Phase II Investigation
Work Plan

Area B: Parcel B5
Sparrows Point Terminal, LLC
Sparrows Point, Maryland

Prepared for:
EnviroAnalytics Group
1650 Des Peres Road, Suite 230
Saint Louis, Missouri 63131

Prepared by:
ARM Group Inc.
9175 Guilford Road
Suite 310
Columbia, MD 21046

Revision 1
December 3, 2015

ARM Project 150300M

Respectfully submitted,

Eric S. Magdar
Senior Geologist

T. Neil Peters, P.E.
Vice President

TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(Continued)

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Introduction

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared the following Work Plan to complete a Phase II site investigation on a portion of the Sparrows Point Terminal, LLC property that has been designated as Area B, Parcel B5 (the Site). Parcel B5 is comprised of approximately 305 acres of the approximately 3,100-acre former plant property located as shown on **Figure 1**.

Site characterization of Parcel B5 will be performed in compliance with requirements pursuant to the following:

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

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

Parcel B5 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency (EPA), and the Maryland Department of the Environment (MDE) (effective October 8, 1997) as documented in correspondence received from EPA on September 12, 2014. Based on this agreement, EPA has determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the EPA's RCRA Corrective Action authorities.

1.2 Site Background

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 steelmaking operations at the Facility ceased in fall 2012.

Groundcover at the Site is comprised of approximately 64% natural soils and 36% slag based on the approximate shoreline of the Sparrows Point Peninsula in 1916, as shown on **Figure 2** (Adapted from Figure 2-20 on the Description of Current Conditions Report (DCC) report prepared by Rust Environmental and Infrastructure, dated January 1998). Parcel B5 was formerly occupied by the Blast Furnace Area and part of the Former Steel Making Area. The components of these main areas are discussed in the Sampling Design and Rationale section. By 2013, all buildings had been demolished, and several pits across the Site filled in. The concrete slabs remain on grade.

Several iron and steel work processes were completed within the boundary of Parcel B5. Descriptions of the facilities and processes are provided below:

Sinter Plant:
The sinter plant produced sinter from iron-bearing fine materials. Burnt lime and the fine materials were combined and passed through an ignition furnace, which fused the materials into cohesive lumps. The finished sinter was cooled and stored before being transferred to be included as a raw material in the blast furnaces.

Blast Furnaces:
Several high temperature blast furnaces were used for extracting iron from ore and other iron-rich recyclable materials. The furnaces received ore, sinter, coke, and limestone and/or dolomite, heated air, and fuel injectants (coal, oil, or natural gas) and produced a molten iron product and slag as a by-product. This slag was stored in piles outside of the furnaces, before being transported out of the B5 parcel area to be crushed and screened for sale as a product. At the time the DCC report was developed, blast furnaces A through G and K had been previously demolished and removed from the site. Blast furnaces H, J, and L remained on site, with only blast furnace L remaining operational.

Recirculating Industrial Water (RIW) System:
The RIW systems acted as gas-cleaning water treatment systems for the blast furnaces. A variety of features were included in the system, including a pipeline, sumps, holding tanks, clarifying tanks, and RIW wastewater treatment plant.

Mould Yard:
When the BOF facilities were unable to receive the hot metals produced from the blast furnaces, the iron could be temporarily stored in the Mould Yard. The hot metal was poured on the ground and allowed to cool. Once it was cooled it could be broken into smaller pieces and then transferred to the BOF.

Iron and Brass Foundry:
The iron and brass foundry was used in casting operations. The metals were melted, poured and cast, and a large volume of lead-containing dust was produced from saws, shot blasters, and grinders within the foundry.

There are eight (8) existing groundwater wells located within the Site boundaries: SG07-PDM008, SG07-PPM008, SG07-PZM007, SW15-PZM005, and SW16-PZM003 (shallow zone); SW15-PZM031 (intermediate zone); SW15-PZM085 and SW16-PZM067 (lower zone). Groundwater samples have been collected from these wells in the past (November to December 2000) and analyzed for a limited set of general water quality parameters. Available analytical data from these samples are presented in **Appendix A**. The data indicate that historical concentrations of iron and/or manganese have exceeded the Project Action Limits (PALs) in wells SW15-PZM005, SW16-PZM003, SW15-PZM031, SW15-PZM085, and SW16-PZM067. There is no historical soil or soil gas sampling data from this parcel.

1.3 Sampling Design and Rationale

Across the whole Sparrows Point property, several buildings and facilities may have been historical sources of environmental contamination. These areas were identified as targets for sampling through a careful review of historical documents. When a sampling target was identified, at least two borings were placed at or around its location using GIS software (ArcMap Version 10.2.2). The first sampling targets to be identified were Recognized Environmental Conditions (RECs) located within the Site boundaries, as shown on the REC Location Map provided in the Phase I Environmental Site Assessment (ESA) prepared by Weaver Boos Consultants dated May 19, 2014. The following RECs were identified within the Site boundaries: the Former Electrical Repair Shop (ERS) Oily Wastewater Tank (REC 8A, Finding 199, also listed as SWMU 195) and Residential Town Tanks (REC 21, Finding 271). REC 8A consisted of a steel aboveground tank of unknown capacity located to the north of the ERS in the Open Hearth Furnace Facility Area. Electrical motors were occasionally steam cleaned, and the wash waters were sent to the tank. Oil was separated out and sent to PORI (SWMUs 71-73). The tank was removed sometime during the late 1980's or early 1990's. REC 21 includes possible storage tanks and boiler rooms depicted on fire insurance maps of the former Sparrows Point residential town. It is unclear if the tanks are underground or aboveground storage tanks

(USTs or ASTs), and no obviously apparent USTs or ASTs were observed during the site visit. The tanks may have contained potentially hazardous substances and/or petroleum products which could have been released to the environment.

Following the identification and evaluation of all RECs at the Site, SWMUs and Areas of Concern (AOCs) were identified from the DCC report Figure 3-1. SWMUs and AOCs that were identified as boring targets include a PCB-contaminated Oil Spill (AOC C), L Furnace Slag Piles (SWMU 165), and Former ERS Oily Wastewater Tank (SWMU 195, discussed with RECs). AOC C describes a previous PCB-contaminated oil release which occurred when a PCB-containing transformer was struck by a vehicle. Approximately 20 gallons of PCB-contaminated oil was released to a soil area of approximately 15 feet by 20 feet in dimension. After soil removal, samples were collected from the spill area, and PCB concentrations in the soil were below the applicable EPA guidelines. SWMU 165 identifies slag piles which collected slag generated as a by-product of the iron making process. After cooling, the slag was crushed and evaluated for reuse. These piles were designated as units managing non-hazardous waste.

In addition, Finding 267 (not identified as a REC, SWMU, or AOC) was selected as a target for sediment sampling. During the site visit, the Pennwood Powerhouse contained large out-of-service equipment, with observed surface staining on and below the equipment. Past flooding (at least one previous incident) caused water to pool on the equipment room floor and drain to the adjacent Pennwood Canal. It is unlikely that the flooding of the Pennwood Powerhouse resulted in a significant release, and the canal sediments were classified as a non-REC. However, the Pennwood Canal was selected as a target for sediment sampling.

Additional Findings (non-RECs) from the Phase I ESA which were identified as Potential Environmental Concerns were also reviewed and targeted as applicable. Parcel B5 contains the former Blast Furnace Area and part of the Former Steel Making Area. According to the Phase I ESA, the Blast Furnace Area included, but was not limited to, the former sinter plant, former and current furnaces, RIW facilities and the former pilot plant. The Blast Furnace Area contained 27 non-REC findings (Findings 205-231) provided on Table 1 of the Phase I ESA. The Former Steel Making Area included, but was not limited to, the caster building, desulfurization plant, sulfur recovery plant, and BOF facilities. The Former Steel Making Area contained 26 non-REC findings (Findings 174-198; Finding 200) provided on Table 1 of the Phase I ESA. Most of the features (findings) were removed from the property prior to the Phase I ESA.

The 27 non-REC findings within the Blast Furnace Area included: Sinter Plant Thickener, Sinter Plant High Density Sludge (HDS) Tank, Sinter Plant Centrifuge Waste Pile, Sinter Plant Drum Separator, Sinter Plant Lime Grit Box, Sinter Plant SPL Tanks, H Furnace Dust Catcher, H Furnace Wastewater Thickener, J Furnace Precipitators, J Furnace Gas Washer, J Furnace Scrubber, J Furnace Dust Catcher, Former J Furnace Thickener, A-G & K Former Furnaces, L Furnace Baghouse, L Furnace Thickener, L Furnace Gas Scrubbers, L Furnace Slag Piles, RIW

Pipeline, RIW Sumps (2), RIW Holding Tank, RIW Clarifying Tank, Pilot Plant Slurry Mixing Tank, Pilot Plant Holding Tank, Pilot Plant Hydrocyclone, Langenfelder Wastewater Treatment Tank, and L Furnace Localized Surface Staining and Pooling.

The 26 non-REC findings within the Former Steel Making Area included: Green Pellet Plant Thickeners, Scrubbers Open Hearth Furnace #4, Caster Dust Baghouse Storage Area, Desulfurizer Baghouse, Desulfurizer Collection Dumpsters, Skimmer Baghouse, Skimmer Baghouse Collection Dumpsters, Former Open Hearth #3 Site, Former Open Hearth #1 Site, Caster Baghouse, BOF Scrubbers, BOF Thickeners, BOF Sand Collection Area, BOF Reclaimed Tank, BOF Mixing Tank, BOF Recycle Tank, BOF Belt Press Station, BOF Reladle Baghouse, BOF Separator, Former Tar Tanks at Fuel Station, Ball Mill Tank, Ball Mill Waste Oil/Tar Dumpster, Tar Decanter Buggies, Tar Storage Box Area, Former Sulfur Recovery Plant, and BOF Treatment Plant Pipeline.

Weaver Boos' opinion regarding the likelihood that petroleum products or hazardous substances were released to soil, groundwater, or structures was based upon the findings of the DCC Report (which was prepared when the features remained on-site in 1998) or on observations of the general area during the site visit. In such areas, Weaver Boos observed no indications of an existing release, or localized oily staining of surfaces or oily water in de minimis quantities. The DCC Report stated no indications of a release and/or recommended no further action in connection with each of the current or former features. Therefore, such features or areas were not considered to be RECs in the opinion of Weaver Boos. A majority of the non-REC findings are not included on the DCC figure; however, it is likely that many of these features were chosen as sampling targets if they were visible on other sets of drawings.

