RESPONSE AND DEVELOPMENT WORK PLAN

AUTOMOTIVE AND RO-RO DISTRIBUTION CENTER
AREA B: SUB-PARCEL B4-1
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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1.0 INTRODUCTION

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Response and Development Work Plan for a portion of the Tradepoint Atlantic property that has been designated as Area B, Sub-Parcel B4-1 (the Site). Tradepoint Atlantic submitted a letter (**Appendix A**) requesting an expedited remedial plan review to achieve construction deadlines for the proposed development on this Site. The Site is approximately 21 acres of land located in Parcel B4 shown on **Figure 1** and is currently vacant with the exception of an approximately 5700 square foot former maintenance building that will be retained for future use. The full extent of Parcel B4 is comprised of approximately 72 acres of the approximately 3,100-acre former steel mill property located in Sparrows Point, Maryland. For scheduling purposes, this parcel was divided into Sub-Parcels B4-1 and B4-2 to facilitate an expedited investigation and re-development of Sub-Parcel B4-1. A separate development plan will be submitted for the balance of Parcel B4 (i.e., including Sub-Parcel B4-2).

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (effective September 12, 2014); and

Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (effective November 25, 2014).

On September 11, 2014, Tradepoint Atlantic submitted an application to the Maryland Department of the Environment's (Department) Voluntary Cleanup Program (VCP). The Site 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 Department (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 Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

In consultation with the Department, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the Department and Tradepoint Atlantic agree that the

Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (COMAR 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on the Parcel B4-1 and complement the statutory requirements of the Voluntary Cleanup Program (Section 7-501 of the Environment Article). Upon submission of a Site Response and Development Work Plan and completion of the remedial activities for the sub-parcel, the Department shall issue a "No Further Action" letter upon a recordation of an environmental covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the Department a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

Alternatively, Tradepoint Atlantic or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this work plan are implemented and a No Further Action letter is issued by the Department pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the work plan, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this work plan.

A Phase II Investigation specific to soil and soil gas conditions was performed for the Site in accordance with the requirements outlined in the ACO as further described in the Phase II Investigation Work Plan – Area B: Parcel B4, Sub-Parcel B4-1 (Expedited Area) dated January 27, 2016. In addition, groundwater at the Site is being investigated in accordance with the separate Area B Groundwater Investigation Work Plan dated October 6, 2015. Findings from the Phase II Investigation are summarized in this document, and the Phase II Report for the Site is attached in **Appendix B.** Data from the Area B Groundwater Investigation has also been evaluated with respect to potential concerns associated with construction activities.

The Site is currently slated for development and use as an automotive and distribution center (Roll-On, Roll-Off, RORO) with development activities generally including grading, asphalt paving and lighting and security improvements. The proposed development also includes improvements to install a stern dock facility for offloading cars from ships (the Fender Area) and a paved access road connecting the storage area to the fender area. Subsequent Site use would involve workers placing and removing automobiles. This Response and Development Work Plan provides engineering and institutional controls, including work practices and applicable protocols, which are required to support the planned development in conjunction with the impacts and potential human health exposures identified by the Phase II Investigation and Area B Groundwater Investigation. The engineering and institutional controls are being submitted for approval to support the development and use of the Site. Engineering and institutional controls approved as part of this Site Response and Development Work Plan shall be described in documentation submitted to the Department demonstrating that the exposure pathways on the sub-parcel are addressed in a manner that protects public health and the environment. This information shall support Tradepoint Atlantic's request for the issuance of a COC for the larger parcel.

2.0 SITE DESCRIPTION AND HISTORY

2.1. SITE DESCRIPTION

The Site has an area of 21 acres. Sub-Parcel B4-1 is shown in **Figure 2**. The development plan also includes paving of approximately 1 acre (the Fender Area) located at the former ore dock in Parcel B5 and paving of approximately 2,000 feet of access road to connect the Fender Area to the proposed storage area at Sub-Parcel B4-1. The Site is currently zoned Manufacturing Heavy-Industrial Major (MH-IM), and is not occupied.

All buildings have been demolished, with the exception of one remaining building within the southwest corner which was most recently used as an equipment maintenance and repair facility by MCM Management Corporation (MCM). According to EAG, the shop was formerly occupied by the Phoenix Aggregate and Industrial Minerals Company. Based on historic aerial images available through Google Earth Pro, the building was constructed between August 2006 and September 2007. The company was active while the steel facility was operational, and primarily served to process slag into aggregate for resale. The building appears to have been used for the maintenance of equipment, with processing operations completed elsewhere on the property. The maintenance shop has an area of approximately 5750 ft^2. The building has an intact concrete slab in fair condition, with some surface pitting and small cracks present.

During demolition, a number of sub-grade structures were identified and backfilled. A report of the backfill activities is provided in **Appendix C**.

The Site is at an elevation of approximately eleven (15) feet above mean sea level (amsl). Elevations in the parcel are fairly uniform between 13 and 16 feet over the majority of the Sub-Parcel B4-1. Although Parcel B4 is generally underlain by native soil (**Figure 2**), surface conditions at the Site are characterized by the presence of slag gravel placed as fill with no soil or vegetation present. Surface runoff collects in low spots on the parcel with no clear discharge location. The surrounding tidal tributaries of the Chesapeake Bay (Bear Creek to the west and the Patapsco River to the south) likely influence macroscopic groundwater flow beneath the Site.

In general, the subsurface geology encountered included slag fill overlying natural soils, which included fine-grained sediments (clays and silts) and coarse grained sediments (sands). Groundwater was observed in the soil borings at depths ranging from 7 to 10 feet below the ground surface (bgs) across the Site.

There is no groundwater use on-site or within the surrounding Tradepoint Atlantic property.

2.2. 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 the Facility ceased in fall 2012. The Site is currently vacant with demolition activities completed from 2013 through early 2016.

Several iron and steel work processes were completed within the boundary of Parcel B4 (and are partially included within the Sub-Parcel B4-1 area). Descriptions of the main facilities and processes are provided below:

Basic Oxygen Furnace (BOF):

Basic oxygen steel making replaced the older open hearth furnace method. Basic oxygen steel making is a method of primary steel making in which carbon-rich molten pig iron is made into steel. Blowing oxygen through molten pig iron lowers the carbon content of the alloy and changes it into low-carbon steel. The process is known as basic because fluxes of burnt lime or dolomite, which are chemical bases, are added to promote the removal of impurities and protect the lining of the converter. The BOF received hot metal from the blast furnaces, scrap steel, and additional recyclable additives. After it was removed from the blast furnaces, the hot metal was passed through a desulfurization process or sent directly to the BOF. Pure oxygen was blown through a water-cooled lance to produce carbon monoxide, which accelerates the metallurgical reactions in the iron. After completion, the molten steel was poured into a ladle, where other alloying agents could be added.

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.

Continuous Caster:

Ladles of steel from the BOF were taken to the Continuous Caster Ladle Metallurgy Station where they may be first reheated with an oxygen lance and/or the chemistry adjusted by adding alloys and other materials and argon stirred. The steel then was moved by crane to the Slab Caster. Steel then was poured into the water-jacketed strand mould of the Slab Caster, from which a continuous slab was formed. The slab entered a roller containment area within the Slab Caster, where it was cooled with water sprays. The slabs then were cut to size by using a torch and then transferred to slab storage or the Hot Strip Mill. Fumes generated by the reactions were controlled by baghouses.

The past activities at the Fender Area are described below.

Ore Dock:

The DCC report discusses 6 PCB transformers, located near the Ore Piers on the southern site boundary, which were identified in the RFA Report as AOC E. AOC E was described as an area characterized by three cranes, each containing two PCB transformers. The transformers were reported to have been replaced by non-PCB transformers in 1995 and the removal and replacement were documented in a PCB Completion Report. The Phase I ESA identified this area as Finding 248. This finding was not identified as a REC and no further action was recommended. The Phase I ESA also notes that Chesapeake Steveadors have employees routinely on site performing tasks related to the unloading of raw materials at the ore dock, the turning basin, and the Pennwood shipping wharf.

3.0 ENVIRONMENTAL SITE ASSESSMENT RESULTS

3.1. PHASE I ENVIRONMENTAL SITE ASSESSMENT (ESA) RESULTS

The Phase I ESA prepared by Weaver Boos Consultants dated May 19, 2014 identified particular features across the Tradepoint Atlantic property which presented potential risks to the environment. These Recognized Environmental Conditions (RECs) included buildings and process areas where releases of hazardous substances and/or petroleum products potentially may have occurred. Weaver Boos completed site visits of Sparrows Point from February 19 through 21, 2014, for the purpose of characterizing current conditions at the former steel plant. A previous visual site inspection (VSI) was conducted as part of the RCRA Facility Assessment (RFA) prepared by A.T. Kearney, Inc. dated August 1993, for the purpose of identifying Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) on the property. This 1991 VSI is regularly cited in the Description of Current Conditions (DCC) report prepared by Rust Environmental and Infrastructure, dated January 1998 (included with Weaver Boos' Phase I ESA). Weaver Boos' distinction of a REC or Non-REC 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 their site visit. Weaver Boos made the determination to identify a feature as a REC based on historical information, observations during the site visit, and prior knowledge and experience with similar facilities. The following REC was identified and targeted for investigation within the Sub-Parcel B4-1 boundaries:

Oil House (REC 8C, Finding 203):

According to the Phase I ESA, documents provided by Baltimore County under the Freedom of Information Act (FOIA) indicated that an oil house was located east of the shipyards. This oil house was considered to be a REC, because the conditions and status of the building were unknown. The oil house was positively identified on several sets of historical drawings, and the REC boundaries were redrawn to enclose this feature. At the time of the investigation this structure had been demolished.

The DCC report Figure 3-1 generally shows the former SWMUs, AOCs and primary facility areas across the Tradepoint Atlantic property. There were no SWMUs or AOCs indicated on this figure within the Sub-Parcel B4-1 boundaries. However, several non-releasing units were identified separately from the DCC report Table 3-1. These units in the Steel Making Area which appear to be within the Sub-Parcel B4-1 boundary include the Caster Dust Baghouse Storage Area (SWMU 76), Former Open Hearth #1 Site (SWMU 82), and Caster Baghouse (SWMU 83). Since these features were not observed to be releasing, they were not considered by Rust Environmental and Infrastructure to be a risk for significant environmental impact and were screened out (not proposed for further action). No additional descriptions of these screened out SWMUs were provided in the DCC report. Due to the determined low risk for environmental impacts, as well as the paving (engineered barrier) proposed to cover the Sub-Parcel B4-1, these features were not explicitly identified as targets during the completion of ARM's field investigations discussed herein.

3.2. PHASE II INVESTIGATION RESULTS – SUB-PARCEL B4-1

Following the review of Weaver Boos' Phase I ESA and other pertinent historical documents, ARM conducted a Phase II Investigation of Sub-Parcel B4-1. The Phase II Investigation report is provided in **Appendix B**. A total of 29 soil samples (from the 15 boring locations shown in **Figure 3**) and three sub-slab soil gas samples (as shown in **Figure 4**) were collected and analyzed to assess the presence or absence of contamination in Sub-Parcel B4-1. The sampling and analysis plan for the parcel was developed to target the specific features which represented a potential release of hazardous substances and/or petroleum products to the environment. Soil samples were analyzed for the EPA Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semi-Volatile Organic Compounds (SVOCs), Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO)/Gasoline Range Organics (GRO), EPA Target Analyte List (TAL) Metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot bgs) were also analyzed for PCBs. Sub-slab soil gas samples were analyzed for VOCs.

3.2.1. Soil

Soil sample results for Sub-Parcel B4-1 were screened against Project Action Limits (PALs) established in the site-wide Quality Assurance Project Plan (QAPP) dated October 2, 2015 to identify the Contaminants of Potential Concern (COPCs) for the Site based on EPA's Regional Screening Levels (RSLs) for the composite worker exposure to soil. **Table 1** and **Table 2** provide a summary of the detected organic compounds and inorganics in the soil samples submitted for laboratory analysis, and **Figures S-1** through **S-3** present all soil sample results that exceeded the PALs. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports are included as electronic attachments. The data validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables. Any compound for which any result exceeded the PAL was identified as a COPC. The COPCs consisted of four inorganic compounds (arsenic, manganese, hexavalent chromium, and lead), three SVOCs (benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene), and three PCBs groups (total PCBs, Aroclor 1254, and Aroclor 1260).

All soil sample results were screened to identify any individual samples that may indicate a local Hot Spot that may require additional evaluation or special management. In accordance with the June 2008 Cleanup Standards for Soil and Groundwater developed by the MDE, a potential Hot Spot was identified if the result was 100 times the PAL (i.e., EPA RSL value adjusted to 1E-4 cancer risk or Hazard Index of 100). There were no Hot Spots identified in Sub-Parcel B4-1.

3.2.2. Sub-Slab Soil Gas

The three sub-slab samples collected during the Phase II Investigation of the remaining building (maintenance shop) did not contain any VOC compounds that exceeded their specified PALs based on the Maryland sub-slab soil gas screening values for non-residential properties. Minimal impacts below the building slab are documented indicating an insignificant risk for vapor intrusion to future workers. **Table 3** presents the results for detected compounds in the soil gas samples. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports are included as electronic attachments. The data validation reports contain a glossary of qualifiers for the final flags assigned to results in the attached summary tables.

3.2.3. Groundwater Results

One groundwater monitoring well is located within the boundary of parcel B4-1. The sample from this groundwater monitoring well indicated two contaminants in excess of the project action limits (PALs); benzo[a]anthracene and Diesel Range Organics (DRO). While the concentrations of these COPCs on site are not deemed to be a human health hazard since there is no groundwater use, proper water management is required to prevent unacceptable discharges or risks to on-site workers. **Tables 4** and **5** present a summary of the detected organic compounds and inorganics in the groundwater sample. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports are included as electronic attachments. The data validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

3.3. PHASE II INVESTIGATION RESULTS – FENDER AREA

The Fender Area was included within the boundaries of Phase II soil investigation of Parcel B5. Two of the Parcel B5 soil borings (B5-137-SB and B5-138-SB) were located in the ore dock area, within approximately 350 feet of the Fender Area (see Figure 3). Three soil samples were collected from each of these borings. All six samples were run for organic analytes and five samples were run for inorganic analytes. **Table 6** presents the results for the organic compounds detected in any of these samples. **Table 7** presents the results for the inorganic compounds detected in any sample. Only arsenic and benzo[a]pyrene were found to exceed their PALs, with maximum concentrations of 6.6 mg/kg and 0.53 mg/kg, respectively. None of the PAL exceedances were identified as Hot Spots.

The Fender Area is also located within the boundaries of the Area B Groundwater Investigation. Five Area B groundwater wells were installed in the vicinity and up-gradient of the ore dock area, which includes the Fender Area. **Table 8** presents the results for the organic compounds detected in any of these samples. **Table 9** presents the results for the inorganic compounds detected in any sample. PAL exceedances noted in the groundwater were chloroform, benzo[a]anthracene, DRO, and thallium (total and dissolved).

4.0 PROPOSED SITE DEVELOPMENT PLAN

Tradepoint Atlantic is proposing to construct an Automotive and RO-RO Distribution Center on Sub-Parcel B4-1. Included in this development will also be improvements on approximately 1 acre of land (the Fender Area) in Parcel B5 for a stern dock facility and a paved access road to connect the two areas. The proposed future use is Tier 3B – Restricted Industrial. Certain metals, PCBs, and PAHs are present in the soils located near the surface at concentrations in excess of the PALs. Therefore, soil is considered a potential media of concern. Future adult workers and visitors could potentially contact surface soil. Future construction workers may contact impacted surface soil during earth movement activities associated with future construction activities.

Groundwater from one well indicated two contaminants in excess of the PALs; benzo[a]anthracene and Diesel Range Organics (DRO). However, groundwater is not considered a media of concern since groundwater is being managed on a site-wide basis for the entire 3,100-acre Property. Additionally, a potable groundwater use restriction will be included as an institutional control in the No Further Action (NFA) Letter and Certificate of Completion (COC) issued by the MDE and a deed restriction prohibiting the potable use of groundwater will be filed. Groundwater is considered a potential media of concern for construction workers. A deed restriction governing groundwater encountered during excavation activities will provide protection for construction workers associated with future excavations at the Site. The proposed health and safety controls outlined in Section 5 and the site-specific Health and Safety Plan (HASP) will also mitigate the potential risk to construction workers from contacting impacted groundwater at the Site.

Potential risks to future adult workers and visitors associated with impacts to soil and groundwater exceeding the PALs will be addressed through a presumptive remedy consisting of engineering controls (capping of the entire area) and institutional controls (deed restrictions). The proposed site development plan provides for a containment remedy and institutional controls that will mitigate future adult workers and visitors from contacting impacted soil at the Site. The proposed health and safety controls outlined in Section 5 and the site-specific Health and Safety Plan (HASP) will mitigate the potential risk to construction workers from contacting impacted soil at the Site.

The site development and construction on Sub-Parcel B4-1 includes asphalt paving of the entire area (approximately 21 acres) and 30-foot wide access roads (totaling approximately 2,000 linear feet) connecting the new paved area to the existing Shipyard Road and to the turning basin. The asphalt paving will serve as a suitable parking and storage area for new automobiles, and will also act as a physical barrier to prevent direct contact with the underlying soils. Drawings for the proposed parcel development are provided in **Appendix D**. In addition, a 36,640 square foot paved area incorporating a foot stern ramp will be built at the turning basin (Fender Area). Drawings for the proposed stern ramp foundation are provided in **Appendix E**. **Figure 5** shows a typical section of the proposed access road construction.

The process of constructing the parking area and the stern dock involves the following tasks:

1. Sediment and erosion control installation.

Installation of erosion and sediment controls, as indicated in the civil drawings in **Appendix D**, will be done prior to any construction at the site. Disturbed soils will be consolidated into areas to be paved to ensure that they are capped during development.

2. Monitoring well abandonment

There is an existing groundwater monitoring well (SW-064-MWS) located on Sub-Parcel B4-1. This well will be properly abandoned in accordance with Code of Maryland Regulations (COMAR) prior to grading in this area.

3. Grading and site preparation.

Site grading will involve the excavation of approximately 4,500 cubic yards of material, mostly associated with the construction of stormwater swales), and the placement of 37,400 cubic yards of material for the parking area; most of the fill (approximately 30,000 cubic yards) consists of subbase and paving materials. Any material that is not suitable for compaction will be excavated and replaced with subbase material, although it is not anticipated that poor soils will be encountered. The cut-fill balance indicates that no material should need to leave the Site, unless it is determined to be unsuitable for compaction. Borrow materials will be obtained from MDE-approved common borrow-site stockpiles or processed slag aggregate, if necessary, and shall be free of organic material, rocks larger than 3”-inches in any direction, frozen material, or other deleterious material.

4. Light standard pier installation.

Lighting standards designed for the site are 100 feet tall, and require reinforced concrete piers that are 20 feet deep. The piers for the lighting standards will be auger-drilled, and the holes will be dewatered prior to placement of concrete since the excavations will extend approximately 10 feet below the water table. Soil removed from the pier excavation and for the installation of any well points will be used as fill in the parking area; water removed will be collected and taken to the TPA wastewater treatment plant.

5. Installation of electrical conduit, stormwater piping and structures.

As with the light piers, material excavated for the stormwater management piping and inlets will be used as fill on the parking area. Stormwater piping will be installed at the grades and lines shown on the plans. Installation of the electrical conduit will occur following the installation of the stormwater piping. It is anticipated that the electrical contractor will install the electrical conductors in conduit and that pull-boxes will be placed as needed for access.

6. Placement of subbase.

Following the installation of stormwater and electrical utilities, the site will be fine-graded and placement of subbase will commence. The parking areas and access roads, approximately 981,800 square feet in total, will receive a uniform 8-inch thick layer of subbase material, which will consist of processed slag. The Berth Apron at the stern ramp, with an area of 36,640 square feet, will receive heavy duty paving with at least 8-inches of aggregate; the required subbase thickness has not yet been determined.

7. Asphalt paving.

The Site, approximately 870,400 square feet including the access roadways, will receive light-duty paving, with 3-inches of asphalt. The 40,000 square foot truck loading area will receive heavy duty paving, with 5-inches of asphalt. The Berth Apron at the stern ramp will receive heavy duty paving, with asphalt thickness being at least 5 inches.

Therefore, the full thickness of the pavement section (i.e., asphalt cap) to be placed over the existing soils will consist of 11 inches (8 inches of subbase and 3 inches of asphalt) in the light duty areas and at least 13 inches (at least 8 inches of subbase and at least 5 inches of asphalt) in the heavy duty areas.

8. Security and lighting.

Following the completion of paving, the contractor will install site security fencing, and will install light masts and final electrical connections.

9. Stormwater management

Stormwater will be conveyed by new piping and inlets to existing drainages. The development has received a variance from the requirement to install new stormwater management facilities on Sub-Parcel B4-1 (**Appendix F**).

10. **Landscaping.**

Upon completion, the entire sub-parcel will be paved. No landscaped areas are planned for the proposed facilities.

5.0 DEVELOPMENT IMPLEMENTATION PROTOCOLS

5.1. SOIL/FILL MANAGEMENT PLAN

This plan presents protocols for the handling of soils and fill materials in association with construction of the Automotive and RO-RO Distribution Center on Sub-Parcel B4-1, including the stern dock construction in the Fender Area and the access road connecting the two areas. In particular, this plan highlights the minimum standards for construction practices and managing potentially contaminated materials to reduce potential risks to workers and the environment.

5.1.1. Contaminants of Potential Concern (COPCs)

Several contaminants of potential concern (COPCs) were identified in soil samples across the site at concentrations that are above the Project Action Limits (PALs). The PALs are set based on EPA's Regional Screening Levels (RSLs) for industrial soils. These COPCs include: Semi-Volatile Organic Compounds (SVOCs) that consist of benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene; Polychlorinated Biphenyls (PCBs) that consist of Aroclor 1260, and Aroclor 1254, and Total PCBs; and Non-Organics that consist of hexavalent chromium, arsenic, lead, and manganese. Because these COPCs can present potential risks to human health and the environment at certain concentrations, this plan presents material management and other protocols to be followed during the work to adequately mitigate such potential risks.

MDE guidance specifies criteria for identifying material as Hot Spot material for which treatment or removal is encouraged as an alternative to containment on site. A table of Soil Screening Levels based on these MDE criteria is provided in **Appendix G**. The soil sampling conducted during the Phase II Investigation has demonstrated that none of the COPCs are present at Sub-Parcel B4-1 at concentrations that would prevent them from remaining or being consolidated under the proposed asphalt cap.

5.1.2. Soil Excavation

All soil excavation activities will be monitored by the on-site environmental professional (EP) whose contact information is provided below.

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Prior to any earthwork being conducted on-site, a pre-excavation meeting shall be held to address proper operating procedures for working on-site and handling potentially contaminated material. This meeting shall consist of the construction manager and any workers involved with earthwork. The site-specific Health and Safety Plan for the project shall be reviewed and discussed.

Soil excavation and removal activities will occur during utility trenching, light pole and inlet/manhole installation, sediment trap and swale construction, and mass grading for the parking lot. Utility trenches are to be over-excavated to one foot on all sides of the proposed utility.

In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the site beneath the proposed asphalt parking. However, the EP will monitor all soil excavation activities for signs of potential contamination that may not have been previously identified. In particular, soils will be monitored with a hand-held photoionization detector (PID) for potential volatile organic compounds (VOCs), and will also be visually inspected for the presence of staining, waste materials, or other indications of contamination that may be different than what was already characterized. MDE will be notified if such materials are encountered.

To the extent practical, all earthmoving activities should be conducted in a manner to minimize double or extra handling of materials. If excavated materials need to be stockpiled prior to placement or other handling, any such stockpiles shall be kept within the site footprint, and in a location that is not subjected to concentrated stormwater runoff. Stockpiles shall be managed as necessary to prevent the erosion and off-site migration of stockpiled materials, and in accordance with the applicable provisions of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control.

If screening of excavated materials by the EP indicates the presence of conditions of potential concern (i.e., sustained PID readings greater than 10 ppm, visual staining, unsuitable waste materials, etc.), such materials shall be segregated for additional sampling and special management. If excavated and stockpiled, such materials should be covered with a plastic tarp to minimize potential exposures and erosion.

5.1.3. Soil Sampling and Disposal

Excavated materials that are determined by the EP to warrant sampling and analysis because of elevated PID readings or other indicators of potential contamination that has not previously been characterized shall be sampled and analyzed to determine how the materials should be managed. A sampling work plan including a description of the material, estimated volume and sampling parameters will be submitted and approved by MDE. If the contaminant concentrations are less than the allowable values indicated on the attached soil screening table in **Appendix G**, those materials will be considered suitable for use as on-site fill below the proposed asphalt parking lot or concrete slabs and foundations. If the concentrations are greater than the values shown on the soil screening table, then the materials will be sampled to determine if they would be classified as hazardous waste.

For excavated materials that are sampled, if sampling indicates that the material is a hazardous waste, then such materials shall be shipped off-site in accordance with applicable regulations to an appropriate and permitted RCRA disposal facility. If the concentrations of excavated sampled materials indicate that the materials are not hazardous, they shall be taken to the on-site landfill for proper disposal.

5.1.4. Fill

According to the cut/fill analysis performed by the design engineer, approximately 33,000 CY of fill will be required for this project. Backfill material imported to the site will be screened according to MDE guidance for suitability. If the contaminant concentrations are less than the allowable values indicated on the attached soil screening table in Appendix F, those materials will be considered suitable for use as on-site fill below the proposed asphalt parking lot or concrete slabs and foundations. Utility trenches will be backfilled with material meeting the MDE definition of clean fill.

5.1.5. Sediment/Erosion Control

Erosion and sediment controls will be installed prior to commencing work as shown on the Erosion and Sediment Control Plan (in **Appendix D**) and in accordance with 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The Erosion and Sediment Control Plan will be approved by Baltimore County prior to construction. In addition, the following measures will be taken to prevent contaminated soil from exiting the site:

- Stabilized construction entrance and wheel wash will be placed at site entrance. Used water from wheel wash will be collected and taken to Humphreys Creek Wastewater Treatment Plant.

- A street sweeper will be used as necessary on adjacent roads. Sweeper dewatering shall be conducted such that used water can be collected and taken to Humphreys Creek Wastewater Treatment Plant.

- Accumulated sediment removed from super silt fence, gabion inlet protection, at-grade inlet protection, temporary stone outlet structures, temporary gabion outlet structures and sediment traps, shall be periodically removed and returned to the site for containment below the proposed asphalt cap or building.

5.1.6. Dust Control

Overall dust control methods shall include:

- Daily site wetting and dust suppression of active work areas. Overspraying of water shall be avoided in order to prevent erosion or sediment control complications.
- Reduced vehicle speeds.
- Minimizing drop heights.
- Stabilizing exposed surfaces as soon as possible

General construction operations, including removal of existing foundations or utilities, soil excavation and transport, soil grading, trenching for utilities, and cap construction activities will be performed at the Site. These activities are anticipated to be performed in areas of soil impacted with select metals, PCBs, and/or select PAHs. To limit worker exposure to contaminants borne on dust and windblown particulates, dust control measures will be implemented, if warranted when the above activities are performed in areas with impacted soil. The action level proposed for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) and/or continuous monitoring during future construction activities on Site will be 3.0 mg/m^3. The lowest of the site-specific dust action levels, OSHA PELs, and ACGIH TLV was selected as the proposed action level.

If visible dust is generated in the breathing zone, air monitoring will be implemented as follows:

- At the start of intrusive activities;
- Periodically during intrusive activities (15-minute intervals);
- When contaminants other than those previously identified are being handled;
- When a different type of operation is initiated or conditions change;
- If personnel are working in areas with obvious particulate contamination; and
- If a sufficient reasonable interval has passed so that exposures may have significantly changed.

