium grained, medium dense, very dark brown, wet, no plasticity, no cohesion	SW-SM	
				(4.8-8') SLAG GRAVEL with trace SAND-sized SLAG, loose, gray and brown, wet, no plasticity, no cohesion	GW	
		-				
6						
	83	2.6				
						Very light sheen 7-8' bgs
		0.4				
8				End of boring		

Total Borehole Depth: 8' bgs.
Boring terminated at 8' bgs due to refusal.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-013-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/20/17
Weather	: Sunny, 80s
Northing (US ft)	: 566663.00
Easting (US ft)	: 1455876.05

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.5') BRICK GRAVEL, medium dense to loose, yellow, dry, no plasticity, no cohesion	NA	
		-		(0.5-3.7') Non-native SAND with BRICK and SLAG GRAVEL, medium dense, dark brown with some red, gray, and yellow, dry, no plasticity, no cohesion		
1			B17-013-SB-1.5			
		-				
2					SW/GW	
	70	32.5				
3						
		29.5	B17-013-SB-4			
				(3.7-4') CLAY with SILT, very firm, reddish yellow, dry, low plasticity, cohesive	CL	
4				(4-7') SLAG GRAVEL, fine to coarse, with SLAG SAND, loose, gray, dry then moist at 9' bgs, no plasticity, no cohesion		No water encountered
		2.1				
5						
		-			GW	
6	75					
		0.2				
7				End of boring		
8						

Total Borehole Depth: 8' bgs.
Boring terminated at 8' bgs due to refusal.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-014-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/18/17
Weather	: Drizzle, 80s
Northing (US ft)	: 566327.37
Easting (US ft)	: 1455969.41

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-0.8') CONCRETE	NA	Drilled through concrete using starbit
			B17-014-SB-1.5	(0.8-4.5') Non-native SAND with trace GRAVEL, very fine to medium grained, medium dense, dark brown, dry, no plasticity, no cohesion		Gray metallic grains present
		-				
	76	379.7			SW	
		4.0				
		27.8	B17-014-SB-5			
5				(4.5-7') SLAG GRAVEL, loose to medium dense, brown and metallic gray with some yellowish red, moist, no plasticity, no cohesion	GW	
		-				
		46.0				
						Wet at 7' bgs
	70	4.4		(7-8') Non-native SAND with trace GRAVEL, very fine to medium grained, medium dense, dark brown, wet, no plasticity, no cohesion	SW	
					GP	
		843.6		(8-8.3') GRAVEL, phyllitc, dense, very pale brown with light gray, wet, no plasticity, no cohesion		
		0.1		(8.3-12') SLAG and BRICK GRAVEL, fine to coarse, with trace SILT, loose, dark brown, red, and yellow, wet, no plasticity, no cohesion		
10					GW	
		-				
		-				
	23			(13-14') SAND with CLAY, medium dense, grayish brown to light brown, wet, no plasticity, no cohesion		
		-			SW-SC	
		-				
				End of boring		
15						

Total Borehole Depth: 14' bgs.
Boring terminated at 14' bgs due to water and piezometer installation.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-015-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566,248.11
Easting (US ft)	: 1,455,566.30

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
	90	0.6	B17-015-SB-1	(0.5-8') Non-native SAND and SLAG, SAND and GRAVEL-sized, medium dense, dark brown with gray grading to brownish gray and light gray, dry then moist at 4' bgs, no plasticity, no cohesion	SW/GW	
		0.0				
		1.4				
		2.9				
		0.4	B17-015-SB-5			
5	60	-				
		-				
		1.7				
		0.1		(8-12') SLAG GRAVEL, fine, medium dense, dark brown with some yellowish red, wet, no plasticity, no cohesion	GP	Wet at 8' bgs
		0.0				
10		-				
		-				
	80	-		(12-13') CLAYEY SAND, medium dense, reddish yellow with light gray, wet, no plasticity, no cohesion	SC	
		-		(13-13.8') SANDY CLAY, very firm, reddish yellow with light gray, very moist, low plasticity, cohesive	CL	
		-		(13.8-15') CLAY, very firm, reddish yellow, very moist, low plasticity, cohesive	CL	
15				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-016-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566244.33
Easting (US ft)	: 1455525.38

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
	60	-	B17-016-SB-1	(0-4') Non-native SAND and SLAG GRAVEL, medium dense, dark brown and light gray, dry, no plasticity, no cohesion	SW/GW	
		-				
		4.7				
		10.0	B17-016-SB-4			
		2.3		(4-7.8') CLAYEY SAND with fine QUARTZ GRAVEL, medium dense, dark brown and yellowish brown, moist, no plasticity, no cohesion	SC	
5		-				
		-				
	50	2.3				
		16.2		(7.8-13') SLAG GRAVEL, fine, medium dense, dark brown, wet at 8' bgs, no plasticity, no cohesion	GP	Wet at 8' bgs
		0.1				
10		-				
		-				
	60	-				Trace petroleum -like odor 12-13' bgs
		-		(13-15') CLAY with SAND grading to CLAY, very firm to hard, reddish yellow and light gray, moist, low plasticity, cohesive	CL	
		-				
15				End of boring		

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-017-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/18/17
Weather	: Partly cloudy, 80s
Northing (US ft)	: 566380.05
Easting (US ft)	: 1455865.54

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-1.7') Non-native SILT and very fine SAND with BRICK GRAVEL, medium dense, yellow and red, dry, no plasticity, no cohesion	NA	
			B17-017-SB-1.5			
		-				
2				(1.7-4.5') Non-native fine GRAVEL and SAND, medium dense, dark brown grading to very dark gray with light metallic grains, moist, no plasticity, no cohesion		Hard drilling; used concrete corer bit
	58	790.1			GW/SW	
		314.0				
4						
		47.2		(4.5-7') Non-native SLAG and BRICK, GRAVEL and SAND-sized, medium dense, brown, light gray, and reddish yellow, moist then wet at 6' bgs, no plasticity, no cohesion		
		968.7	B17-017-SB-6		GW/SW	
6	85					Wet at 6' bgs
		14,361				
				End of boring		
8						

Total Borehole Depth: 7' bgs.
Boring terminated at 7' bgs due to refusal.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-018-SB

(page 1 of 1)

Client	: EnviroAnalytics Group	Date	: 9/19/17
ARM Project No.	: 150300M-22-3	Weather	: Cloudy, 70s
Project Description	: Sparrows Point - Parcel B17		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: M. Replogle, E.I.T.	Northing (US ft)	: 566495.64
Drilling Company	: Allied Drilling Co.	Easting (US ft)	: 1455856.12
Driller	: Mike Garvine		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0.-0.5') CONCRETE		
		-	B17-018-SB-1.5	(0.5-5') SLAG GRAVEL, fine to coarse, with some SLAG SAND, medium dense to dense, light gray, grayish brown, and dark brown, dry then wet 4-4.5' bgs, moist 4.5-5' bgs, no plasticity, no cohesion	GW	
		-				
2						Drilling though concrete using star bit
	60	46.4				
		100.5	B17-018-SB-4			
4						No water encountered
		0.6				
				End of boring		
6						