Following the identification of all RECs, SWMUs, and AOCs, four (4) sets of historical site drawings were reviewed to identify additional sampling targets. These site 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 the table below:

Parcel B5 Historical Site Drawings 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.)	5015	6/14/1957	3/12/1982
		5016	5/28/1958	3/12/1982
		5017	7/7/1958	3/12/1982
		5018	7/7/1958	3/12/1982
		5021	10/1/1958	3/11/1982
		5022	5/5/1958	3/11/1982
		5023	9/8/1958	3/11/1982
		5024	9/1/1958	3/11/1982
		5027	6/24/1959	3/11/1982
		5028	6/24/1959	3/11/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5115	*Unknown*	9/4/2008
		5116	*Unknown*	8/14/2008
		5117	*Unknown*	8/14/2008
		5118	*Unknown*	8/14/2008
		5121	*Unknown*	11/7/2008
		5122	*Unknown*	11/7/2008
		5123	*Unknown*	11/7/2008
		5124	*Unknown*	5/3/2007
		5127	*Unknown*	8/14/2008
		5128	*Unknown*	12/14/2007
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5515	10/1/1958	9/11/2008
		5516	9/1/1958	9/12/2008
		5517	8/21/1959	2/9/1982
		5518	1/21/1957	2/10/1982
		5521	9/30/1959	9/10/2008
		5522	*Unknown*	9/10/2008
		5523	*Unknown*	2/24/1982
		5524	*Unknown*	2/24/1982
		5527	*Unknown*	9/10/2008
		5528	*Unknown*	9/10/2008
Drip Legs	Coke Oven Gas Drip Legs Locations	5885B	*Unknown*	Sept. 1988
		5886B	*Unknown*	Sept. 1988

Sampling target locations were identified if the historical site drawings depicted industrial activities or a specific feature at a location that may have been a source of environmental contamination that impacted the Site. Based on this criterion, the following sampling targets were identified at the Site: Dispersant Tank/Acid Storage Tank, Fuel/Oil Tanks, Fuel/Oil Loading and Unloading Stations, Fuel Shop, Fuel Storage Area, Iron and Brass Foundry, Iron Bleaching Pit, Oil Houses, Paint Shops, "Trans" Pits, Settling Tank, (Unknown Contents) Tanks, Tar Storage Area, Thickener Tanks, and Wastewater Treatment Building. The number of proposed borings that targeted a specific feature is directly related to the size and likely historical presence of materials that could have impacted the Site. The full list of sampling targets, along with the specific rationale for sampling each, is provided as **Appendix B.**

Sample locations were added to fill in areas with insufficient coverage (large spatial gaps between proposed borings) within the Site and to meet the sample density requirements set forth in the Quality Assurance Project Plan (QAPP), Worksheet 17 – Sampling Design and Rationale. Additional samples were added to satisfy specific MDE requests. Parcel B5 contains a total of 305.3 acres: 191.0 acres without engineered barriers and 114.2 acres with engineered barriers (parking/roads or building slabs). In accordance with the relevant sampling density requirements, a minimum of 64 soil boring locations are required in the areas without engineered barriers, and a minimum of 20 soil boring locations are required in the areas with engineered barriers. A total of 109 borings have been proposed in areas without engineered barriers and a total of 71 borings have been proposed in areas with engineered barriers**. Figures 3 through 8** show the proposed borings and the Site boundary overlain on the relevant figures and drawings from the historical documents.

Groundwater at the Site will be investigated as described in the Area B Groundwater Investigation Work Plan. The groundwater sample locations proposed in this plan are shown on **Figure 9**.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

2.1 Project Personnel

The site characterization of Area B Parcel B5 will be conducted by ARM under a contract with EAG. ARM will provide project planning, field sampling and reporting support. The required drilling, Geoprobe® and laboratory services will be contracted directly by EAG. The management, field, and laboratory responsibilities of key project personnel are defined in this section.

The ARM Project Manager, Mr. Eric Magdar is responsible for ensuring that all activities are conducted in accordance with this Work Plan and the contract requirements. Mr. Magdar will provide technical coordination with the MDE, EPA and EAG. The ARM Project Manager is responsible for managing all operations conducted for this project including:

- Ensure all personnel assigned to this project review the technical project plans before initiation of all tasks associated with the project.
- Review of project plans in a timely manner.
- Ensure proper methods and procedures are implemented to collect representative samples.
- Monitor the project budget and schedule and ensure the availability of necessary personnel, equipment, subcontractors, and other necessary services.

The lead ARM Geologist, Mr. Stewart Kabis, will be responsible for coordinating field activities including the collection, preservation, documentation and shipment of samples. Mr. Kabis will directly communicate with the ARM Project Manager and Laboratory Project Manager on issues pertaining to sample shipments, schedules, container requirements, and other necessary issues. Mr. Kabis is also responsible for ensuring the accuracy of sample documentation including the completion of the chain-of-custody (CoC) forms.

Pace Analytical Services, Inc. (PACE) of Greensburg, Pennsylvania will provide the analytical services for this project. The address for the laboratory is as follows:

Pace Analytical
1638 Roseytown Road
Greensburg, PA 15601

During the field activities, the Laboratory Project Manager will coordinate directly with the ARM Project Manager on issues regarding sample shipments, schedules, container requirements, and other field-laboratory logistics. The Laboratory Project Manager will monitor the daily

activities of the laboratory, coordinate all production activities, and ensure that work is being conducted as specified in this document. Ms. Samantha Bayura will be the Laboratory Project Manager for PACE on this project.

2.2 Health and Safety Issues

Because of the potential presence of metals, petroleum hydrocarbons and chlorinated hydrocarbons in the soil and groundwater at the Site, the investigation will be conducted under a site-specific Health and Safety Plan to protect investigation workers from possible exposure to contaminated soil and groundwater.

Based on information provided to ARM, the planned site activities will be conducted under modified Level D personal protection. The requirements of the modified Level D protection are defined in ARM's site specific Health and Safety Plan. All field personnel assigned for work at the Site have been trained in accordance with the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120) and other applicable OSHA training standards. All field staff will be experienced in hazardous waste site work, use of personal protective equipment (PPE), and emergency response procedures.

3.0 FIELD ACTIVITIES AND PROCEDURES

3.1 Utility Clearance

ARM will take appropriate precautions to avoid subsurface utilities and structures during the site investigation. Prior to initiating any subsurface investigations, ARM will attempt to determine the location of utilities in the project area using the Miss Utility system. Additionally, any required state or local permits will be acquired prior to the commencement of site activities.

In addition to the Miss Utility system, EAG will clear each proposed boring with utility personnel currently working on the property. To facilitate this, ARM will locate with a GPS and mark all proposed boring locations in the field.

3.2 Sampling Plan

The purpose of this site characterization is to identify any existing hazardous conditions across the entire Site. A summary of the RECs and other areas of concern that will be investigated, along with the proposed boring identification number and the analyses being performed, has been provided as **Appendix B.**

This Work Plan presents the methods and protocols to be used to complete the site characterization. These methods and procedures follow the MDE-VCP and EPA guidelines. Information regarding the project organization, field activities and sampling methods, sampling equipment, sample handling and management procedures, the laboratory analytical methods and selected laboratory, quality control and quality assurance procedures, investigation-derived waste (IDW) management methods, reporting requirements are described in detail in the Quality Assurance Project Plan (QAPP) that has been developed to support the investigation and remediation of the Sparrows Point Terminal Site (Sparrows Point Terminal Quality Assurance Project Plan, ARM Group Inc., October 2, 2015).

The proposed schedule of this investigation is contained in this work plan. All site characterization activities will be conducted under the site-specific health and safety plan (HASP); which is provided as **Appendix C**.

3.3 Soil Investigation

Soil samples will be collected from the locations identified on **Figures 3 through 8**, and in accordance with procedures referenced in the QAPP Worksheet 21—Field SOPs (Standard Operating Procedures), SOP No. 009 Sub-Surface Soil Sampling.

Regarding soil sampling depth, a shallow sample will be collected from the 0 to 1 foot depth interval, and a deeper sample will be collected from the 4 to 5 foot depth interval. One additional set of samples will also be collected from the 9 to 10 foot depth interval if groundwater has not been encountered; however, these samples will be held by the laboratory pending the analysis of the 0 to 1 and 4 to 5 foot depth interval samples. If the PID or other field observations indicate contamination to exist at a depth greater than 3 feet bgs but less than 9 feet bgs, and is above the water table, the sample from the deeper 4-5 foot interval may be shifted to the depth interval indicated by the PID response. It should be noted that no soil samples will be collected from a depth that is below the water table.

After soil sampling has been concluded at a location, all down-hole soil sampling equipment will be decontaminated according to procedures referenced in the QAPP Worksheet 21—Field SOPs, SOP No. 016 Equipment Decontamination. The decontamination procedures that will be used during the course of this investigation include Decontamination Area (Section 3.1 of the SOP), Decontamination of Sampling Equipment (Section 3.5), Decontamination of Measurement Devices & Monitoring Equipment (Section 3.7), Decontamination of Subsurface Drilling Equipment (Section 3.8), and Document and Record Keeping (Section 5).

All soil samples will be analyzed for TCL-VOCs, TCL-SVOCs, TAL-Metals, TPH-DRO, TPH-GRO, hexavalent chromium, and cyanide. Additionally, the shallow soil samples collected across the Site from the 0-1 foot bgs interval will also be analyzed for PCBs. Several soil boring locations were selected for shallow (0-1 foot bgs interval) asbestos sampling, due to their proximity to former structures, coke gas lines and/or drip legs which may have included asbestos containing building materials or pipe wrap. The 14 locations selected for asbestos samples include: B5-002, B5-006, B5-012, B5-018, B5-023, B5-028, B5-034, B5-079, B5-120, B5-136, B5-168, B5-171, B5-179 and B5-180. These proposed sample locations are shown on **Figure 10**.

Analytical methods, sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30—Sample Containers, Preservation, and Holding Times.

3.4 Pennwood Canal Sediment Investigation

The Pennwood Power Station is a former electric power plant located in the central/southeast area of the Site, adjacent to the Pennwood Canal. While the grounds formerly occupied by the power station itself are contained as Parcel B9, the inflow and outflow canals connecting the power station to Old Road Bay are part of Parcel B5. As part of this investigation, sediment samples will be collected from the substrate of the inflow and outflow canals.

Sediment samples will be collected at three transects in order to characterize sediment quality in the inflow and outflow canals. Transects are spaced approximately 1160 feet apart along the length of the canals. A transect consists of two sampling locations: one sample collected from the middle of the inflow canal and one sample collected from the middle of the outflow canal. Sediment sample locations (B5-126 through B5-131) are shown on **Figures 3 through 8**. At each location, a sediment sample will be collected from the top 12 inches of sediment.

All sediment samples will be collected in accordance with the methods specified in SOP No. 003 Sediment Sampling. Each sediment sample will be analyzed for TCL-VOCs, TCL-SVOCs, TAL Metals, TPH-DRO, TPH-GRO, PCBs, hexavalent chromium, and cyanide.

3.5 NAPL Delineation

In the event that NAPL bearing soils are identified within a boring, a temporary piezometer will be installed according to the specifications identified in QAPP Worksheet 21—Field SOPs, SOP No. 28 – Direct Push Installation and Construction of Temporary Groundwater Sample Collection Points. ARM will immediately check the piezometer for the presence of NAPL using an oil-water interface probe in accordance with methods referenced in the SOP No. 19 – Depth to Groundwater and NAPL Measurements. If NAPL is not detected, the piezometer will be allowed to equilibrate for at least 48 hours prior to a second measurement. If no product is detected after 48 hours, the piezometer will be emptied, removed and discarded, and the borehole will be abandoned in accordance with Maryland abandonment standards as stated in COMAR 26.04.04.34 through 36.