Air monitoring will be performed using a ThermoElectron Corporation Personal Data RAM 1000AN dust monitor or equivalent real-time air monitoring device. If the action level (3 mg/m^3) is exceeded as a result of conditions occurring at the Site, operations will be stopped and dust suppression implemented. The background dust concentration will be utilized to evaluate whether Site activities are the source of the action level exceedance. Background concentrations will be based on measurements over a minimum of a one hour period at the upwind Site boundary. This upwind data will be used to calculate a time weighted average background dust concentration. The background dust concentration may need to be recalculated periodically during the work day, based on changed upwind conditions. Operations may be resumed once monitoring indicates that dust concentrations are below the action level.

As applicable, air monitoring will be conducted during RAP implementation activities in the immediate work zones and surrounding areas to assess levels of exposure to Site workers, establish that the work zone designations are valid, and verify that respiratory protection being worn by personnel, if needed, is adequate. Concurrent with the work zone air monitoring, perimeter air monitoring will also be performed to ensure contaminants are not migrating off-site. Perimeter monitoring will include monitoring along the perimeter of the Site, including both the downwind and upwind portions of the Site. The concentration measured in the downwind portion of the Site shall not exceed the concentration in the upwind portion. If exceedances attributable to Site conditions are identified downwind for more than five minutes, dust control measures and additional monitoring will be implemented. The dust suppression measures may include wetting or misting through use of a hose connected to an available water supply or a water truck stationed on Site.

Dust control measures will be implemented as described above to address dust generated as a result of construction and RAP activities conducted on Site. However, based on the nature of the area and/or on-going activities surrounding the Site, it is possible that windblown particulates may come from surrounding areas. As discussed above, the dust concentration in the upwind portion of the Site will be considered when monitoring dust levels in the work zone.

5.2. WATER MANAGEMENT

This plan presents the protocols for handling of any groundwater or surface water that needs to be removed to facilitate construction of the Automotive and RO-RO Distribution Center.

5.2.1. Contaminants of Potential Concern (COPCs)

One groundwater monitoring well is located within the boundary of parcel B4-1. Samples of this groundwater monitoring well indicated two contaminants in excess of the PALs; benzo(a)anthracene and Diesel Range Organics. While the concentrations of these COPCs on site are not deemed to be a human health hazard since there is no groundwater use, proper water management is required to prevent unacceptable discharges or risks to on-site workers.

5.2.2. Dewatering

Dewatering during construction will likely be necessary for the installation of high-mast light poles. The depth to groundwater is approximately 10 feet below grade and the light poles extend over 20 feet into the ground. If dewatering is required, it shall be done in accordance with all local, state and federal regulations. Water shall be pumped to the nearby caster pit or to portable storage tanks to be tested. Approvals will be requested to send the collected water to the Humphrey Creek Wastewater Treatment Plant.

5.3. HEALTH AND SAFETY

A site-specific Health and Safety Plan (**Appendix H**) has been developed and is attached to this plan to present the minimum requirements for worker health and safety protection for the project. All contractors working on the site must prepare their own Health and Safety Plan that provides a level of protection at least as much as that provided by the attached Health and Safety Plan. Alternately, on-site contactors may elect to adopt the Health and Safety Plan provided.

Prior to commencing work, the contractor must conduct an on-site safety meeting for all personnel. All personnel must be made aware of the Health and Safety Plan. Detailed safety information shall be provided to personnel who may be exposed to contaminants of potential concern. Workers will be responsible for following safety procedures to prevent contact with potentially contaminated soil or groundwater.

5.4. INSTITUTIONAL CONTROLS (FUTURE LAND USE CONTROLS)

Long-term conditions related to future use of the Site will be placed on the RAP approval, NFA Letter, and COC. These conditions are anticipated to include the following:

- A restriction prohibiting potable use of groundwater at the Site;
- Implementation of inspection procedures and maintenance of the containment remedies as outlined in Section 5.5 below.

The responsible party will file the above deed restrictions as defined by the MDE VCP in the NFA Letter and COC. The proposed paved areas are subject to the proposed response action containment remedy and the maintenance requirement. The Site will be subject to the potable groundwater use restriction.

The Tenant will be required to sign onto the Environmental Covenant with restriction in the NFA. TPA will notify the Tenant of this requirement and will provide MDE with contact information for the Tenant prior to issuance of the NFA Letter.

5.5. POST REMEDIATION REQUIREMENTS

Post remediation requirements will include compliance with the conditions specified in the NFA Letter, COC, and the deed restrictions recorded for the Site. Deed restrictions will be recorded within 30 days after receipt of the final NFA Letter.

Maintenance requirements will include maintenance of the capped areas to minimize degradation of the cap and exposure to the underlying soil. An Operations and Maintenance Plan (O&M Plan) for the capped areas is included in **Appendix I**. The O&M Plan includes the inspection protocols and a maintenance schedule.

The responsible party will perform cap maintenance inspections, perform maintenance of the cap, and retain cap inspection records. Areas of the pavement cap that have degraded to a Pavement Condition Index (PCI) of 4.0 will be repaired within 30 days of discovery. MDE shall be notified within ten business days of any repairs that are the result of a PCI of 4.0 or greater or if damage to the landscaped capped area(s) exceeds one foot in diameter and/or two feet in depth. The notification will include documentation of the conditions being repaired and the location of the repair.

5.6. Construction Oversight

Construction Oversight by an EP will ensure and document that the project is built as designed and appropriate environmental and safety protocols are followed.

Upon completion, the EP will certify that the project is constructed in accordance with this Development Plan. Records shall be provided to document:

- Daily Observations of Construction Activities during site grading
- Compliance with Soil Screening requirements
- Proper Cap Thickness and Construction
- Proper Water Management

6.0 PERMITS, NOTIFICATIONS AND CONTINGENCIES

The participant and their contractors will comply with all local, state and federal laws and regulations by obtaining any necessary approvals and permits to conduct the activities contained herein. Erosion and Sediment Control plans will be submitted to and approved by Baltimore County prior to construction. There are no wetlands identified within the project area and no work will be performed beyond the shoreline so no permits are required from the MDE Water Resources Administration.

Contingency measures will include the following:

1. the MDE will be notified immediately of any previously undiscovered contamination, previously undiscovered storage tanks and other oil-related issues, and citations from regulatory entities related to health and safety practices; and

2. any significant change to the implementation schedule will be noted in the progress reports to MDE

7.0 IMPLEMENTATION SCHEDULE

The proposed implementation schedule is shown below. Progress reports will be submitted to MDE upon completion of each milestone shown below.

Task	Proposed Completion Date
Anticipated Plan Approval	May 25, 2016
Installation of Erosion and Sediment Controls	May 26, 2016
Completion of site preparation/grading	June 3, 2016
Installation of paving	June 6, 2016
Submittal of Completion Report/Notice of Readiness for Use*	June 29, 2016
Request for a NFA from the MDE	July 1, 2016
Recordation of institutional controls in the land records office of Baltimore County	Within thirty days of receiving the approval of NFA from the MDE
Submit proof of recordation with Baltimore County	Upon receipt from Baltimore County

*Notice of Readiness for Use shall be prepared by Professional Engineer registered in Maryland and submitted with the Completion Report to certify that the work is consistent with the requirements of this Development Plan and the Site is suitable for occupancy and use.

FIGURES

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Private Property
Area A Boundaries
Area B Boundaries

Tradepoint Atlantic
Area A and Area B Parcels

August 1, 2016

EnviroAnalytics Group

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

Tradepoint Atlantic

Baltimore County, MD

Figure
1

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Area A Boundaries
Area B Boundaries
Land
Marsh
Water

Approximate Shoreline 1916

August 1, 2016

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

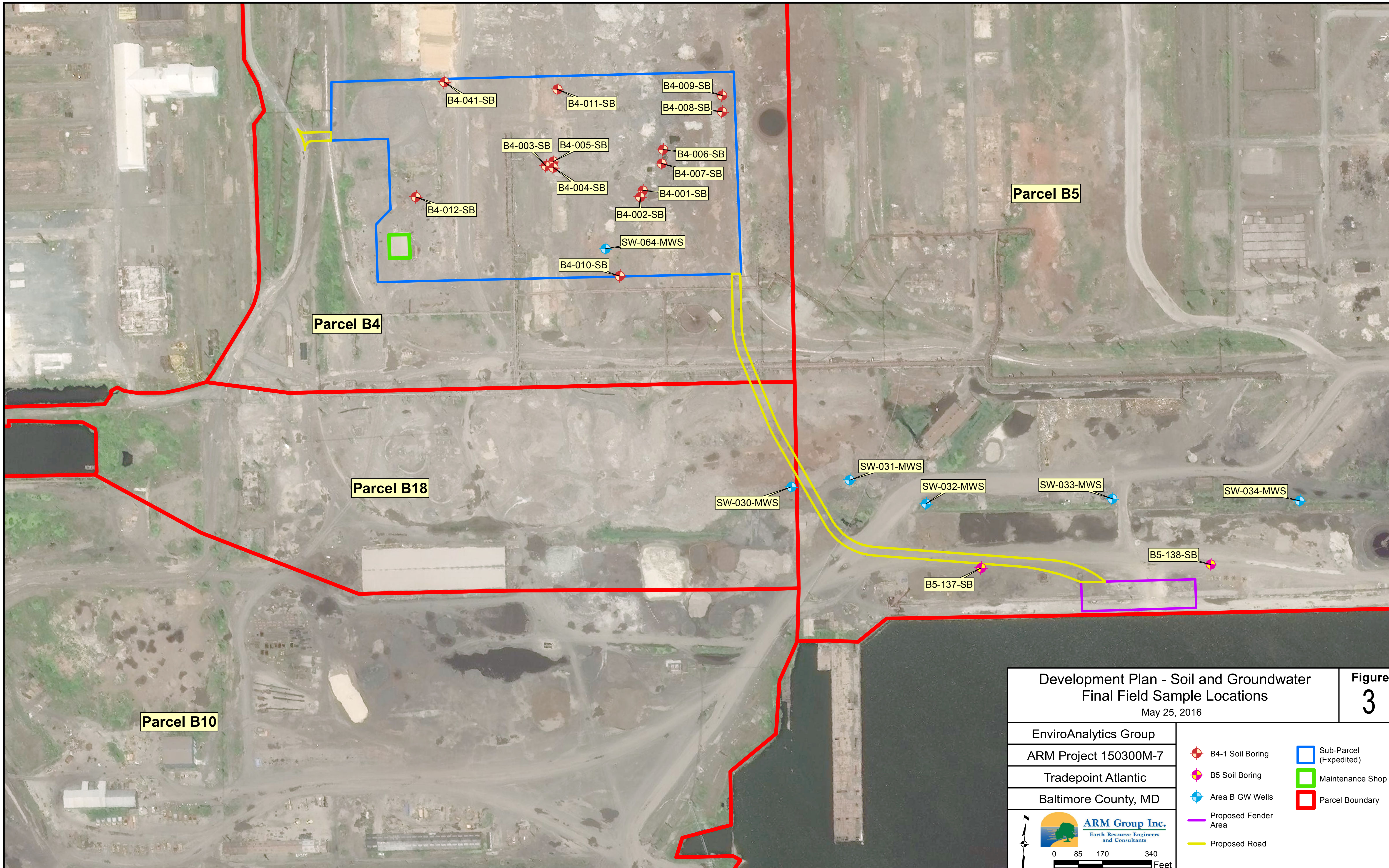
EnviroAnalytics Group

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

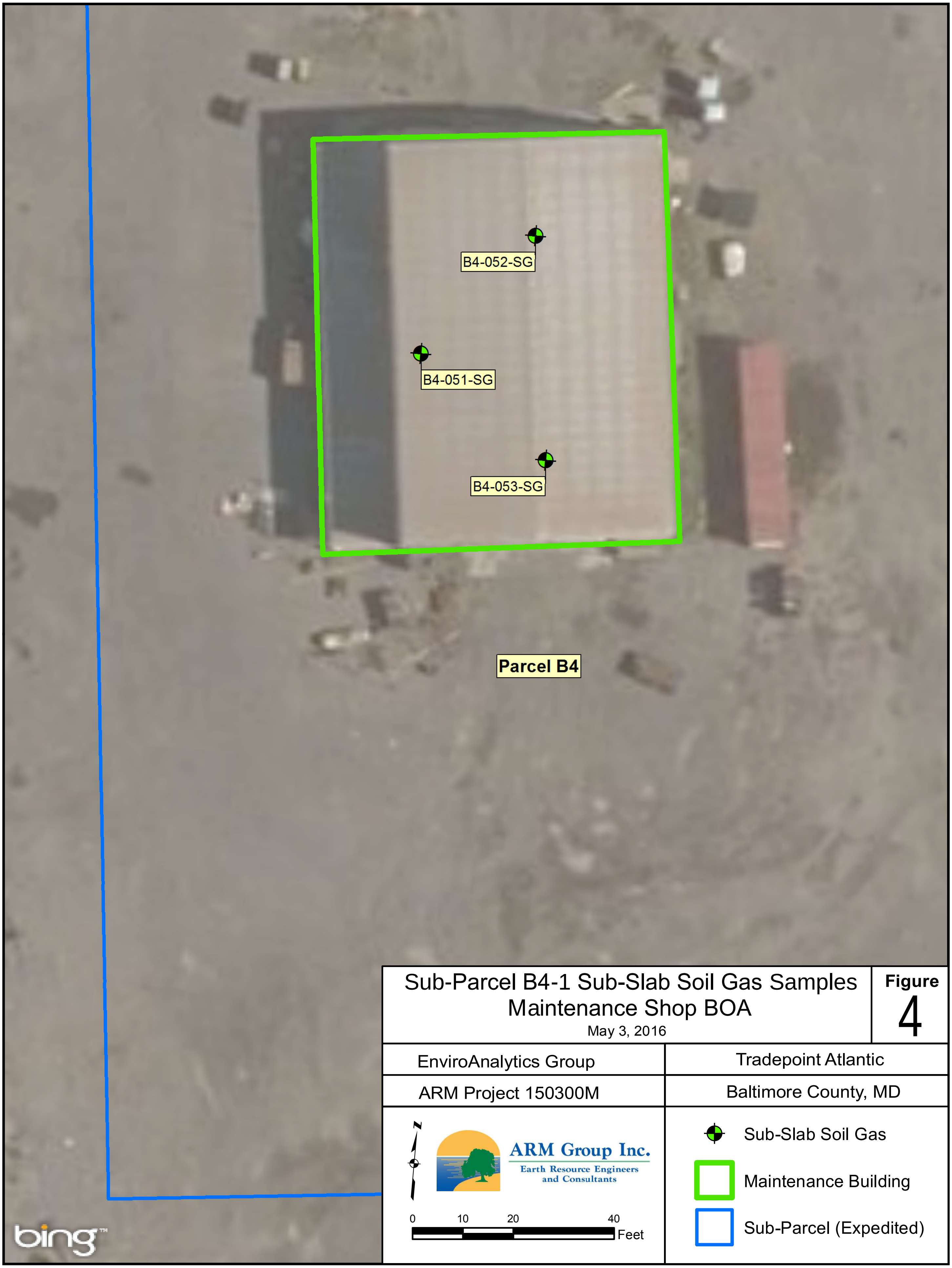
Tradepoint Atlantic

Baltimore County, MD

Figure 2



Parcel B4
Parcel B5
Parcel B18
Parcel B10
B4-041-SB
B4-011-SB
B4-009-SB
B4-008-SB
B4-003-SB
B4-005-SB
B4-006-SB
B4-007-SB
B4-004-SB
B4-001-SB
B4-012-SB
B4-002-SB
SW-064-MWS
B4-010-SB
SW-031-MWS
SW-032-MWS
SW-033-MWS
SW-034-MWS
SW-030-MWS
B5-138-SB
B5-137-SB
Development Plan - Soil and Groundwater
Final Field Sample Locations
May 25, 2016
Figure
3
EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD
ARM Group Inc.
Earth Resource Engineers and Consultants
0 85 170 340
Feet
B4-1 Soil Boring
B5 Soil Boring
Area B GW Wells
Proposed Fender Area
Proposed Road
Sub-Parcel (Expedited)
Maintenance Shop
Parcel Boundary



Sub-Parcel B4-1 Sub-Slab Soil Gas Samples
Maintenance Shop BOA
May 3, 2016

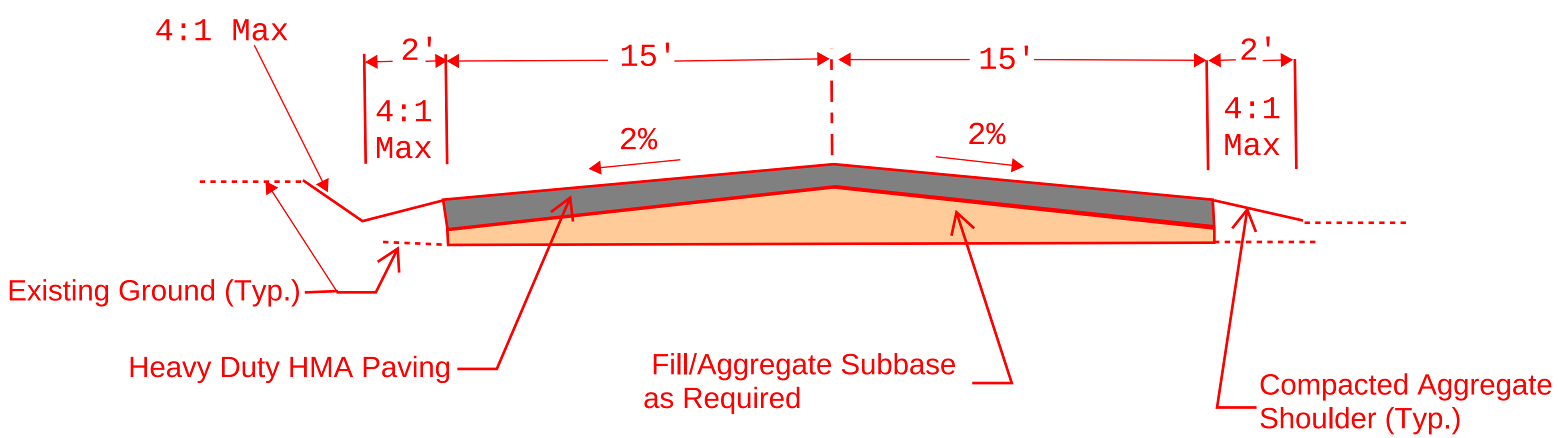
Figure
4

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

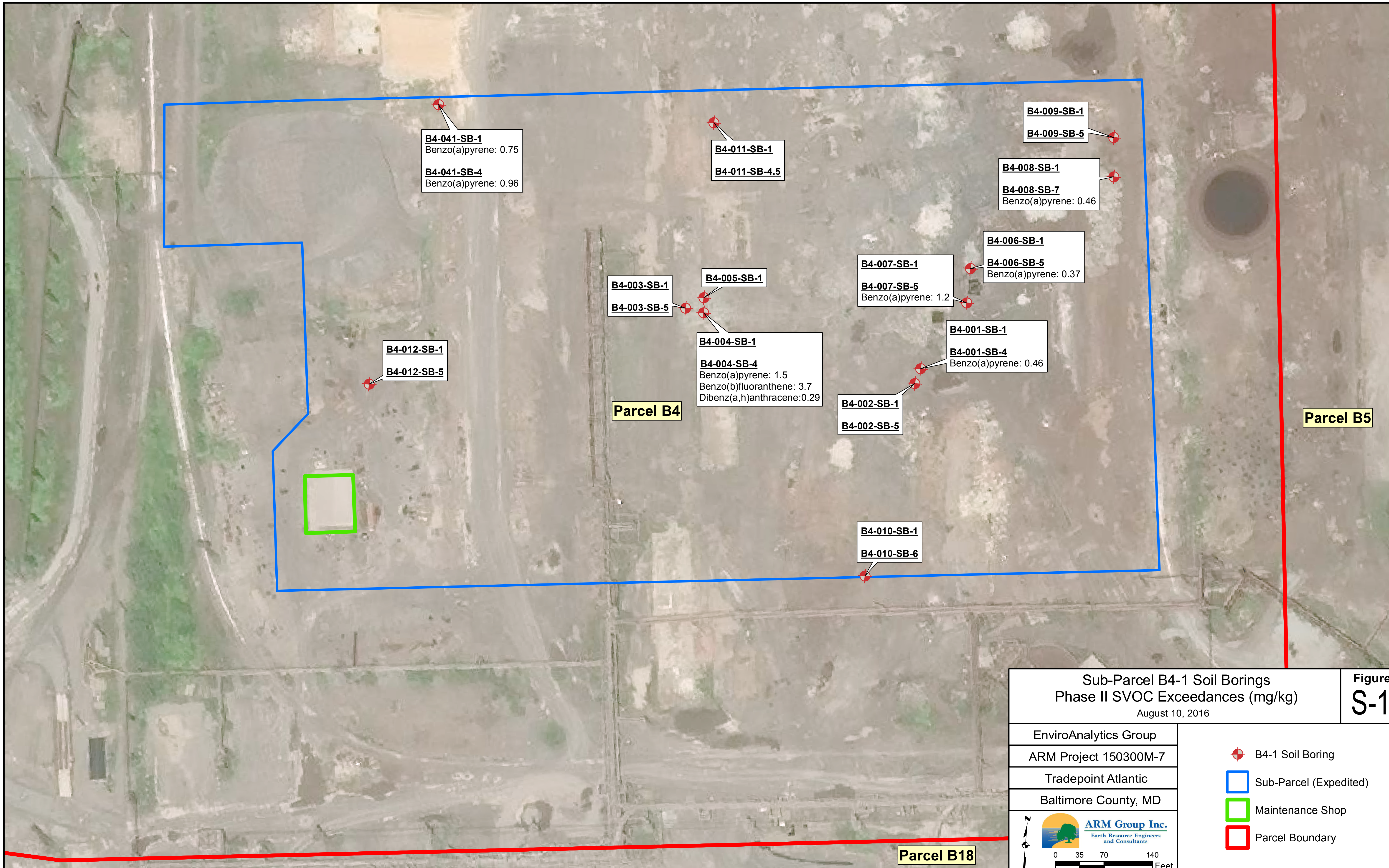
ARM Group Inc.
Earth Resource Engineers and Consultants

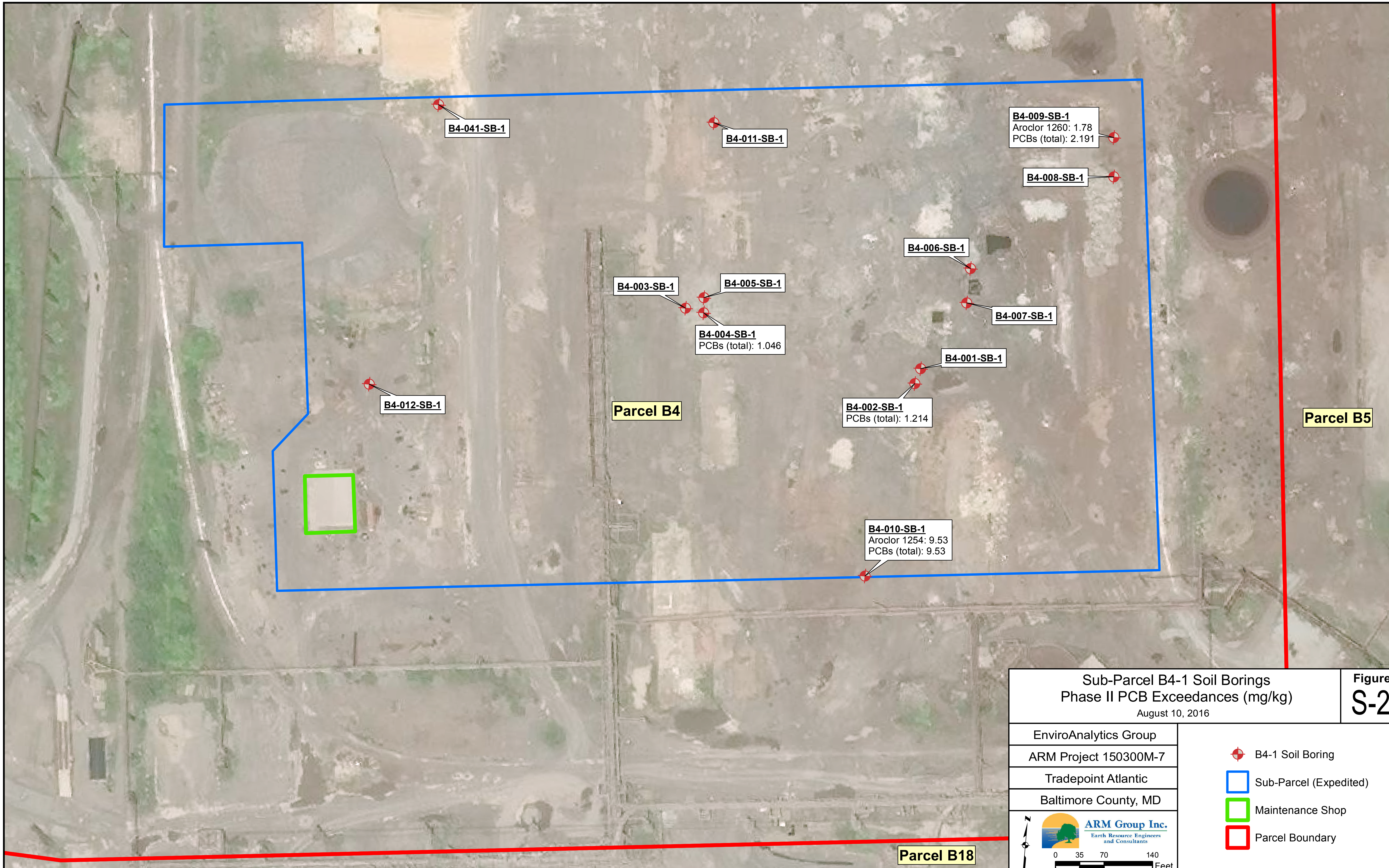
0 10 20 40 Feet

Sub-Slab Soil Gas
Maintenance Building
Sub-Parcel (Expedited)



Development Plan RORO Access Road Typical Section May 25, 2016	**Figure** 5
EnviroAnalytics Group	Tradepoint Atlantic
	Baltimore County, MD


B4-041-SB-1
Benzo(a)pyrene: 0.75
B4-041-SB-4
Benzo(a)pyrene: 0.96
B4-011-SB-1
B4-011-SB-4.5
B4-009-SB-1
B4-009-SB-5
B4-008-SB-1
B4-008-SB-7
Benzo(a)pyrene: 0.46
B4-006-SB-1
B4-006-SB-5
Benzo(a)pyrene: 0.37
B4-007-SB-1
B4-007-SB-5
Benzo(a)pyrene: 1.2
B4-003-SB-1
B4-003-SB-5
B4-005-SB-1
B4-004-SB-1
B4-004-SB-4
Benzo(a)pyrene: 1.5
Benzo(b)fluoranthene: 3.7
Dibenz(a,h)anthracene:0.29
B4-001-SB-1
B4-001-SB-4
Benzo(a)pyrene: 0.46
B4-012-SB-1
B4-012-SB-5
Parcel B4
B4-002-SB-1
B4-002-SB-5
Parcel B5
B4-010-SB-1
B4-010-SB-6
Parcel B18
Sub-Parcel B4-1 Soil Borings
Phase II SVOC Exceedances (mg/kg)
August 10, 2016
Figure
S-1
EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD
ARM Group Inc.
Earth Resource Engineers and Consultants
0 35 70 140
Feet
B4-1 Soil Boring
Sub-Parcel (Expedited)
Maintenance Shop
Parcel Boundary