Total Borehole Depth: 5' bgs.
Boring terminated at 5' bgs due to refusal.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-019-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/19/17
Weather	: Cloudy, 70s
Northing (US ft)	: 566,492.00
Easting (US ft)	: 1,456,019.00

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-1') CONCRETE, light brown, dry, no plasticity, no cohesion	NA	
		-	B17-019-SB-2	(1-4') SAND, very fine to medium, medium dense, dark brown, dry, no plasticity, no cohesion		
2	60	54.0			SW	
		557.3	B17-019-SB-4			
4		22.3		(4-7.5') SAND with some CLAY, medium dense to dense, reddish yellow with trace very pale brown, very moist then wet at 6.5' bgs, no plasticity, no cohesion		
		-			SW	
6		3.1				Wet at 6.5' bgs
	70	134.2				
8		493.6		(7.5-14') SLAG, fine to coarse GRAVEL-sized, medium dense, black and very dark brown, wet, no plasticity, no cohesion		
		3.1				
10		-			GW	
		-				
12	8	-				
		-				
14				End of boring		
16						

Total Borehole Depth: 14' bgs.
Boring terminated at 14' bgs due to water and piezometer installation.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-020-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/19/17
Weather	: Sunny, 70s
Northing (US ft)	: 566,525.00
Easting (US ft)	: 1,455,937.00

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.5') CONCRETE	NA	Large wood flooring block soaked with oil encountered at surface
		-	B17-020-SB-1.5	(0.5-6') Non-native SAND with some BRICK and SLAG GRAVEL, medium dense, brown with gray and red, dry, no plasticity, no cohesion		
2	50	- 1.6				
		15.6	B17-020-SB-4		SW/GW	
4		1.2				
		-				
6		-		(6-10') BRICK and SLAG, SAND and GRAVEL-sized, medium dense, red, brown, and gray, wet at 7.6' bgs, no plasticity, no cohesion		
	70	8.5				Wet at 7.6' bgs
8		2.4				
		0.4			SW/GW	
10		-				
		-				
12	40	-				
		-		(13-15') SLAG GRAVEL, fine, medium dense, very dark brown, wet, no plasticity, no cohesion		
14		0.4			GP	
				End of boring		
16						

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B17-021-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-22-3
Project Description	: Sparrows Point - Parcel B17
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Allied Drilling Co.
Driller	: Mike Garvine
Drilling Equipment	: Geoprobe 7822DT

Date	: 9/21/17
Weather	: Sunny, 80s
Northing (US ft)	: 566448.41
Easting (US ft)	: 1455606.28

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		-		(0-4') Non-native SAND and SLAG, SAND and GRAVEL-sized, with some small CLAY lenses, medium dense, brown and light brownish gray, dry, no plasticity, no cohesion		
			B17-021-SB-1.5			
		-				
2					SW/GW	
	40	-				
		79.8				
4						
		42.7	B17-021-SB-5	(4-10') SLAG, SAND and GRAVEL-sized, medium dense, dark brown with reddish yellow, dry then moist at 9' bgs, wet at 9.5' bgs, no plasticity, no cohesion		
		-				
6						Moderate sweet odor throughout
		-				
					SW/GW	
	24	-				
8						
		2.6				
						Wet at 9.5' bgs
10				End of boring		
12						

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

APPENDIX C

April 1, 2016

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 31, 2016. 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 ELEVATION*
SW-026-MWS	566649.66	1455514.08	11.51	8.61

January 8, 2018

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 December 21, 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*
B17-009-PZ	566399.864	1455500.380	11.74	8.85
B17-014-PZ	566328.351	1455971.324	11.44	8.41
B17-015-PZ	566246.232	1455566.305	11.19	8.52
B17-016-PZ	566237.817	1455530.962	11.61	8.81
B17-019-PZ	566490.422	1456020.349	11.49	8.88
B17-020-PZ	566522.901	1455937.273	11.42	8.78

APPENDIX D

PID CALIBRATION LOG

PROJECT NAME: Area B, Parcel B17 Phase II	SAMPLER NAME: L. Perrin	
PROJECT NUMBER: 150300M-22	DATE: September 2017	PAGE 1 of 1

DATE/TIME	SAMPLER INITIALS	PID SERIAL #	FRESH AIR CAL	STANDARD	STANDARD CONCENTRATION	METER READING	COMMENTS
9/18/2017 9:08	LLP	592-913262	0.0	Isobutylene	100 ppm	99.9	-
9/19/2017 8:30	LLP	592-913262	0.0	Isobutylene	100 ppm	100.0	-
9/20/2017 8:40	LLP	592-913262	0.0	Isobutylene	100 ppm	100.0	-
9/21/2017 8:30	LLP	592-913262	0.0	Isobutylene	100 ppm	100.0	-
11/6/2017 9:30	LLP	592-919897	0.0	Isobutylene	100 ppm	100.0	-
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		

APPENDIX E

Test Pit Photograph Log
Area B: Parcel B17
Sparrows Point, Maryland

Photo 1: View of test pit at B17-007-SB, facing north, prior to clearing and cleaning. NAPL can be observed on the water.

Photo 2: View of test pit at B17-007-SB prior to clearing and cleaning.

Photo 3: View of the ACE Environmental crew cleaning pit at B17-007-SB and the ENRC crew using the backhoe to remove the impacted material.

Photo 4: View of the cleaned concrete box facing east. Please note the circle along the concrete floor between the I-beams; this was the Geoprobe attempt to complete B17-007-SB.

Photo 5: View of the cleaned concrete box facing south.

Photo 6: View of the cleaned concrete box facing north.

Photo 7: View of covered material removed from test pit at B17-007-SB facing north. A gravel filter berm was temporarily set up around the stockpile to prevent run-on and runoff of stormwater.

Photo 8: View of shallow test pit at B17-021-SB facing northwest. Reinforced concrete and large diameter rebar encountered during test pit activities. Little to no petroleum impacts observed.

Photo 9: View of shallow test pit at B17-021-SB facing east. Reinforced concrete and large diameter rebar encountered during test pit activities. Little to no petroleum impacts observed.

APPENDIX F

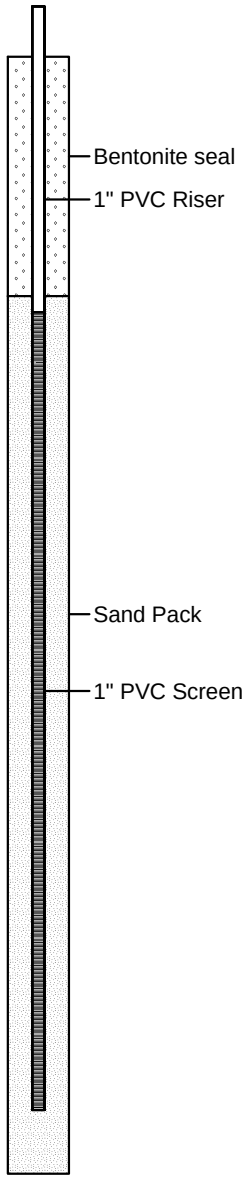
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-009-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/20/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.74' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.84' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 9.84' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.8' Riser Amount: 3.2'	Northing (US ft): 566399.86 Easting (US ft): 1455500.38
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 3' bgs Bottom: 14' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 3' bgs Grain Size: 3/8" chips	
15		End of Boring	