If NAPL is detected in the initial piezometer, ARM will remobilize (following utility clearance) to install and inspect additional soil borings and shallow, temporary piezometers to the north, south, east, and west of the detection point at distances of 25 feet. These borings will be installed according to the same specifications as the previous borings (SOP No. 009 Sub-Surface Soil Sampling). At each location, continuous core soil samples will be screened with a hand-held PID and inspected for evidence of NAPL, and the additional temporary piezometers will be installed to a final depth determined by ARM personnel.

Each additional piezometer installed to delineate the NAPL will be checked for the presence of product with an oil-water interface probe immediately after installation, 48 hours after installation, and again after a 30 day equilibration period. If NAPL is identified within any of the piezometers, additional borings/piezometers will be added as necessary to complete the delineation. The MDE will be notified within 48 hours if NAPL is detected within any of the temporary piezometers. Once the MDE has given approval to abandon the additional piezometers, each piezometer will be emptied, removed and discarded. All boreholes will be abandoned in accordance with Maryland abandonment standards as stated in COMAR

26.04.04.34 through 36. A full report documenting the results of the delineation, including NAPL thickness, will be submitted to the MDE within 30 days of completing the field activities.

3.6 Sample Documentation

3.6.1 Sample Numbering

Samples will be numbered in accordance with the QAPP Appendix C—Data Management Plan.

3.6.2 Sample Labels & Chain-of-Custody Forms

Samples will be labeled and recorded on the Chain-of-Custody form in accordance with methods referenced in the QAPP Worksheet 26 & 27—Sample Handling, Custody and Disposal.

3.7 Laboratory Analysis

EAG has contracted PACE of Greensburg, Pennsylvania to perform the laboratory analysis for this project. All sample analyses to be performed are listed in **Appendix B**. The samples will be submitted for analysis with a standard turnaround time (approximately 5 work days). The specific list of compounds and analytes that the soil and groundwater samples will be analyzed for, as well as the quantitation limits and project action limits, is provided in Worksheet 15 – Project Action Limits and Laboratory-Specific Detection/Quantitation Limits.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

All soil samples will be collected using dedicated equipment including new soil core liners and polyethylene tubing. Each cooler temperature will be measured and documented by the laboratory upon receipt.

Quality control (QC) samples are collected during field studies for various purposes, among which are to isolate site effects (control samples), to define background conditions (background sample), and to evaluate field/laboratory variability (spikes and blanks, trip blanks, duplicates, etc.).

The following QC samples will be submitted for analysis to support the data validation:

- Trip Blank – at a rate of one per day
  - Soil – VOCs only
- Blind Field Duplicate – at a rate of one duplicate per twenty samples
  - Soil - VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, PCBs, 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, PCBs, and Hexavalent Chromium
- Field Blank and Equipment Blank
  - Soil - VOC, SVOC, Metals, TPH-DRO, TPH-GRO, Hexavalent Chromium, and Cyanide

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

5.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

All investigation derived waste (IDW) procedures will be carried out in accordance with methods referenced in the QAPP Worksheet 21—Field SOPs, SOP No. 5 – Investigation-Derived Wastes Management.

6.0 DATA VALIDATION

All data validation procedures will be carried out in accordance with the QAPP Worksheet 34—Data Verification and Validation Inputs, Worksheet 35- Data Verification Procedures and Worksheet 36-Data Validation Procedures.

7.0 REPORTING

Following the receipt of all sampling results from "Area B Parcel B5", ARM will prepare a Phase II Site Investigation Report that will document the sample collection procedures and supporting rationale, and present and interpret the analytical results. All results will be presented in tabular and graphical formats as appropriate to best summarize the data for future use. The sample results will be compared against relevant criteria such as the MDE Generic Numeric Cleanup Standards and the EPA Regional Screening Levels, considering appropriate land use factors and institutional controls, to identify contaminants and exposure pathways of potential concern. ARM will also present recommendations for any additional site investigation activities if warranted.

8.0 SCHEDULE

The activities below are planned so that they may be completed within six months of agency approval of this Work Plan. In addition, the investigation report will be submitted to the regulatory authorities within four months of completion of the field investigation in accordance with these approximate timeframes:

- the sample collection activities will take approximately six (6) weeks to complete (including mobilization activities) once approval of the work plan is received;
- the soil and groundwater sample analysis, data validation and review is expected to require an additional eight (8) weeks to complete; and
- the preparation of the investigation report, including an internal Quality Assurance Review cycle, will require another eight (8) weeks.

FIGURES

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Area B Boundaries
Area A Boundaries
Private Property

Sparrows Point
Area A and Area B Parcels

November 25, 2015

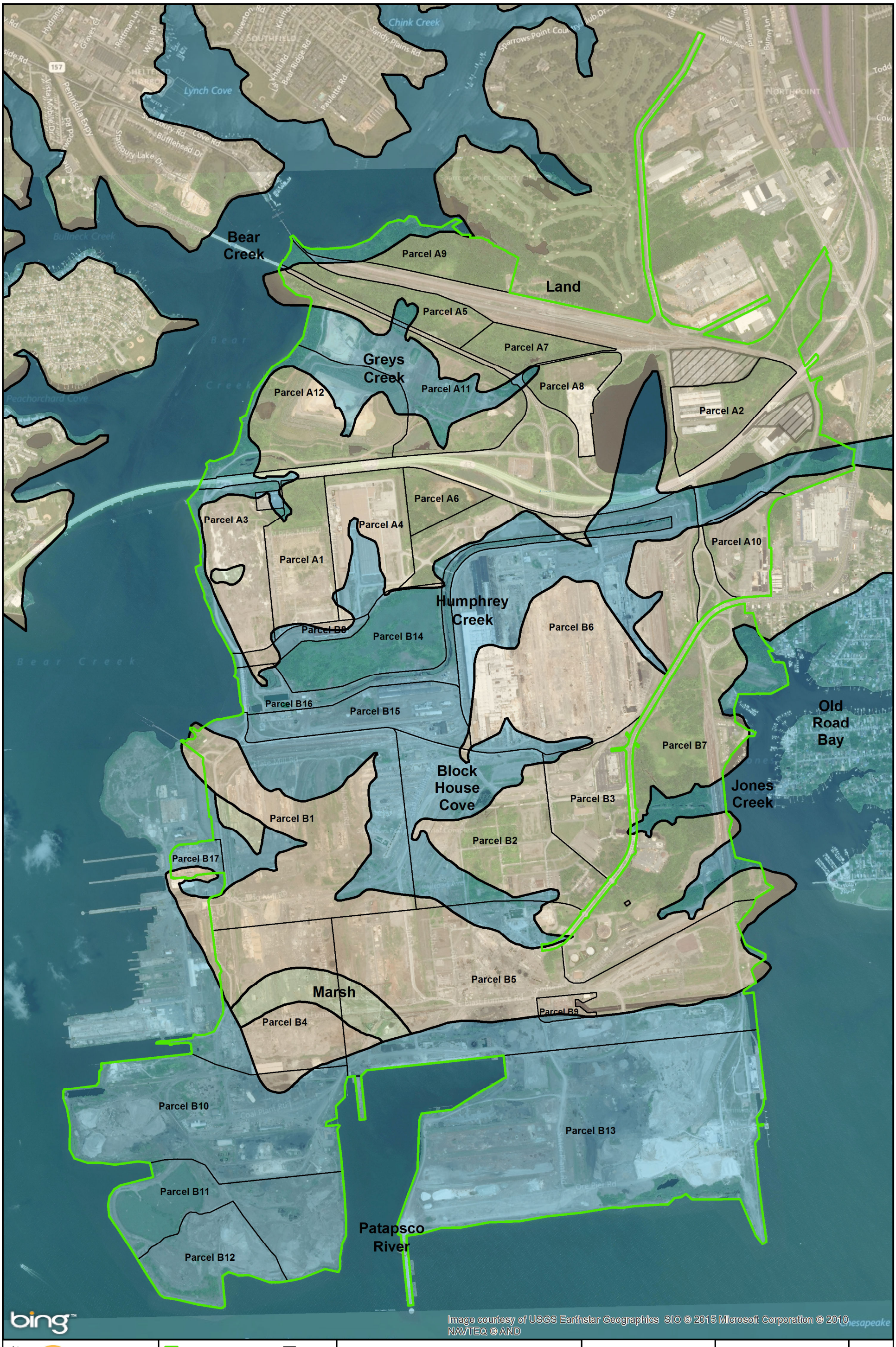
EnviroAnalytics Group

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

Sparrows Point Terminal

Baltimore County, MD

Figure 1



ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Area B Boundaries
Area A Boundaries
Land
Marsh
Water

Approximate Shoreline in 1916

November 25, 2015

Adapted from Figure 2-5 of the Description of Current Conditions Report prepared by Rust Environmental and Infrastructure, dated January 1998