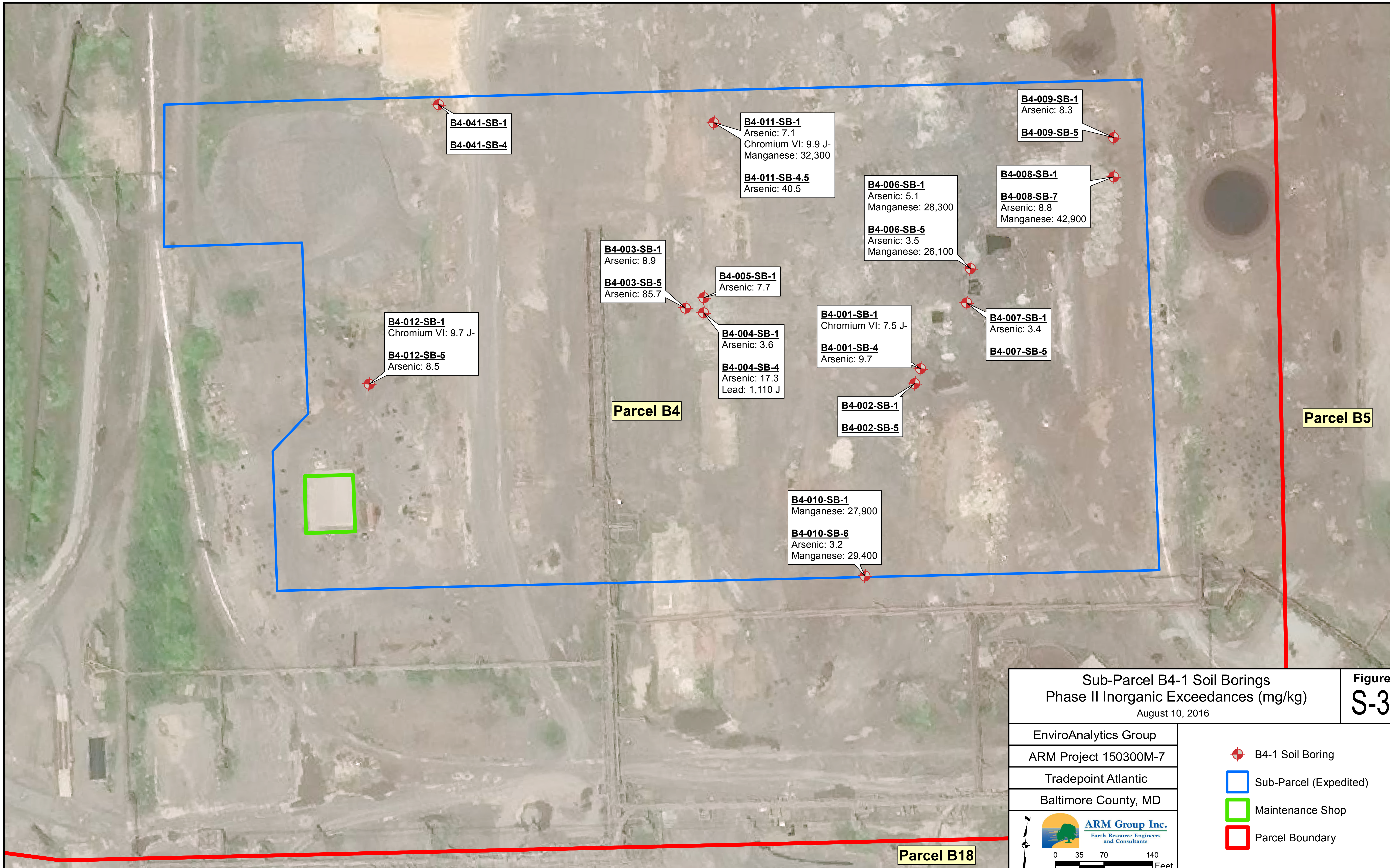


Sub-Parcel B4-1 Soil Borings
Phase II PCB Exceedances (mg/kg)
August 10, 2016

Figure
S-2

EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants



Sub-Parcel B4-1 Soil Borings
Phase II Inorganic Exceedances (mg/kg)
August 10, 2016

Figure
S-3

EnviroAnalytics Group

ARM Project 150300M-7

Tradepoint Atlantic

Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

TABLES

Table 1
Summary of Detected Organics in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	**Units**	**PAL**	B4-001-SB-1		B4-001-SB-4		B4-002-SB-1		B4-002-SB-5		B4-003-SB-1		B4-003-SB-5		B4-004-SB-1		B4-004-SB-4		B4-005-SB-1		B4-006-SB-1		B4-006-SB-5		B4-007-SB-1		B4-007-SB-5	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			3/1/2016		3/1/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Volatile Organic Compounds																												
1,2,3-Trichlorobenzene	mg/kg	930	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
1,2,4-Trichlorobenzene	mg/kg	110	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
2-Butanone (MEK)	mg/kg	190,000	0.01	U	0.014	U	**0.0026**	J	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	**0.0081**	J	0.0082	U
2-Hexanone	mg/kg	1,300	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	**0.002**	J	0.0082	U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	0.013	U	0.0082	U
Acetone	mg/kg	670,000	**0.023**		**0.13**		**0.031**		**0.041**		0.013	UJ	**0.13**	J	**0.015**	J	**0.031**	J	**0.039**	J	**0.021**		**0.038**	J	**0.11**		**0.011**	
Benzene	mg/kg	5.1	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	**0.013**		0.0059	U	0.0057	U	0.006	U	**0.0038**	J	**0.0043**	J	0.0066	U	**0.0018**	J
Chloroform	mg/kg	1.4	0.0051	U	**0.0093**		0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
Cyclohexane	mg/kg	27,000	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	0.013	U	0.0082	U
Ethylbenzene	mg/kg	25	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	**0.0061**		0.0059	U	0.0057	U	0.006	U	**0.0016**	J	0.0048	UJ	0.0066	U	**0.0013**	J
Toluene	mg/kg	47,000	**0.0056**		**0.0047**	J	**0.0061**		**0.018**		**0.0059**	J	**0.017**		**0.0053**	J	**0.0059**		**0.0049**	J	**0.0099**		**0.0091**	J	**0.0095**		**0.0075**	
Xylenes	mg/kg	2,800	0.015	U	0.021	U	0.013	U	0.038	U	0.02	U	**0.0062**	J	0.018	U	0.017	U	0.018	U	0.012	U	0.014	UJ	0.02	U	0.012	U
Semi-Volatile Organic Compounds (PAHs via SIM)																												
1,1-Biphenyl	mg/kg	200	0.072	U	**0.026**	J	0.072	U	0.094	U	**0.017**	J	**0.02**	J	0.075	U	**0.073**	J	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
2,4-Dimethylphenol	mg/kg	16,000	0.072	R	0.078	U	0.072	R	0.094	U	0.075	U	0.073	U	0.075	U	**0.024**	J	0.074	U	0.071	R	0.071	R	0.073	UJ	0.07	U
2-Methylnaphthalene	mg/kg	3,000	**0.017**		**0.11**		**0.018**		**0.0075**	J	**0.051**	J	**0.14**		**0.014**	J	**0.26**		**0.032**	J	**0.024**		**0.027**		**0.0048**	J	**0.034**	
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14	R	**0.045**	J	0.14	R	0.19	U	0.15	U	0.15	U	0.15	U	**0.038**	J	0.15	U	0.14	R	0.14	R	0.15	UJ	0.14	U
Acenaphthene	mg/kg	45,000	**0.001**	J	**0.027**		**0.0037**	J	0.0094	U	0.077	U	**0.0077**		0.076	U	**0.029**	J	0.074	U	**0.043**		**0.077**		**0.0012**	J	**0.28**	
Acenaphthylene	mg/kg	45,000	**0.0022**	J	**0.056**		**0.024**		**0.0022**	J	**0.041**	J	**0.013**		**0.023**	J	**0.13**		**0.026**	J	**0.0076**		**0.0049**	J	**0.0009**	J	**0.0069**	J
Acetophenone	mg/kg	120,000	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	**0.034**	J	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Anthracene	mg/kg	230,000	**0.0067**	B	**0.11**		**0.031**		**0.0047**	B	**0.067**	J	**0.017**		**0.039**	J	**0.23**		**0.052**	J	**0.021**		**0.023**		**0.0048**	B	**0.064**	
Benzaldehyde	mg/kg	120,000	0.072	R	0.078	R	0.072	R	0.094	R	**0.033**	J	**0.031**	J	**0.023**	J	**0.056**	J	0.074	U	0.071	R	0.071	R	0.073	R	0.07	R
Benzo[a]anthracene	mg/kg	2.9	**0.033**		**0.54**		**0.076**		**0.015**		**0.22**		**0.058**		**0.11**		**1.1**		**0.19**		**0.12**		**0.19**		**0.019**		**0.53**	
Benzo[a]pyrene	mg/kg	0.29	**0.021**		**0.46**		**0.066**		**0.014**		**0.27**		**0.066**		**0.17**		**1.5**		**0.24**		**0.23**		**0.37**		**0.015**		**1.2**	
Benzo[b]fluoranthene	mg/kg	2.9	**0.097**		**1.1**		**0.18**		**0.042**		**0.71**		**0.18**		**0.39**		**3.7**		**0.58**		**0.55**		**0.83**		**0.047**		**1.6**	
Benzo[g,h,i]perylene	mg/kg	none	**0.013**		**0.12**		**0.022**		**0.0057**	B	**0.1**		**0.022**		**0.085**		**0.79**		**0.1**		**0.12**		**0.17**		**0.0062**	B	**0.49**	
Benzo[k]fluoranthene	mg/kg	29	**0.093**		**1.1**		**0.18**		**0.041**		**0.68**		**0.18**		**0.38**		**3.5**		**0.55**		**0.52**		**0.79**		**0.045**		**0.68**	
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.072	U	0.078	U	**0.018**	B	0.094	U	**0.64**	J	**0.016**	B	**0.18**	B	**0.11**	B	**0.1**	J	0.071	U	0.071	U	0.073	U	0.07	U
Carbazole	mg/kg	none	0.072	U	**0.052**	J	0.072	U	0.094	U	**0.038**	J	0.073	U	**0.024**	J	**0.15**	J	**0.021**	J	0.071	U	0.071	U	0.073	U	**0.052**	J
Chrysene	mg/kg	290	**0.053**		**0.58**		**0.09**		**0.026**		**0.26**		**0.092**		**0.17**		**1.2**		**0.23**		**0.19**		**0.24**		**0.03**		**0.57**	
Dibenz[a,h]anthracene	mg/kg	0.29	**0.0045**	J	**0.061**		**0.0084**		**0.0022**	J	**0.033**	J	**0.0088**		**0.031**	J	**0.29**		**0.035**	J	**0.046**		**0.07**		**0.0025**	J	**0.22**	
Di-n-butylphthalate	mg/kg	82,000	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	0.077	U	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Di-n-ocytlphthalate	mg/kg	8,200	0.072	U	0.078	U	0.072	U	0.094	U	**0.026**	J	0.073	UJ	0.075	UJ	0.077	UJ	0.074	UJ	0.071	U	0.071	U	0.073	U	0.07	U
Fluoranthene	mg/kg	30,000	**0.12**		**0.95**		**0.19**		**0.026**		**0.44**		**0.12**		**0.26**		**1.9**		**0.33**		**0.28**		**0.32**		**0.047**		**0.57**	
Fluorene	mg/kg	30,000	0.0074	U	**0.027**		**0.028**		**0.001**	J	**0.014**	J	**0.0072**	J	**0.0068**	J	**0.034**	J	**0.0074**	J	**0.0059**	J	**0.0072**		**0.0019**	J	**0.02**	
Hexachloroethane	mg/kg	8.00	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	0.077	U	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.012**		**0.13**		**0.023**		**0.0056**	J	**0.1**		**0.023**		**0.064**	J	**0.61**		**0.098**		**0.12**		**0.19**		**0.0056**	J	**0.59**	
Naphthalene	mg/kg	17	**0.027**		**0.096**		**0.11**		**0.011**		**0.061**	J	**0.093**		**0.14**		**0.21**		**0.096**		**0.056**		**0.033**		**0.0052**	J	**0.048**	
Phenanthrene	mg/kg	none	**0.096**		**0.33**		**0.15**		**0.02**		**0.19**		**0.16**		**0.12**		**0.71**		**0.16**		**0.19**		**0.15**		**0.023**		**0.27**	
Phenol	mg/kg	250,000	0.072	R	**0.11**		0.072	R	0.094	U	0.075	U	0.073	U	0.075	U	**0.019**	J	0.074	U	0.071	R	0.071	R	0.073	UJ	0.07	U
Pyrene	mg/kg	23,000	**0.1**		**0.92**		**0.16**		**0.024**		**0.41**		**0.12**		**0.27**		**2**		**0.3**		**0.21**		**0.26**		**0.037**		**0.5**	
PCBs																												
Aroclor 1248	mg/kg	0.94	0.0529	U	NA		**0.179**		NA		0.0549	U	NA		**0.46**		NA		**0.0351**	J	0.0545	U	NA		0.0548	U	NA	
Aroclor 1254	mg/kg	0.97	0.0529	U	NA		**0.193**		NA		**0.0342**	J	NA		**0.343**		NA		**0.0428**	J	0.0545	U	NA		0.0548	U	NA	
Aroclor 1260	mg/kg	0.99	**0.218**		NA		**0.842**		NA		**0.045**	J	NA		**0.243**		NA		**0.0298**	J	0.0545	U	NA		0.0548	U	NA	
Total PCB	mg/kg	0.97	**0.218**		NA		**1.214**		NA		**0.0792**		NA		**1.046**		NA		**0.1077**		0.0545	U	NA		0.0548	U	NA	
Gasoline and Diesel Range Organics (DRO/GRO)																												
DRO	mg/kg	620	**75.8**		**137**		**53.1**		**31.2**		**157**		**77.2**		**196**		**434**		**89.7**		**66.4**		**39**		**24.1**		**46.9**	
GRO	mg/kg	620	10.6	U	12.8	U	10.2	U	27.5	U	13.8	U	**13.8**		12.2	U	14.3	U	16.7	U	9.5	U	9.5	U	13.2	U	11.7	U

Detections in bold

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

NA: This parameter was not analyzed for this sample

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 1
Summary of Detected Organics in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-008-SB-1		B4-008-SB-7		B4-009-SB-1		B4-009-SB-5		B4-010-SB-1		B4-010-SB-6		B4-011-SB-1		B4-011-SB-4.5		B4-012-SB-1		B4-012-SB-5		B4-041-SB-1		B4-041-SB-4	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			2/29/2016		2/29/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Volatile Organic Compounds																										
1,2,3-Trichlorobenzene	mg/kg	930	**0.0022**	J	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
1,2,4-Trichlorobenzene	mg/kg	110	**0.0022**	J	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
2-Butanone (MEK)	mg/kg	190,000	0.01	U	0.012	U	0.012	U	0.011	U	**0.0027**	J	**0.0042**	J	0.011	U	0.011	U	**0.0042**	J	0.01	U	0.0097	U	0.012	U
2-Hexanone	mg/kg	1,300	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	0.01	U	0.011	U	0.011	U	0.01	U	0.01	U	0.0097	U	0.012	U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	**0.0021**	J	0.011	U	0.011	U	0.01	U	0.01	U	0.0097	U	0.012	U
Acetone	mg/kg	670,000	**0.017**	J	**0.028**	J	**0.06**		**0.031**		**0.097**	J	**0.091**	J	0.011	UJ	**0.025**	J	**0.05**		**0.12**		**0.0049**	J	**0.047**	
Benzene	mg/kg	5.1	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	**0.011**		0.0051	U	**0.016**		0.0048	U	0.0062	U
Chloroform	mg/kg	1.4	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
Cyclohexane	mg/kg	27,000	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	0.01	U	0.011	U	0.011	U	0.01	U	**0.027**		0.0097	U	0.012	U
Ethylbenzene	mg/kg	25	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	**0.0086**		0.0051	U	**0.0071**		0.0048	U	0.0062	U
Toluene	mg/kg	47,000	**0.0053**		**0.0025**	J	**0.011**		**0.0088**		**0.0091**		**0.0035**	J	**0.005**	J	**0.025**		**0.0043**	J	**0.019**		**0.0047**	J	**0.0074**	
Xylenes	mg/kg	2,800	0.015	U	0.018	U	0.018	U	0.017	U	0.016	U	0.015	U	0.017	U	**0.01**	J	0.015	U	**0.0054**	J	0.015	U	0.019	U
Semi-Volatile Organic Compounds (PAHs via SIM)																										
1,1-Biphenyl	mg/kg	200	0.072	U	**0.018**	J	0.073	U	0.072	U	**0.02**	J	**0.028**	J	0.073	U	0.072	U	**0.036**	J	0.07	U	**0.066**	J	**0.021**	J
2,4-Dimethylphenol	mg/kg	16,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	R	0.071	R	0.073	R	0.072	U	0.074	R	0.07	U	0.072	U	0.077	U
2-Methylnaphthalene	mg/kg	3,000	**0.021**		**0.062**		**0.023**	J	**0.037**		**0.1**		**0.11**		**0.017**		**0.032**		**0.092**		**0.0075**		**0.05**		**0.098**	
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14	U	0.14	U	0.14	U	0.14	U	0.14	R	0.14	R	0.15	R	0.14	U	0.15	R	0.14	U	0.14	U	0.15	U
Acenaphthene	mg/kg	45,000	**0.0047**	J	**0.013**		**0.011**	J	**0.015**		**0.01**		**0.029**		**0.0011**	J	**0.036**		**0.0062**	J	**0.0053**	J	**0.18**		**0.079**	
Acenaphthylene	mg/kg	45,000	0.0072	U	**0.07**		**0.0064**	J	**0.0019**	J	**0.072**		**0.31**		**0.0035**	J	**0.0015**	J	**0.0033**	J	**0.00073**	J	**0.011**		**0.019**	
Acetophenone	mg/kg	120,000	0.072	U	0.073	U	0.073	U	0.072	U	**0.046**	J	**0.026**	J	**0.024**	J	**0.024**	J	0.074	U	**0.018**	J	0.072	U	0.077	U
Anthracene	mg/kg	230,000	**0.015**	J	**0.11**		**0.034**	J	**0.0045**	B	**0.048**		**0.18**		**0.0071**	J	**0.0015**	J	**0.0095**		0.0071	U	**0.43**		**0.17**	
Benzaldehyde	mg/kg	120,000	**0.021**	J	**0.024**	J	0.073	R	0.072	R	**0.044**	J	**0.026**	J	**0.023**	J	**0.044**	J	**0.039**	J	0.07	R	0.072	R	0.077	R
Benzo[a]anthracene	mg/kg	2.9	**0.025**	J	**0.48**		**0.098**	J	**0.029**		**0.057**		**0.17**		**0.027**		**0.0061**	J	**0.044**		0.0071	U	**0.8**		**1.1**	
Benzo[a]pyrene	mg/kg	0.29	**0.022**	J	**0.46**		**0.072**	J	**0.043**		**0.05**		**0.16**		**0.031**		**0.0057**	J	**0.034**		0.0071	U	**0.75**		**0.96**	
Benzo[b]fluoranthene	mg/kg	2.9	**0.069**	J	**1.2**		**0.28**	J	**0.056**		**0.15**		**0.35**		**0.095**		**0.019**		**0.15**		0.0071	U	**1.3**		**1.3**	
Benzo[g,h,i]perylene	mg/kg	none	**0.0089**	J	**0.1**		**0.04**	J	**0.019**		**0.028**		**0.062**		**0.015**		**0.0031**	J	**0.013**		0.0071	U	**0.19**		**0.24**	
Benzo[k]fluoranthene	mg/kg	29	**0.066**	J	**1.1**		**0.27**	J	**0.054**		**0.14**		**0.34**		**0.091**		**0.018**		**0.14**		0.0071	U	**1.3**		**0.54**	
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.13**	J	0.073	UJ	**0.085**	B	0.072	U	**0.019**	B	**0.052**	B	0.073	U	0.072	U	0.074	U	0.07	U	**0.024**	B	**0.016**	B
Carbazole	mg/kg	none	0.072	U	**0.12**	J	**0.02**	J	0.072	U	**0.051**	J	**0.098**		0.073	U	0.072	U	0.074	U	0.07	U	**0.7**		**0.053**	J
Chrysene	mg/kg	290	**0.042**	J	**0.46**		**0.19**	J	**0.046**		**0.077**		**0.18**		**0.036**		**0.0097**		**0.061**		0.0071	U	**0.72**		**1.4**	
Dibenz[a,h]anthracene	mg/kg	0.29	**0.0024**	J	**0.056**		**0.013**	J	**0.0068**	J	**0.0093**		**0.023**		**0.0054**	J	0.0073	U	**0.0052**	J	0.0071	U	**0.078**		**0.12**	
Di-n-butylphthalate	mg/kg	82,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	U	**0.035**	J	0.073	U	0.072	U	0.074	U	0.07	U	0.072	U	0.077	U
Di-n-ocytlphthalate	mg/kg	8,200	0.072	U	0.073	UJ	0.073	U	0.072	U	0.072	U	0.071	U	0.073	U	0.072	U	0.074	U	0.07	U	0.072	UJ	0.077	U
Fluoranthene	mg/kg	30,000	**0.082**	J	**0.97**		**0.28**	J	**0.029**		**0.24**		**0.64**		**0.065**		**0.027**		**0.11**		**0.00095**	J	**2**		**1.4**	
Fluorene	mg/kg	30,000	**0.0045**	J	**0.018**		**0.011**	J	**0.0027**	J	**0.059**		**0.18**		**0.0018**	J	**0.026**		**0.0022**	J	**0.0032**	J	**0.15**		**0.022**	
Hexachloroethane	mg/kg	8.00	0.072	UJ	0.073	U	0.073	U	0.072	U	0.072	U	0.071	U	0.073	U	**0.066**	J	0.074	U	0.07	U	0.072	U	0.077	U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.0061**	J	**0.13**		**0.034**	J	**0.0095**		**0.027**		**0.063**		**0.015**		**0.0027**	J	**0.013**		0.0071	U	**0.21**		**0.27**	
Naphthalene	mg/kg	17	**0.016**		**0.076**		**0.037**	J	**0.085**		**1.2**		**0.82**		**0.034**		**0.056**		**0.036**		**0.021**		**0.12**		**0.084**	
Phenanthrene	mg/kg	none	**0.066**	J	**0.37**		**0.14**	J	**0.015**		**0.29**		**0.8**		**0.037**		**0.032**		**0.072**		**0.0023**	J	**1.5**		**0.6**	
Phenol	mg/kg	250,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	R	0.071	R	0.073	R	0.072	U	0.074	R	0.07	U	0.072	U	0.077	U
Pyrene	mg/kg	23,000	**0.075**	J	**0.92**		**0.22**	J	**0.052**		**0.19**		**0.51**		**0.055**		**0.017**		**0.095**		**0.0011**	J	**1.7**		**2.1**	
PCBs																										
Aroclor 1248	mg/kg	0.94	0.0545	U	NA		**0.113**		NA		0.538	U	NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Aroclor 1254	mg/kg	0.97	0.0545	U	NA		**0.298**		NA		**9.53**		NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Aroclor 1260	mg/kg	0.99	**0.766**	J	NA		**1.78**		NA		0.538	U	NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Total PCB	mg/kg	0.97	**0.766**		NA		**2.191**		NA		**9.53**		NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Gasoline and Diesel Range Organics (DRO/GRO)																										
DRO	mg/kg	620	**584**		**64.1**		**159**		**17.4**		**246**		**424**		**53**		**168**		**264**		**100**		**27.2**		**347**	
GRO	mg/kg	620	12.1	U	**6.5**	J	11.5	U	13.6	U	10.2	U	10.3	U	11.8	U	**26.7**		11.1	U	**26.6**		10.5	U	13.4	U

Detections in bold

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

NA: This parameter was not analyzed for this sample

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 2
Summary of Inorganics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	**Units**	**PAL**	B4-001-SB-1		B4-001-SB-4		B4-002-SB-1		B4-002-SB-5		B4-003-SB-1		B4-003-SB-5		B4-004-SB-1		B4-004-SB-4		B4-005-SB-1		B4-006-SB-1		B4-006-SB-5		B4-007-SB-1		B4-007-SB-5	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			3/1/2016		3/1/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Metals																												
Aluminum	mg/kg	1,100,000	**11,800**		**23,500**		**14,400**		**72,600**		**20,800**		**5,140**		**10,700**		**20,600**		**13,300**		**6,340**		**6,820**		**25,700**		**15,800**	
Antimony	mg/kg	470	2.1	UJ	2.4	UJ	1.8	UJ	4	UJ	3.5	UJ	**3.6**	J	2	UJ	3.5	UJ	3.4	UJ	1.7	UJ	1.8	UJ	2.8	UJ	2.3	UJ
Arsenic	mg/kg	3	1.8	U	**9.7**		1.5	U	**2.7**		**8.9**		**85.7**		**3.6**		**17.3**		**7.7**		**5.1**		**3.5**		**3.4**		2	U
Barium	mg/kg	220,000	**52.5**		**401**		**124**		**411**		**239**		**35.7**		**117**		**367**		**108**		**54.2**		**69**		**290**		**130**	
Beryllium	mg/kg	2,300	0.71	U	**2.7**		**0.66**		**2.4**		**1.8**		**0.21**	B	**0.66**	B	**2.1**		**0.79**	B	**0.2**	J	**0.22**	J	**4.6**		**1.6**	
Cadmium	mg/kg	980	**0.88**	B	**1.2**	B	**1.5**		**1**	B	**2.8**		**0.12**	B	**1.8**		**23.9**		**1.9**		**0.97**		**0.68**	B	**0.78**	B	**0.66**	B
Chromium (total)	mg/kg	120,000	**1,100**		**163**		**957**		**239**		**305**	J	**48.3**	J	**141**	J	**230**	J	**175**	J	**1,240**		**1,280**		**19.2**		**975**	
Chromium VI	mg/kg	6.3	**7.5**	J-	**0.84**	B	**1.9**	J-	**0.63**	B	1.2	UJ	1.1	UJ	1.1	UJ	**0.32**	J-	1.1	UJ	**2.8**	J-	**2.5**	J-	1.1	UJ	**0.43**	B
Cobalt	mg/kg	350	**3.4**	B	**21.6**		**3.5**		**7.3**		**8.8**		**23.6**		**9.2**		**18.6**		**5.2**	B	**9.8**		**6.2**		**2**	J	**3.8**	J
Copper	mg/kg	47,000	**74.1**	J	**120**	J	**83.9**	J	**25.4**	J	**92.6**		**145**		**59.6**		**227**		**53.9**		**79.7**	J	**62.7**	J	**13.6**	J	**30.1**	B
Iron	mg/kg	820,000	**272,000**		**147,000**		**171,000**		**9,590**		**76,200**		**130,000**		**44,200**		**124,000**		**41,200**		**242,000**		**237,000**		**21,100**		**118,000**	
Lead	mg/kg	800	**13.5**		**106**		**137**		**7**		**210**	J	**52.1**	J	**179**	J	**1,110**	J	**140**	J	**40.4**		**47.3**		**14.8**		**38.3**	
Manganese	mg/kg	26,000	**24,000**		**4,670**		**23,000**		**1,390**		**9,050**		**19,400**		**6,180**		**6,200**		**4,580**		**28,300**		**26,100**		**1,970**		**22,200**	
Mercury	mg/kg	350	**0.026**	J	**0.045**	J	**0.11**	J	0.13	UJ	**0.3**	J-	**0.038**	J-	**0.12**	J-	**0.13**	J-	**0.056**	J-	**0.022**	J	**0.026**	J	0.1	UJ	**0.014**	J
Nickel	mg/kg	22,000	**31.5**		**72.7**		**27.4**		**42.5**		**43.5**		**33.5**		**26**		**71.2**		**23.7**		**48.1**		**37.5**		**4.5**	B	**15.3**	
Selenium	mg/kg	5,800	2.8	U	3.2	U	2.4	U	**3.8**	J	4.6	U	3	U	2.7	U	4.7	U	4.5	U	2.3	U	2.5	U	**4.2**		3.1	U
Silver	mg/kg	5,800	2.1	UJ	2.4	UJ	1.8	UJ	4	UJ	3.5	U	**2.1**	J	2	U	**3.3**	J	3.4	U	1.7	UJ	1.8	UJ	2.8	UJ	2.3	UJ
Thallium	mg/kg	12	7.1	UJ	8.1	UJ	6.1	UJ	10.6	UJ	11.6	U	7.4	U	6.8	U	11.7	U	11.3	U	**6.3**	J	**6.9**	J	9.3	UJ	7.8	UJ
Vanadium	mg/kg	5,800	**763**	J	**198**	J	**557**	J	**16.7**	J	**215**	J	**126**	J	**80.4**	J	**447**	J	**128**	J	**2,530**	J	**2,690**	J	**39.2**	J	**2,120**	J
Zinc	mg/kg	350,000	**155**		**272**		**499**		**97.3**		**819**	J	**46**	J	**568**	J	**3,020**	J	**416**	J	**219**		**279**		**98.1**		**271**	
Other																												
Cyanide	mg/kg	150	**0.14**	J-	**0.62**	J-	**0.51**	J-	**2**	J-	**0.77**	J-	**0.58**	J-	**1.2**	J-	**1**	J-	**1.4**	J-	**0.089**	J-	**0.15**	J-	**0.17**	J-	**0.27**	J-