Total Depth: 14'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

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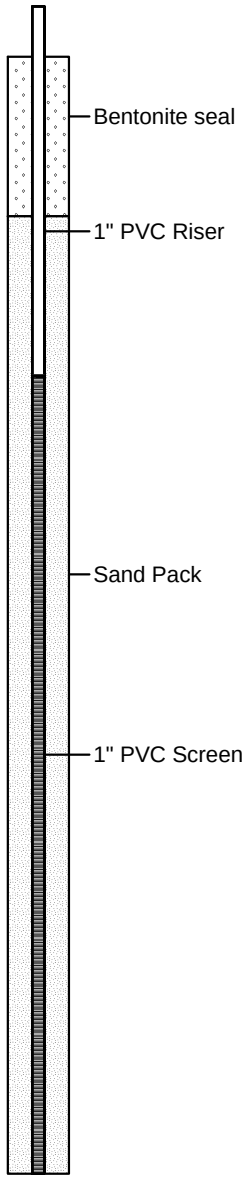
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-014-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/18/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.44' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 8.73' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 8.78' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.9' Riser Amount:4'	Northing (US ft): 566328.35 Easting (US ft): 1455971.32
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 2' bgs Bottom: 14' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 2' bgs Grain Size: 3/8" chips	
		End of Boring	
15			



Total Depth: 14'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

02-23-2018 P:\EnviroAnalytics Group\150300M EAG_Sparrows Point Area B\Documents\Parcel B17\Piezometer Logs\2_Bor Logs\B17-014-PZ.bor

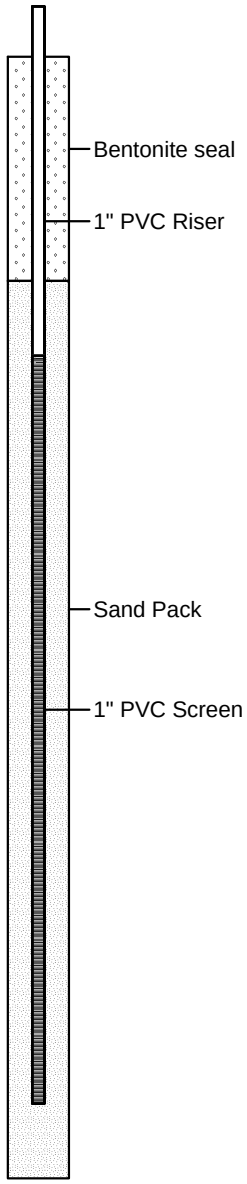
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-015-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/21/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.19' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.07' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 9.20' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.8' Riser Amount:4'	Northing (US ft): 566246.23 Easting (US ft): 1455566.31
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 3' bgs Bottom: 15' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 3' bgs Grain Size: 3/8" chips	
15		End of Boring	



Total Depth: 15'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

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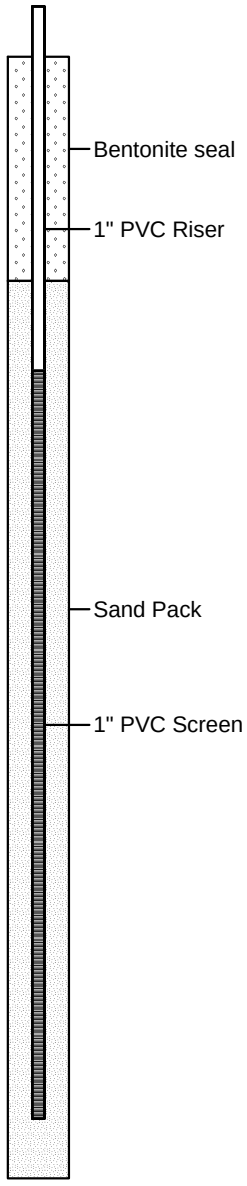
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-016-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/21/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.61' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.65' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 9.81' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.8' Riser Amount:4.2'	Northing (US ft): 566237.82 Easting (US ft): 1455530.96
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 3' bgs Bottom: 15' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 3' bgs Grain Size: 3/8" chips	
15		End of Boring	



Total Depth: 15'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

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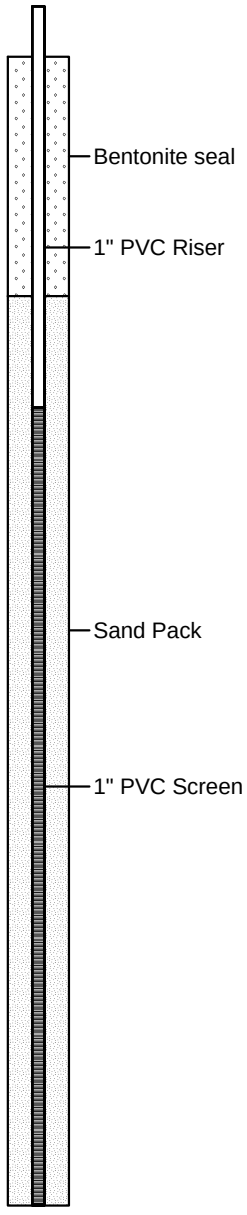
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-019-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/19/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.49' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 8.68' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 8.98' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.6' Riser Amount:4.4'	Northing (US ft): 566490.42 Easting (US ft): 1456020.35
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 3' bgs Bottom: 14.4' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 3' bgs Grain Size: 3/8" chips	
		End of Boring	
15			



Total Depth: 14.4'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

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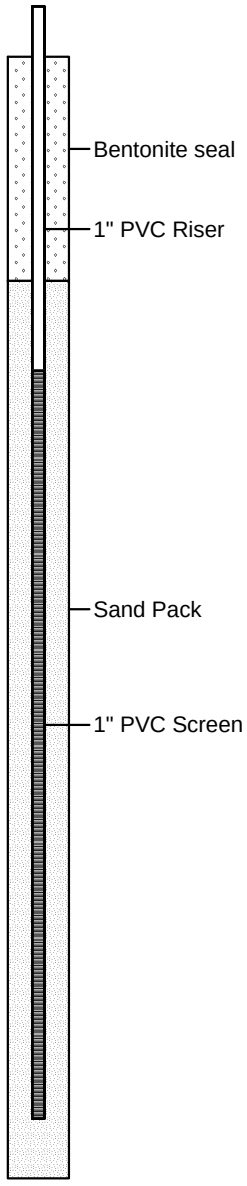
ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: B17-020-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel B17
Sparrows Point, MD
ARM Project No.: 150300M-22-3
Page 1 of 1

Date Installed	: 09/19/2017	Drilling Company	: Allied
Casing/Riser Type	: PVC	TOC Elevation	: 11.42' amsl
Borehole Diameter	: 2.25"	0-Hr DTW	: 8.97' TOC
Drilling Method	: 7822DT Geoprobe	48-Hr DTW	: 8.79' TOC
Driller	: Mike Garvine	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev.	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 2.7' Riser Amount:4.2'	Northing (US ft): 566522.90 Easting (US ft): 1455937.27
5		Screen Type: PVC Screen Diameter: 1" Screen Amount: 10' Slot Size: 0.010"	No LNAPL or DNAPL detected at 48 hours
		Filter (sand) Pack: Top: 3' bgs Bottom: 15' bgs Grain Size: WG #2	
10		Bentonite Seal: Top: 0 (surface) Bottom: 3' bgs Grain Size: 3/8" chips	
15		End of Boring	