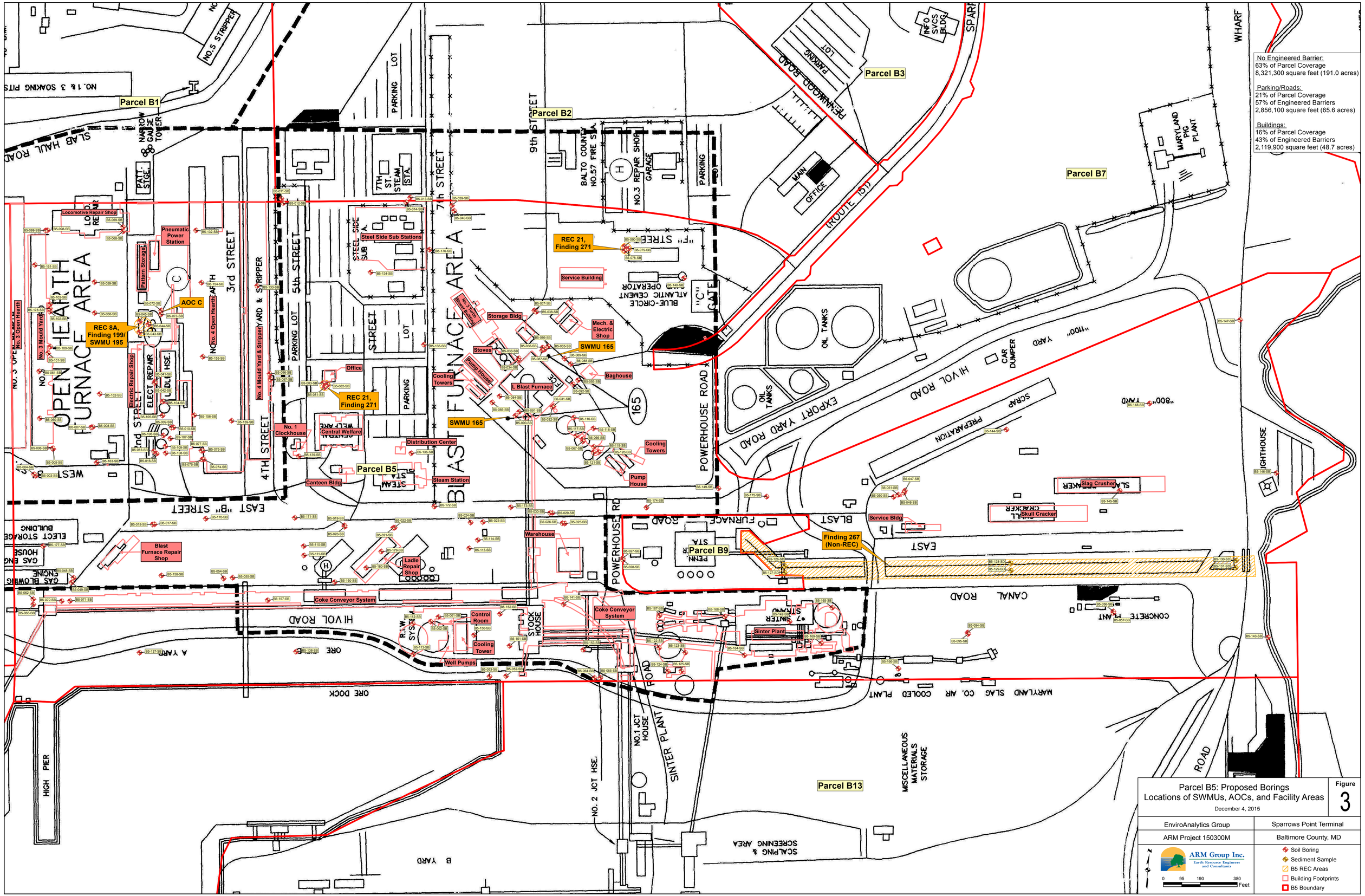
EnviroAnalytics Group

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

Sparrows Point Terminal

Baltimore County, MD

Figure 2



Parcel B5: Proposed Borings
Locations of SWMUs, AOCs, and Facility Areas

December 4, 2015

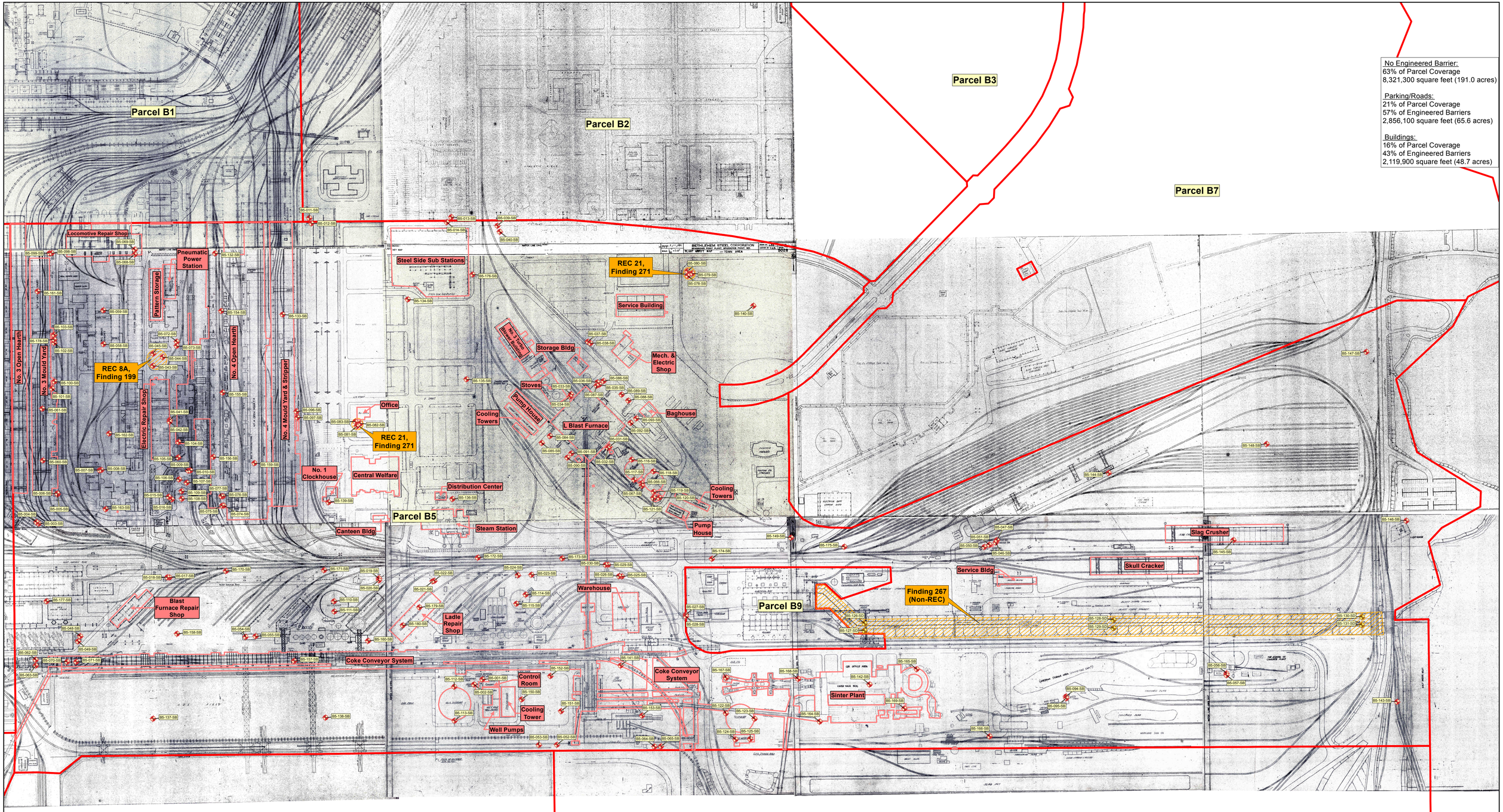
Figure 3

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Soil Boring
- Sediment Sample
- B5 REC Areas
- Building Footprints
- B5 Boundary



Parcel B5: Proposed Borings
Historical Site Drawings - 5000 Set

December 4, 2015

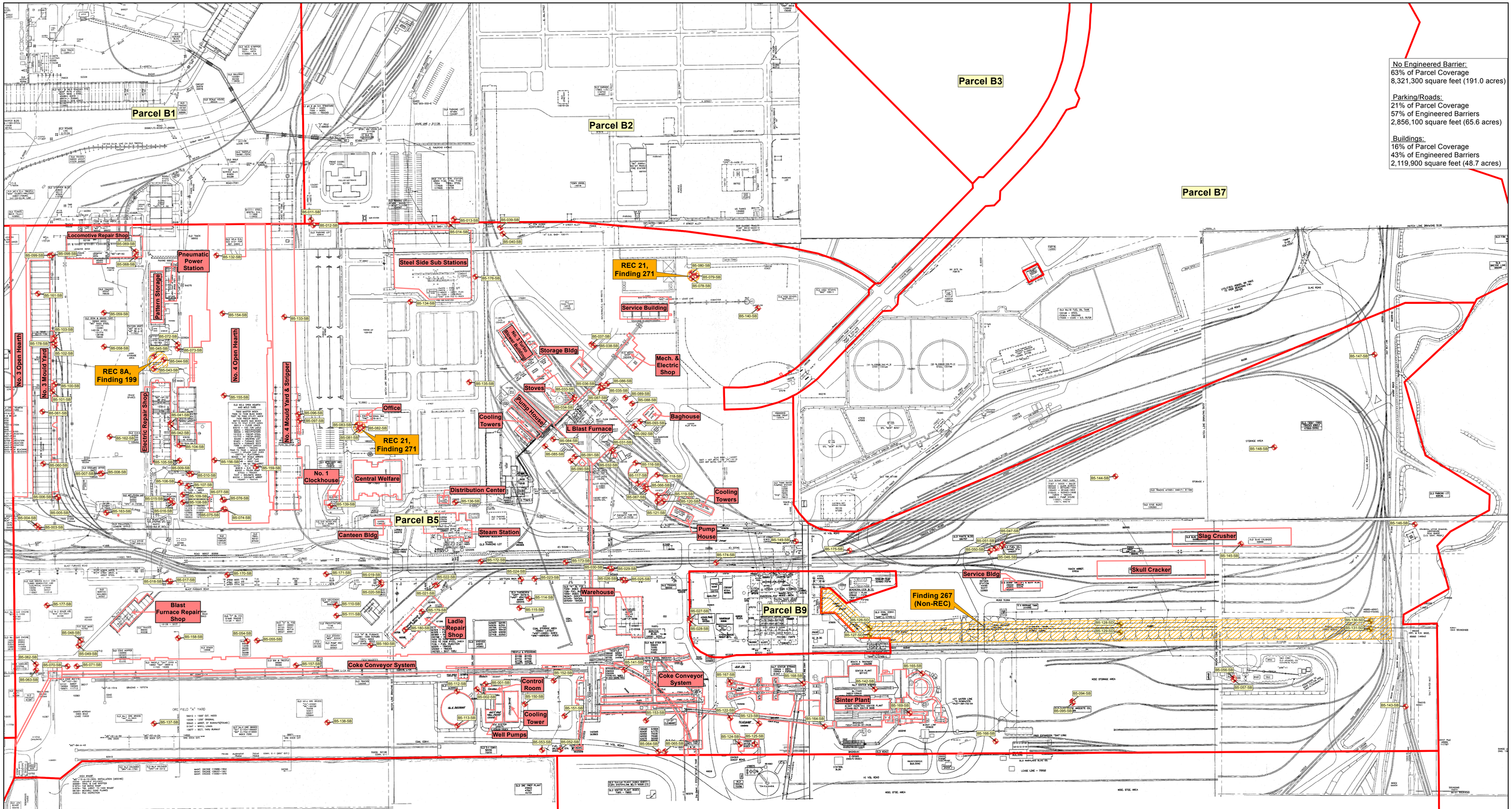
Figure 4

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Soil Boring
- Sediment Sample
- B5 REC Areas
- Building Footprints
- B5 Boundary



No Engineered Barrier:
63% of Parcel Coverage
8,321,300 square feet (191.0 acres)

Parking/Roads:
21% of Parcel Coverage
57% of Engineered Barriers
2,856,100 square feet (65.6 acres)

Buildings:
16% of Parcel Coverage
43% of Engineered Barriers
2,119,900 square feet (48.7 acres)