Detections in bold

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

NA: This parameter was not analyzed for this sample

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 2
Summary of Inorganics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-008-SB-1		B4-008-SB-7		B4-009-SB-1		B4-009-SB-5		B4-010-SB-1		B4-010-SB-6	
			Soil		Soil		Soil		Soil		Soil		Soil	
			2/29/2016		2/29/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016	
Metals														
Aluminum	mg/kg	1,100,000	**39,500**		**9,860**		**15,100**		**42,800**		**16,200**		**36,500**	
Antimony	mg/kg	470	3.1	UJ	2	UJ	3.2	UJ	2.3	UJ	2.5	UJ	2.1	UJ
Arsenic	mg/kg	3	**2.4**	B	**8.8**		**8.3**		1.9	U	**2.5**		**3.2**	
Barium	mg/kg	220,000	**632**		**209**		**141**		**535**		**89.2**		**96.9**	
Beryllium	mg/kg	2,300	**6.8**		**0.32**	B	**1.1**		**7.1**		**0.36**	J	**0.32**	B
Cadmium	mg/kg	980	**1.6**		**0.9**	B	**7.5**		**0.32**	B	**0.82**	B	**0.63**	J
Chromium (total)	mg/kg	120,000	**83.5**	J	**1,220**	J	**279**		**138**		**1,200**	J	**1,050**	J
Chromium VI	mg/kg	6.3	1.1	UJ	**0.22**	J-	**0.44**	B	**0.22**	B	1.1	UJ	**1.2**	J-
Cobalt	mg/kg	350	**2.4**	J	**7.3**		**10**		**0.72**	B	**2.4**	B	**2.3**	B
Copper	mg/kg	47,000	**23.3**		**103**		**102**	J	**4**	J	**44.5**		**57.3**	
Iron	mg/kg	820,000	**39,700**		**149,000**		**151,000**		**31,800**		**179,000**		**171,000**	
Lead	mg/kg	800	**49.8**	J	**160**	J	**518**		**2**		**108**	J	**205**	J
Manganese	mg/kg	26,000	**4,820**		**42,900**		**10,000**		**4,920**		**27,900**		**29,400**	
Mercury	mg/kg	350	0.11	R	**0.1**	J-	**0.38**		0.1	UJ	**0.12**	J-	**0.3**	J-
Nickel	mg/kg	22,000	**15.2**		**30.2**		**43.5**		**5**	J	**26.7**		**23.7**	
Selenium	mg/kg	5,800	4.1	U	**3.3**		4.3	U	**4.3**		**2.9**	J	**1.9**	J
Silver	mg/kg	5,800	3.1	U	2	U	**3.7**	J	2.3	UJ	2.5	U	**1**	J
Thallium	mg/kg	12	10.3	U	6.7	U	10.8	UJ	7.8	UJ	8.2	U	6.9	U
Vanadium	mg/kg	5,800	**44.3**	J	**2,280**	J	**143**	J	**56.8**	J	**704**	J	**596**	J
Zinc	mg/kg	350,000	**832**	J	**281**	J	**4,880**		**17.5**		**459**	J	**222**	J
Other														
Cyanide	mg/kg	150	**1**	J-	**0.86**	J-	**0.54**	J-	**2.5**	J-	**3.3**	J-	**5.8**	J-

Parameter	Units	PAL	B4-011-SB-1		B4-011-SB-4.5		B4-012-SB-1		B4-012-SB-5		B4-041-SB-1		B4-041-SB-4	
			Soil		Soil		Soil		Soil		Soil		Soil	
			2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Metals														
Aluminum	mg/kg	1,100,000	**23,600**		**4,590**		**32,100**		**16,100**		**11,400**		**25,700**	
Antimony	mg/kg	470	2.2	UJ	**2**	B	2.4	UJ	3.2	UJ	2.5	UJ	2.2	UJ
Arsenic	mg/kg	3	**7.1**		**40.5**		2	U	**8.5**		2.1	U	**2.3**	
Barium	mg/kg	220,000	**39.2**		**27.5**		**92.8**		**70.2**		**60.6**		**213**	
Beryllium	mg/kg	2,300	**0.25**	B	1.1	U	**0.33**	J	**0.65**	J	**0.33**	J	**2.5**	
Cadmium	mg/kg	980	**0.33**	B	1.6	U	**0.71**	B	**0.18**	B	**0.7**	B	**1.3**	
Chromium (total)	mg/kg	120,000	**1,050**	J	**220**	J	**942**		**72.8**		**1,430**		**93.7**	
Chromium VI	mg/kg	6.3	**9.9**	J-	1.1	UJ	**9.7**	J-	**0.3**	B	**4.8**	J-	1.2	UJ
Cobalt	mg/kg	350	**4.1**		**26**		**1.6**	J	**8**		**0.35**	B	**2.4**	B
Copper	mg/kg	47,000	**40**		**402**		**23.1**	J	**25.6**	J	**25.1**	J	**158**	J
Iron	mg/kg	820,000	**212,000**		**255,000**		**159,000**		**220,000**		**169,000**		**41,400**	
Lead	mg/kg	800	**25.2**	J	**31.4**	J	**24.3**		**27.2**		**46.8**		**81**	
Manganese	mg/kg	26,000	**32,300**		**16,800**		**25,100**		**2,300**		**25,500**		**5,030**	
Mercury	mg/kg	350	**0.025**	J-	**0.0032**	J-	**0.0032**	J	0.1	UJ	**0.21**	J	**0.027**	J
Nickel	mg/kg	22,000	**36.8**		**54.2**		**16.5**		**23.5**		**11**		**19.8**	
Selenium	mg/kg	5,800	3	U	4.2	U	3.2	U	4.3	U	3.3	U	3	U
Silver	mg/kg	5,800	**3**		**4.6**		2.4	UJ	3.2	UJ	2.5	UJ	2.2	UJ
Thallium	mg/kg	12	7.4	U	10.5	U	8.1	UJ	10.8	UJ	8.3	UJ	7.5	UJ
Vanadium	mg/kg	5,800	**480**	J	**108**	J	**598**	J	**83.2**	J	**701**	J	**59.7**	J
Zinc	mg/kg	350,000	**82.9**	J	**43.6**	J	**159**		**29.8**		**80.6**		**218**	
Other														
Cyanide	mg/kg	150	**0.85**	J-	**0.11**	J-	**0.18**	J-	**0.13**	J-	**0.19**	J-	**0.24**	J-

Detections in bold

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

NA: This parameter was not analyzed for this sample

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 3
Summary of VOCs Detected in Sub-Slab Soil Gas
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-051-SG Sub-Slab Soil Gas 4/20/2016		B4-052-SG Sub-Slab Soil Gas 4/20/2016		B4-053-SG Sub-Slab Soil Gas 4/20/2016	
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m³	2,200,000	1.09	U	**3.38**		**1.58**	
2-Butanone (MEK)	µg/m³	2,200,000	**45.3**		**43.6**		**46.8**	
4-Methyl-2-pentanone (MIBK)	µg/m³	1,400,000	**0.9**		**0.78**	J	**0.86**	
Acetone	µg/m³	14,000,000	**207**		**219**		**170**	
Benzene	µg/m³	1,600	**3.39**		**6.39**		**7.48**	
Bromodichloromethane	µg/m³	none	**7.84**		**4.09**		**9.18**	
Carbon disulfide	µg/m³	310,000	**111**		**101**		**80.4**	
Chloroform	µg/m³	540	**56.6**		**43.6**		**39**	
Chloromethane	µg/m³	40,000	**0.58**		**0.45**		**0.5**	
Ethylbenzene	µg/m³	5,000	**1.13**		**1.35**		**1.95**	
Methylene Chloride	µg/m³	270,000	**6.56**		**6.45**		**6.95**	
Styrene	µg/m³	440,000	**0.68**	J	0.85	U	**0.47**	J
Tetrachloroethene	µg/m³	18,000	**16.2**		**66.7**		**9.02**	
Toluene	µg/m³	2,200,000	**7.95**		**21.7**		**37.6**	
Trichloroethene	µg/m³	880	1.07	U	**1.45**		1.07	U
Xylenes	µg/m³	44,000	**6.12**		**4.65**		**6.04**	

Detections in bold

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.

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

Table 4
Summary of Organic Compounds Detected in Groundwater
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SW-064-MWS Groundwater 3/28/2016	
Semi-Volatile Organic				
1,4-Dioxane	µg/L	0.46	**0.062**	J
Anthracene	µg/L	1,800	**0.036**	J
Benzo[a]anthracene	µg/L	0.012	**0.016**	J
Fluoranthene	µg/L	800	**0.015**	J
Naphthalene	µg/L	0.17	**0.13**	
Phenanthrene	µg/L	none	**0.02**	J
Pyrene	µg/L	120	**0.014**	J
TPH: Gasoline and Diesel Range Organics (DRO/GRO)				
DRO	µg/L	47	**93.2**	J

Detections in bold

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

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

Table 5
Summary of Inorganics Detected in Groundwater
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SW-064-MWS Groundwater 3/28/2016	
Metals				
Aluminum	µg/L	20,000	**192**	J
Aluminum (dissolved)	µg/L	20,000	**72**	
Barium	µg/L	2,000	**61.9**	
Barium (dissolved)	µg/L	2,000	**60.5**	
Chromium	µg/L	100	**1.5**	B
Chromium (dissolved)	µg/L	100	**1.9**	B
Iron	µg/L	14,000	**47.6**	J
Manganese	µg/L	430	**6.7**	
Nickel	µg/L	390	**0.66**	B
Selenium	µg/L	50	**5.6**	B
Selenium (dissolved)	µg/L	50	**6.6**	J
Vanadium	µg/L	86	**2.4**	B
Vanadium (dissolved)	µg/L	86	**2.3**	B
Zinc	µg/L	6,000	**1.1**	B
Zinc (dissolved)	µg/L	6,000	**0.95**	B

Detections in bold
B: The compond/analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
J: The positive result reported for this analyte is a quantitative estimate, but may be biased low
Values in Red indicate an exceedance of the Project Action Limit (PAL)

Table 6
Summary of Organics Detected in Soil
Fender Area
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B5-137-SB-1		B5-137-SB-5		B5-137-SB-9.5		B5-138-SB-1		B5-138-SB-5		B5-138-SB-10	
			Soil		Soil		Soil		Soil		Soil		Soil	
			1/4/2016		1/4/2016		1/4/2016		1/4/2016		1/4/2016		1/4/2016	
Volatile Organic Compounds (VOCs)														
Acetone	mg/kg	670,000	0.25	J	0.12	J	NA		0.035	J	0.051	J	NA	
Benzene	mg/kg	5.1	0.0051	U	0.0047	U	NA		0.0045	U	**0.0076**		NA	
Toluene	mg/kg	47,000	0.0051	U	0.0047	U	NA		0.0045	U	**0.0022**	J	NA	
Semi-Volatile Organic Compounds (PAHs via SIM)														
2-Methylnaphthalene	mg/kg	3,000	**0.21**		**0.077**		NA		**0.047**		**0.17**		NA	
Acenaphthene	mg/kg	45,000	**0.035**		**0.0077**		NA		**0.003**	J	**0.057**	J	NA	
Acenaphthylene	mg/kg	45,000	**0.071**		**0.02**		NA		**0.0063**	J	**0.045**	J	NA	
Anthracene	mg/kg	230,000	**0.13**		**0.033**		NA		**0.012**		**0.14**	J	NA	
Benzo[a]anthracene	mg/kg	2.9	**0.47**	J	**0.24**		NA		**0.079**		**0.66**		NA	
Benzo[a]pyrene	mg/kg	0.29	**0.44**	J	**0.33**	J	**0.0063**	J	**0.09**		**0.53**		**0.011**	
Benzo[b]fluoranthene	mg/kg	2.9	**0.78**		**0.88**	J	NA		**0.23**		**1.1**		NA	
Benzo[g,h,i]perylene	mg/kg	none	**0.25**	J	**0.2**	J	NA		**0.082**		**0.32**		NA	
Benzo[k]fluoranthene	mg/kg	29	**0.24**	J	**0.72**	J	NA		**0.19**		**0.9**		NA	
Chrysene	mg/kg	290	**0.53**	J	**0.29**		NA		**0.1**		**0.73**		NA	
Dibenz[a,h]anthracene	mg/kg	0.29	**0.098**	J	**0.067**	J	NA		**0.024**		**0.11**	J	NA	
Fluoranthene	mg/kg	30,000	**1.5**		**0.53**		NA		**0.22**		**1.3**		NA	
Fluorene	mg/kg	30,000	**0.025**		**0.0089**		NA		**0.0033**	J	**0.06**	J	NA	
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.26**	J	**0.19**	J	NA		**0.071**		**0.29**		NA	
Naphthalene	mg/kg	17	**0.55**	J	**0.24**		NA		**0.11**		**0.38**		NA	
Phenanthrene	mg/kg	none	**1.2**		**0.31**		NA		**0.15**		**0.94**		NA	
Pyrene	mg/kg	23,000	**1.1**		**0.46**		NA		**0.18**		**1.5**		NA	
Gasoline and Diesel Range Organics (DRO/GRO)														
DRO	mg/kg	620	**96.6**	J	**41.3**		NA		**42.3**		**343**		NA	

Detections in bold

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, but may be biased low

NA: This parameter was not analyzed for this sample

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 7
Summary of Inorganics in Soil
Fender Area
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B5-137-SB-1		B5-137-SB-5		B5-137-SB-9.5		B5-138-SB-1		B5-138-SB-5		B5-138-SB-10	
			Soil		Soil		Soil		Soil		Soil		Soil	
			1/4/2016		1/4/2016		1/4/2016		1/4/2016		1/4/2016		1/4/2016	
Metals														
Aluminum	mg/kg	1,100,000	**14,200**		**21,000**		NA		**15,600**		**14,800**		NA	
Arsenic	mg/kg	3	**5**		2.3	U	NA		1.8	U	**5.6**		**6.6**	
Barium	mg/kg	220,000	**69.6**	J	**86**	J	NA		**59.3**	J	**147**	J	NA	
Beryllium	mg/kg	2,300	**0.31**	B	**0.54**	J	NA		0.72	U	**1.3**		NA	
Cadmium	mg/kg	980	**1.8**		**0.6**	B	NA		**0.64**	B	**1.5**	B	NA	
Chromium (total)	mg/kg	120,000	**899**		**1,050**		NA		**1,070**		**275**		NA	
Chromium VI	mg/kg	6.3	**0.18**	J-	**0.18**	J-	NA		**1.3**	J-	**0.23**	J-	NA	
Cobalt	mg/kg	350	**3.8**	B	**1.1**	J	NA		**0.77**	B	**9.8**		NA	
Copper	mg/kg	47,000	**50.7**		**27.2**		NA		**28.5**		**60.7**		NA	
Iron	mg/kg	820,000	**276,000**		**177,000**		NA		**185,000**		**68,100**		NA	
Lead	mg/kg	800	**24.3**	J	**18.7**	J	NA		**12.9**	J	**146**	J	NA	
Manganese	mg/kg	26,000	**23,700**		**25,600**		NA		**25,500**		**5,440**		NA	
Mercury	mg/kg	350	**0.024**	J-	**0.0078**	J-	NA		**0.0059**	J-	**0.31**	J-	NA	
Nickel	mg/kg	22,000	**31.9**		**16.1**		NA		**12.3**		**58**		NA	
Silver	mg/kg	5,800	**5.2**		**3.9**		NA		**4**		3.2	U	NA	
Vanadium	mg/kg	5,800	**579**		**589**		NA		**693**		**210**		NA	
Zinc	mg/kg	350,000	**1,330**	J	**252**	J	NA		**170**	J	**791**	J	NA	
Other														
Cyanide	mg/kg	150	**0.94**		**0.66**		NA		**0.47**	J	**4.2**		NA	

Detections in bold

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, but may be biased low

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

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

NA: This parameter was not analyzed for this sample

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

Table 8
Summary of Organics Detected in Groundwater
Fender Area
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SW-030-MWS		SW-031-MWS		SW-032-MWS		SW-033-MWS		SW-034-MWS	
			Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
			2/1/2016		2/1/2016		2/1/2016		2/10/2016		2/1/2016	
Volatile Organic Compounds												
Bromomethane	µg/L	7.5	1	U	1	U	1	U	**0.67**	J	1	U
Chloroform	µg/L	0.22	1	U	1	U	**1.3**		1	U	1	U
Semi-Volatile Organic Compounds (PAHs via SIM)												
1,4-Dioxane	µg/L	0.46	**0.1**		**0.11**		**0.18**		**0.18**		**0.18**	
2-Methylnaphthalene	µg/L	36	0.1	U	**0.022**	J	0.11	U	**0.04**	J	0.1	U
Acenaphthene	µg/L	530	0.1	U	**0.02**	J	**0.074**	J	**0.22**		**0.067**	J
Anthracene	µg/L	1,800	**0.026**	J	**0.058**	J	**0.036**	J	**0.061**	J	**0.022**	J
Benzo[a]anthracene	µg/L	0.012	0.1	U	**0.017**	J	**0.016**	J	**0.024**	J	0.1	U
Benzo[a]pyrene	µg/L	0.2	0.1	U	0.11	U	0.11	U	**0.011**	J	0.1	U
Benzo[b]fluoranthene	µg/L	0.034	0.1	U	0.11	U	0.11	U	**0.016**	J	0.1	U
Benzo[k]fluoranthene	µg/L	0.34	0.1	U	0.11	U	0.11	U	**0.012**	J	0.1	U
Chrysene	µg/L	3.4	0.1	U	**0.0091**	J	**0.01**	J	**0.013**	J	0.1	U
Fluoranthene	µg/L	800	0.1	U	**0.038**	J	**0.046**	J	**0.088**	J	0.1	U
Fluorene	µg/L	290	0.1	U	**0.026**	J	**0.05**	J	**0.12**		0.1	U
Naphthalene	µg/L	0.17	**0.027**	B	**0.037**	B	**0.086**	B	**0.1**	B	**0.067**	
Phenanthrene	µg/L	none	0.1	U	**0.12**		**0.099**	J	**0.24**		**0.02**	J
Phenol	µg/L	5800	1	U	1.1	U	1.1	U	**0.29**	J	1	U
Pyrene	µg/L	120	0.1	U	**0.031**	J	**0.038**	J	**0.057**	J	0.1	U
TPH: Gasoline and Diesel Range Organics (DRO/GRO)												
DRO	µg/L	47	**214**	J	**694**	J	106	UJ	**99.6**	J	**170**	J

Detections in bold

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

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

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.

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

Table 9
Summary of Inorganics Detected in Groundwater
Fender Area
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SW-030-MWS Groundwater 2/1/2016		SW-031-MWS Groundwater 2/1/2016		SW-032-MWS Groundwater 2/1/2016		SW-033-MWS Groundwater 2/10/2016		SW-034-MWS Groundwater 2/1/2016	
Metals												
Aluminum	µg/L	20,000	**766**		**320**		**266**		**881**		**249**	
Aluminum (dissolved)	µg/L	20,000	**698**		**83.5**		**93.8**		**49.8**	J	**224**	
Antimony (dissolved)	µg/L	6	6	U	6	U	**2.4**	B	6	U	6	U
Arsenic	µg/L	10	**3.9**	J	**3.8**	J	5	U	**3.5**	B	**3.2**	J
Arsenic (dissolved)	µg/L	10	**4.5**	B	**3.1**	B	5	U	**4.3**	B	5	U
Barium	µg/L	2,000	**22.6**		**30.1**		**62**		**53**		**73.3**	
Barium (dissolved)	µg/L	2,000	**21.6**		**29.4**		**57.6**		**47.1**		**69**	
Beryllium	µg/L	4	1	U	1	U	1	U	**0.34**	J	1	U
Chromium	µg/L	100	5	U	**1.4**	J	**3.3**	J	**8.8**		**1.9**	J
Chromium (dissolved)	µg/L	100	5	U	5	U	**1.2**	B	**7.9**		**1.7**	B
Cobalt	µg/L	6	5	U	5	U	**5.2**		5	U	5	U
Copper	µg/L	1,300	**1.9**	B	5	U	5	U	**2.5**	J	5	U
Cyanide	µg/L	200	**64.6**		**6.1**	J	**32.4**		**81.1**		**71.8**	
Iron	µg/L	14,000	**131**		**346**		**1,970**		**448**		**35**	J
Iron (dissolved)	µg/L	14,000	**29.9**	J	70	U	**59.9**	J	**38.8**	B	**34.2**	J
Manganese	µg/L	430	**4.7**	B	**46.7**		**336**		**14.6**		**5.7**	
Manganese (dissolved)	µg/L	430	**0.92**	J	**40.4**		**98.6**		**2.3**	B	**3.6**	J
Nickel	µg/L	390	**1.6**	B	**2.8**	B	**4.6**	B	**1.2**	B	10	U
Nickel (dissolved)	µg/L	390	**3.6**	B	**1.7**	B	**3**	B	10	U	**0.82**	B
Selenium	µg/L	50	8	U	8	U	8	U	**4**	B	8	U
Selenium (dissolved)	µg/L	50	8	U	8	U	8	U	**4.2**	B	8	U
Thallium	µg/L	2	10	U	10	U	10	U	**4.2**	J	10	U
Thallium (dissolved)	µg/L	2	**4.8**	J	10	U	10	U	**6.1**	B	**4.5**	B
Vanadium	µg/L	86	**38.2**		**6.6**		**15.2**		**32.2**		**42.7**	
Vanadium (dissolved)	µg/L	86	**39.6**		**6.2**		**6.1**		**26.3**		**41.2**	
Zinc	µg/L	6,000	**6.9**	B	**2.8**	B	**2.7**	B	**3.7**	B	10	U
Zinc (dissolved)	µg/L	6,000	**2.2**	B	**3.9**	B	10	U	**1.5**	B	**1.5**	B

Detections in bold

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, but may be biased low

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

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

APPENDIX A

TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

May 24, 2016

Maryland Department of Environment
1800 Washington Boulevard
Baltimore MD, 21230

Attention: Ms. Barbara Brown

Subject: Request to Enter Temporary CHS Review

Ms. Brown:

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

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

On September 11, 2014, Tradepoint Atlantic submitted an application to the Maryland Department of the Environment's (Department) Voluntary Cleanup Program (VCP). The Site 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 Department (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 Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

In consultation with the Department, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the Department and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (COMAR 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on the Parcel B-4 and B-5 and complement the statutory requirements of the Voluntary Cleanup Program (Section 7-501 of the Environment Article). Upon submission of a Site

TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

Response and Development Work Plan and completion of the remedial activities for the sub-parcel, the Department shall issue a "No Further Action" letter upon a recordation of an environmental covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the Department a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

Alternatively, Tradepoint Atlantic or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this work plan are implemented and a No Further Action letter is issued by the Department pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the work plan, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this work plan.

Engineering and institutional controls approved as part of this Site Response and Development Work Plan shall be described in documentation submitted to the Department demonstrating that the exposure pathways on the sub-parcel are addressed in a manner that protects public health and the environment. This information shall support Tradepoint Atlantic's request for the issuance of a COC for the larger parcel.

Please do not hesitate to contact Tradepoint Atlantic for further information.

Thank you,

Justin Dunn
Director of Development
1600 Sparrows Point Boulevard
Baltimore, MD 21219

APPENDIX B

PHASE II
INVESTIGATION REPORT

AREA B: SUB-PARCEL B4-1
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:

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

Prepared By:

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

ARM Project No. 150300M-7

Respectfully Submitted,

Eric S. Magdar
Senior Geologist

T. Neil Peters, P.E.
Vice President

Revision 2 – August 10, 2016

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1.0 SITE OVERVIEW

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, Sub-Parcel B4-1 (the Site). The full extent of Parcel B4 is comprised of approximately 72 acres of the approximately 3,100-acre former plant property located as shown on **Figure 1**. For scheduling purposes, this parcel was divided into Sub-Parcels B4-1 and B4-2 to facilitate an expedited investigation and closure of Sub-Parcel B4-1. The portion of Parcel B4 investigated by this Phase II Investigation has an area of approximately 21 acres. A separate report will be submitted for the balance Parcel B4 (i.e., including Sub-Parcel B4-2).

The Phase II Investigation was performed in accordance with procedures outlined in the Phase II Investigation Work Plan – Area B: Parcel B4, Sub-Parcel B4-1 (Expedited Area) dated January 27, 2016 in compliance with requirements pursuant to the following:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (effective September 12, 2014); and

- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (effective November 25, 2014).

Parcel B4-1 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.

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

1.1. SITE HISTORY

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

Parcel B4 was formerly occupied by part of the Former Steel Making Area. All buildings have been demolished, with the exception of a few small shops. One existing building, an equipment maintenance and repair facility occupied by MCM Management Corporation (MCM), is located within the Sub-Parcel B4-1 in the southwest corner. According to EAG, the shop was formerly occupied by the Phoenix Aggregate and Industrial Minerals Company. Based on historic aerial images available through Google Earth Pro, the building was constructed between August 2006 and September 2007. The company was active while the steel facility was operational, and primarily served to process slag into aggregate for resale. The building appears to have been used for the maintenance of equipment, with processing operations completed elsewhere on the property. There were no aggregate stockpiles observed close to the building in historical aerial images. A site visit was completed by ARM on March 2, 2016 in order to observe current conditions and storage within the building. The building has an intact concrete slab in fair condition, with some surface pitting and small cracks present.

Several iron and steel work processes were completed within the boundary of Parcel B4 (and are partially included within the Sub-Parcel B4-1 area). Descriptions of the main facilities and processes are provided below:

Basic Oxygen Furnace (BOF):

Basic oxygen steel making replaced the older open hearth furnace method. Basic oxygen steel making is a method of primary steel making in which carbon-rich molten pig iron is made into steel. Blowing oxygen through molten pig iron lowers the carbon content of the alloy and changes it into low-carbon steel. The process is known as basic because fluxes of burnt lime or dolomite, which are chemical bases, are added to promote the removal of impurities and protect the lining of the converter. The BOF received hot metal from the blast furnaces, scrap steel, and additional recyclable additives. After it was removed from the blast furnaces, the hot metal was passed through a desulfurization process or sent directly to the BOF. Pure oxygen was blown through a water-cooled lance to produce carbon monoxide, which accelerates the metallurgical reactions in the iron. After completion, the molten steel was poured into a ladle, where other alloying agents could be added.

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.

Continuous Caster:

Ladles of steel from the BOF were taken to the Continuous Caster Ladle Metallurgy Station where they may be first reheated with an oxygen lance and/or the chemistry adjusted by adding alloys and other materials and argon stirred. The steel then was moved by crane to the Slab Caster. Steel then was poured into the water-jacketed strand mould of the Slab Caster, from which a continuous slab was formed. The slab entered a roller containment area within the Slab Caster, where it was cooled with water sprays. The slabs then were cut to size by using a torch and then transferred to slab storage or the Hot Strip Mill.