Total Depth: 15'

TOC: Top of PVC casing
DTW: Depth to water

bgs: Below ground surface
amsl: Above mean sea level

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APPENDIX G

Low Flow Sampling
Temporary Piezometers

ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: B17 Phase II	Project Number: 150300M-22-3
Piezometer Number: B17-009-PZ	Date: 10/11/19
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 10.09	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 15.92	

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
0900	0	10.09	19.85	7.35	0.648	10.71	34		
0905	0.2	10.09	20.09	7.96	0.647	0.00	-71		cloudy
0910	0.4	10.09	20.35	7.90	0.624	0.00	-117		
0915	0.6	10.09	20.56	7.92	0.613	0.00	-143		clear
0920	0.8	10.09	20.72	7.92	0.605	0.00	-155		
0925	1.0	10.09	20.88	7.94	0.603	0.00	-156		
0930	1.2	10.09	20.98	7.95	0.602	0.00	-166		

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-009-PZ	0940	TCL-VOCs	~~3~~ - 40 mL VOA	HCl	Y-9
		TPH-GRO	~~3~~ - 40 mL VOA	HCl	Y-9
		TPH-DRO	~~2~~ - 1 L Amber	none	Y-10
		TCL-SVOCs	~~2~~ 1 L Amber	none	
		Oil & Grease	~~2~~ - 1 L Amber	HCl	Y-3
		Total Cyanide	~~1~~ - 250 mL Plastic	NaOH	Y-3 sets
		TAL-Metals & Mercury (Dissolved) **Field Filtered**	1 - 250 mL Plastic >avail cyanide	HNO3	Y-3
		Hexavalent Chromium (Dissolved) **Field Filtered**	1 - 250 mL Plastic	None	Y-3
		Matrix Spike			
		Duplicate			

Sampled By: LMG

Comments:

tech suspect

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: B17 Phase II	Project Number: 150300M-22-3
Piezometer Number: B17-014-PZ	Date: 10/10/19
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 9.11 TOC	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 16.72 TOC	

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
0956	0	9.11	22.81	7.55	0.842	4.88	-172	0.0	cloudy @ initia
1001	0.2	9.11	22.85	7.79	~~0.836~~	0.00	-252	940	slightly turbid
1006	0.4	9.11	22.79	7.89	0.702	0.00	-255	508	clearer
1011	0.6	9.11	22.79	7.93	0.694	0.00	-253	302	
1016	0.8	9.11	22.96	7.96	0.690	0.00	-253	159	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-014-PZ	1021	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	1 - 1 L Amber	HCl	
		Total Cyanide	1 - 250 mL Plastic	NaOH	
		TAL-Metals & Mercury (Dissolved) **Field Filtered**	1 - 250 mL Plastic → avail cyanide	HNO3	
		Hexavalent Chromium (Dissolved) **Field Filtered**	1 - 250 mL Plastic	None	
Matrix Spike					
Duplicate					

Sampled By: LMC

Comments: turb suspect

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: B17 Phase II	Project Number: 150300M-22
Piezometer Number: B17-015-PZ	Date: 10/10/18
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 9.36	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 16.89	

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
1410	0	9.36	31.22	7.47	0.667	0.00	7	0.0	
1415	0.2	9.36	27.95	7.32	0.658	0.00	-89	0.0	
1420	0.4	9.36	26.20	7.25	0.669	0.00	-99	849	
1425	0.6	9.36	25.30	7.22	0.674	0.00	-104	224	
1430	0.8	9.36	25.14	7.19	0.673	0.00	-105	188	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-015-PZ	1435	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	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					

12 and avail cyanide

Sampled By: LMG

Comments:
turb suspect

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: B17 Phase II	Project Number: 150308M-22
Piezometer Number: B17-016-PZ	Date: 10/10/19
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 9.95	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 12.62	

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
1252	0	9.95	31.84	7.167	0.663	0.00	-32	0.0	turbid
1257	0.2	9.95	31.63	7.54	0.648	0.00	-162	0.0	
1302	0.4	9.95	29.32	7.44	0.657	0.00	-144	0.0	very clear
1307	0.6	9.95	29.10	7.41	0.660	0.00	-155	768	
1312	0.8	9.95	28.73	7.40	0.661	0.00	-155	457	
1317	1.0	9.95	27.91	7.38	0.664	0.00	-147	1000	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-016-PZ	1322	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	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: LMG

Comments: turb suspect

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: B17 Phase II	Project Number: 150300M-22-3
Piezometer Number: B17-019-PZ	Date: 10/11/19
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 9.12	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 16.99	

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
1329	0	9.12	24.78	7.92	0.759	0.00	-172		
1334	0.2	9.12	24.60	7.97	0.759	0.00	-205		
1339	0.4	9.12	24.37	7.99	0.759	0.00	-212		
1344	0.6	9.12	24.18	7.99	0.761	0.00	-214		

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-019-PZ	1349	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	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: LMG

Comments: turb not operable

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: B17 Phase II	Project Number: 150300M-22-3
Piezometer Number: B17-020-PZ	Date: 10/11/17
Piezometer Diameter (in): 1	One Well Volume (gal):
Depth to Product (ft): none	QED Controller Settings:
Depth to Water (ft): 9.13	Flow Rate (mL/min) 200
Product Thickness (ft): none	Length of time Purged (min)
Depth to Bottom (ft): 16.78	

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
1200	0	9.13	22.02	8.20	0.584	0.00	-160		
1205	0.2	9.13	22.06	8.23	0.569	0.00	-208		
1210	0.4	9.13	22.11	8.23	0.565	0.00	-214		
1215	0.6	9.13	22.15	8.24	0.563	0.00	-216		

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter/Order	Container	Perservative	Collected?
B17-020-PZ	1220	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	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: LMH

Comments: turb susped

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

ARM Group Inc.
Earth Resource Engineers and Consultants

Project Name: Area B GW Investigation	Project Number: 150300M-10-3
Well Number: SW-026-MW5	Date: 3/30/16
Well Diameter (in): 2	One Well Volume (gal):
Total Depth (ft):	QED Controller Settings:
Depth to Water (ft) 9.71	Flow Rate (mL/min) 400 mL/min
Height of Water Column (ft):	Length of time Purged (min) 30

WELL PURGING RECORD

Time	Volume Purged (gallons)	Temp (°C)	pH (s.u.)	Specific Conductance (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Comments
1033	0	14.03	5.16	0.5816	5.52	9	480	gray
1038	0.5	15.82	7.11	0.609	2.64	13	120	
1043	1.0	15.60	7.43	0.6114	2.49	23	49.6	
1048	1.5	15.43	7.50	0.617	2.46	2	31.5	
1053	2.0	15.35	7.55	0.619	2.41	-15	21.8	
1058	2.5	15.31	7.61	0.628	2.28	-25	14.8	
1103	3.0	15.31	7.62	0.628	2.30	-19	10.8	

MONITORING SAMPLE RECORD

Sample ID	Time Collected	Parameter	Container	Perservative	Y/N
SW-026-MW5	1108	TCL-VOCs	3 - 40 mL VOA	HCL	Y
		TCL-SVOCs	2- 1 L Amber	none	Y
		TAL-Metals (Total)	1 - 250 mL Plastic	HNO3	Y
		TAL-Metals (Dissolved)	1 - 250 mL Plastic	HNO3	Y
		TPH-DRO	2 - 1 L Amber	none	Y
		TPH-GRO	3 - 40 mL VOA	HCL	Y
		Hexavalent Chromium	1 - 250 mL Plastic	None	Y
		Cyanide	1 - 250 mL Plastic	NAOH	Y
		PCBs	2 - 1 L Amber	none	Y
Matrix Spike present?					
Duplicate assessed?					