Parcel B5: Proposed Borings Historical Site Drawings - 5100 Set

December 4, 2015

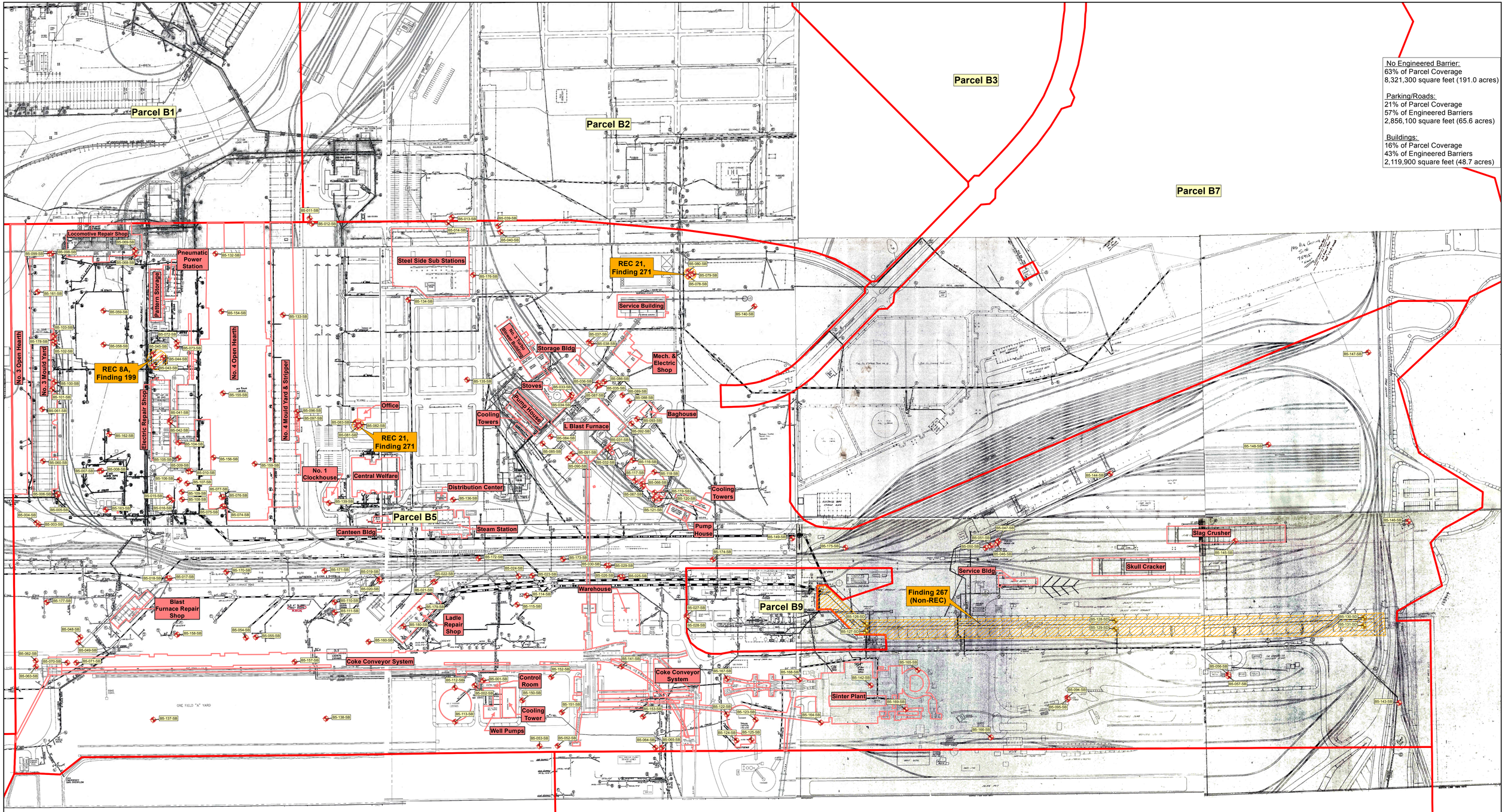
Figure 5

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Soil Boring
- Sediment Sample
- B5 REC Areas
- Building Footprints
- B5 Boundary

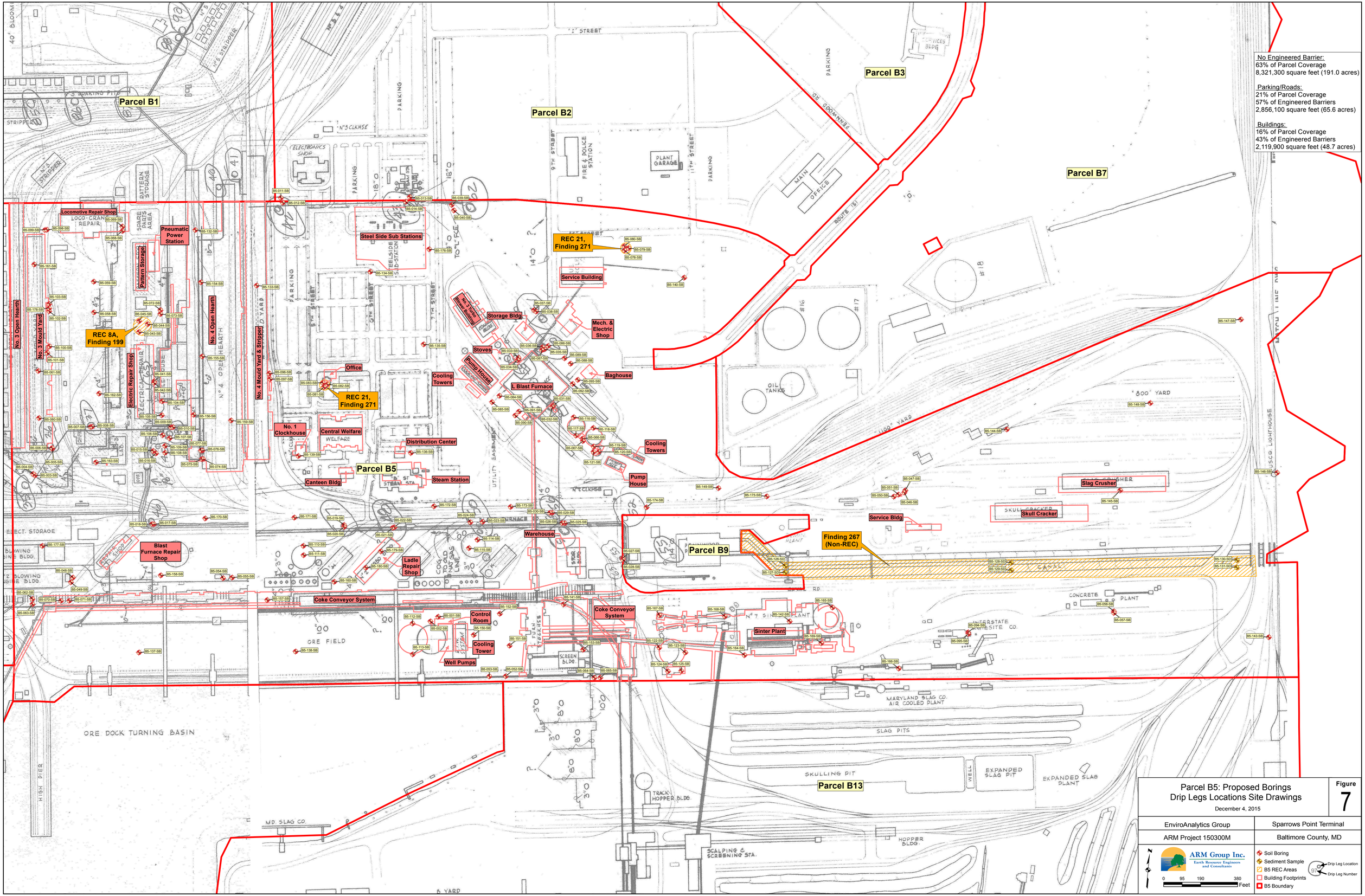


Parcel B5: Proposed Borings Historical Site Drawings - 5500 Set December 4, 2015	Figure 6
EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Soil Boring
- Sediment Sample
- B5 REC Areas
- Building Footprints
- B5 Boundary


Parcel B1
Parcel B2
Parcel B3
Parcel B5
Parcel B7
Parcel B9
Parcel B13
Locomotive Repair Shop
Pneumatic Power Station
Pattern Storage
No. 3 Open Hearth
No. 3 Mould Yard
No. 4 Open Hearth
No. 4 Mould Yard & Stripper
REC 8A, Finding 199
Electric Repair Shop
Steel Side Sub Stations
REC 21, Finding 271
Service Building
Storage Bldg
No. 3 Stripper Blower Building
Mech. & Electric Shop
Stoves
Pump House
Baghouse
L Blast Furnace
Cooling Towers
Office
No. 1 Clockhouse
Central Welfare
Distribution Center
Canteen Bldg
Steam Station
Pump House
Blast Furnace Repair Shop
Ladle Repair Shop
Coke Conveyor System
Warehouse
Control Room
Cooling Tower
Well Pumps
Coke Conveyor System
Sinter Plant
Finding 267 (Non-REC)
Service Bldg
Slag Crusher
Skull Cracker
I STREET
9TH STREET
11TH STREET
PARKING
FIRE & POLICE STATION
PLANT GARAGE
MAIN OFFICE
SERVICES BLDG
ROUTE 151
PENNWOOD RD
ORE FIELD
ORE DOCK TURNING BASIN
HIGH PIER
MD SLAG CO.
MARYLAND SLAG CO. AIR COOLED PLANT
SLAG PITS
SKULLING PIT
EXPANDED SLAG PIT
EXPANDED SLAG PLANT
CONCRETE PLANT
INTERSTATE CONCRETE SITE CO.
SCALPING & SCREENING STA.
TRACK HOPPER BLDG.
HOPPER BLDG.
SCREEN BLDG.
OIL TANKS
USCG LIGHTHOUSE
No Engineered Barrier:
63% of Parcel Coverage
8,321,300 square feet (191.0 acres)
Parking/Roads:
21% of Parcel Coverage
57% of Engineered Barriers
2,856,100 square feet (65.6 acres)
Buildings:
16% of Parcel Coverage
43% of Engineered Barriers
2,119,900 square feet (48.7 acres)
Parcel B5: Proposed Borings
Drip Legs Locations Site Drawings
December 4, 2015
Figure 7
EnviroAnalytics Group
Sparrows Point Terminal
ARM Project 150300M
Baltimore County, MD
ARM Group Inc.
Earth Resource Engineers and Consultants
0 95 190 380 Feet
Soil Boring
Sediment Sample
B5 REC Areas
Building Footprints
B5 Boundary
Drip Leg Location
Drip Leg Number

Parcel B5: Proposed Borings
Aerial View

December 4, 2015

Figure 8

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Soil Boring
- Sediment Sample
- B5 REC Areas
- Building Footprints
- B5 Boundary

Parcel B5: Proposed Groundwater Samples
Aerial View (From Groundwater Work Plan)
December 4, 2015

Figure 9

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Proposed Near-field Well
- Proposed Perimeter Well
- Existing Well
- B5 REC Areas
- Building Footprints
- B5 Boundary

Parcel B5: Proposed Asbestos Samples
Aerial View
December 4, 2015

Figure 10

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150300M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 95 190 380 Feet

- Asbestos Sample
- Former Main Gas Line
- B5 REC Areas
- Building Footprints
- B5 Boundary