1.2. OBJECTIVES

The objective of this investigation was to identify the presence or absence of any existing hazardous conditions for future tenants or personnel working on the Site. A summary of the areas that were investigated, along with the boring identification number and the analyses performed, has been provided as **Appendix A**. This summary is a modified version of the sampling plan table provided in the Parcel B4, Sub-Parcel B4-1 (Expedited Area) Work Plan submitted January 27, 2016.

2.0 ENVIRONMENTAL SETTING

2.1. LAND USE

The Tradepoint Atlantic property consists largely of the former Sparrows Point steel mill plant, and includes two solid waste landfills (Coke Point Landfill and Greys Landfill) which historically accepted various wastes from the facility. According to the Phase I Environmental Site Assessment (ESA) prepared by Weaver Boos dated May 19, 2014, the property is zoned Manufacturing Heavy-Industrial Major (MH-IM). Surrounding property zoning classifications (beyond Tradepoint Atlantic) include the following: Manufacturing Light (ML); Resource Conservation (RC); Density Residential (DR); Business Roadside (BR); Business Major (BM); Business Local (BL); and Residential Office (RO). Light industrial and commercial properties are located northeast of the property and northwest of the property across Bear Creek. The residential area of Edgemere is located northeast of the property across Jones Creek and Fort Howard to the southeast across Old Road Bay. 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 eleven (15) feet above mean sea level (amsl). Elevations in the parcel are fairly uniform between 13 and 16 feet over the majority of the Sub-Parcel B4-1. Surface runoff collects in low spots on the parcel with no clear discharge location. Deviations from this elevation range are largely due to several stockpiles and material debris present on the Site, primarily located along the northern boundary. Any remaining stockpiles will be cleared prior to development (ongoing), and any drainage influences imposed by these piles are expected to change. The surrounding tidal tributaries of the Chesapeake Bay (Bear Creek to the west and the Patapsco River to the south) likely influence macroscopic groundwater flow beneath the Site.

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 eastern boundary of the Coastal Plane 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).

2.3. SITE GEOLOGY

Groundcover of the full Parcel B4 is comprised of approximately 66% natural soils and 34% slag based on the approximate shoreline of the Sparrows Point Peninsula in 1916, as shown on

Figure 2 (Adapted from Figure 2-20 in the Description of Current Conditions (DCC) report prepared by Rust Environmental and Infrastructure, dated January 1998). The Sub-Parcel B4-1 has a larger proportion of slag-fill, with 35% natural soils and 65% slag based on the same shoreline map.

In general, the subsurface geology encountered included slag fill overlying natural soils, which included fine-grained sediments (clays and silts) and coarse grained sediments (sands). Groundwater was observed in the soil borings at depths ranging from 6.5 to 10 feet below the ground surface (bgs) across the Site. Soil boring logs are provided in **Appendix B**.

3.0 SITE INVESTIGATION

A total of 25 soil samples from 13 boring locations and three sub-slab soil gas samples were collected for analysis between February 29, 2016 and April 20, 2016 as part of the Sub-Parcel B4-1 Phase II Investigation.

3.1. METHODS

This Phase II Investigation utilized methods and protocols that followed the MDE-VCP and EPA guidelines. 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 Sub-Parcel B4-1 Work Plan dated January 27, 2016 and site-wide Quality Assurance Project Plan (QAPP) dated October 2, 2015; which have been developed to support the investigation and remediation of the Tradepoint Atlantic property.

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

Activities within and around the buildings and facilities previously located on Sub-Parcel B4-1 may have been historical sources of environmental contamination. If present, these areas were identified as targets for sampling through a careful review of historical documents. When a sampling target was identified, a boring was placed at or next to its location using GIS software (ArcMap Version 10.2.2). The first sampling targets to be identified on the Site, if present, were any Recognized Environmental Conditions (RECs) shown on the REC Location Map provided in Weaver Boos' Phase I ESA. Based on the review of historical documents and aerial images, REC boundaries are adjusted, as appropriate, from the original positions shown on the REC Location Map. Additional findings (non-RECs) from the Phase I ESA which were identified as potential environmental concerns were also reviewed and targeted as applicable. A former Oil House (REC8C, Finding 203) was identified and targeted in the Sub-Parcel B4-1 Work Plan.

Following the identification and evaluation of all RECs at the Site, SWMUs and AOCs were identified from the DCC report prepared by Rust Environmental and Infrastructure. The DCC report did not identify any releasing units, and no features were considered to be a risk for significant environmental impact or proposed for further action.

Following the identification of all SWMUs and AOCs, four (4) sets of historical drawings were reviewed to identify additional sampling targets. These drawings included the 5000 Set (Plant Arrangement), the 5100 Set (Plant Index), and 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 1**.

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 this criterion, additional sampling targets include: Emergency Plating Pit, Substation/Transformers, and Tar Tanks. ARM received a list of former PCB-containing transformer equipment from Tradepoint Atlantic personnel, for inclusion as additional targets. There were no substations identified as possible PCB-contaminated areas within Sub-Parcel B4-1. A subset of the drip legs were selected for inclusion in the full Parcel B4 sampling plan. In total, five drip legs were targeted (each with 2 soil borings) from the 13 locations indicated on the historical drip legs drawings. Every drip leg which was not explicitly targeted was located within 100 feet of at least one other soil boring. One of the five targeted drip legs is located within Sub-Parcel B4-1. A summary of the areas that were investigated, along with the applicable boring identification numbers and the analyses performed, has been provided as **Appendix A**. Additional sample locations were then added across the Site to eliminate large spatial gaps between proposed borings. During the completion of fieldwork, it was necessary to shift some borings from the locations proposed in the Work Plan, primarily due to access restrictions and equipment refusal. **Table 2** provides the identification numbers of the field adjusted borings, the rationale for field adjustment, the coordinates of the proposed and final locations, and the distance/direction of the field shifts.

The density of soil borings was maintained above the requirements set forth in QAPP Worksheet 17 – Sampling Design and Rationale. Sub-Parcel B4-1 has an area of 21 acres, all to be covered by engineered barriers. Therefore, a minimum of 7 soil borings were required to meet the minimum density requirements for engineered barriers. A total of 13 borings have been completed within this sub-parcel. The maintenance shop building footprint was covered by a separate soil gas investigation, discussed below.

A sub-slab soil gas survey of the MCM maintenance shop was completed as part of the Phase II Investigation. The purpose of the investigation was to verify that conditions within, below, and around the building would not pose a potentially unacceptable risk to current and future commercial workers occupying the buildings.

There is no groundwater use on-site. Therefore, exposure to groundwater is not a potential concern. The exterior of the building would be used only for worker parking and vehicle traffic, and there is only a minimal risk for exposure to soils. It is unlikely that commercial workers will come into regular contact with (or ingest) potentially contaminated soil as they walk into the building from their vehicles. Given the very short duration of any potential exposure to soil outside of the building, the risk associated with exposure to the soils surrounding the building would be expected to be minimal.

Any required construction or subsurface utility work would be performed by Tradepoint Atlantic's contractors, and the lease would include a restriction to prevent the tenant from disturbing any pavement or doing any excavation on the property without measures protective of workers' health and approved protocols. Therefore direct contact with the soil outside of the building, and potential exposure by dermal contact or incidental ingestion or by inhalation of vapors in an excavation, are not pathways of concern.

Based on the potential exposures described above, an evaluation of the potential for impacts to indoor air is sufficient to assess the risk to a commercial worker presented by the proposed use of the existing building.

The maintenance shop has an area of approximately 5750 ft^2. According to the density requirement given in QAPP Worksheet 17 – Sampling Design and Rationale, three sampling locations were required in the structure. Based on observations made during ARM's site visit (March 2, 2016) and a separate MDE site visit (April 12, 2016), sub-slab soil gas samples were added to the sampling plan which targeted an observed parts washer and a miscellaneous storage enclosure (with evidence of a minor oil release). The remaining sample location provided general coverage of the main repair floor.

3.2. SOIL INVESTIGATION

Continuous core soil borings were advanced at 13 locations across the Site to assess the presence or absence of soil contamination, and to assess the vertical distribution of any encountered contamination (**Figure 3**). The continuous core soil borings were advanced to depths between 5 and 10 feet bgs, using the Geoprobe® MC-7 Macrocore soil sampler. At each location, the soil core was visually inspected and screened with a hand-held Photo Ionization Detector (PID) prior to logging soil types. Soil boring logs have been included as **Appendix B,** and the PID calibration log has been included as **Appendix C**. Please note that unless otherwise indicated, all USCS group symbols provided on the attached boring logs are from visual observations, and not from laboratory testing.

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

All 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.

All Phase II Investigation soil samples were submitted to Pace Analytical Services, Inc. (PACE), and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) via USEPA Method 8260B, TCL semi-volatile organic compounds (SVOCs) via USEPA Methods 8270D and 8270D SIM, Target Analyte List (TAL) Metals via 6010C and 7471C, hexavalent chromium via USEPA Method 7196A, cyanide via USEPA Method 9012, and total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO) via USEPA Methods 8015B and 8015D. Additionally, the shallow soil samples collected across the Site from the 0 to 1 foot bgs interval were also analyzed for polychlorinated biphenyls (PCBs) via USEPA Method 8082. Sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.3. MAINTENANCE SHOP SOIL GAS INVESTIGATION

A total of three sub-slab soil gas samples were collected from temporary monitoring probes installed at the locations provided on **Figure 4** to determine if historical on-site activities had negatively impacted the subsurface beneath the maintenance shop, and to determine if there is a potentially unacceptable human health risk associated with the vapor intrusion to indoor air risk pathway. Sub-slab soil gas samples were collected according to procedures and methods referenced in **Field SOP Number 002** provided in Appendix A of the QAPP.

A core-drill was used to create a pilot-hole approximately three-inches in diameter that extended through the concrete floor to facilitate the collection of each sub-slab soil gas sample. A hand auger was then used to create a borehole that extended through the subgrade and into the soil to a depth of at least eight inches below the bottom of the concrete floor slab. A six inch soil gas implant, constructed of double woven stainless steel wire screen, was then attached to an appropriate length of polyethylene tubing and lowered to the bottom of the borehole. Once the implant and tubing were installed, the tubing was capped with a three-way valve, and clean sand was added around the implant to create a permeable layer that extended at least two inches above the implant. Bentonite was then added and hydrated to create a seal above the sand pack that extended to the surface. Once installed, each sub-slab soil gas monitoring probe was allowed to equilibrate for at least 24 hours.

Leak tests were performed prior to sample collection to ensure that valid soil gas samples were collected, and to provide quantitative proof of the integrity of the surface seal. The testing involved the introduction of a gaseous tracer compound (helium) into a shroud which covered the sampling point, and then monitoring with a hand held meter for the presence of helium in the air withdrawn from the subsurface.

While the shroud was inflated, air was purged from the monitoring point using a three-way valve and a syringe. Using the same three-way valve and a syringe, a Tedlar bag was then filled with at least 500 mL of air that was withdrawn from the monitoring point. The air inside of the Tedlar bag was then screened in the field with the meter.

As stated in **Field SOP Number 002**, if less than 10% of the starting concentration of the tracer gas within the shroud was observed in the Tedlar bag sample, the seal could be considered competent and sampling would continue. During fieldwork, the concentration of helium measured in the Tedlar bag was always significantly less than 10%, and each seal was deemed adequate to proceed.

Prior to sampling, a syringe was attached to the three-way valve and three purge volumes of air were removed. After the probe had been purged of any ambient air, an evacuated stainless steel canister (summa canisters) with a flow restrictor set for an 8-hour intake time was attached to the tubing. The sub-slab soil gas sample was then collected over a period of eight hours. At the completion of the sampling period, the valve of the summa canister was closed, and an identification tag was attached to the canister. The probes were then removed, the borehole filled, and the surface repaired.

All sub-slab soil gas samples were submitted to PACE, and analyzed for VOCs via USEPA Method TO-15.

3.4. Management of Investigation-Derived Waste

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

- soil cuttings generated from soil borings and the installation of sub-slab soil gas sampling points;
- decontamination fluids; and
- used personal protective equipment

Following the completion of field activities, a composite sample was gathered from the Parcel B4 (full parcel) IDW soil drums for soil TCLP analysis by various methods. Following this analysis, the waste soil was characterized as non-hazardous. A list of all detections from the

TCLP analysis of the soil cuttings can be found in **Table 3**, which indicates no exceedances of TCLP criteria.

IDW drums containing aqueous materials were characterized by preparing composite samples from randomly selected drums. Each composite sample included aliquots from three individual drums that were chosen from a set of 30 drums being stored on-site at the date of collection. A total of eight aqueous composite samples were collected for TCLP analysis. A list of all detections from the TCLP analysis of the aqueous waste can be found in **Table 4**, which indicates no exceedances of TCLP criteria.

The parcel specific IDW drum log from the Site investigation for the full Parcel B4 is included as **Appendix D**. 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

The analytical results for the detected parameters are summarized and compared to the site-specific project action limits (PALs) in **Table 5** (Organics) and **Table 6** (Inorganics). The laboratory Certificates of Analysis (including Chains of Custody) are included as **Appendix E**. The Data Validation Reports have been included as **Appendix F**. The validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

4.1.1. Soil Conditions: Organic Compounds

As provided on **Table 5**, 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 5 provides a summary of SVOCs detected above the laboratory's MDLs in the soil samples collected from across the Site. Three SVOCs, all polynuclear aromatic hydrocarbons (PAHs), were detected above (or equal to) their respective PALs. Exceedances were noted at roughly half of the boring locations distributed throughout the parcel. A summary of the PAL exceedance locations has been provided on **Figure S-1**.

Shallow soil samples collected across the Site from the 0-1 foot bgs interval were also analyzed for PCBs. **Table 5** provides a summary of the PCBs detected above the laboratory's MDLs. Only two PCB mixtures (and total PCBs) were detected above the specified PALs. The PAL exceedance locations have been provided on **Figure S-2**.

Table 5 provides a summary of TPH-DRO/GRO detections above the laboratory's MDLs in the soil samples collected from across the Site. There were no TPH compound groups detected above the applicable PALs.

4.1.2. Soil Conditions: Inorganic Constituents

Table 6 provides a summary of inorganic constituents detected above the laboratory's MDLs in the soil samples collected from across the Site. Four inorganic compounds were detected above their respective PALs. Arsenic was by far the most common inorganic exceedance, and was detected above the PAL in 15 of the soil samples (60%) analyzed for this compound. For comparison, the remaining compounds had only nine exceedances combined. A summary of the PAL exceedance locations has been provided on **Figure S-3**.

4.1.3. Soil Conditions: Results Summary

Constituents of potential concern (COPCs) were defined as any compound exhibiting at least one exceedance of its applicable PAL. **Table 7** provides a summary of results for all COPCs in soil. The table displays the detection frequency for each COPC and compares the maximum detected values for each compound to the applicable PALs. The maximum detections for each PAH listed in the table (and lead) were associated with a single sample (B4-004-SB-4) which targeted REC8C (Oil House) identified in Weaver Boos' Phase I ESA. Based on the previous uses of the parcel, specific features may have exhibited higher levels of contamination than others. The sampling plan defined in the Sub-Parcel B4-1 Work Plan was designed to target the specific features which represented a potential release of hazardous substances and/or petroleum products to the environment. **Table 8** indicates which soil impacts (PAL exceedances) are associated with the specific targets listed in the sampling plan table (**Appendix A**).

All soil data were screened to determine whether individual sample results may be indicative of the presence of discrete Hot Spots on the Site. Following the guidelines presented in the June 2008 Cleanup Standards for Soil and Groundwater prepared by the MDE, a potential Hot Spot would be identified if the result was 100 times the PAL (i.e., a lifetime cancer risk of 1E-4 or Hazard Index of 100). The MDE guidance indicates that all identified Hot Spots have to be addressed in accordance with a MDE approved Remedial Action Plan, with the expectation that treatment shall be used to remediate Hot Spot contamination, wherever practicable. Regarding Sub-Parcel B4-1, none of the maximum detections of any compound exceeded these criteria.

4.2. SUB-SLAB SOIL GAS CONDITIONS

The detected VOC parameters are summarized and compared to the site-specific PALs in attached **Table 9** (Maintenance Shop). While there were VOCs detected in the sub-slab samples, none of the detections exceeded the PAL for the respective compound in any of the sub-slab soil gas samples submitted for analysis. The laboratory's Certificates of Analysis (including Chains of Custody) are included as **Appendix G**, and the Data Validation Reports are included as **Appendix H**. The validation reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

5.0 DATA USABILITY ASSESSMENT

The approved site-wide QAPP specified a process for evaluating data usability in the context of meeting project goals. Specifically, the goal of the Phase II Investigation is to determine if potentially hazardous substances or petroleum products (VOCs, SVOCs, PCBs, TAL metals, cyanide, or TPH-DRO/GRO) are present in Site media (soil and sub-slab soil gas) at concentrations that could pose an unacceptable risk to Site receptors. Individual results are compared to the Project Action Limits established in the QAPP (i.e., the most current USEPA RSLs) to identify the presence of constituents of potential concern in each environmental medium.

Quality control (QC) samples were collected during field studies to evaluate field/laboratory variability. A summary of QA/QC samples associated with this investigation has been included as **Appendix I**. The following QC samples were 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 per twenty samples
  - Soil - VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, PCBs, Hexavalent Chromium, and Cyanide
  - Air (Soil Gas) - VOCs only
- 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 – at a rate of one per twenty samples
  - Soil - VOC, SVOC, Metals, TPH-DRO, TPH-GRO, Hexavalent Chromium, and Cyanide
  - Air (Soil Gas) - VOCs for Equipment Blank only

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 and/or checked once per day. The PID calibration log has been provided in **Appendix C**.

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 chain of custody forms 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

All samples were submitted to, and analyzed by, PACE. PACE then compiled all results and supporting information into a Level IV Data package; which was submitted to Environmental Data Quality Inc. (EDQI) for a USEPA Stage 2B data validation.

All soil 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. USEPA Region III references this guidance for validation requirements. This document specifies procedures for validating data generated for Contract Laboratory Program (CLP) analyses. The approved QAPP dated October 2, 2015, and the quality control requirements specified in the methods and associated acceptance criteria, were also used to evaluate the non-CLP data. Data validation for sub-slab soil gas samples has not yet been completed at this time.

The Data Validation Reports for the soil data provided by EDQI are included as **Appendix F**. The soil gas Data Validation Reports are included as **Appendix H**.

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 during the data validation process for soils and sub-slab soil gas as described in the Data Validation Reports provided as **Appendix F** and **Appendix H**. 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 validation report provided by EDQI. Particular results may have been marked with the "R" flag if the result was deemed to be unreliable and was not included in any further data evaluation. A summary of the soil results that were rejected during data validation has been provided on **Table 10**. No sub-slab soil gas results were rejected during data validation, so an additional table is not warranted. 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 002, 008, 009, 010, 011, 017, 024, and 025**. Review of the field notes and laboratory sample receipt records indicated that collection of soil and sub-slab soil gas at the Site was representative, with no significant deviations from the SOPs.

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

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

Completeness is expressed as a ratio of the number of valid data points to the total number of analytical data results. Non-usable ("R" flagged) data results are 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 in soil and sub-slab soil gas is provided in **Appendix J**. All compounds in sub-slab soil gas had a completeness of 100%, indicating that no analytical results were rejected for this type of sample.

A total of 11 acid extractable SVOCs had completeness values below the goal of 90% in soils. These compounds (2,4-dinitrophenol, 2,3,4,6-tetrachlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2,4-dimethylphenol, 2-chlorophenol, 2-methylphenol, 3&4-methylphenol (m&p Cresol), pentachlorophenol, and phenol) each had a calculated completeness between 60% and 68%. The results for these compounds were rejected due to poor recoveries, which is believed to be due to the highly alkaline conditions typical of slag fill. These compounds are generally not expected to be site-related contaminants.

The only additional limitations identified in the soil data were the number of rejected sample results for benzaldehyde, 1,4-dioxane, and bromomethane. The rejected results for these compounds are not uncommon. The lack of soil data for these compounds is not considered to be a significant data gap as they are not expected to be site-related contaminants. Overall, the soil data can be used as intended.

6.0 FINDINGS AND RECOMMENDATIONS

The objective of this Phase II Investigation was to identify the presence or absence of any existing hazardous conditions for future tenants or personnel working on the Site. During the Phase II Investigation, a total of 25 soil samples from 13 boring locations and three sub-slab soil gas samples were collected and analyzed to assess the presence of absence of contamination in Sub-Parcel B4-1. 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, TAL-Metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot bgs) were also analyzed for PCBs. Sub-slab soil gas samples were analyzed for VOCs.

The Phase I ESA conducted by Weaver Boos identified one REC at the Site, and additional sample targets were identified during Work Plan development. These findings warranted the extensive field investigations conducted during this Phase II Investigation. The samples collected during this study have provided analytical data regarding current conditions at the Site, and facilitated the identification of potential contaminant releases. Soil conditions have been adequately characterized to support risk assessment and associated response action planning, if necessary, as well as development planning. Minimal impacts in the sub-slab soil gas samples from below the maintenance shop are documented, indicating an insignificant risk for vapor intrusion to future workers.

6.1. SOIL

The concentrations of constituents in the soil have been adequately characterized by the Phase II Investigation to provide estimates of exposure point concentrations to support risk assessment. COPCs in soil consisted of four inorganic compounds (arsenic, manganese, hexavalent chromium, and lead), three SVOCs (benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene), and three PCB groups (total PCBs, Aroclor 1254, and Aroclor 1260). With the exception of arsenic, manganese, and benzo[a]pyrene, the remaining COPCs appeared to be present above their applicable PALs only at individual isolated locations. While most compounds did not appear to be widespread at the Site, individual contaminants could potentially be found in discrete Hot Spots. Contaminant Hot Spots could result from the systemic use of hazardous substances and/or petroleum products in designated areas, as well as documented or undocumented releases. In accordance with the June 2008 Cleanup Standards for Soil and Groundwater developed by the MDE, a potential Hot Spot was identified if the result was 100 times the PAL (i.e., EPA Region III RBC value in excess of 1E-4 cancer risk or Hazard Index of 100). There were no Hot Spots identified in Sub-Parcel B4-1 requiring further action.

There were no PAL exceedances for VOCs or TPH within the Sub-Parcel, indicating that these compound groups are not COPCs at the Site. Inorganics, SVOCs and PCBs in soil were responsible for a limited number of PAL exceedances within the Sub-Parcel B4-1 boundary. However, there were no individual soil sample results that exceeded 100 times the PAL, indicating the absence of Hot Spots. The current characterization activities are sufficient to perform a risk assessment for future uses of the Site. As there were no significant data gaps, no further investigation of soil in this parcel is recommended.

6.2. SUB-SLAB SOIL GAS

The nature and extent of constituents in sub-slab soil gas has been adequately characterized by the Phase II Investigation. The sub-slab samples collected during the investigation of the maintenance shop did not contain any VOC compounds that exceeded their specified PALs. Further investigation is not recommended based on the documentation of minimal impacts below the building slab, and the apparent insignificant risk for vapor intrusion.

7.0 REFERENCES

ARM Group, Inc. (2016). *Phase II Investigation Work Plan: Parcel B4, Sub-Parcel B4-1 (Expedited Area).* Revision 0. January 27, 2016.

ARM Group, Inc. (2015). *Quality Assurance Project Plan: Sparrows Point Terminal Site*. Revision 2. October 2, 2015.

Rust Environmental & Infrastructure (1998). *Description of Current Conditions: Bethlehem Steel Corporation*. Final Draft. January, 1998.

State of Maryland Department of the Environment (2008). *Cleanup Standards for Soil and Groundwater*. Interim Final Guidance (Update No. 2.1). June 2008.

Weaver Boos Consultants (2014). *Phase I Environmental Site Assessment: Former RG Steel Facility*. Final Draft. May 19, 2014.