Sampled By: LMB

Comments: Dissolved metals are Field Filtered

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)

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Area B Parcel B17 Phase II Date 10/10/17
Weather Partly Cloudy, 70s
Calibrated by L. Glumac Instrument Horiba
Serial Number 2BOMSAX4

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard 4.49mS/cm	4.49	71 F	4.23¥	83 F
Specific Conductance Standard #2	-		-	
pH (7)	-		-	
pH (4)	4.00		4.14	
pH(10)	-		-	
ORP Zobel Solution	-		-	
Dissolved Oxygen 100% water saturated air mg/L	10.01¥		14.70¥	
Dissolved Oxygen Zero Dissolved Oxygen Solution mg/L	-		-	
Barometric Pressure mm Hg	764.03		764.29	
Turbidity #1 (0 NTU)	0.00		0.00	
Turbidity #2	-		-	
Turbidity #3	-		-	

¥ DO was outside of the calibration acceptance criteria. Specific Conductance is outside of the post-calibration acceptance criteria.Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Area B Parcel B17 Phase II Date 10/11/17
Weather Cloudy, Rainy, 70s
Calibrated by L. Glumac Instrument Horiba
Serial Number 2BOMSAX4

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard 4.49 mS/cm	4.48	72 F	4.43	72 F
Specific Conductance Standard #2	-		-	
pH (7)	-		-	
pH (4)	4.00		4.06	
pH(10)	-		-	
ORP Zobel Solution	-		-	
Dissolved Oxygen 100% water saturated air mg/L	10.07¥		16.61¥	
Dissolved Oxygen Zero Dissolved Oxygen Solution mg/L	-		-	
Barometric Pressure mm Hg	764.03		763.02	
Turbidity #1 (0 NTU)	¥		¥	
Turbidity #2	-		-	
Turbidity #3	-		-	

¥ DO is outside of the calibration acceptance criteria. Turbidity was inoperable and was not recorded on the purge logs. Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Area B GW Investigation Date 3/30/16
Weather Sunny, 40s
Calibrated by LMG Instrument Horiba
Serial Number U-5000 Series, EAG owned

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1	4.51 mS/cm	42 °F	4.66 mS/cm¥	55
Specific Conductance Standard #2	--	42 °F	--	55
pH (7)	--	42 °F	--	55
pH (4)	4.00	42 °F	4.08	55
pH(10)	--	42 °F	--	55
ORP Zobel Solution	--	42 °F	--	55
Dissolved Oxygen 100% water saturated air mg/L	11.24¥	42 °F	9.67¥	55
Dissolved Oxygen Zero Dissolved Oxygen Solution mg/L	--	42 °F	--	55
Barometric Pressure mm Hg	30.4 in Hg (estimated)	NA	30.3 in Hg (estimated)	NA
Turbidity #1 (0.1 NTU)	0.1	42 °F	0.0	55
Turbidity #2 (15 NTU)	--	42 °F	--	55
Turbidity #3 (100 NTU)	--	42 °F	--	55
Turbidity #4 (750 NTU)				

¥DO and specific conductance is outside of the post-calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

APPENDIX H

Parcel B17 - IDW Drum Log

Drum ID	Designation	Activity/Phase	Contents	Open Date
403-S-1/29/16-B17	Non-haz.	Parcel B17/Phase II	Soil	1/29/2016
472-GW-2/18/16-B17	Non-haz.	Parcel B17/Phase II	Water	2/18/2016
772-PPE-1/7/17-B17	Non-haz.	Parcel B17/Phase II	PPE	1/7/2017
944-Soil-9/18/17-B17	Non-haz.	Parcel B17/Phase II	Soil	9/18/2017
945-Decon Water-9/18/17-B17	Non-haz.	Parcel B17/Phase II	Water	9/18/2017
946-Liners-9/18/17-B17	Non-haz.	Parcel B17/Phase II	Liners	9/18/2017
947-PPE-9/18/17-B17	Non-haz.	Parcel B17/Phase II	PPE	9/18/2017
948-PPE-9/21/17-B17	Non-haz.	Parcel B17/Phase II	PPE	9/21/2017
962-Purge Water-10/6/17-B17	Non-haz.	Parcel B17/Phase II	Water	10/6/2017
977-Decon Water-10/15/17-A5/B18/B17/A9/GRY/B13	Non-haz.	Parcels A5/B18/B17/A9/GRY/B13 / Phase II	Water	10/15/2017

APPENDIX I

NAPL Gauging Activities
Parcel B17
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	Installation Date	Abandonment Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	9/18/2017			9/19/2017			9/20/2017		
						Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)
B17-008-PZ	11/6/2017	NA	15	5-15	2.88	NA	NA	NA	NA	NA	NA	NA	NA	NA
B17-011-PZ	9/18/2017	NA	14	4-14	2.50	-	8.14	-	NM	NM	NM	-	8.15	-
B17-012-PZ	9/20/2017	NA	8	3-8	2.65	NA	NA	NA	NA	NA	NA	-	8.99	-

Sample ID	Installation Date	Abandonment Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	9/22/2017			11/6/2017			11/8/2017		
						Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)
B17-008-PZ	11/6/2017	NA	15	5-15	2.88	NA	NA	NA	-	8.95	-	-	8.73	-
B17-011-PZ	9/18/2017	NA	14	4-14	2.50	NM	NM	NM	NM	NM	NM	NM	NM	NM
B17-012-PZ	9/20/2017	NA	8	3-8	2.65	-	8.99	-	NM	NM	NM	NM	NM	NM

Sample ID	Installation Date	Abandonment Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	12/11/2017			1/23/2018		
						Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)
B17-008-PZ	11/6/2017	NA	15	5-15	2.88	-	9.30	-	NM	NM	NM
B17-011-PZ	9/18/2017	NA	14	4-14	2.50	NM	NM	NM	-	9.20	-
B17-012-PZ	9/20/2017	NA	8	3-8	2.65	NM	NM	NM	-	9.68	-

NA = Not Applicable
NM = Not Measured
SHADED = NAPL Detection
bgs = below ground surface
TOC = Top of Casing