Appendix A

Parcel B5 Historical Well Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Well		Chemical Analyte	CAS #	Detection Limit	Units	Project Action Limit (PAL)	Result
Shallow Zone	SG07-PDM008	Sulfate	14808-79-8	25	mg/L	No PAL	370
	SG07-PDM008	Chloride	16887-00-6	2	mg/L	No PAL	180
	SG07-PDM008	Bicarbonate	71-52-3	2	mg/L	No PAL	2 U
	SG07-PDM008	Iron	7439-89-6	0.1	mg/L	14	0.2
	SG07-PDM008	Magnesium	7439-95-4	0.1	mg/L	No PAL	0.8
	SG07-PDM008	Manganese	7439-96-5	0.01	mg/L	0.43	0.04
	SG07-PDM008	Potassium	7440-09-7	0.1	mg/L	No PAL	83
	SG07-PDM008	Sodium	7440-23-5	0.5	mg/L	No PAL	140
	SG07-PDM008	Calcium	7440-70-2	0.5	mg/L	No PAL	140
	SG07-PDM008	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	1000
Shallow Zone	SG07-PPM008	Sulfate	14808-79-8	25	mg/L	No PAL	460
	SG07-PPM008	Chloride	16887-00-6	10	mg/L	No PAL	240
	SG07-PPM008	Bicarbonate	71-52-3	10	mg/L	No PAL	10 U
	SG07-PPM008	Iron	7439-89-6	0.1	mg/L	14	0.3
	SG07-PPM008	Magnesium	7439-95-4	0.1	mg/L	No PAL	1
	SG07-PPM008	Manganese	7439-96-5	0.01	mg/L	0.43	0.07
	SG07-PPM008	Potassium	7440-09-7	0.1	mg/L	No PAL	150
	SG07-PPM008	Sodium	7440-23-5	0.5	mg/L	No PAL	160
	SG07-PPM008	Calcium	7440-70-2	0.5	mg/L	No PAL	350
	SG07-PPM008	Total dissolved solids (TDS)	TDS	20	mg/L	No PAL	1600
Shallow Zone	SG07-PZM007	Sulfate	14808-79-8	10	mg/L	No PAL	190
	SG07-PZM007	Chloride	16887-00-6	5	mg/L	No PAL	170
	SG07-PZM007	Bicarbonate	71-52-3	4	mg/L	No PAL	4 U
	SG07-PZM007	Iron	7439-89-6	0.1	mg/L	14	0.1 U
	SG07-PZM007	Magnesium	7439-95-4	0.1	mg/L	No PAL	0.1 U
	SG07-PZM007	Manganese	7439-96-5	0.01	mg/L	0.43	0.01 U
	SG07-PZM007	Potassium	7440-09-7	0.1	mg/L	No PAL	39
	SG07-PZM007	Sodium	7440-23-5	0.5	mg/L	No PAL	100
	SG07-PZM007	Calcium	7440-70-2	0.5	mg/L	No PAL	220
	SG07-PZM007	Total dissolved solids (TDS)	TDS	20	mg/L	No PAL	1000

Parcel B5 Historical Well Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Well		Chemical Analyte	CAS #	Detection Limit	Units	Project Action Limit (PAL)	Result
Shallow Zone	SW15-PZM005	Sulfate	14808-79-8	2	mg/L	No PAL	52
	SW15-PZM005	Chloride	16887-00-6	1	mg/L	No PAL	39
	SW15-PZM005	Bicarbonate	71-52-3	1	mg/L	No PAL	1 U
	SW15-PZM005	Iron	7439-89-6	0.1	mg/L	14	2.2
	SW15-PZM005	Magnesium	7439-95-4	0.1	mg/L	No PAL	3.3
	SW15-PZM005	Manganese	7439-96-5	0.01	mg/L	0.43	0.53
	SW15-PZM005	Potassium	7440-09-7	0.1	mg/L	No PAL	8.4
	SW15-PZM005	Sodium	7440-23-5	0.5	mg/L	No PAL	15
	SW15-PZM005	Calcium	7440-70-2	0.5	mg/L	No PAL	19
	SW15-PZM005	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	170
Shallow Zone	SW16-PZM003	Sulfate	14808-79-8	10	mg/L	No PAL	370
	SW16-PZM003	Chloride	16887-00-6	5	mg/L	No PAL	210
	SW16-PZM003	Bicarbonate	71-52-3	1	mg/L	No PAL	1.5 B
	SW16-PZM003	Iron	7439-89-6	0.1	mg/L	14	6.3
	SW16-PZM003	Magnesium	7439-95-4	0.1	mg/L	No PAL	53
	SW16-PZM003	Manganese	7439-96-5	0.01	mg/L	0.43	3.8
	SW16-PZM003	Potassium	7440-09-7	0.1	mg/L	No PAL	3.9
	SW16-PZM003	Sodium	7440-23-5	0.5	mg/L	No PAL	120
	SW16-PZM003	Calcium	7440-70-2	0.5	mg/L	No PAL	46
	SW16-PZM003	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	830
Intermediate Zone	SW15-PZM031	Sulfate	14808-79-8	1	mg/L	No PAL	9.4
	SW15-PZM031	Chloride	16887-00-6	10	mg/L	No PAL	430
	SW15-PZM031	Bicarbonate	71-52-3	2	mg/L	No PAL	120
	SW15-PZM031	Iron	7439-89-6	0.1	mg/L	14	32
	SW15-PZM031	Magnesium	7439-95-4	0.1	mg/L	No PAL	38
	SW15-PZM031	Manganese	7439-96-5	0.01	mg/L	0.43	2.7
	SW15-PZM031	Potassium	7440-09-7	0.1	mg/L	No PAL	7.6
	SW15-PZM031	Sodium	7440-23-5	0.5	mg/L	No PAL	110
	SW15-PZM031	Calcium	7440-70-2	0.5	mg/L	No PAL	83
	SW15-PZM031	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	840

Parcel B5 Historical Well Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Well		Chemical Analyte	CAS #	Detection Limit	Units	Project Action Limit (PAL)	Result
Lower Zone	SW15-PZM085	Sulfate	14808-79-8	1	mg/L	No PAL	14
	SW15-PZM085	Chloride	16887-00-6	2	mg/L	No PAL	130
	SW15-PZM085	Bicarbonate	71-52-3	1	mg/L	No PAL	79
	SW15-PZM085	Iron	7439-89-6	0.1	mg/L	14	33
	SW15-PZM085	Magnesium	7439-95-4	0.1	mg/L	No PAL	20
	SW15-PZM085	Manganese	7439-96-5	0.01	mg/L	0.43	1.1
	SW15-PZM085	Potassium	7440-09-7	0.1	mg/L	No PAL	4.4
	SW15-PZM085	Sodium	7440-23-5	0.5	mg/L	No PAL	44
	SW15-PZM085	Calcium	7440-70-2	0.5	mg/L	No PAL	32
	SW15-PZM085	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	350
Lower Zone	SW16-PZM067	Sulfate	14808-79-8	2	mg/L	No PAL	27
	SW16-PZM067	Chloride	16887-00-6	2	mg/L	No PAL	42
	SW16-PZM067	Bicarbonate	71-52-3	4	mg/L	No PAL	140
	SW16-PZM067	Iron	7439-89-6	0.1	mg/L	14	5.5
	SW16-PZM067	Magnesium	7439-95-4	0.1	mg/L	No PAL	16
	SW16-PZM067	Manganese	7439-96-5	0.01	mg/L	0.43	2.6
	SW16-PZM067	Potassium	7440-09-7	0.1	mg/L	No PAL	5.2
	SW16-PZM067	Sodium	7440-23-5	0.5	mg/L	No PAL	9.7
	SW16-PZM067	Calcium	7440-70-2	0.5	mg/L	No PAL	49
	SW16-PZM067	Total dissolved solids (TDS)	TDS	10	mg/L	No PAL	300

Samples collected from SG07-PDM007 and SG07-PPM007 on 11/15/2000.
Samples collected from SW15-PZM005, SW15-PZM031, SW15-PZM085, SW16-PZM003, and SW16-PZM067 on 12/14/2000.
Samples collected from SG07-PZM007 on 12/18/2000.
Highlighted values indicate PAL exceedances

Appendix B

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
Dispersant Tank/Acid Storage Tank		Drawing 5016	Investigate potential impacts related to dispersant/acid storage tanks (potential leaks or releases).	2	B5-001 and B5-002	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, PCBs Asbestos (B5-002)
Drip Legs (20)		Drip Legs Drawings 5885 and 5886	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.	40	B5-003 through B5-042	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, PCBs Asbestos (B5-006, B5-012, B5-018, B5-023, B5-028, and B5-034)
Former ERS Oily Wastewater Tank	REC 8A, Finding 199/ SWMU 195	REC Location Map/ DCC Figure	The unit consisted of a steel aboveground tank of unknown capacity located to the north of the Electrical Repair Shop (ERS) in the Open Hearth Furnace Facility Area. Electrical motors were occasionally steam cleaned, and the wash waters were sent to the tank. Oil was separated out and sent to PORI (SWMUs 71-73). The tank was removed sometime during the late 1980's or early 1990's. No analytical data are available for this area.	3	B5-043 through B5-045	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, PCBs
Fuel/Oil Tank (3)		Drawings 5015, 5017, and 5522	Investigate potential impacts related to fuel/oil storage tanks (potential leaks or releases).	6	B5-048 through B5-051; B5-066 and B5-067	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, PCBs
Fuel/Oil Loading and Unloading Stations (2)		Drawings 5017 and 5116	Investigate potential impacts related to fuel/oil loading and unloading stations (potential leaks or releases).	4	B5-046 and B5-47; B5-052 and B5-053	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, PCBs

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
Fuel Shop		Drawing 5015	Investigate potential impacts related to the fuel shop (potential leaks or releases).	2	B5-054 and B5-055	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, PCBs
Fuel Storage Area		Drawing 5018	Investigate potential impacts related to the fuel/oil storage area (potential leaks or releases).	2	B5-056 and B5-057	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, PCBs
Iron and Brass Foundry		Drawing 5021	Investigate potential impacts related to activities in the iron and brass foundry.	2	B5-058 and B5-059	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, PCBs
Iron Bleaching Pit		Drawing 5121	Investigate potential impacts related to the iron bleaching pit (potential leaks or releases).	2	B5-060 and B5-061	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, PCBs
Oil House (2)		Drawings 5015 and 5016	Investigate potential impacts related to oil houses (potential leaks or releases).	4	B5-062 through B5-065	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, PCBs
Paint Shop (2)		Drawings 5015 and 5027	Investigate potential impacts related to paint shops (potential leaks or releases).	4	B5-068 through B5-071	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, PCBs
PCB-Contaminated Oil Spill	AOC C	DCC Figure	As documented in a January 28, 1991 spill report letter from BSC to MDE, approximately 20 gallons of PCB contaminated oil was released to a soil area of approximately 15 feet by 20 feet in dimension when a PCB-containing transformer was struck by a vehicle and ruptured. After soil removal, 19 soil samples were collected from the spill area. Analytical results ranged from 0.2 to 13.3 ppm PCB concentrations. Clean soil was used to backfill the excavation and not slag as indicated in the RFA report.	2	B5-072 and B5-073	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, PCBs