FIGURES

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500
Feet

Site Boundary
Private Property
Area A Boundaries
Area B Boundaries

Tradepoint Atlantic
Area A and Area B Parcels
August 1, 2016

EnviroAnalytics Group	Tradepoint Atlantic	Figure
Area A: Project 150298M Area B: Project 150300M	Baltimore County, MD	1

N

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Area A Boundaries
Area B Boundaries
Land
Marsh
Water

Approximate Shoreline 1916
August 1, 2016

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

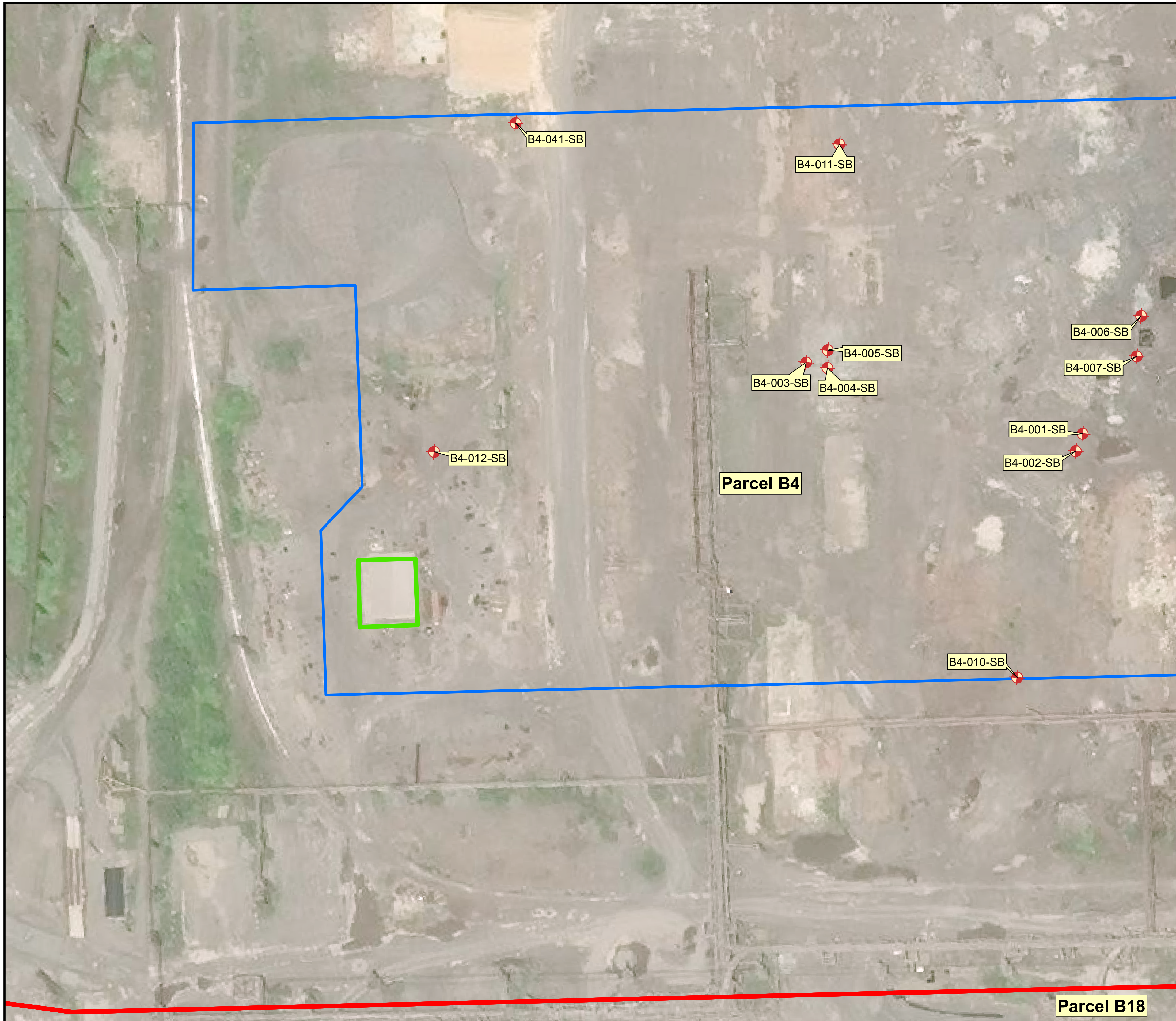
EnviroAnalytics Group

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

Tradepoint Atlantic

Baltimore County, MD

Figure 2

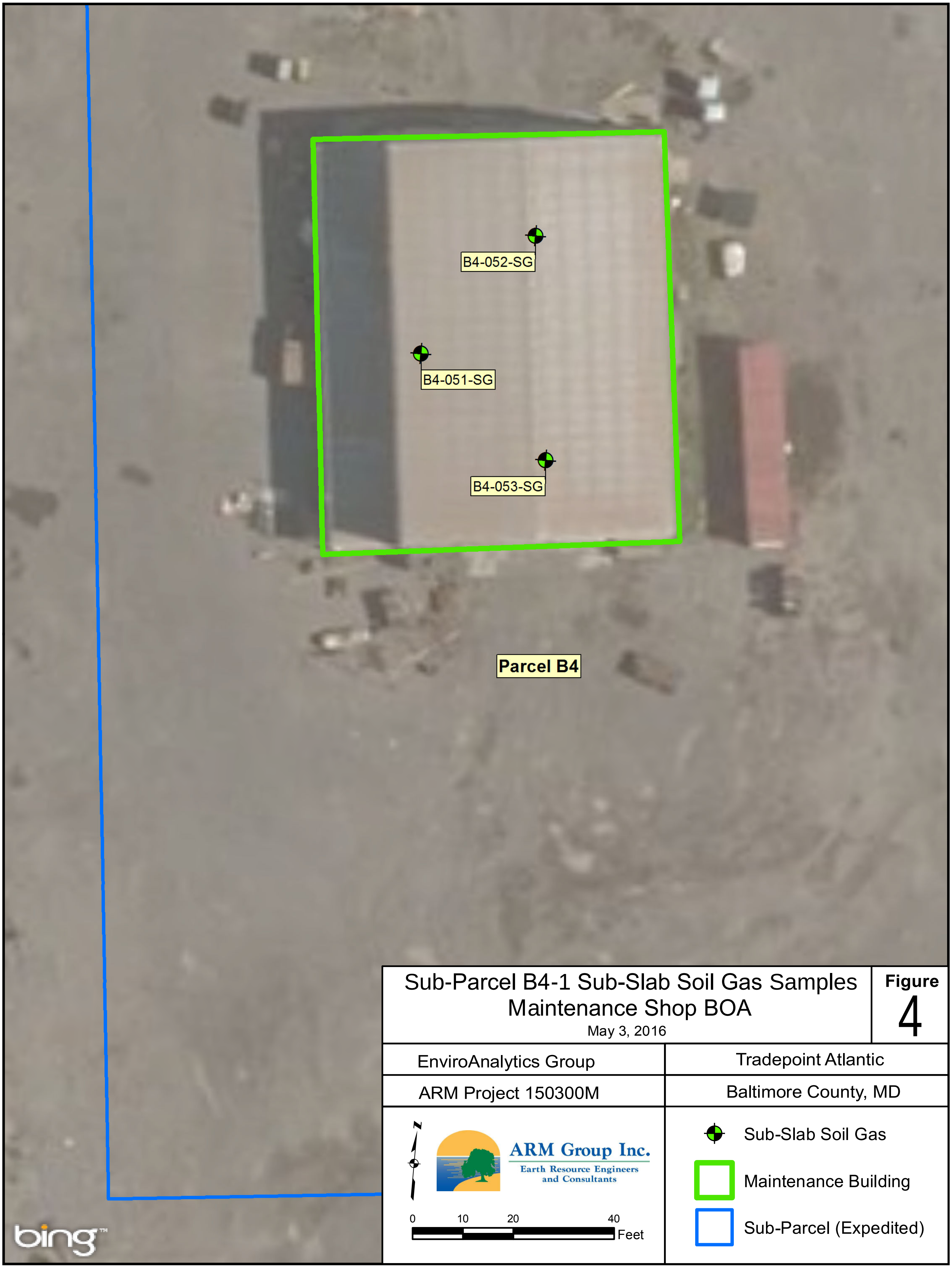


Sub-Parcel B4-1 Soil Borings
Final Field Sample Locations
May 24, 2016

Figure 3

EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

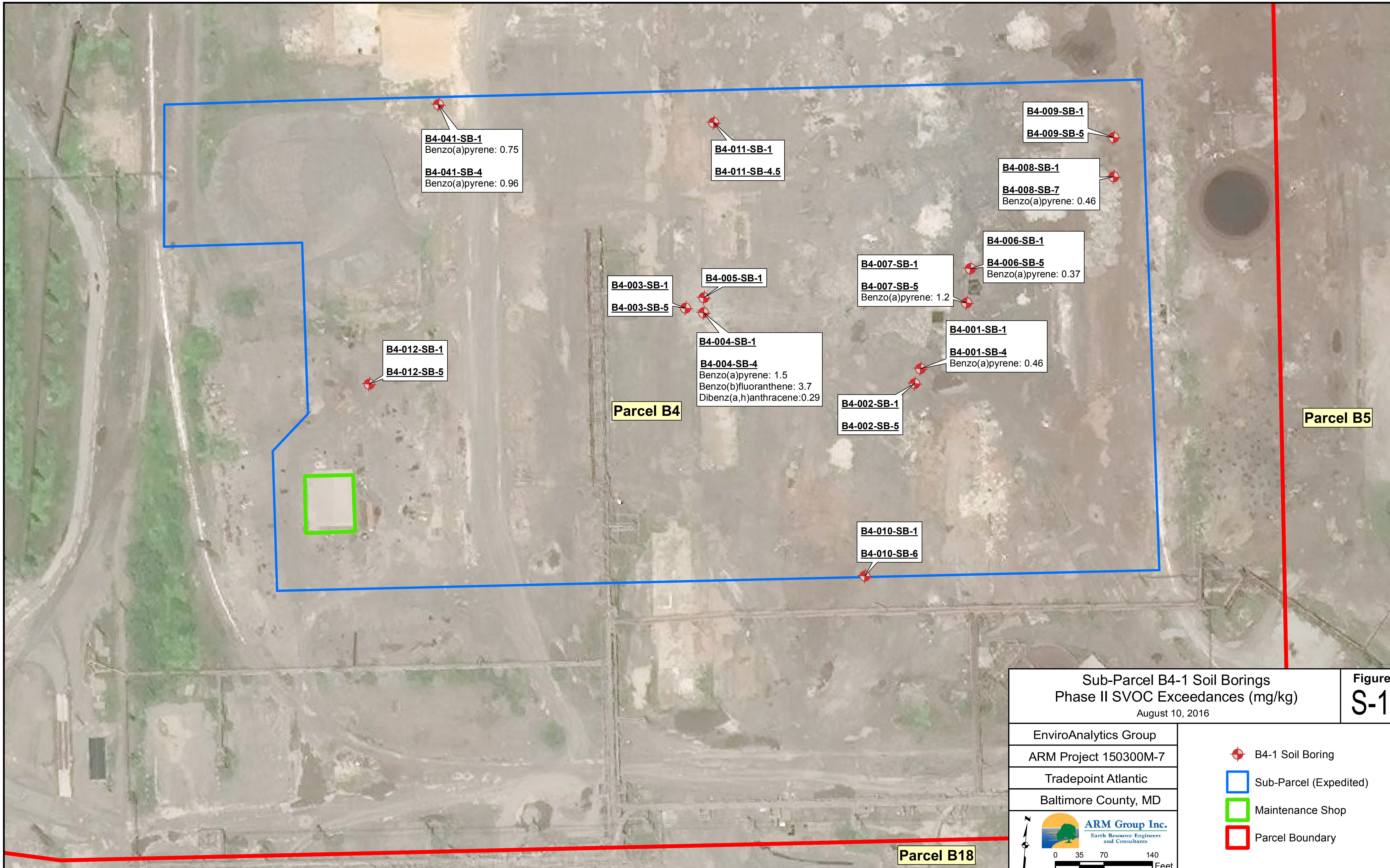


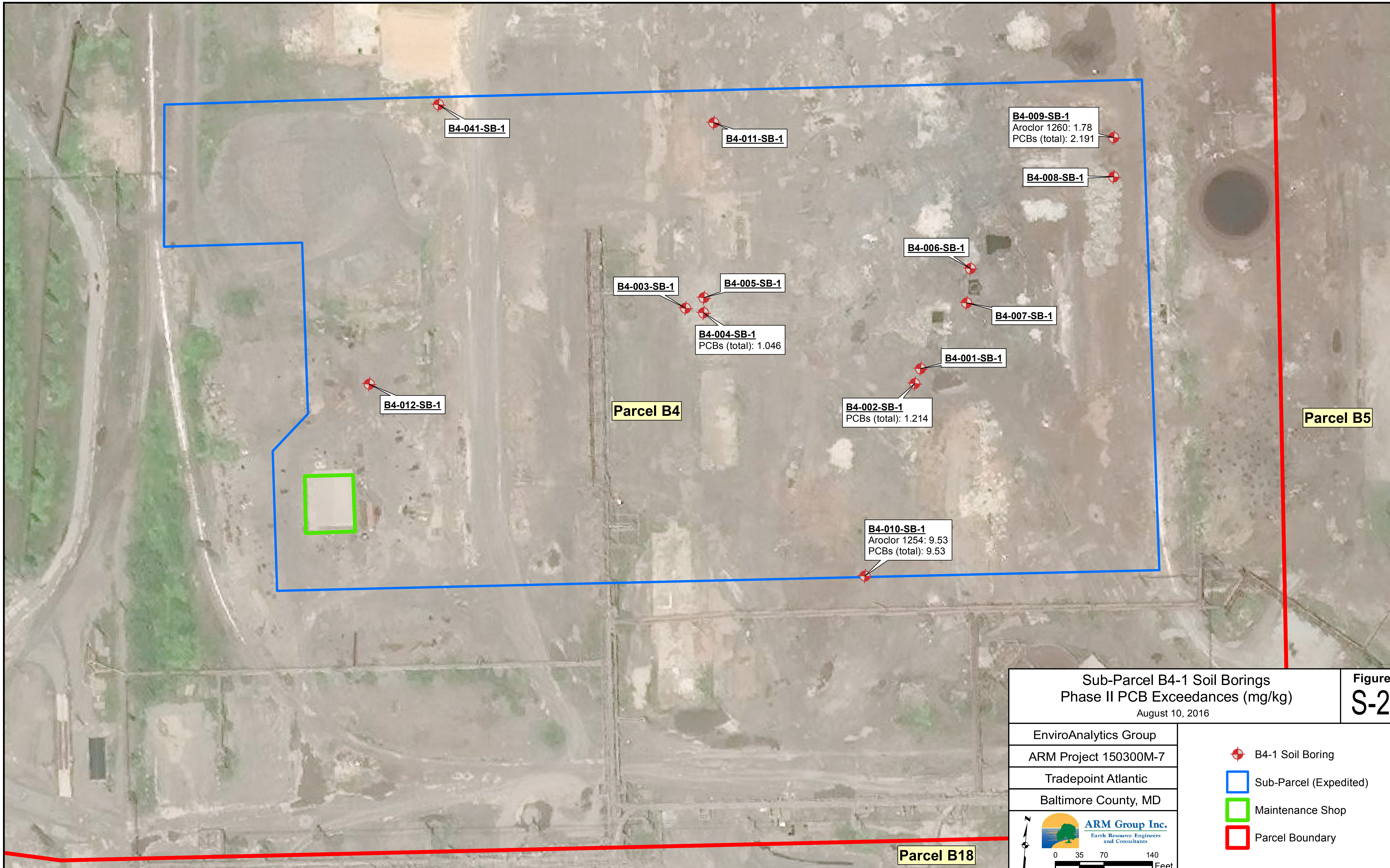
Sub-Parcel B4-1 Sub-Slab Soil Gas Samples
Maintenance Shop BOA
May 3, 2016

Figure 4

EnviroAnalytics Group | Tradepoint Atlantic

ARM Project 150300M | Baltimore County, MD


B4-041-SB-1
Benzo(a)pyrene: 0.75
B4-041-SB-4
Benzo(a)pyrene: 0.96
B4-011-SB-1
B4-011-SB-4.5
B4-009-SB-1
B4-009-SB-5
B4-008-SB-1
B4-008-SB-7
Benzo(a)pyrene: 0.46
B4-006-SB-1
B4-006-SB-5
Benzo(a)pyrene: 0.37
B4-007-SB-1
B4-007-SB-5
Benzo(a)pyrene: 1.2
B4-003-SB-1
B4-003-SB-5
B4-005-SB-1
B4-004-SB-1
B4-004-SB-4
Benzo(a)pyrene: 1.5
Benzo(b)fluoranthene: 3.7
Dibenz(a,h)anthracene:0.29
B4-001-SB-1
B4-001-SB-4
Benzo(a)pyrene: 0.46
B4-012-SB-1
B4-012-SB-5
B4-002-SB-1
B4-002-SB-5
Parcel B4
Parcel B5
B4-010-SB-1
B4-010-SB-6
Parcel B18
Sub-Parcel B4-1 Soil Borings
Phase II SVOC Exceedances (mg/kg)
August 10, 2016
Figure
S-1
EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD
ARM Group Inc.
Earth Resource Engineers and Consultants
N
0 35 70 140
Feet
B4-1 Soil Boring
Sub-Parcel (Expedited)
Maintenance Shop
Parcel Boundary

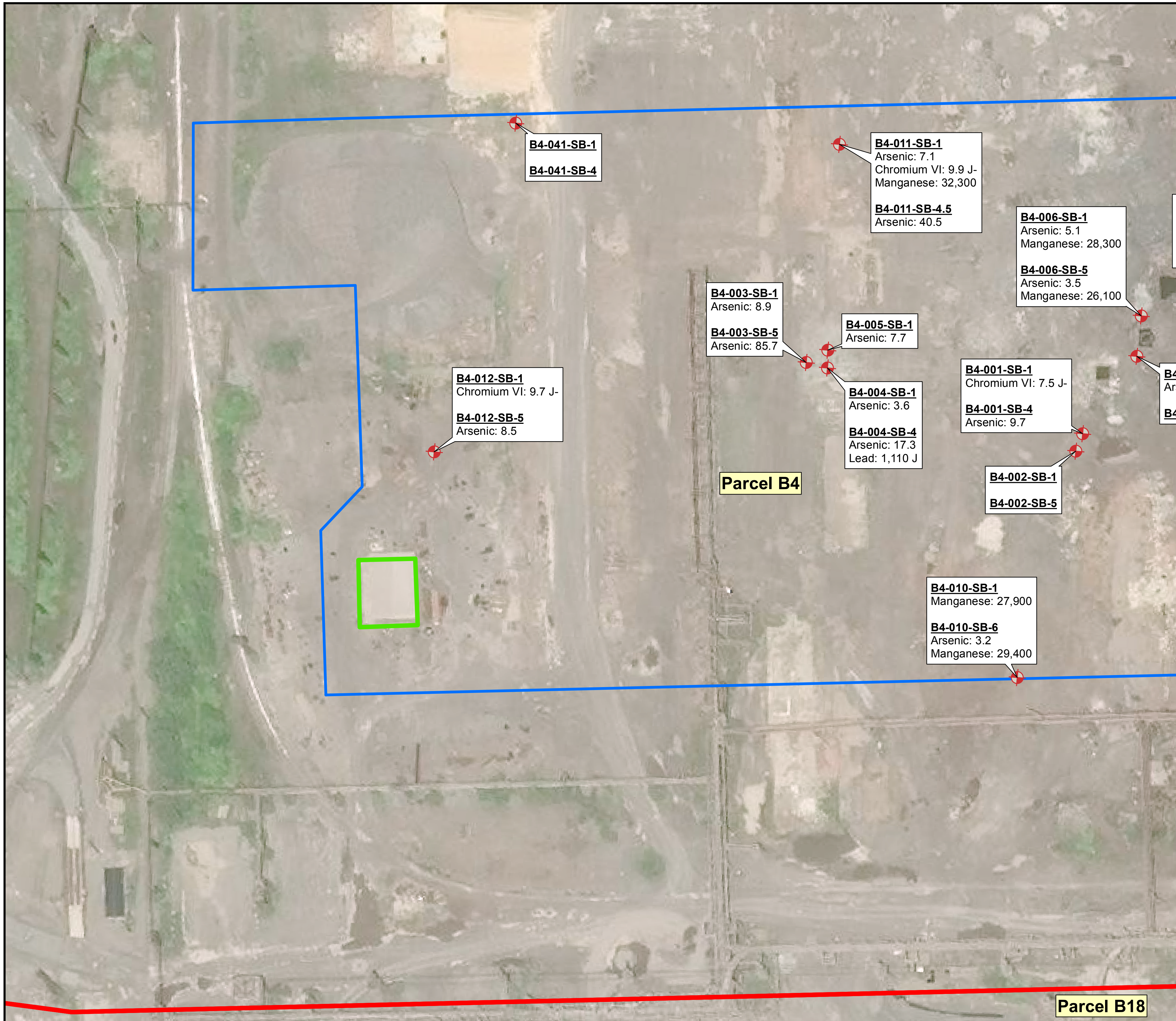


Sub-Parcel B4-1 Soil Borings
Phase II PCB Exceedances (mg/kg)
August 10, 2016

Figure
S-2

EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants



Sub-Parcel B4-1 Soil Borings
Phase II Inorganic Exceedances (mg/kg)
August 10, 2016

Figure
S-3

EnviroAnalytics Group
ARM Project 150300M-7
Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 35 70 140
Feet

B4-1 Soil Boring
Sub-Parcel (Expedited)
Maintenance Shop
Parcel Boundary

TABLES

TABLE 1 **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.)	5020	*Unknown*	3/9/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5120 5120-A 5120-B	*Unknown* *Unknown* *Unknown*	6/26/2008 3/28/2008 9/28/2010
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5520	*Unknown*	3/19/1992
Drip Legs	Coke Oven Gas Drip Legs Locations	5885B	*Unknown*	Sept. 1988

TABLE 2
FIELD SHIFTED BORING LOCATIONS

Location ID	Sample Target	Proposed Location[¥]		Final Location[¥]		Relocation Distance & Direction		Rationale
		Northing	Easting	Northing	Easting			
B4-001-SB	Drip Leg	564,545	1,457,530	564,546	1,457,554	25 ft	E	Refusal
B4-002-SB	Drip Leg	564,525	1,457,532	564,524	1,457,548	16 ft	E	Refusal
B4-003-SB	Oil House	564,606	1,457,222	564,604	1,457,209	13 ft	SW	Refusal
B4-005-SB	Oil House	564,615	1,457,235	564,621	1,457,235	6 ft	N	Refusal
B4-006-SB	Pit (emergency plating)	564,683	1,457,613	564,697	1,457,613	14 ft	N	Metal Plates/Pit
B4-007-SB	Pit (emergency plating)	564,656	1,457,615	564,647	1,457,612	10 ft	SW	Metal Plates/Pit and Refusal
B4-008-SB	Substation/Transformers	564,826	1,457,790	564,846	1,457,808	27 ft	NE	Refusal
B4-009-SB	Substation/Transformers	564,885	1,457,777	564,903	1,457,803	31 ft	NE	Refusal
B4-011-SB	None (site coverage)	564,856	1,457,230	564,874	1,457,227	19 ft	N	Refusal

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

TABLE 3 TCLP DETECTIONS FOR SOLID IDW					
Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
2-Butanone (MEK)	0.0657	200	No	J	5
Barium	0.11	100	No	J	1
Cadmium	0.0009	1	No	J	0.05
Chromium	0.012	5	No	J	0.05

J = The positive result reported for this analyte is a quantitative estimate below the laboratory PQL.
TCLP = Toxicity characteristic leaching procedure
LOQ = Limit of Quantitation

TABLE 4 TCLP DETECTIONS FOR LIQUID IDW						
Location ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 1	Barium	0.0338	100	No		0.01
Water Disposal 1	Cadmium	0.0006	1	No	J	0.003
Water Disposal 1	Chromium	0.0016	5	No	J	0.005
Water Disposal 2	Barium	0.0811	100	No		0.01
Water Disposal 2	Chloroform	0.0029	6	No		0.001
Water Disposal 2	Chromium	0.0012	5	No	J	0.005
Water Disposal 3	Barium	0.0051	100	No	J	0.01
Water Disposal 3	Chloroform	0.0016	6	No		0.001
Water Disposal 3	Chromium	0.00085	5	No	J	0.005
Water Disposal 4	Arsenic	0.0094	5	No		0.005
Water Disposal 4	Barium	0.101	100	No		0.01
Water Disposal 4	Chloroform	0.0024	6	No		0.001
Water Disposal 4	Chromium	0.0012	5	No	J	0.005
Water Disposal 5	Barium	0.398	100	No		0.01
Water Disposal 5	Cadmium	0.00058	1	No	J	0.003
Water Disposal 5	Chloroform	0.0039	6	No		0.001
Water Disposal 5	Chromium	0.0012	5	No	J	0.005
Water Disposal 6	Barium	2.14	100	No		0.01
Water Disposal 6	Cadmium	0.001	1	No	J	0.003
Water Disposal 6	Chloroform	0.00058	6	No	J	0.001
Water Disposal 7	Barium	0.0889	100	No		0.01
Water Disposal 7	Cadmium	0.00067	1	No	J	0.003
Water Disposal 7	Chloroform	0.00075	6	No	J	0.001
Water Disposal 7	Trichloroethene	0.00065	0.5	No	J	0.001
Water Disposal 8	Barium	0.01	100	No	J	0.01

J = The positive result reported for this analyte is a quantitative estimate below the laboratory PQL.
TCLP = Toxicity characteristic leaching procedure
LOQ = Limit of Quantitation

Table 5
Summary of Organics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	**Units**	**PAL**	B4-001-SB-1		B4-001-SB-4		B4-002-SB-1		B4-002-SB-5		B4-003-SB-1		B4-003-SB-5		B4-004-SB-1		B4-004-SB-4		B4-005-SB-1		B4-006-SB-1		B4-006-SB-5		B4-007-SB-1		B4-007-SB-5	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			3/1/2016		3/1/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Volatile Organic Compounds																												
1,2,3-Trichlorobenzene	mg/kg	930	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
1,2,4-Trichlorobenzene	mg/kg	110	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
2-Butanone (MEK)	mg/kg	190,000	0.01	U	0.014	U	**0.0026**	J	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	**0.0081**	J	0.0082	U
2-Hexanone	mg/kg	1,300	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	**0.002**	J	0.0082	U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	0.013	U	0.0082	U
Acetone	mg/kg	670,000	**0.023**		**0.13**		**0.031**		**0.041**		0.013	UJ	**0.13**	J	**0.015**	J	**0.031**	J	**0.039**	J	**0.021**		**0.038**	J	**0.11**		**0.011**	
Benzene	mg/kg	5.1	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	**0.013**		0.0059	U	0.0057	U	0.006	U	**0.0038**	J	**0.0043**	J	0.0066	U	**0.0018**	J
Chloroform	mg/kg	1.4	0.0051	U	**0.0093**		0.0043	U	0.013	U	0.0066	U	0.0054	U	0.0059	U	0.0057	U	0.006	U	0.004	U	0.0048	UJ	0.0066	U	0.0041	U
Cyclohexane	mg/kg	27,000	0.01	U	0.014	U	0.0086	U	0.026	U	0.013	U	0.011	U	0.012	U	0.011	U	0.012	U	0.0081	U	0.0096	UJ	0.013	U	0.0082	U
Ethylbenzene	mg/kg	25	0.0051	U	0.007	U	0.0043	U	0.013	U	0.0066	U	**0.0061**		0.0059	U	0.0057	U	0.006	U	**0.0016**	J	0.0048	UJ	0.0066	U	**0.0013**	J
Toluene	mg/kg	47,000	**0.0056**		**0.0047**	J	**0.0061**		**0.018**		**0.0059**	J	**0.017**		**0.0053**	J	**0.0059**		**0.0049**	J	**0.0099**		**0.0091**	J	**0.0095**		**0.0075**	
Xylenes	mg/kg	2,800	0.015	U	0.021	U	0.013	U	0.038	U	0.02	U	**0.0062**	J	0.018	U	0.017	U	0.018	U	0.012	U	0.014	UJ	0.02	U	0.012	U
Semi-Volatile Organic Compounds (PAHs via SIM)																												
1,1-Biphenyl	mg/kg	200	0.072	U	**0.026**	J	0.072	U	0.094	U	**0.017**	J	**0.02**	J	0.075	U	**0.073**	J	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
2,4-Dimethylphenol	mg/kg	16,000	0.072	R	0.078	U	0.072	R	0.094	U	0.075	U	0.073	U	0.075	U	**0.024**	J	0.074	U	0.071	R	0.071	R	0.073	UJ	0.07	U
2-Methylnaphthalene	mg/kg	3,000	**0.017**		**0.11**		**0.018**		**0.0075**	J	**0.051**	J	**0.14**		**0.014**	J	**0.26**		**0.032**	J	**0.024**		**0.027**		**0.0048**	J	**0.034**	
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14	R	**0.045**	J	0.14	R	0.19	U	0.15	U	0.15	U	0.15	U	**0.038**	J	0.15	U	0.14	R	0.14	R	0.15	UJ	0.14	U
Acenaphthene	mg/kg	45,000	**0.001**	J	**0.027**		**0.0037**	J	0.0094	U	0.077	U	**0.0077**		0.076	U	**0.029**	J	0.074	U	**0.043**		**0.077**		**0.0012**	J	**0.28**	
Acenaphthylene	mg/kg	45,000	**0.0022**	J	**0.056**		**0.024**		**0.0022**	J	**0.041**	J	**0.013**		**0.023**	J	**0.13**		**0.026**	J	**0.0076**		**0.0049**	J	**0.0009**	J	**0.0069**	J
Acetophenone	mg/kg	120,000	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	**0.034**	J	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Anthracene	mg/kg	230,000	**0.0067**	B	**0.11**		**0.031**		**0.0047**	B	**0.067**	J	**0.017**		**0.039**	J	**0.23**		**0.052**	J	**0.021**		**0.023**		**0.0048**	B	**0.064**	
Benzaldehyde	mg/kg	120,000	0.072	R	0.078	R	0.072	R	0.094	R	**0.033**	J	**0.031**	J	**0.023**	J	**0.056**	J	0.074	U	0.071	R	0.071	R	0.073	R	0.07	R
Benzo[a]anthracene	mg/kg	2.9	**0.033**		**0.54**		**0.076**		**0.015**		**0.22**		**0.058**		**0.11**		**1.1**		**0.19**		**0.12**		**0.19**		**0.019**		**0.53**	
Benzo[a]pyrene	mg/kg	0.29	**0.021**		**0.46**		**0.066**		**0.014**		**0.27**		**0.066**		**0.17**		**1.5**		**0.24**		**0.23**		**0.37**		**0.015**		**1.2**	
Benzo[b]fluoranthene	mg/kg	2.9	**0.097**		**1.1**		**0.18**		**0.042**		**0.71**		**0.18**		**0.39**		**3.7**		**0.58**		**0.55**		**0.83**		**0.047**		**1.6**	
Benzo[g,h,i]perylene	mg/kg	none	**0.013**		**0.12**		**0.022**		**0.0057**	B	**0.1**		**0.022**		**0.085**		**0.79**		**0.1**		**0.12**		**0.17**		**0.0062**	B	**0.49**	
Benzo[k]fluoranthene	mg/kg	29	**0.093**		**1.1**		**0.18**		**0.041**		**0.68**		**0.18**		**0.38**		**3.5**		**0.55**		**0.52**		**0.79**		**0.045**		**0.68**	
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.072	U	0.078	U	**0.018**	B	0.094	U	**0.64**	J	**0.016**	B	**0.18**	B	**0.11**	B	**0.1**	J	0.071	U	0.071	U	0.073	U	0.07	U
Carbazole	mg/kg	none	0.072	U	**0.052**	J	0.072	U	0.094	U	**0.038**	J	0.073	U	**0.024**	J	**0.15**	J	**0.021**	J	0.071	U	0.071	U	0.073	U	**0.052**	J
Chrysene	mg/kg	290	**0.053**		**0.58**		**0.09**		**0.026**		**0.26**		**0.092**		**0.17**		**1.2**		**0.23**		**0.19**		**0.24**		**0.03**		**0.57**	
Dibenz[a,h]anthracene	mg/kg	0.29	**0.0045**	J	**0.061**		**0.0084**		**0.0022**	J	**0.033**	J	**0.0088**		**0.031**	J	**0.29**		**0.035**	J	**0.046**		**0.07**		**0.0025**	J	**0.22**	
Di-n-butylphthalate	mg/kg	82,000	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	0.077	U	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Di-n-ocytlphthalate	mg/kg	8,200	0.072	U	0.078	U	0.072	U	0.094	U	**0.026**	J	0.073	UJ	0.075	UJ	0.077	UJ	0.074	UJ	0.071	U	0.071	U	0.073	U	0.07	U
Fluoranthene	mg/kg	30,000	**0.12**		**0.95**		**0.19**		**0.026**		**0.44**		**0.12**		**0.26**		**1.9**		**0.33**		**0.28**		**0.32**		**0.047**		**0.57**	
Fluorene	mg/kg	30,000	0.0074	U	**0.027**		**0.028**		**0.001**	J	**0.014**	J	**0.0072**	J	**0.0068**	J	**0.034**	J	**0.0074**	J	**0.0059**	J	**0.0072**		**0.0019**	J	**0.02**	
Hexachloroethane	mg/kg	8.00	0.072	U	0.078	U	0.072	U	0.094	U	0.075	U	0.073	U	0.075	U	0.077	U	0.074	U	0.071	U	0.071	U	0.073	U	0.07	U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.012**		**0.13**		**0.023**		**0.0056**	J	**0.1**		**0.023**		**0.064**	J	**0.61**		**0.098**		**0.12**		**0.19**		**0.0056**	J	**0.59**	
Naphthalene	mg/kg	17	**0.027**		**0.096**		**0.11**		**0.011**		**0.061**	J	**0.093**		**0.14**		**0.21**		**0.096**		**0.056**		**0.033**		**0.0052**	J	**0.048**	
Phenanthrene	mg/kg	none	**0.096**		**0.33**		**0.15**		**0.02**		**0.19**		**0.16**		**0.12**		**0.71**		**0.16**		**0.19**		**0.15**		**0.023**		**0.27**	
Phenol	mg/kg	250,000	0.072	R	**0.11**		0.072	R	0.094	U	0.075	U	0.073	U	0.075	U	**0.019**	J	0.074	U	0.071	R	0.071	R	0.073	UJ	0.07	U
Pyrene	mg/kg	23,000	**0.1**		**0.92**		**0.16**		**0.024**		**0.41**		**0.12**		**0.27**		**2**		**0.3**		**0.21**		**0.26**		**0.037**		**0.5**	
PCBs																												
Aroclor 1248	mg/kg	0.94	0.0529	U	NA		**0.179**		NA		0.0549	U	NA		**0.46**		NA		**0.0351**	J	0.0545	U	NA		0.0548	U	NA	
Aroclor 1254	mg/kg	0.97	0.0529	U	NA		**0.193**		NA		**0.0342**	J	NA		**0.343**		NA		**0.0428**	J	0.0545	U	NA		0.0548	U	NA	
Aroclor 1260	mg/kg	0.99	**0.218**		NA		**0.842**		NA		**0.045**	J	NA		**0.243**		NA		**0.0298**	J	0.0545	U	NA		0.0548	U	NA	
Total PCB	mg/kg	0.97	**0.218**		NA		**1.214**		NA		**0.0792**		NA		**1.046**		NA		**0.1077**		0.0545	U	NA		0.0548	U	NA	
Gasoline and Diesel Range Organics (DRO/GRO)																												
DRO	mg/kg	620	**75.8**		**137**		**53.1**		**31.2**		**157**		**77.2**		**196**		**434**		**89.7**		**66.4**		**39**		**24.1**		**46.9**	
GRO	mg/kg	620	10.6	U	12.8	U	10.2	U	27.5	U	13.8	U	**13.8**		12.2	U	14.3	U	16.7	U	9.5	U	9.5	U	13.2	U	11.7	U