APPENDIX J

QA/QC Tracking Log

Trip Blank:	Date:	Sample IDs	
TB1	9/18/2017	1) B17-005-SB-2	
TB1		2) B17-005-SB-4	
		3) B17-011-SB-1.5	
		4) B17-011-SB-5	
TB1		5) B17-014-SB-1.5	
TB1		6) B17-014-SB-5	
TB1		7) B17-017-SB-1.5	Duplicate: B17-014-SB-1.5
TB1		8) B17-017-SB-6	Date: 9/18/2017
TB1		9) B17-008-SB-1.5	MS/MSD: B17-019-SB-4
TB1		10) B17-008-SB-7.5	Date: 9/19/2017
	9/19/2017	11) B17-007-SB-1	Field Blank:
TB1		12) B17-018-SB-1.5	Date: 9/19/2017
TB1		13) B17-018-SB-4	Eq. Blank:
		14) B17-020-SB-1.5	Date: 9/19/2017
TB1		15) B17-020-SB-4	
TB1		16) B17-019-SB-2	
TB1		17) B17-019-SB-4	
	9/20/2017	18) B17-004-SB-1	
TB1		19) B17-004-SB-4	
TB1		20) B17-013-SB-1.5	

Trip Blank:	Date:	Sample IDs	
TB1	10/10/2017	1) B17-014-PZ	
TB1		2) B17-016-PZ	
TB1		3) B17-015-PZ	
TB1	10/11/2017	4) B17-009-PZ	
TB1		5) B17-020-PZ	
TB1		6) B17-019-PZ	
		7)	Duplicate: B17-020-PZ
		8)	Date: 10/11/2017
		9)	MS/MSD: B17-009-PZ
		10)	Date: 10/11/2017
		11)	Field Blank:
		12)	Date: 10/11/2017
		13)	Eq. Blank:
		14)	Date:
		15)	
		16)	
		17)	
		18)	
		19)	
		20)	

TB1	9/20/2017	1) B17-013-SB-4	
		2) B17-012-SB-1.5	
		3) B17-012-SB-4	
		4) B17-009-SB-1.5	
TB1		5) B17-009-SB-4	
		6) B17-006-SB-1.5	
TB1		7) B17-006-SB-4	Duplicate: B17-006-SB-4
	9/21/2017	8) B17-015-SB-1	Date: 9/20/2017
		9) B17-015-SB-5	MS/MSD: B17-015-SB-5
		10) B17-016-SB-1	Date: 9/21/2017
TB1		11) B17-016-SB-4	Field Blank:
		12) B17-010-SB-2	Date: 9/20/2017
TB1		13) B17-010-SB-8	Eq. Blank:
TB1		14) B17-021-SB-1.5	Date: 9/20/2017
		15) B17-021-SB-5	
		16) B17-002-SB-1	
TB1		17) B17-002-SB-5	
		18) B17-001-SB-1	
		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)	