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
"Trans" Pit (2)		Drawing 5021	Investigate potential impacts related to activities in the "trans" pits (potential leaks or releases).	4	B5-074 through B5-077	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, PCBs
Residential Town Tank (2)	REC 21, Finding 271	REC Location Map	Fire insurance maps depict buildings with boiler rooms and up to 9 tanks in the former Town area. It is unclear if these tanks are USTs or ASTs. No obviously apparent USTs or ASTs were observed during the site visit. Based on our review of historical source information and experience, tanks may have contained potentially hazardous substances and/or petroleum products which could have resulted in a release to the environment.	6	B5-078 through B5-083	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, PCBs Asbestos (B5-079)
Slag Pit/Piles (4)	SWMU 165	DCC Figure/ Drawing 5022	The furnace slag piles collected the slag generated as a by-product of the iron making process. The piles are designated as units managing non-hazardous waste. The slag was crushed and then evaluated for reuse. No specific details on the nature or condition of the wastes are given in the RFA Report.	8	B5-084 through B5-091	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, PCBs
Settling Tank		Drawing 5022	Investigate potential impacts related to the settling tank (potential leaks or releases).	2	B5-092 and B5-093	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, PCBs
Tank - Unknown Contents (4)		Drawings 5021, 5517, and 5521	Investigate potential impacts related to several storage tanks with unknown contents (potential leaks or releases).	8	B5-094 through B5-101	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, PCBs
Tar Storage Area		Drawing 5021	Investigate potential impacts related to the tar storage area (potential leaks or releases).	3	B5-102 and B5-103; B5-178	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, PCBs

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
Thickener Tank (10)		Drawings 5015, 5016, 5021, and 5022	Investigate potential impacts related to thickener tanks (potential leaks or releases).	20	B5-104 through B5-123	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, PCBs Asbestos (B5-120)
Wastewater Treatment		Drawing 5516	Investigate potential impacts related to the wastewater treatment building (potential leaks or releases).	2	B5-124 and B5-125	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, PCBs
Pennwood Canal Sediment Samples	Finding 267 (Non-REC)	REC Location Map	During the site visit, the Pennwood Powerhouse contained large equipment out of use. Some surface staining was observed on and below the equipment. Occasional flooding (at least one previous incident) caused water to pool on the equipment room floor and drain to the adjacent Pennwood Canal. It is unlikely that the flooding of the Pennwood Powerhouse resulted in a significant release of hazardous substances or petroleum products, and the Pennwood sediments were not classified as a REC.	6	B5-126 through B5-131	Total depth of 12 inches	Top 12 inches of sediment at each location.	VOC, SVOC, Metals, DRO/GRO, PCBs
Parcel B5 Coverage			Investigate potential impacts related to unknown historical activities, and characterize soil and groundwater in areas not previously sampled.	17	B5-132 through B5-141; B5-143 through B5-149	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, PCBs Asbestos (B5-136)
Open Hearth Furnace Area			MDE Request. Investigate potential impacts in the open hearth furnace areas not previously evaluated.	9	B5-150 through B5-158	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, PCBs
No. 4 Mould Yard and Stripper		Drawing 5121	MDE Request. Investigate potential impacts related to the No. 4 mould yard and stripper (potential leaks or releases).	1	B5-159	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, PCBs

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
Old H Furnace Area		Drawing 5115	MDE Request. Investigate potential impacts related to the old H furnace area (potential leaks or releases).	1	B5-160	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, PCBs
No. 3 Mould Yard		Drawing 5021	MDE Request. Investigate potential impacts related to the No. 3 mould yard (potential leaks or releases).	1	B5-161	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, PCBs
Storage Area		Drawing 5021	MDE Request. Investigate potential impacts related to the exterior storage area (potential leaks or releases).	1	B5-162	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, PCBs
Electric Substation		Drawing 5021	MDE Request. Investigate potential impacts related to the electric substation (potential leaks or releases).	1	B5-163	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, PCBs
Sinter Area		Drawings 5016 and 5017	MDE Request. Investigate potential impacts related to the sinter machine building (potential leaks or releases).	7	B5-142; B5-164 through B5-169	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, PCBs Asbestos (B5-168)
Railroad Tracks		Drawings 5015, 5016, and 5017	MDE Request. Investigate potential impacts related to the railroad tracks (potential leaks or releases).	6	B5-170 through B5-175	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, PCBs Asbestos (B5-171)

Parcel B5 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters†
								Soil Samples
Tar/ Underground Conduit/ Transformer		Drawing 5122	MDE Request. Investigate potential impacts related to the tar/ underground conduit/ transformers (potential leaks or releases).	1	B5-176	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, PCBs
Various Industrial Buildings (proximal boring)		Drawing 5015	MDE Request. Investigate potential impacts related to the old gas drive engines, power house, and service building (potential leaks or releases).	1	B5-177	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, PCBs
Ladle Repair Shop			Investigate potential impacts related to ladle repair shop, particulalry for the presence of asbestos.	2	B5-179 and B5-180	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, PCBs Asbestos (B5-179 and B5-180)
			Total:	180				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
No Engineered Barrier (>100 acres): 1 boring per 3 acres with no less than 40.
Engineered Barrier (>100 acres): 1 boring per 6 acres with no less than 20.
No Engineered Barrier (191.0 acres) = **64 Borings Required, 109 Proposed**
Engineered Barrier (114.2 acres) = **20 Borings Required, 71 Proposed**
Parking/Roads (65.6 acres)
Buildings (48.7 acres)

VOCs - 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
PCBs - Polychlorinated Biphenyls (0-1' interval only)
Asbestos - Asbestos (0-1' interval only), individual locations identified
bgs - Below Ground Surface
† Groundwater Samples are addressed by the Area B Groundwater Work Plan

Appendix C

Health and Safety Plan

Area B: Parcel B5
Sparrows Point Terminal, LLC
Sparrows Point, Maryland

Prepared for:
EnviroAnalytics Group
1650 Des Peres Road
Suite 230
Saint Louis, Missouri 63131

Prepared by:
ARM Group Inc.
9175 Guilford Road
Suite 310
Columbia, MD 21046

December 2015

ARM Project 150300M

Respectfully submitted,

Eric S. Magdar
Senior Geologist

T. Neil Peters
Vice President

TABLE OF CONTENTS

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been prepared for employees of ARM Group Inc. (ARM) to address personnel health and safety requirements for employees of ARM and its subcontractors to complete a Phase II investigation on a portion of the Sparrows Point Terminal, LLC property that has been designated as Parcel B5. The on-site activities shall include the following: collection of soil samples, and collection of sediment samples. ARM will comply with industry-standard health and safety protocol and Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 to prevent human exposure to volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), petroleum hydrocarbons, polychlorinated biphenyls (PCB) and metals present in site soil and groundwater.

2.0 GENERAL INFORMATION

2.1 Site Description

Parcel B5, which is comprised of 305 acres of the approximately 3,100-acre former plant property, is located off of Sparrows Point Boulevard in Sparrows Point, Maryland. Parcel B5 is one of 17 parcels that make up a larger area, known as Area B, of the Sparrows Point facility. Area B and its parcels are shown on **Figure 1.**

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

2.2 Site Hazards

The following is a general description of the potential site hazards.

Chemical Hazards:

- VOCs, SVOCs, PCBs, metals and petroleum hydrocarbons potentially present in soil and groundwater.

Explosive Hazards:

- VOC and petroleum hydrocarbon vapors in boreholes, and collection containers.

Physical Hazards:

- Slipping/tripping in work area
- Stress/fatigue from heat or cold temperatures
- Traffic
- Driving on steep slopes in off-road conditions
- Insect and animal bites
- Hand tools

Mechanical/Electrical Hazards:

- Underground utilities
- Heavy equipment (Geoprobe)
- Noise from heavy equipment operations
- Power tools

2.3 Utilities

Prior to initiating any subsurface investigations, all underground utilities will be cleared using the Miss Utility system. Additionally, EnviroAnalytics Group (EAG) will clear each proposed boring with utility personnel currently working on the property. The ARM staff will be responsible for avoiding any above ground utilities while operating vehicles on the site.

2.4 Waste Management

A small quantity of investigation derived waste (IDW) material will be generated as a result of the planned site work. These wastes could include decontamination fluids, soil cuttings, personnel protective equipment (PPE) and disposable sampling equipment. All IDW will be containerized in steel 55-gallon drums for on-site treatment or off-site disposal, pending the receipt of analytical results.

2.5 Site Controls and Security

It is the responsibility of ARM staff to keep unauthorized personnel away from the work areas during site work. All equipment used at the site must be secured or taken off-site. Subsurface intrusions should be covered to reduce any hazard that may be posed. Traffic cones, caution tape, physical barriers, or other such means as necessary shall be used to ensure that no unauthorized work area entry occurs.

3.0 OPERATING PROCEDURES

3.1 Air Monitoring

Due to the nature of the site activities and materials potentially present at the site, no vapor hazards are expected. If discernable odors are noted, then work will be temporarily suspended and air monitoring will be initiated using a PID or explosive gas indicator. If sustained vapor concentrations are measured at or above action levels in the breathing zone, work will immediately cease until such time as appropriate action is established. This action may require the upgrade of PPE or reevaluation of the need to proceed.

3.2 Personnel Protection

Personnel health and safety protection shall follow the guidelines provided by this HASP. Modifications to the HASP may be made by the field supervisor with the approval of the ARM Project Manager on a day-to-day basis as conditions change, based on existing conditions. Any necessary revisions must be fully documented by the field supervisor to include the specifics and rationalizations for the change.

It is anticipated that a modified Level D will be appropriate for the anticipated site activities. PPE associated with this designated level of protection (Level D), as established by the USEPA, is listed in a later section. Equipment listed for this level should be available to all personnel.

PPE will be stored in a clean, dry environment prior to it usage. Disposable equipment shall remain, in as much as possible, its original manufacturer's packaging to ensure its integrity. PPE that is assigned to a specific end user is subject to inspection by the supervisor at any time.

3.2.1 Determination of Level of Protection Requirements

The appropriate level of personnel protection must be established on the basis of ambient air monitoring responses. Air monitoring action levels should be consistent with the primary compounds of concern as listed in Table 3-1 (below). Appropriate action should be taken if total organic vapor air concentrations are sustained at a concentration equal to or greater than the PEL listed on Table 3-1.

Substance	CAS #	OSHA PEL (ppm)	IDLH (ppm)
Benzene	71-43-2	10	500
Toluene	108-88-3	200	500
Ethyl benzene	100-41-4	100	800
Xylenes	1330-20-7	100	900
Naphthalene	91-20-3	10	250
Tetrachloroethylene	127-18-4	100	150
Trichloroethylene	79-01-6	100	1,000

Notes: ppm = parts per million, PEL = Permissible Exposure Limit,
STEL = Short Term Exposure Limit, IDLH = Immediately Dangerous to Life or Health

This criterion will be applicable to all activities unless specific protection requirement for a certain task are addressed separately. As previously stated, it is anticipated that a modified Level D will be appropriate for the anticipated site activities; which requires a regular worker uniform, steel-toed safety shoes, hardhat, safety glasses and long paints. Level D will be considered the minimum protection level for all work on-site.