Detections in bold

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.

NA: This parameter was not analyzed for this sample.

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 5
Summary of Organics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-008-SB-1		B4-008-SB-7		B4-009-SB-1		B4-009-SB-5		B4-010-SB-1		B4-010-SB-6		B4-011-SB-1		B4-011-SB-4.5		B4-012-SB-1		B4-012-SB-5		B4-041-SB-1		B4-041-SB-4	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			2/29/2016		2/29/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Volatile Organic Compounds																										
1,2,3-Trichlorobenzene	mg/kg	930	**0.0022**	J	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
1,2,4-Trichlorobenzene	mg/kg	110	**0.0022**	J	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
2-Butanone (MEK)	mg/kg	190,000	0.01	U	0.012	U	0.012	U	0.011	U	**0.0027**	J	**0.0042**	J	0.011	U	0.011	U	**0.0042**	J	0.01	U	0.0097	U	0.012	U
2-Hexanone	mg/kg	1,300	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	0.01	U	0.011	U	0.011	U	0.01	U	0.01	U	0.0097	U	0.012	U
4-Methyl-2-pentanone (MIBK)	mg/kg	56,000	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	**0.0021**	J	0.011	U	0.011	U	0.01	U	0.01	U	0.0097	U	0.012	U
Acetone	mg/kg	670,000	**0.017**	J	**0.028**	J	**0.06**		**0.031**		**0.097**	J	**0.091**	J	0.011	UJ	**0.025**	J	**0.05**		**0.12**		**0.0049**	J	**0.047**	
Benzene	mg/kg	5.1	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	**0.011**		0.0051	U	**0.016**		0.0048	U	0.0062	U
Chloroform	mg/kg	1.4	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	0.0056	U	0.0051	U	0.0051	U	0.0048	U	0.0062	U
Cyclohexane	mg/kg	27,000	0.01	U	0.012	U	0.012	U	0.011	U	0.01	U	0.01	U	0.011	U	0.011	U	0.01	U	**0.027**		0.0097	U	0.012	U
Ethylbenzene	mg/kg	25	0.0051	U	0.006	U	0.0058	U	0.0055	U	0.0052	U	0.0051	U	0.0056	U	**0.0086**		0.0051	U	**0.0071**		0.0048	U	0.0062	U
Toluene	mg/kg	47,000	**0.0053**		**0.0025**	J	**0.011**		**0.0088**		**0.0091**		**0.0035**	J	**0.005**	J	**0.025**		**0.0043**	J	**0.019**		**0.0047**	J	**0.0074**	
Xylenes	mg/kg	2,800	0.015	U	0.018	U	0.018	U	0.017	U	0.016	U	0.015	U	0.017	U	**0.01**	J	0.015	U	**0.0054**	J	0.015	U	0.019	U
Semi-Volatile Organic Compounds (PAHs via SIM)																										
1,1-Biphenyl	mg/kg	200	0.072	U	**0.018**	J	0.073	U	0.072	U	**0.02**	J	**0.028**	J	0.073	U	0.072	U	**0.036**	J	0.07	U	**0.066**	J	**0.021**	J
2,4-Dimethylphenol	mg/kg	16,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	R	0.071	R	0.073	R	0.072	U	0.074	R	0.07	U	0.072	U	0.077	U
2-Methylnaphthalene	mg/kg	3,000	**0.021**		**0.062**		**0.023**	J	**0.037**		**0.1**		**0.11**		**0.017**		**0.032**		**0.092**		**0.0075**		**0.05**		**0.098**	
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14	U	0.14	U	0.14	U	0.14	U	0.14	R	0.14	R	0.15	R	0.14	U	0.15	R	0.14	U	0.14	U	0.15	U
Acenaphthene	mg/kg	45,000	**0.0047**	J	**0.013**		**0.011**	J	**0.015**		**0.01**		**0.029**		**0.0011**	J	**0.036**		**0.0062**	J	**0.0053**	J	**0.18**		**0.079**	
Acenaphthylene	mg/kg	45,000	0.0072	U	**0.07**		**0.0064**	J	**0.0019**	J	**0.072**		**0.31**		**0.0035**	J	**0.0015**	J	**0.0033**	J	**0.00073**	J	**0.011**		**0.019**	
Acetophenone	mg/kg	120,000	0.072	U	0.073	U	0.073	U	0.072	U	**0.046**	J	**0.026**	J	**0.024**	J	**0.024**	J	0.074	U	**0.018**	J	0.072	U	0.077	U
Anthracene	mg/kg	230,000	**0.015**	J	**0.11**		**0.034**	J	**0.0045**	B	**0.048**		**0.18**		**0.0071**	J	**0.0015**	J	**0.0095**		0.0071	U	**0.43**		**0.17**	
Benzaldehyde	mg/kg	120,000	**0.021**	J	**0.024**	J	0.073	R	0.072	R	**0.044**	J	**0.026**	J	**0.023**	J	**0.044**	J	**0.039**	J	0.07	R	0.072	R	0.077	R
Benzo[a]anthracene	mg/kg	2.9	**0.025**	J	**0.48**		**0.098**	J	**0.029**		**0.057**		**0.17**		**0.027**		**0.0061**	J	**0.044**		0.0071	U	**0.8**		**1.1**	
Benzo[a]pyrene	mg/kg	0.29	**0.022**	J	**0.46**		**0.072**	J	**0.043**		**0.05**		**0.16**		**0.031**		**0.0057**	J	**0.034**		0.0071	U	**0.75**		**0.96**	
Benzo[b]fluoranthene	mg/kg	2.9	**0.069**	J	**1.2**		**0.28**	J	**0.056**		**0.15**		**0.35**		**0.095**		**0.019**		**0.15**		0.0071	U	**1.3**		**1.3**	
Benzo[g,h,i]perylene	mg/kg	none	**0.0089**	J	**0.1**		**0.04**	J	**0.019**		**0.028**		**0.062**		**0.015**		**0.0031**	J	**0.013**		0.0071	U	**0.19**		**0.24**	
Benzo[k]fluoranthene	mg/kg	29	**0.066**	J	**1.1**		**0.27**	J	**0.054**		**0.14**		**0.34**		**0.091**		**0.018**		**0.14**		0.0071	U	**1.3**		**0.54**	
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.13**	J	0.073	UJ	**0.085**	B	0.072	U	**0.019**	B	**0.052**	B	0.073	U	0.072	U	0.074	U	0.07	U	**0.024**	B	**0.016**	B
Carbazole	mg/kg	none	0.072	U	**0.12**	J	**0.02**	J	0.072	U	**0.051**	J	**0.098**		0.073	U	0.072	U	0.074	U	0.07	U	**0.7**		**0.053**	J
Chrysene	mg/kg	290	**0.042**	J	**0.46**		**0.19**	J	**0.046**		**0.077**		**0.18**		**0.036**		**0.0097**		**0.061**		0.0071	U	**0.72**		**1.4**	
Dibenz[a,h]anthracene	mg/kg	0.29	**0.0024**	J	**0.056**		**0.013**	J	**0.0068**	J	**0.0093**		**0.023**		**0.0054**	J	0.0073	U	**0.0052**	J	0.0071	U	**0.078**		**0.12**	
Di-n-butylphthalate	mg/kg	82,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	U	**0.035**	J	0.073	U	0.072	U	0.074	U	0.07	U	0.072	U	0.077	U
Di-n-ocytlphthalate	mg/kg	8,200	0.072	U	0.073	UJ	0.073	U	0.072	U	0.072	U	0.071	U	0.073	U	0.072	U	0.074	U	0.07	U	0.072	UJ	0.077	U
Fluoranthene	mg/kg	30,000	**0.082**	J	**0.97**		**0.28**	J	**0.029**		**0.24**		**0.64**		**0.065**		**0.027**		**0.11**		**0.00095**	J	**2**		**1.4**	
Fluorene	mg/kg	30,000	**0.0045**	J	**0.018**		**0.011**	J	**0.0027**	J	**0.059**		**0.18**		**0.0018**	J	**0.026**		**0.0022**	J	**0.0032**	J	**0.15**		**0.022**	
Hexachloroethane	mg/kg	8.00	0.072	UJ	0.073	U	0.073	U	0.072	U	0.072	U	0.071	U	0.073	U	**0.066**	J	0.074	U	0.07	U	0.072	U	0.077	U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.0061**	J	**0.13**		**0.034**	J	**0.0095**		**0.027**		**0.063**		**0.015**		**0.0027**	J	**0.013**		0.0071	U	**0.21**		**0.27**	
Naphthalene	mg/kg	17	**0.016**		**0.076**		**0.037**	J	**0.085**		**1.2**		**0.82**		**0.034**		**0.056**		**0.036**		**0.021**		**0.12**		**0.084**	
Phenanthrene	mg/kg	none	**0.066**	J	**0.37**		**0.14**	J	**0.015**		**0.29**		**0.8**		**0.037**		**0.032**		**0.072**		**0.0023**	J	**1.5**		**0.6**	
Phenol	mg/kg	250,000	0.072	U	0.073	U	0.073	U	0.072	U	0.072	R	0.071	R	0.073	R	0.072	U	0.074	R	0.07	U	0.072	U	0.077	U
Pyrene	mg/kg	23,000	**0.075**	J	**0.92**		**0.22**	J	**0.052**		**0.19**		**0.51**		**0.055**		**0.017**		**0.095**		**0.0011**	J	**1.7**		**2.1**	
PCBs																										
Aroclor 1248	mg/kg	0.94	0.0545	U	NA		**0.113**		NA		0.538	U	NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Aroclor 1254	mg/kg	0.97	0.0545	U	NA		**0.298**		NA		**9.53**		NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Aroclor 1260	mg/kg	0.99	**0.766**	J	NA		**1.78**		NA		0.538	U	NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Total PCB	mg/kg	0.97	**0.766**		NA		**2.191**		NA		**9.53**		NA		0.0546	U	NA		0.0549	U	NA		0.0517	U	NA	
Gasoline and Diesel Range Organics (DRO/GRO)																										
DRO	mg/kg	620	**584**		**64.1**		**159**		**17.4**		**246**		**424**		**53**		**168**		**264**		**100**		**27.2**		**347**	
GRO	mg/kg	620	12.1	U	**6.5**	J	11.5	U	13.6	U	10.2	U	10.3	U	11.8	U	**26.7**		11.1	U	**26.6**		10.5	U	13.4	U

Detections in bold

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.

NA: This parameter was not analyzed for this sample.

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 6
Summary of Inorganics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-001-SB-1		B4-001-SB-4		B4-002-SB-1		B4-002-SB-5		B4-003-SB-1		B4-003-SB-5		B4-004-SB-1		B4-004-SB-4		B4-005-SB-1		B4-006-SB-1		B4-006-SB-5		B4-007-SB-1		B4-007-SB-5	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			3/1/2016		3/1/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Metals																												
Aluminum	mg/kg	1,100,000	**11,800**		**23,500**		**14,400**		**72,600**		**20,800**		**5,140**		**10,700**		**20,600**		**13,300**		**6,340**		**6,820**		**25,700**		**15,800**	
Antimony	mg/kg	470	2.1	UJ	2.4	UJ	1.8	UJ	4	UJ	3.5	UJ	**3.6**	J	2	UJ	3.5	UJ	3.4	UJ	1.7	UJ	1.8	UJ	2.8	UJ	2.3	UJ
Arsenic	mg/kg	3	1.8	U	**9.7**		1.5	U	**2.7**		**8.9**		**85.7**		**3.6**		**17.3**		**7.7**		**5.1**		**3.5**		**3.4**		2	U
Barium	mg/kg	220,000	**52.5**		**401**		**124**		**411**		**239**		**35.7**		**117**		**367**		**108**		**54.2**		**69**		**290**		**130**	
Beryllium	mg/kg	2,300	0.71	U	**2.7**		**0.66**		**2.4**		**1.8**		**0.21**	B	**0.66**	B	**2.1**		**0.79**	B	**0.2**	J	**0.22**	J	**4.6**		**1.6**	
Cadmium	mg/kg	980	**0.88**	B	**1.2**	B	**1.5**		**1**	B	**2.8**		**0.12**	B	**1.8**		**23.9**		**1.9**		**0.97**		**0.68**	B	**0.78**	B	**0.66**	B
Chromium (total)	mg/kg	120,000	**1,100**		**163**		**957**		**239**		**305**	J	**48.3**	J	**141**	J	**230**	J	**175**	J	**1,240**		**1,280**		**19.2**		**975**	
Chromium VI	mg/kg	6.3	**7.5**	J-	**0.84**	B	**1.9**	J-	**0.63**	B	1.2	UJ	1.1	UJ	1.1	UJ	**0.32**	J-	1.1	UJ	**2.8**	J-	**2.5**	J-	1.1	UJ	**0.43**	B
Cobalt	mg/kg	350	**3.4**	B	**21.6**		**3.5**		**7.3**		**8.8**		**23.6**		**9.2**		**18.6**		**5.2**	B	**9.8**		**6.2**		**2**	J	**3.8**	J
Copper	mg/kg	47,000	**74.1**	J	**120**	J	**83.9**	J	**25.4**	J	**92.6**		**145**		**59.6**		**227**		**53.9**		**79.7**	J	**62.7**	J	**13.6**	J	**30.1**	B
Iron	mg/kg	820,000	**272,000**		**147,000**		**171,000**		**9,590**		**76,200**		**130,000**		**44,200**		**124,000**		**41,200**		**242,000**		**237,000**		**21,100**		**118,000**	
Lead	mg/kg	800	**13.5**		**106**		**137**		**7**		**210**	J	**52.1**	J	**179**	J	**1,110**	J	**140**	J	**40.4**		**47.3**		**14.8**		**38.3**	
Manganese	mg/kg	26,000	**24,000**		**4,670**		**23,000**		**1,390**		**9,050**		**19,400**		**6,180**		**6,200**		**4,580**		**28,300**		**26,100**		**1,970**		**22,200**	
Mercury	mg/kg	350	**0.026**	J	**0.045**	J	**0.11**	J	0.13	UJ	**0.3**	J-	**0.038**	J-	**0.12**	J-	**0.13**	J-	**0.056**	J-	**0.022**	J	**0.026**	J	0.1	UJ	**0.014**	J
Nickel	mg/kg	22,000	**31.5**		**72.7**		**27.4**		**42.5**		**43.5**		**33.5**		**26**		**71.2**		**23.7**		**48.1**		**37.5**		**4.5**	B	**15.3**	
Selenium	mg/kg	5,800	2.8	U	3.2	U	2.4	U	**3.8**	J	4.6	U	3	U	2.7	U	4.7	U	4.5	U	2.3	U	2.5	U	**4.2**		3.1	U
Silver	mg/kg	5,800	2.1	UJ	2.4	UJ	1.8	UJ	4	UJ	3.5	U	**2.1**	J	2	U	**3.3**	J	3.4	U	1.7	UJ	1.8	UJ	2.8	UJ	2.3	UJ
Thallium	mg/kg	12	7.1	UJ	8.1	UJ	6.1	UJ	10.6	UJ	11.6	U	7.4	U	6.8	U	11.7	U	11.3	U	**6.3**	J	**6.9**	J	9.3	UJ	7.8	UJ
Vanadium	mg/kg	5,800	**763**	J	**198**	J	**557**	J	**16.7**	J	**215**	J	**126**	J	**80.4**	J	**447**	J	**128**	J	**2,530**	J	**2,690**	J	**39.2**	J	**2,120**	J
Zinc	mg/kg	350,000	**155**		**272**		**499**		**97.3**		**819**	J	**46**	J	**568**	J	**3,020**	J	**416**	J	**219**		**279**		**98.1**		**271**	
Other																												
Cyanide	mg/kg	150	**0.14**	J-	**0.62**	J-	**0.51**	J-	**2**	J-	**0.77**	J-	**0.58**	J-	**1.2**	J-	**1**	J-	**1.4**	J-	**0.089**	J-	**0.15**	J-	**0.17**	J-	**0.27**	J-

Detections in bold

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.

NA: This parameter was not analyzed for this sample.

R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.

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

Table 6
Summary of Inorganics Detected in Soil
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-008-SB-1		B4-008-SB-7		B4-009-SB-1		B4-009-SB-5		B4-010-SB-1		B4-010-SB-6		B4-011-SB-1		B4-011-SB-4.5		B4-012-SB-1		B4-012-SB-5		B4-041-SB-1		B4-041-SB-4	
			Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
			2/29/2016		2/29/2016		3/1/2016		3/1/2016		2/29/2016		2/29/2016		2/29/2016		2/29/2016		3/1/2016		3/1/2016		3/1/2016		3/1/2016	
Metals																										
Aluminum	mg/kg	1,100,000	**39,500**		**9,860**		**15,100**		**42,800**		**16,200**		**36,500**		**23,600**		**4,590**		**32,100**		**16,100**		**11,400**		**25,700**	
Antimony	mg/kg	470	3.1	UJ	2	UJ	3.2	UJ	2.3	UJ	2.5	UJ	2.1	UJ	2.2	UJ	**2**	B	2.4	UJ	3.2	UJ	2.5	UJ	2.2	UJ
Arsenic	mg/kg	3	**2.4**	B	**8.8**		**8.3**		1.9	U	**2.5**		**3.2**		**7.1**		**40.5**		2	U	**8.5**		2.1	U	**2.3**	
Barium	mg/kg	220,000	**632**		**209**		**141**		**535**		**89.2**		**96.9**		**39.2**		**27.5**		**92.8**		**70.2**		**60.6**		**213**	
Beryllium	mg/kg	2,300	**6.8**		**0.32**	B	**1.1**		**7.1**		**0.36**	J	**0.32**	B	**0.25**	B	1.1	U	**0.33**	J	**0.65**	J	**0.33**	J	**2.5**	
Cadmium	mg/kg	980	**1.6**		**0.9**	B	**7.5**		**0.32**	B	**0.82**	B	**0.63**	J	**0.33**	B	1.6	U	**0.71**	B	**0.18**	B	**0.7**	B	**1.3**	
Chromium (total)	mg/kg	120,000	**83.5**	J	**1,220**	J	**279**		**138**		**1,200**	J	**1,050**	J	**1,050**	J	**220**	J	**942**		**72.8**		**1,430**		**93.7**	
Chromium VI	mg/kg	6.3	1.1	UJ	**0.22**	J-	**0.44**	B	**0.22**	B	1.1	UJ	**1.2**	J-	**9.9**	J-	1.1	UJ	**9.7**	J-	**0.3**	B	**4.8**	J-	1.2	UJ
Cobalt	mg/kg	350	**2.4**	J	**7.3**		**10**		**0.72**	B	**2.4**	B	**2.3**	B	**4.1**		**26**		**1.6**	J	**8**		**0.35**	B	**2.4**	B
Copper	mg/kg	47,000	**23.3**		**103**		**102**	J	**4**	J	**44.5**		**57.3**		**40**		**402**		**23.1**	J	**25.6**	J	**25.1**	J	**158**	J
Iron	mg/kg	820,000	**39,700**		**149,000**		**151,000**		**31,800**		**179,000**		**171,000**		**212,000**		**255,000**		**159,000**		**220,000**		**169,000**		**41,400**	
Lead	mg/kg	800	**49.8**	J	**160**	J	**518**		**2**		**108**	J	**205**	J	**25.2**	J	**31.4**	J	**24.3**		**27.2**		**46.8**		**81**	
Manganese	mg/kg	26,000	**4,820**		**42,900**		**10,000**		**4,920**		**27,900**		**29,400**		**32,300**		**16,800**		**25,100**		**2,300**		**25,500**		**5,030**	
Mercury	mg/kg	350	0.11	R	**0.1**	J-	**0.38**		0.1	UJ	**0.12**	J-	**0.3**	J-	**0.025**	J-	**0.0032**	J-	**0.0032**	J	0.1	UJ	**0.21**	J	**0.027**	J
Nickel	mg/kg	22,000	**15.2**		**30.2**		**43.5**		**5**	J	**26.7**		**23.7**		**36.8**		**54.2**		**16.5**		**23.5**		**11**		**19.8**	
Selenium	mg/kg	5,800	4.1	U	**3.3**		4.3	U	**4.3**		**2.9**	J	**1.9**	J	3	U	4.2	U	3.2	U	4.3	U	3.3	U	3	U
Silver	mg/kg	5,800	3.1	U	2	U	**3.7**	J	2.3	UJ	2.5	U	**1**	J	**3**	J	**4.6**		2.4	UJ	3.2	UJ	2.5	UJ	2.2	UJ
Thallium	mg/kg	12	10.3	U	6.7	U	10.8	UJ	7.8	UJ	8.2	U	6.9	U	7.4	U	10.5	U	8.1	UJ	10.8	UJ	8.3	UJ	7.5	UJ
Vanadium	mg/kg	5,800	**44.3**	J	**2,280**	J	**143**	J	**56.8**	J	**704**	J	**596**	J	**480**	J	**108**	J	**598**	J	**83.2**	J	**701**	J	**59.7**	J
Zinc	mg/kg	350,000	**832**	J	**281**	J	**4,880**		**17.5**		**459**	J	**222**	J	**82.9**	J	**43.6**	J	**159**		**29.8**		**80.6**		**218**	
Other																										
Cyanide	mg/kg	150	**1**	J-	**0.86**	J-	**0.54**	J-	**2.5**	J-	**3.3**	J-	**5.8**	J-	**0.85**	J-	**0.11**	J-	**0.18**	J-	**0.13**	J-	**0.19**	J-	**0.24**	J-

Detections in bold
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.
NA: This parameter was not analyzed for this sample.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this compound/analyte in the sample.
Values in Red indicate an exceedance of the Project Action Limit (PAL)

TABLE 7
SUMMARY OF SOIL COPCs

Parameter	CAS#	Frequency of Detections (%)	Sample ID of Max Result	Unit	PAL Solid	Max Result
Aroclor 1254	11097-69-1	46	B4-010-SB-1	mg/kg	0.97	9.53
Aroclor 1260	11096-82-5	54	B4-009-SB-1	mg/kg	0.99	1.78
Arsenic	7440-38-2	76	B4-003-SB-5	mg/kg	3.0	85.7
Benzo[a]pyrene	50-32-8	96	B4-004-SB-4	mg/kg	0.29	1.5
Benzo[b]fluoranthene	205-99-2	96	B4-004-SB-4	mg/kg	2.9	3.7
Chromium VI	18540-29-9	64	B4-011-SB-1	mg/kg	6.3	9.9
Dibenz[a,h]anthracene	53-70-3	92	B4-004-SB-4	mg/kg	0.29	0.29
Lead	7439-92-1	100	B4-004-SB-4	mg/kg	800	1,110
Manganese	7439-96-5	100	B4-008-SB-7	mg/kg	26,000	42,900
PCBs (total)	1336-36-3	62	B4-010-SB-1	mg/kg	0.97	9.53

TABLE 8
SOIL PAL EXCEEDANCES FOR SPECIFIC TARGETS

Target Feature	Boring ID	Sample Depth (ft)	Parameter	PAL (mg/kg)	Result (mg/kg)	Flag
Drip Legs	B4-001-SB	1	Chromium VI	6.3	7.5	J-
		4	Arsenic	3	9.7	
		4	Benzo[a]pyrene	0.29	0.46	
	B4-002-SB	1	PCBs (total)	0.97	1.214	
REC Oil House	B4-003-SB	1	Arsenic	3	8.9	
		5	Arsenic	3	85.7	
	B4-004-SB	1	Arsenic	3	3.6	
		1	PCBs (total)	0.97	1.046	
		4	Arsenic	3	17.3	
		4	Lead	800	1,110	J
		4	Benzo[a]pyrene	0.29	1.5	
		4	Benzo[b]fluoranthene	2.9	3.7	
		4	Dibenz[a,h]anthracene	0.29	0.29	
	B4-005-SB	1	Arsenic	3	7.7	
Emergency Plating Pit	B4-006-SB	1	Arsenic	3	5.1	
		1	Manganese	26,000	28,300	
		5	Arsenic	3	3.5	
		5	Manganese	26,000	26,100	
		5	Benzo[a]pyrene	0.29	0.37	
	B4-007-SB	1	Arsenic	3	3.4	
		5	Benzo[a]pyrene	0.29	1.2	
Substation/ Transformer	B4-008-SB	7	Arsenic	3	8.8	
		7	Manganese	26,000	42,900	
		7	Benzo[a]pyrene	0.29	0.46	
	B4-009-SB	1	Arsenic	3	8.3	
		1	Aroclor 1260	0.99	1.78	
		1	PCBs (total)	0.97	2.191	
Tar Tanks	B4-041-SB	1	Benzo[a]pyrene	0.29	0.75	
		4	Benzo[a]pyrene	0.29	0.96	

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.