Soil samples with a sustained PID reading of 10 ppm or greater were collected for VOCs.
VOC samples were placed in a cooler with a trip 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 Validated Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Cyanide	CN	Soil	mg/kg	31	25	0	31	100.00%
Aluminum	Metal	Soil	mg/kg	31	31	0	31	100.00%
Antimony	Metal	Soil	mg/kg	31	9	0	31	100.00%
Arsenic	Metal	Soil	mg/kg	31	27	0	31	100.00%
Barium	Metal	Soil	mg/kg	31	31	0	31	100.00%
Beryllium	Metal	Soil	mg/kg	31	30	0	31	100.00%
Cadmium	Metal	Soil	mg/kg	31	26	0	31	100.00%
Chromium	Metal	Soil	mg/kg	31	31	0	31	100.00%
Chromium VI	Metal	Soil	mg/kg	31	1	0	31	100.00%
Cobalt	Metal	Soil	mg/kg	31	31	0	31	100.00%
Copper	Metal	Soil	mg/kg	31	31	0	31	100.00%
Iron	Metal	Soil	mg/kg	31	31	0	31	100.00%
Lead	Metal	Soil	mg/kg	31	31	0	31	100.00%
Manganese	Metal	Soil	mg/kg	31	31	0	31	100.00%
Mercury	Metal	Soil	mg/kg	31	31	0	31	100.00%
Nickel	Metal	Soil	mg/kg	31	31	0	31	100.00%
Selenium	Metal	Soil	mg/kg	31	10	0	31	100.00%
Silver	Metal	Soil	mg/kg	31	31	0	31	100.00%
Thallium	Metal	Soil	mg/kg	31	0	0	31	100.00%
Vanadium	Metal	Soil	mg/kg	31	31	0	31	100.00%
Zinc	Metal	Soil	mg/kg	31	31	0	31	100.00%
Aroclor 1016	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1221	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1232	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1242	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1248	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1254	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1260	PCB	Soil	mg/kg	16	1	0	16	100.00%
Aroclor 1262	PCB	Soil	mg/kg	16	0	0	16	100.00%
Aroclor 1268	PCB	Soil	mg/kg	16	2	0	16	100.00%
PCBs (total)	PCB	Soil	mg/kg	16	3	0	16	100.00%
1,1-Biphenyl	SVOC	Soil	mg/kg	31	12	0	31	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
2,4,5-Trichlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
2,4,6-Trichlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
2,4-Dichlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
2,4-Dimethylphenol	SVOC	Soil	mg/kg	31	1	3	28	90.32%
2,4-Dinitrophenol	SVOC	Soil	mg/kg	31	1	3	28	90.32%
2,4-Dinitrotoluene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
2,6-Dinitrotoluene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
2-Chloronaphthalene	SVOC	Soil	mg/kg	31	4	0	31	100.00%
2-Chlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
2-Methylnaphthalene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
2-Methylphenol	SVOC	Soil	mg/kg	31	1	3	28	90.32%
2-Nitroaniline	SVOC	Soil	mg/kg	31	0	0	31	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Soil	mg/kg	31	1	3	28	90.32%
3,3'-Dichlorobenzidine	SVOC	Soil	mg/kg	31	0	0	31	100.00%
4-Chloroaniline	SVOC	Soil	mg/kg	31	0	0	31	100.00%
4-Nitroaniline	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Acenaphthene	SVOC	Soil	mg/kg	31	28	0	31	100.00%
Acenaphthylene	SVOC	Soil	mg/kg	31	30	0	31	100.00%
Acetophenone	SVOC	Soil	mg/kg	31	13	0	31	100.00%
Anthracene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Benz[a]anthracene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Benzaldehyde	SVOC	Soil	mg/kg	31	13	9	22	70.97%
Benzo[a]pyrene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Benzo[b]fluoranthene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Benzo[g,h,i]perylene	SVOC	Soil	mg/kg	31	31	0	31	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 Validated Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Benzo[k]fluoranthene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
bis(2-chloroethoxy)methane	SVOC	Soil	mg/kg	31	0	0	31	100.00%
bis(2-Chloroethyl)ether	SVOC	Soil	mg/kg	31	0	0	31	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Soil	mg/kg	31	0	0	31	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Caprolactam	SVOC	Soil	mg/kg	31	6	0	31	100.00%
Carbazole	SVOC	Soil	mg/kg	31	15	0	31	100.00%
Chrysene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Dibenz[a,h]anthracene	SVOC	Soil	mg/kg	31	30	0	31	100.00%
Diethylphthalate	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Di-n-butylphthalate	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Di-n-ocytlphthalate	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Fluoranthene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Fluorene	SVOC	Soil	mg/kg	31	28	0	31	100.00%
Hexachlorobenzene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Hexachlorobutadiene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Hexachlorocyclopentadiene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Hexachloroethane	SVOC	Soil	mg/kg	31	2	0	31	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Isophorone	SVOC	Soil	mg/kg	31	0	0	31	100.00%
Naphthalene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Nitrobenzene	SVOC	Soil	mg/kg	31	0	0	31	100.00%
N-Nitroso-di-n-propylamine	SVOC	Soil	mg/kg	31	0	0	31	100.00%
N-Nitrosodiphenylamine	SVOC	Soil	mg/kg	31	1	0	31	100.00%
Pentachlorophenol	SVOC	Soil	mg/kg	31	0	3	28	90.32%
Phenanthrene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Phenol	SVOC	Soil	mg/kg	31	3	2	29	93.55%
Pyrene	SVOC	Soil	mg/kg	31	31	0	31	100.00%
Diesel Range Organics	TPH	Soil	mg/kg	31	30	0	31	100.00%
Gasoline Range Organics	TPH	Soil	mg/kg	31	8	0	31	100.00%
Oil and Grease	TPH	Soil	mg/kg	31	31	0	31	100.00%
1,1,1-Trichloroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,1,2,2-Tetrachloroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,1,2-Trichloroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,1-Dichloroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,1-Dichloroethene	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2,3-Trichlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2,4-Trichlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dibromo-3-chloropropane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dibromoethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dichlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dichloroethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dichloroethene (Total)	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,2-Dichloropropane	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,3-Dichlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,4-Dichlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
2-Butanone (MEK)	VOC	Soil	mg/kg	18	2	0	18	100.00%
2-Hexanone	VOC	Soil	mg/kg	18	2	0	18	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Soil	mg/kg	18	1	0	18	100.00%
Acetone	VOC	Soil	mg/kg	18	11	0	18	100.00%
Benzene	VOC	Soil	mg/kg	18	3	0	18	100.00%
Bromodichloromethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
Bromoform	VOC	Soil	mg/kg	18	0	0	18	100.00%
Bromomethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
Carbon disulfide	VOC	Soil	mg/kg	18	3	0	18	100.00%
Carbon tetrachloride	VOC	Soil	mg/kg	18	0	0	18	100.00%
Chlorobenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Chloroethane	VOC	Soil	mg/kg	18	0	0	18	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 Validated Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Chloroform	VOC	Soil	mg/kg	18	0	0	18	100.00%
Chloromethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
cis-1,2-Dichloroethene	VOC	Soil	mg/kg	18	0	0	18	100.00%
cis-1,3-Dichloropropene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Cyclohexane	VOC	Soil	mg/kg	18	1	0	18	100.00%
Dibromochloromethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
Dichlorodifluoromethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
Ethylbenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Isopropylbenzene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Methyl Acetate	VOC	Soil	mg/kg	18	0	0	18	100.00%
Methyl tert-butyl ether (MTBE)	VOC	Soil	mg/kg	18	0	0	18	100.00%
Methylene Chloride	VOC	Soil	mg/kg	18	0	0	18	100.00%
Styrene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Tetrachloroethene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Toluene	VOC	Soil	mg/kg	18	3	0	18	100.00%