Respiratory protection against dust must also be considered during site work, particularly on windy days. The usage of dust respirators (high efficiency particulate air [HEPA] filters) will be determined by site conditions and judgment of the field supervisor. Sprinklers may be used to control dust during work activities.

3.2.2 Dermal Protection

In general, dermal protection levels will correspond with the respiratory protection level in use during an activity as described in other sections. For most activities on the site, Level D dermal protection will be adequate. When work tasks are such that a higher level of personal protection is required, dermal protection may be upgraded to coated Tyvek (Saranex) or chemical-resistant rain suit or Tyvek. This determination will be made by the ARM Field Supervisor as required.

Chemical and abrasion-resistant outer gloves and inner chemical-resistant disposable gloves would be required in the work zone to provide adequate protection of hands and assist in preventing transfer of contaminants. xAs much of the investigation may require handling of possibly contaminated equipment, groundwater, or soil, chemical-resistant gloves should be required for all on-site work with these materials. Various operations, which require dexterity and do not necessitate the abrasion-resistant feature of outer gloves, could be performed with the inner gloves only, at the direction of the ARM Field Supervisor.

3.2.3 Eye Protection

Since many volatile contaminants are capable of penetrating skin tissues, the eyes provide a potential route of entry into the body. Typically, volatile organic vapors will be detected in the air-monitoring program. Dust and air-borne particulates will be monitored visually and nuisance dust standards will be applied. If exceeded, dust masks will be donned. Eye protection requirements must correspond to the respiratory protection level.

3.3 Task-Related Personnel Protection

At a minimum, all workers are required to wear long pants, steel toed shoes and a sleeved shirt at all times. Additional PPE will be required on a task-specific basis.

3.3.1 Installation of Geoprobe Soil Borings, Soil Logging and Soil Sampling Activities

All personnel should wear the following:

- Long pants and sleeved shirt/vest (high visibility)
- Steel toe safety boots
- Safety glasses with side shields
- Hearing protection
- Chemical resistant gloves

3.3.2 Collection of Sediment Samples

Sediment samples will be collected from the Penn***wood*** Canal as part of the scope of this work plan. The sediment sample collection process may involve at least two field personnel using a small boat or similar watercraft to collect samples at specified widths across the canal. All personnel aboard the boat will wear life jackets at all times and will exercise extreme caution to avoid creating unbalanced conditions while aboard the boat. In addition to the life jacket, all personnel should wear the following:

- Long pants and sleeved shirt/vest (high visibility)
- Steel toe safety boots
- Safety glasses with side shields
- Hearing protection
- Chemical resistant gloves

3.4 Explosion Prevention

Due to the potential presence of flammable materials at the site, the following safety guidelines must be followed to prevent the possibility of explosion:

a. All monitoring equipment will be intrinsically safe or explosion-proof, if used in areas of possible explosive atmospheres.

b. A fire extinguisher, first-aid kit, and an eye wash station will be located at the site within a short distance of site work.

c. Any compressed gas cylinders or bottles will be stored safely as required by the OSHA regulations. In addition, metal barriers must be provided and installed between oxygen and acetylene bottles, extending above the height of the regulators. At the end of each work shift, regulators shall be removed and replaced with protective caps.

d. No explosives, whatsoever, shall be used or stored on the premises.

e. All cleaning fluids or solvents must be stored and transported in OSHA-approved safety containers.

f. Propane, butane, or other heavier-than-air gases shall not be transported onto or used on-site unless prior approval is obtained in writing from the Project Manager and the Facility Operator.

4.0 DECONTAMINATION PROCEDURES

Decontamination procedures will be used on some field tasks, but not all, completed at the site. All decontamination operations will be performed at the sampling location unless the level of PPE is upgraded. If the level of PPE is upgraded, all decontamination operations will be performed in a central decontamination area and supervised by the ARM Field Supervisor. If necessary, a decontamination corridor will be set up adjacent to the area and equipped with brushes, plastic bags, and drum storage. Disposable outerwear and contaminated disposable equipment will be collected and bagged for future disposal. The ARM Field Supervisor would be required to inspect PPE and clothing to determine if decontamination procedures were sufficient to allow passage into the staging area.

The following decontamination facilities, as a minimum, will be provided in the staging area:

a. Hand washing facilities

b. First-aid kit

c. Eye wash station

d. Fire extinguisher

Proper on-site decontamination procedures, the use of disposable outer clothing, and field wash of hands and face as soon as possible after leaving the decontamination corridor could effectively minimize the opportunity for skin contact with contaminants.

4.1 Personnel Decontamination Procedures

Decontamination procedures should be as follows:

Level D decontamination will consist of:

1. Potable water wash and potable water rinse of boots and outer gloves (if worn).

2. Bag or drum all visibly impacted disposable clothing.

3. Field wash of hands and face.

4.2 Equipment Decontamination

All equipment such as drilling and excavation equipment, tools, and pumps should be cleaned with potable water and a non-phosphate detergent (Liquinox), to prevent cross-contamination during the field effort and prior to equipment being taken from the site. Specific procedures for decontamination of field equipment would be established by the ARM Project Manager in order to prevent cross contamination by the drilling or sampling equipment.

Level D personnel protection is required during equipment decontamination.

5.0 EMERGENCY CONTINGENCY INFORMATION

Pertinent emergency telephone numbers are listed in Table 5-1. This information must be reviewed by and provided to all personnel prior to site entry.

Table 5-1
Emergency Telephone Numbers

Facility/Title	Telephone Number
Fire and Police	911
Ambulance	911
James Calenda, EnviroAnalytics Group	(314) 620-3056
Eric Magdar, ARM Manager	Office: (410) 290-7775 Cell: (301) 529-7140
Hospital – Johns Hopkins Bayview	(410) 550-0350

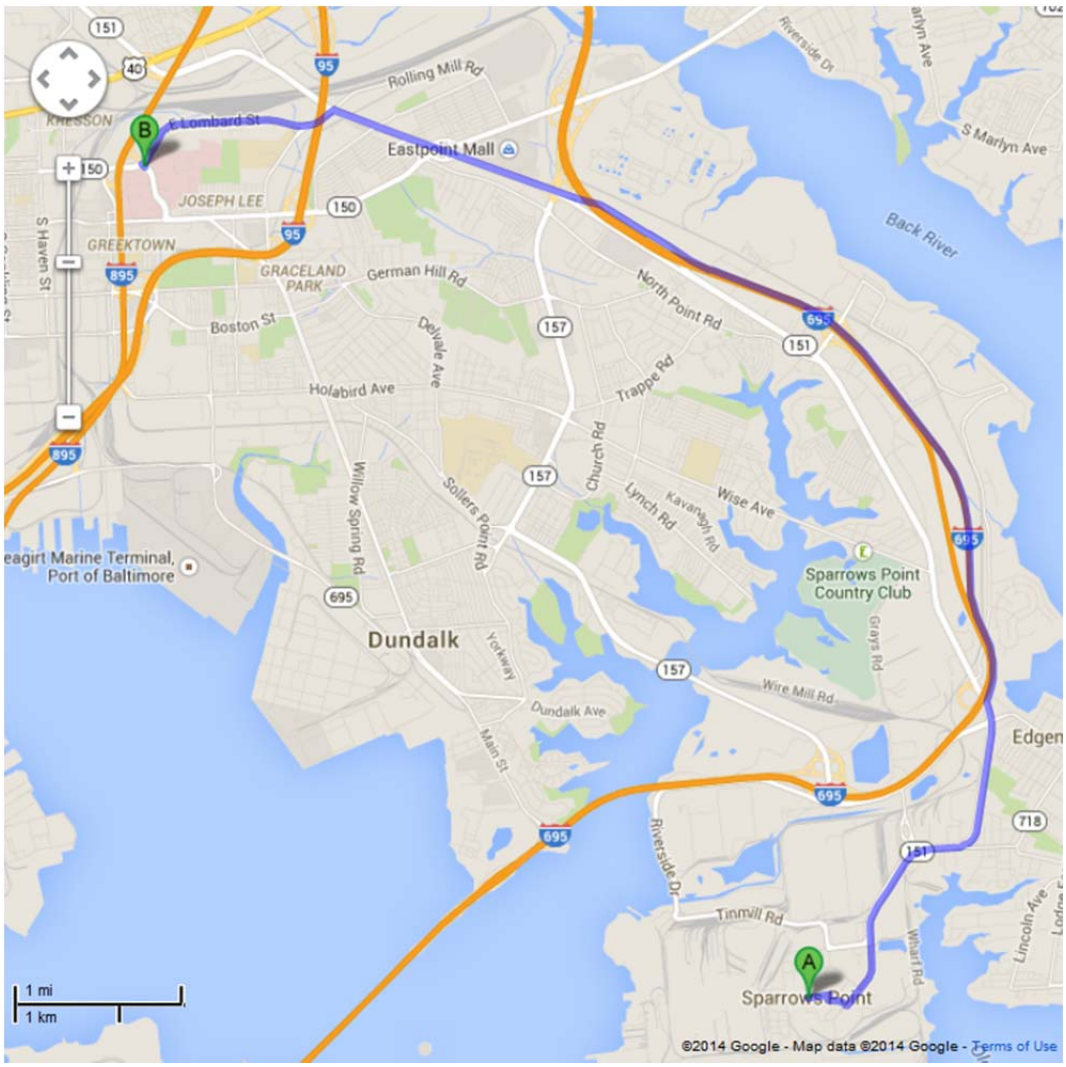
In the event of a fire or explosion, the site will be evacuated immediately and the appropriate emergency response groups notified. In the event of an environmental incident caused by spill or spread of contamination, personnel will attempt to contain the spread of contamination, if possible.

In the event of a personnel injury, emergency first aid would be applied on site by ARM as deemed necessary. The victim should be transported to the local medical facility if needed. The map to the hospital is provided below.

Hospital Route From Sparrows Point Terminal

Johns Hopkins Bayview
4940 Eastern Avenue
Baltimore, MD
(410) 550-0350

1. Start out going East on 7th Street.
2. Turn LEFT onto Sparrow Point Road.
3. Travel 1.4 miles and continue onto North Point Boulevard.
4. Travel 0.9 miles and turn slight right to merge onto I-695 North/Baltimore Beltway toward Essex.
5. Travel 3.4 miles and take EXIT 40 for MD-151/N. Pt. Blvd. N toward MD-150/East. Blvd W/Baltimore.
6. Travel 0.5 miles and merge onto MD-151 N/North Point Blvd.
7. Travel 2.0 miles and turn LEFT onto Kane Street.
8. Travel 0.2 miles and turn slight right onto E. Lombard Street.
9. Travel 1.2 miles and turn left onto Bayview Blvd.
10. Make a left at the emergency room of the hospital



6.0 ACKNOWLEDGEMENT OF PLAN

All site personnel are required to read and comply with the HASP. The following safety compliance affidavit should be signed and dated by each person directed to work on-site.

I have read this HASP and agree to conduct all on-site work in conformity with the requirements of the HASP. I acknowledge that failure to comply with the designated procedures in the HASP may lead to my removal from the site, and appropriate disciplinary actions by my employer.

Title and Company	Name	Signature	Date