trans-1,2-Dichloroethene	VOC	Soil	mg/kg	18	0	0	18	100.00%
trans-1,3-Dichloropropene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Trichloroethene	VOC	Soil	mg/kg	18	0	0	18	100.00%
Trichlorofluoromethane	VOC	Soil	mg/kg	18	0	0	18	100.00%
Vinyl chloride	VOC	Soil	mg/kg	18	0	0	18	100.00%
Xylenes	VOC	Soil	mg/kg	18	0	0	18	100.00%
1,4-Dioxane	VOC/SVOC	Soil	mg/kg	18	0	18	0	0.00%
Available Cyanide	CN	Water	ug/L	3	3	0	3	100.00%
Total Cyanide	CN	Water	ug/L	4	2	0	4	100.00%
Aluminum	Metal	Water	ug/L	5	4	0	5	100.00%
Antimony	Metal	Water	ug/L	5	0	0	5	100.00%
Arsenic	Metal	Water	ug/L	5	0	0	5	100.00%
Barium	Metal	Water	ug/L	5	5	0	5	100.00%
Beryllium	Metal	Water	ug/L	5	0	0	5	100.00%
Cadmium	Metal	Water	ug/L	5	0	0	5	100.00%
Chromium	Metal	Water	ug/L	5	1	0	5	100.00%
Chromium VI	Metal	Water	ug/L	4	0	0	4	100.00%
Cobalt	Metal	Water	ug/L	5	0	0	5	100.00%
Copper	Metal	Water	ug/L	5	0	0	5	100.00%
Iron	Metal	Water	ug/L	5	4	0	5	100.00%
Lead	Metal	Water	ug/L	5	0	0	5	100.00%
Manganese	Metal	Water	ug/L	5	4	0	5	100.00%
Mercury	Metal	Water	ug/L	5	0	0	5	100.00%
Nickel	Metal	Water	ug/L	5	0	0	5	100.00%
Selenium	Metal	Water	ug/L	5	0	0	5	100.00%
Silver	Metal	Water	ug/L	5	0	0	5	100.00%
Thallium	Metal	Water	ug/L	5	0	0	5	100.00%
Vanadium	Metal	Water	ug/L	5	1	0	5	100.00%
Zinc	Metal	Water	ug/L	5	1	0	5	100.00%
Dichlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Heptachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Hexachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Monochlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Nonachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Octachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
PCBs (total)	PCB	Water	ug/L	1	0	0	1	100.00%
Pentachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Tetrachlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
Trichlorobiphenyl	PCB	Water	ug/L	1	0	0	1	100.00%
1,1-Biphenyl	SVOC	Water	ug/L	4	0	0	4	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Water	ug/L	4	0	0	4	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2,4,5-Trichlorophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2,4,6-Trichlorophenol	SVOC	Water	ug/L	4	0	0	4	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 Validated Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
2,4-Dichlorophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2,4-Dimethylphenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2,4-Dinitrophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2,4-Dinitrotoluene	SVOC	Water	ug/L	4	0	0	4	100.00%
2,6-Dinitrotoluene	SVOC	Water	ug/L	4	0	0	4	100.00%
2-Chloronaphthalene	SVOC	Water	ug/L	4	0	0	4	100.00%
2-Chlorophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2-Methylnaphthalene	SVOC	Water	ug/L	4	2	0	4	100.00%
2-Methylphenol	SVOC	Water	ug/L	4	0	0	4	100.00%
2-Nitroaniline	SVOC	Water	ug/L	4	0	0	4	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Water	ug/L	4	0	0	4	100.00%
3,3'-Dichlorobenzidine	SVOC	Water	ug/L	4	0	0	4	100.00%
4-Chloroaniline	SVOC	Water	ug/L	4	0	0	4	100.00%
4-Nitroaniline	SVOC	Water	ug/L	4	0	0	4	100.00%
Acenaphthene	SVOC	Water	ug/L	4	2	0	4	100.00%
Acenaphthylene	SVOC	Water	ug/L	4	2	0	4	100.00%
Acetophenone	SVOC	Water	ug/L	4	0	0	4	100.00%
Anthracene	SVOC	Water	ug/L	4	2	0	4	100.00%
Benz[a]anthracene	SVOC	Water	ug/L	4	1	0	4	100.00%
Benzaldehyde	SVOC	Water	ug/L	4	0	0	4	100.00%
Benzo[a]pyrene	SVOC	Water	ug/L	4	0	0	4	100.00%
Benzo[b]fluoranthene	SVOC	Water	ug/L	4	0	0	4	100.00%
Benzo[g,h,i]perylene	SVOC	Water	ug/L	4	0	0	4	100.00%
Benzo[k]fluoranthene	SVOC	Water	ug/L	4	0	0	4	100.00%
bis(2-chloroethoxy)methane	SVOC	Water	ug/L	4	0	0	4	100.00%
bis(2-Chloroethyl)ether	SVOC	Water	ug/L	4	0	0	4	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Water	ug/L	4	0	0	4	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Water	ug/L	4	1	0	4	100.00%
Caprolactam	SVOC	Water	ug/L	4	0	0	4	100.00%
Carbazole	SVOC	Water	ug/L	4	0	0	4	100.00%
Chrysene	SVOC	Water	ug/L	4	1	0	4	100.00%
Dibenz[a,h]anthracene	SVOC	Water	ug/L	4	0	0	4	100.00%
Diethylphthalate	SVOC	Water	ug/L	4	0	0	4	100.00%
Di-n-butylphthalate	SVOC	Water	ug/L	4	0	0	4	100.00%
Di-n-ocytlphthalate	SVOC	Water	ug/L	4	0	0	4	100.00%
Fluoranthene	SVOC	Water	ug/L	4	3	0	4	100.00%
Fluorene	SVOC	Water	ug/L	4	2	0	4	100.00%
Hexachlorobenzene	SVOC	Water	ug/L	4	0	0	4	100.00%
Hexachlorobutadiene	SVOC	Water	ug/L	4	0	0	4	100.00%
Hexachlorocyclopentadiene	SVOC	Water	ug/L	4	0	0	4	100.00%
Hexachloroethane	SVOC	Water	ug/L	4	0	0	4	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Water	ug/L	4	0	0	4	100.00%
Isophorone	SVOC	Water	ug/L	4	0	0	4	100.00%
Naphthalene	SVOC	Water	ug/L	4	2	0	4	100.00%
Nitrobenzene	SVOC	Water	ug/L	4	0	0	4	100.00%
N-Nitroso-di-n-propylamine	SVOC	Water	ug/L	4	0	0	4	100.00%
N-Nitrosodiphenylamine	SVOC	Water	ug/L	4	0	0	4	100.00%
Pentachlorophenol	SVOC	Water	ug/L	4	0	0	4	100.00%
Phenanthrene	SVOC	Water	ug/L	4	2	0	4	100.00%
Phenol	SVOC	Water	ug/L	4	0	0	4	100.00%
Pyrene	SVOC	Water	ug/L	4	2	0	4	100.00%
Diesel Range Organics	TPH	Water	ug/L	4	2	0	4	100.00%
Gasoline Range Organics	TPH	Water	ug/L	4	0	0	4	100.00%
Oil and Grease	TPH	Water	ug/L	3	0	0	3	100.00%
1,1,1-Trichloroethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,1,2,2-Tetrachloroethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,1,2-Trichloroethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,1-Dichloroethane	VOC	Water	ug/L	4	0	0	4	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 Validated Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
1,1-Dichloroethene	VOC	Water	ug/L	4	0	0	4	100.00%
1,2,3-Trichlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
1,2,4-Trichlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dibromo-3-chloropropane	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dibromoethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dichlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dichloroethane	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dichloroethene (Total)	VOC	Water	ug/L	4	0	0	4	100.00%
1,2-Dichloropropane	VOC	Water	ug/L	4	0	0	4	100.00%
1,3-Dichlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
1,4-Dichlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
2-Butanone (MEK)	VOC	Water	ug/L	4	0	0	4	100.00%
2-Hexanone	VOC	Water	ug/L	4	0	0	4	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Water	ug/L	4	0	0	4	100.00%
Acetone	VOC	Water	ug/L	4	0	1	3	75.00%
Benzene	VOC	Water	ug/L	4	0	0	4	100.00%
Bromodichloromethane	VOC	Water	ug/L	4	0	0	4	100.00%
Bromoform	VOC	Water	ug/L	4	0	0	4	100.00%
Bromomethane	VOC	Water	ug/L	4	0	0	4	100.00%
Carbon disulfide	VOC	Water	ug/L	4	0	0	4	100.00%
Carbon tetrachloride	VOC	Water	ug/L	4	0	0	4	100.00%
Chlorobenzene	VOC	Water	ug/L	4	0	0	4	100.00%
Chloroethane	VOC	Water	ug/L	4	0	0	4	100.00%
Chloroform	VOC	Water	ug/L	4	0	0	4	100.00%
Chloromethane	VOC	Water	ug/L	4	0	0	4	100.00%
cis-1,2-Dichloroethene	VOC	Water	ug/L	4	0	0	4	100.00%
cis-1,3-Dichloropropene	VOC	Water	ug/L	4	0	0	4	100.00%
Cyclohexane	VOC	Water	ug/L	4	0	0	4	100.00%
Dibromochloromethane	VOC	Water	ug/L	4	0	0	4	100.00%
Dichlorodifluoromethane	VOC	Water	ug/L	4	0	0	4	100.00%
Ethylbenzene	VOC	Water	ug/L	4	0	0	4	100.00%
Isopropylbenzene	VOC	Water	ug/L	4	0	0	4	100.00%
Methyl Acetate	VOC	Water	ug/L	4	0	0	4	100.00%
Methyl tert-butyl ether (MTBE)	VOC	Water	ug/L	4	0	0	4	100.00%
Methylene Chloride	VOC	Water	ug/L	4	0	0	4	100.00%
Styrene	VOC	Water	ug/L	4	0	0	4	100.00%
Tetrachloroethene	VOC	Water	ug/L	4	0	0	4	100.00%
Toluene	VOC	Water	ug/L	4	0	0	4	100.00%
trans-1,2-Dichloroethene	VOC	Water	ug/L	4	0	0	4	100.00%
trans-1,3-Dichloropropene	VOC	Water	ug/L	4	0	0	4	100.00%
Trichloroethene	VOC	Water	ug/L	4	0	0	4	100.00%
Trichlorofluoromethane	VOC	Water	ug/L	4	0	0	4	100.00%
Vinyl chloride	VOC	Water	ug/L	4	0	0	4	100.00%
Xylenes	VOC	Water	ug/L	4	0	0	4	100.00%
1,4-Dioxane	VOC/SVOC	Water	ug/L	4	1	0	4	100.00%

Data validation has been completed for a representative 50% of all samples