Table 9
Summary of VOCs Detected in Sub-Slab Soil Gas
Sub-Parcel B4-1
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	B4-051-SG Sub-Slab Soil Gas 4/20/2016		B4-052-SG Sub-Slab Soil Gas 4/20/2016		B4-053-SG Sub-Slab Soil Gas 4/20/2016	
Volatile Organic Compounds								
1,1,1-Trichloroethane	μg/m^3	2,200,000	1.09	U	**3.38**		**1.58**	
2-Butanone (MEK)	μg/m^3	2,200,000	**45.3**		**43.6**		**46.8**	
4-Methyl-2-pentanone (MIBK)	μg/m^3	1,400,000	**0.9**		**0.78**	J	**0.86**	
Acetone	μg/m^3	14,000,000	**207**		**219**		**170**	
Benzene	μg/m^3	1,600	**3.39**		**6.39**		**7.48**	
Bromodichloromethane	μg/m^3	none	**7.84**		**4.09**		**9.18**	
Carbon disulfide	μg/m^3	310,000	**111**		**101**		**80.4**	
Chloroform	μg/m^3	540	**56.6**		**43.6**		**39**	
Chloromethane	μg/m^3	40,000	**0.58**		**0.45**		**0.5**	
Ethylbenzene	μg/m^3	5,000	**1.13**		**1.35**		**1.95**	
Methylene Chloride	μg/m^3	270,000	**6.56**		**6.45**		**6.95**	
Styrene	μg/m^3	440,000	**0.68**	J	0.85	U	**0.47**	J
Tetrachloroethene	μg/m^3	18,000	**16.2**		**66.7**		**9.02**	
Toluene	μg/m^3	2,200,000	**7.95**		**21.7**		**37.6**	
Trichloroethene	μg/m^3	880	1.07	U	**1.45**		1.07	U
Xylenes	μg/m^3	44,000	**6.12**		**4.65**		**6.04**	

Detections in bold

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.

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

EnviroAnalytics Group

Sub-Parcel B4-1 - Table 10

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: *B4-001-SB-1*					
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R
Sample: *B4-001-SB-4*					
Benzaldehyde	0.078	mg/kg	120,000	no	R
Sample: *B4-002-SB-1*					
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: B4-002-SB-5					
Benzaldehyde	0.094	mg/kg	120,000	no	R
Sample: B4-003-SB-1					
1,4-Dioxane	0.13	mg/kg	24	no	R
Bromomethane	0.0066	mg/kg	30	no	R
Sample: B4-003-SB-5					
1,4-Dioxane	0.11	mg/kg	24	no	R
Bromomethane	0.0054	mg/kg	30	no	R
Sample: B4-004-SB-1					
1,4-Dioxane	0.12	mg/kg	24	no	R
Bromomethane	0.0059	mg/kg	30	no	R
Sample: B4-004-SB-4					
1,4-Dioxane	0.11	mg/kg	24	no	R
Bromomethane	0.0057	mg/kg	30	no	R
Sample: B4-005-SB-1					
1,4-Dioxane	0.12	mg/kg	24	no	R
Bromomethane	0.006	mg/kg	30	no	R
Sample: B4-006-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

Parameter	Result	Units	PAL	Exceeds PAL?	Flag

Sample: B4-006-SB-1

Phenol	0.071	mg/kg	250,000	no	R

Sample: B4-006-SB-5

2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
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: B4-007-SB-1

Benzaldehyde	0.073	mg/kg	120,000	no	R

Sample: B4-007-SB-5

Benzaldehyde	0.07	mg/kg	120,000	no	R

Sample: B4-008-SB-1

1,1,2,2-Tetrachloroethane	0.0051	mg/kg	2.7	no	R
1,4-Dioxane	0.1	mg/kg	24	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
Bromomethane	0.0051	mg/kg	30	no	R
Hexachlorocyclopentadiene	0.072	mg/kg	7.5	no	R
Mercury	0.11	mg/kg	350	no	R
Methyl Acetate	0.051	mg/kg	1,200,000	no	R

Sample: B4-008-SB-7

1,4-Dioxane	0.12	mg/kg	24	no	R

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: B4-009-SB-1					
Benzaldehyde	0.073	mg/kg	120,000	no	R
Sample: B4-009-SB-5					
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Sample: B4-010-SB-1					
1,4-Dioxane	0.1	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R
Sample: B4-010-SB-6					
1,4-Dioxane	0.1	mg/kg	24	no	R
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
Bromomethane	0.0051	mg/kg	30	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R

Parameter	Result	Units	PAL	Exceeds PAL?	Flag

Sample: *B4-011-SB-1*

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
1,4-Dioxane	0.11	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.073	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.073	mg/kg	210	no	R
2,4-Dichlorophenol	0.073	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.073	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.073	mg/kg	5,800	no	R
2-Methylphenol	0.073	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Bromomethane	0.0056	mg/kg	30	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.073	mg/kg	250,000	no	R

Sample: *B4-011-SB-4.5*

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
1,4-Dioxane	0.11	mg/kg	24	no	R
Bromomethane	0.0056	mg/kg	30	no	R

Sample: *B4-012-SB-1*

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
2,3,4,6-Tetrachlorophenol	0.074	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.074	mg/kg	210	no	R
2,4-Dichlorophenol	0.074	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.074	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.074	mg/kg	5,800	no	R
2-Methylphenol	0.074	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.15	mg/kg	41,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.074	mg/kg	250,000	no	R

Sample: *B4-012-SB-5*

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Benzaldehyde	0.07	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: *B4-041-SB-1*					
Benzaldehyde	0.072	mg/kg	120,000	no	R
Sample: *B4-041-SB-4*					
Benzaldehyde	0.077	mg/kg	120,000	no	R

ARM Group Inc.
Earth Resource Engineers and Consultants

APPENDIX A

Parcel B4, Sub-Parcel B4-1 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
Drip Legs		Drip Legs Drawing 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. A subset of the drip legs was selected for investigation.	2	B4-001 and B4-002	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 (0-1')
REC Oil House	REC 8C, Finding 203	REC Location Map/ Drawing 5020	The Phase I ESA identified this particular oil house to be a REC, because the conditions and status of the building were unknown. The oil house was positively identified on several sets of historical drawings. Current aerial images indicate that this structure is no longer in use and has been demolished.	3	B4-003 through B4-005	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 (0-1')
Emergency Plating Pit		Drawing 5120-A	Investigate potential impacts related to the emergency plating pit (potential leaks or releases).	2	B4-006 and B4-007	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, DRO/GRO, PCBs (0-1')
Substation/ Transformers		Drawing 5120	Investigate potential impacts related to a substation/transformers which are not on the list of PCB-containing equipment (potential leaks or releases).	2	B4-008 and B4-009	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, DRO/GRO, PCBs (0-1')
Tar Tanks		Drawing 5020	Investigate potential impacts related to the tar tanks (potential leaks or releases).	1	B4-041	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 (0-1')

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
Parcel B4 Coverage			Investigate potential impacts related to any historical activities which may have occurred on the site (potential leaks or releases).	3	B4-010 through B4-012	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 (0-1')
			Total	13				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
Engineered Barrier (16-40 acres): 1 boring per 3 acres with no less than 7.
No Engineered Barrier (0 acres): N/A
Engineered Barrier (21 acres) = **7 borings required, 13 included**
No Engineered Barrier (0 acres) = **N/A**

VOCs - Volatile Organic Compounds (Target Compound List)
SVOCs - Semivolatile Organic Compounds (Target Compound List)
Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)
PCBs - Polychlorinated Biphenyls
DRO/GRO - Diesel Range Organics/Gasoline Range Organics
bgs - Below Ground Surface

APPENDIX B

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-001-SB

Client	: EnviroAnalytics Group	Date	: 3/1/2016
ARM Project No.	: 150300M-7-3	Weather	: 40s, sunny
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,546.4789
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,457,554.39
Driller	: Tim Niblett		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	100	0.0	B4-001-SB-1	(0-1') SAND, light brown, fine to medium grained with gravel slag, very loose, soft	SW-GW	
		0.1		(1-1.5') GRAVEL, black, with asphalt, hard, very loose, moist	SW	
				(1.5-2') SAND, light brown, fine to medium grained with gravel slag, very loose, soft	SW-GW	
		120.1		(2-6') SAND, brown with some oxidation present, very loose, dry	SW	
		395.6	B4-001-SB-4			
		132.1				
5	100	181.9				
				(6-6.3') SAND, gray, coarse grained, slightly firm, moist, loose	SW	
		119.6		(6.3-7') SAND, brown with some oxidation present, very loose, moist; wet at bottom	SW	Boring terminated at 7' bgs due to encountering groundwater
				End of Boring		
10						

Total Borehole Depth: 7' bgs.

ARM Group Inc. Earth Resource Engineers and Consultants		
Boring ID: B4-002-SB (page 1 of 1)	Client : EnviroAnalytics Group ARM Project No. : 150300M-7-3 Project Description : Sparrows Point - Parcel B4 Site Location : Sparrows Point, MD ARM Representative : L. Perrin Checked by : W. Mader P.G., CPSS Drilling Company : Green Services, Inc Driller : Tim Niblett Drilling Equipment : Geoprobe 7822DT	Date : 3/1/2016 Weather : 40s, sunny Northing (US ft) : 564,524.3374 Easting (US ft) : 1,457,547.755

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	50	-	B4-002-SB-1	(0-4') SAND, light brown, fine to medium grained with gravel, dry, very loose	SW	
		-				
		2.2				
		4.3				
		2.2	B4-002-SB-5	(4-8.5') SAND, beige, coarse grained, moist, large pieces of oxidized metal, low cohesion, no plasticity	SP	
5	60	-				
		-				
		0.7				
		-		(8.5-10') GRAVEL, light gray, with sand, hard, loose, wet	GW	Wet at 8.5' bgs
10		-				Boring terminated at 10' bgs due to encountering groundwater

Total Borehole Depth: 10' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-003-SB

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-7-3
Project Description	: Sparrows Point - Parcel B4
Site Location	: Sparrows Point, MD
ARM Representative	: L. Glumac
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 2/29/2016
Weather	: 50s, cloudy/windy
Northing (US ft)	: 564,603.8415
Easting (US ft)	: 1,457,209.414

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-003-SB-1	(0-2') SILT, black, with some gray to white granular slag, moist	ML	
		-				
	75	0.1		(2-4') Sandy SILT, black, fine grained with some gray granular slag, moist	SM	
		1.4				
		396.5	B4-003-SB-5	(4-7') Sandy SILT, brown and black, moist	SM	
5		-				
		-				
	25	-		(7-10') Slag, black, granular with some red brick, wet	SW-GW	
		-				
		-				
10						Boring terminated at 10' bgs

Total Borehole Depth: 10' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-004-SB

(page 1 of 1)

Client	: EnviroAnalytics Group	Date	: 2/29/2016
ARM Project No.	: 150300M-7-3	Weather	: 50s, cloudy
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Glumac		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,599.7756
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,457,235.99
Driller	: Don Marchese		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-004-SB-1	(0-1.5') SILT, brown, with brownish gray slag, moist	ML	
		0.1				
	87	3.0		(1.5-2.5') Concrete, light brown to white, with gray slag, dry	N/A	
		241.7	B4-004-SB-4	(2.5-4') SILT, dark brown to black with some mustard yellow, moist	ML	
		26.0		(4-6') Slag, red to black, moist	GW	
5		0.2				
	100	0.1		(6-7.5') Sandy SILT, reddish brown, fine grained, moist	SM	
		-		(7.5-8') Slag, white to black, granular, wet	SW	Boring terminated at 8' bgs due to refusal
				End of Boring		
10						

Total Borehole Depth: 8' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-005-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-7-3
Project Description	: Sparrows Point - Parcel B4
Site Location	: Sparrows Point, MD
ARM Representative	: L. Glumac
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT
Date	: 2/29/2016
Weather	: 50s, cloudy/windy
Northing (US ft)	: 564,621.3024
Easting (US ft)	: 1,457,234.51

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-005-SB-1	(0-4') Sandy SILT, brown to black, with some concrete, moist, fine grained	SM	
		-				
	50	4.5				
		5.3				
5		-		(4-7') Concrete, gray and white and turquoise in spots	N/A	
	30	-				
		-		(7-10') Slag, black with some orange, wet	GW	
		-				
10		-				Boring terminated at 10' bgs

Total Borehole Depth: 10' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-006-SB

(page 1 of 1)

Client : EnviroAnalytics Group
ARM Project No. : 150300M-7-3
Project Description : Sparrows Point - Parcel B4
Site Location : Sparrows Point, MD
ARM Representative : L. Perrin
Checked by : W. Mader P.G., CPSS
Drilling Company : Green Services, Inc
Driller : Tim Niblett
Drilling Equipment : Geoprobe 7822DT

Date : 3/1/2016
Weather : 40s, sunny

Northing (US ft) : 564,696.7803
Easting (US ft) : 1,457,613.429

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-006-SB-1	(0-9') SAND, brown, with few gravels, moist, very loose		
		-				
	44	-				
		1.3				
		20.9	B4-006-SB-5		SP-SW	
5		-				
		-				Wet at 7' bgs
	80	1.4				
		0.9				
		6.5		(9-10') SAND, gray, fine to medium grained, loose, wet, low cohesion	SP-SW	Boring terminated at 10' bgs due to encountering groundwater
10						

Total Borehole Depth: 10' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-007-SB

Client	: EnviroAnalytics Group	Date	: 3/1/2016
ARM Project No.	: 150300M-7-3	Weather	: 40s, sunny
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,646.6698
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,457,612.088
Driller	: Tim Niblett		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	80	-	B4-007-SB-1	(0-1') GRAVEL, light gray, hard, loose, dry	GW	
		7.5		(1-2.5') SAND, light gray, medium to coarse grained with gravel, very loose, dry	SW-GW	
		18.3		(2.5-3.6') Concrete, white, sand to gravel sized, very loose	N/A	
		5.6				
		59.6	B4-007-SB-5	(3.6-7') SAND, dark brown, medium to fine grained, very loose, dry	SW	
5	100	11.9				
		3.9				Wet at 7' bgs
				(7-7.5') SAND, dark brown, coarse grained, low cohesion, wet	SP	Boring terminated at 7.5' bgs due to encountering groundwater and refusal
				End of Boring		
10						

Total Borehole Depth: 7.5' bgs.

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-7-3
Project Description	: Sparrows Point - Parcel B4
Site Location	: Sparrows Point, MD
ARM Representative	: L. Glumac
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 2/29/2016
Weather	: 50s, cloudy/windy
Northing (US ft)	: 564,846.4933
Easting (US ft)	: 1,457,807.583

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-008-SB

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		1.3	B4-008-SB-1	(0-1') SILT, brown, fine grained with some quartz, moist	ML	
		0.7		(1-4') Silty SAND, brown, fine to medium grained, dry	ML	
	83	1.3				
		0.2				
		-		(4-5.5') Silty SAND, brown, fine to medium grained with some gray concrete and trace slag, moist	SM	
5		3.1		(5.5-7') Silty SAND, brown, fine to medium grained with some granular slag	SM	
		21.6	B4-008-SB-7			
	80	-		(7-7.5') Slag, black and brown, medium gravel sized with some red brick chunks	GW	
				(7.5-8') Slag, white, chunks	GP	
		-		(8-9') Silty CLAY, brown, saturated	CL	
		-		(9-10') Slag, black, medium gravel sized, saturated	GP	Boring terminated at 10' bgs
10						

Total Borehole Depth: 10' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-009-SB

Client	: EnviroAnalytics Group	Date	: 3/1/2016
ARM Project No.	: 150300M-7-3	Weather	: 40s, sunny
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,902.9773
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,457,802.794
Driller	: Tim Niblett		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	87	-	B4-009-SB-1	(0-1.5') SAND, brown, fine grained with fill gravel, loose, dry, no plasticity	SP	
		1.8		(1.5-6') SAND, light brown, loose, dry	SW	
		10.0				
		12.5				
		29.0	B4-009-SB-5			
5	57	-				
		30.8		(6-7.5') SAND, brownish gray, medium to coarse grained, loose, moist, no plasticity	SW	
		3.1		(7.5-8.5') SAND, beige, coarse grained, low cohesion	SP	Wet at 8.5' bgs Boring terminated at 8.5' bgs due to encountering groundwater and refusal
				End of Boring		
10						

Total Borehole Depth: 8.5' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-010-SB

(page 1 of 1)

Client	: EnviroAnalytics Group	Date	: 2/29/2016
ARM Project No.	: 150300M-7-3	Weather	: 50s, cloudy
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Glumac		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,241.6121
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,457,500.436
Driller	: Don Marchese		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	100	6.7	B4-010-SB-1	(0-2') SILT, brown, with some gray small to medium gravel sized slag, dry	ML	
		10.5				
		11.6		(2-3') Sandy SILT, dark brown, fine grained with some granular slag, moist	ML	
		8.3		(3-4') Slag, mustard yellow to white to gray, moist	GW	
		0.5		(4-5') Silty SAND, black, fine grained, moist	SM	
5	90	25.9	B4-010-SB-6	(5-6') Silty SAND, gray to black, fine grained, moist	SM	
		6.6		(6-7.5') Silty SAND, brown, fine grained with granular slag and trace brick pieces, dry	SM	
		3.4		(7.5-8') SILT, turquoise, moist, possible slag derived	ML	
		2.3		(8-10') SAND, light brown, medium grained, wet	SP	
		-				
10						Boring terminated at 10' bgs

Total Borehole Depth: 10' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-011-SB

Client	: EnviroAnalytics Group
ARM Project No.	: 150300M-7-3
Project Description	: Sparrows Point - Parcel B4
Site Location	: Sparrows Point, MD
ARM Representative	: L. Glumac
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 2/29/2016
Weather	: 50s, cloudy
Northing (US ft)	: 564,873.9603
Easting (US ft)	: 1,457,226.524

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-011-SB-1	(0-1') SILT, dark brown to black, fine grained with black slag, moist	ML	
		-		(1-2') Concrete, gray to white, dry	N/A	
	92	0.7		(2-2.5') SAND, light brown, with some gray concrete, moist	SW	
				(2.5-3.5') Slag, brown, with some medium grained sand	GW-SW	
		47.2		(3.5-4') Slag, black, moist	GW	
		173.9	B4-011-SB-4	(4-4.5') SAND, light brown, medium grained, moist	SP	
5	100	0.5		(4.5-6') Slag, gray to white to turquoise, with some sand, moist, wet at 5' bgs	GW-SW	Boring terminated at 6' bgs due to refusal
				End of Boring		
10						

Total Borehole Depth: 6' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-012-SB

Client	: EnviroAnalytics Group	Date	: 3/1/2016
ARM Project No.	: 150300M-7-3	Weather	: 40s, sunny
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,454.9432
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,456,764.743
Driller	: Don Marchese		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	92	-	B4-012-SB-1	(0-1') Sandy GRAVEL, light brown, hard, loose, dry	GW	
		84.5		(1-2.5') Silty SAND, light brown, very loose, dry, no plasticity	SM	
		298.2		(2.5-3') SAND, brown, fine to medium grained, dry, very loose, some oxidation	SW	
		806.0		(3-4') COBBLES, purple, porphyritic, hard, loose, dry	GW	
5		1509.4	B4-012-SB-5	(4-5') Gravelly SAND, orange and black with metallic flakes, dry, loose	GW/SW	Boring terminated at 5' bgs due to refusal

Total Borehole Depth: 5' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: B4-041-SB

(page 1 of 1)

Client	: EnviroAnalytics Group	Date	: 3/1/2016
ARM Project No.	: 150300M-7-3	Weather	: 40s, sunny
Project Description	: Sparrows Point - Parcel B4		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 564,865.1204
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,456,829.184
Driller	: Tim Niblett		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	B4-041-SB-1	(0-3') Sandy GRAVEL, gray, hard, loose, dry	GW	
		-				
	70	9.0				
		122.6		(3-5') Silty SAND, brown, loose, moist	SM	
		4.1	B4-026-SB-5			
5		2.0		(5-6.5') Sandy SILT, brown, dry	ML	
		3.8		(6.5-7.5') Sandy GRAVEL, gray, wet, hard, loose	GW	Wet at 6.5' bgs
	100	-		(7.5-8') SAND, brown, wet, loose	SW	
		-		(8-10') CLAY, brown, with trace sand and 3" gravel layer at 9' bgs, high cohesion, high plasticity	CH	Sulfur odor
		-				Boring terminated at 10' bgs due to encountering groundwater
10						

Total Borehole Depth: 10' bgs.

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APPENDIX C

PID CALIBRATION LOG

PROJECT NAME: Parcel B4	SAMPLER NAME: N. Kurtz, S. Kabis, L. Perrin, & L. Gluma	
PROJECT NUMBER: 150300M-7-3	DATE: February 29, 2016	PAGE__1__of __1__

DATE/TIME	PID SERIAL #	FRESH AIR CAL	STANDARD	STANDARD CONCENTRATION	METER READING	COMMENTS
2/29/2016 9:12	592-913262	0.0 ppm	Isobutylene	100 ppm	99.4 ppm	-
3/1/2016 8:01	592-913262	0.0 ppm	Isobutylene	100 ppm	95.6 ppm	-
3/2/2016 8:23	592-902091	0.0 ppm	Isobutylene	100 ppm	100.0 ppm	-
3/3/2016 7:45	592-902091	0.0 ppm	Isobutylene	100 ppm	100.0 ppm	-
3/4/2016 9:22	592-902091	0.0 ppm	Isobutylene	100 ppm	100.0 ppm	-
3/7/2016 9:31	592-902091	0.0 ppm	Isobutylene	100 ppm	100.1 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 D

EnviroAnalytics Group

Sub-Parcel B4-1 - IDW Drum Log
Phase II Investigation

Drum ID	Designation	Activity/Phase	Contents	Open Date
27-N. Acid-10/13/15-B	Non-haz.	Area B	Nitric Acid	10/13/2015
28-Hexane-10/13/15-B	Hazardous	Area B	Hexane	10/13/2015
335-Soil-2/29/16-B4	Non-haz.	Parcel B4	Soil	2/29/2016
336-PPE-2/29/16-B4	Non-haz.	Parcel B4	PPE	2/29/2016
337-Liners-2/29/16-B4	Non-haz.	Parcel B4	Liners	2/29/2016
338-Decon water-2/29/16-B4	Non-haz.	Parcel B4	Decon water	2/29/2016
339-Nitric Acid-2/29/16-B4	Non-haz.	Parcel B4	Nitric Acid	2/29/2016
340-PPE-3/3/16-B4	Non-haz.	Parcel B4	PPE	3/3/2016
342-Soil-3/4/16-B4	Non-haz.	Parcel B4	Soil	3/4/2016
343-PPE-3/8/16-B4	Non-haz.	Parcel B4	PPE	3/8/2016

APPENDIX E

(Electronic Attachment)

APPENDIX F

(Electronic Attachment)

APPENDIX G

(Electronic Attachment)

APPENDIX H

(Electronic Attachment)

APPENDIX I

QA/QC Tracking Log

Date:	Sample IDs		
2/29/2016	1)	B4-010-SB-1	
	2)	B4-010-SB-6	
	3)	B4-013-SB-1	
	4)	B4-013-SB-7.5	
	5)	B4-004-SB-1	
	6)	B4-004-SB-4	
	7)	B4-003-SB-1	Duplicate: B4-003-SB-5
	8)	B4-003-SB-5	Date: 2/29/2016
	9)	B4-005-SB-1	MS/MSD: B4-008-SB-1
	10)	B4-011-SB-1	Date: 2/29/19
	11)	B4-011-SB-4.5	Field Blank:
	12)	B4-008-SB-1	Date: 2/29/2016
	13)	B4-008-SB-7	Eq. Blank:
3/1/2016	14)	B4-009-SB-1	Date: 2/29/2016
	15)	B4-009-SB-5	
	16)	B4-007-SB-1	
	17)	B4-007-SB-5	
	18)	B4-006-SB-1	
	19)	B4-006-SB-5	
	20)	B4-002-SB-1	

Date:	Sample IDs		
4/20/2016	1)	B4-051-SG	
	2)	B4-052-SG	
	3)	B4-053-SB	
	4)		
	5)		
	6)		
	7)		Duplicate: B4-052-SG
	8)		Date: 4/20/2016
	9)		MS/MSD:
	10)		Date:
	11)		Field Blank:
	12)		Date:
	13)		Eq. Blank:
	14)		Date: 4/20/2016
	15)		
	16)		
	17)		
	18)		
	19)		
	20)		

3/1/2016	1)	B4-002-SB-5	
	2)	B4-001-SB-1	
	3)	B4-001-SB-4	
	4)	B4-012-SB-1	
	5)	B4-012-SB-5	
	6)	B4-041-SB-1	
	7)	B4-041-SB-4	Duplicate: B4-039-SB-5
	8)	B4-042-SB-1	Date: 3/2/2016
	9)	B4-042-SB-5	MS/MSD: B4-037-SB-6
3/2/2016	10)	B4-049-SB-1	Date: 3/2/2016
	11)	B4-049-SB-4.5	Field Blank:
	12)	B4-040-SB-1	Date: 3/1/2016
	13)	B4-040-SB-5	Eq. Blank:
	14)	B4-039-SB-1	Date: 3/1/2016
	15)	B4-039-SB-5	
	16)	B4-037-SB-1	
	17)	B4-037-SB-6	
	18)	B4-037-SB-10	
	19)	B4-038-SB-1	
	20)	B4-038-SB-5	

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)		

Trip Blanks: 2/29/2016, 3/1/2016, 3/2/2016

APPENDIX J

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Cyanide	CN	Soil	mg/kg	25	25	0	25	100.00%
Aluminum	Metal	Soil	mg/kg	25	25	0	25	100.00%
Antimony	Metal	Soil	mg/kg	25	2	0	25	100.00%
Arsenic	Metal	Soil	mg/kg	25	19	0	25	100.00%
Barium	Metal	Soil	mg/kg	25	25	0	25	100.00%
Beryllium	Metal	Soil	mg/kg	25	23	0	25	100.00%
Cadmium	Metal	Soil	mg/kg	25	24	0	25	100.00%
Chromium	Metal	Soil	mg/kg	25	25	0	25	100.00%
Chromium VI	Metal	Soil	mg/kg	25	16	0	25	100.00%
Cobalt	Metal	Soil	mg/kg	25	25	0	25	100.00%
Copper	Metal	Soil	mg/kg	25	25	0	25	100.00%
Iron	Metal	Soil	mg/kg	25	25	0	25	100.00%
Lead	Metal	Soil	mg/kg	25	25	0	25	100.00%
Manganese	Metal	Soil	mg/kg	25	25	0	25	100.00%
Mercury	Metal	Soil	mg/kg	25	20	1	24	96.00%
Nickel	Metal	Soil	mg/kg	25	25	0	25	100.00%
Selenium	Metal	Soil	mg/kg	25	6	0	25	100.00%
Silver	Metal	Soil	mg/kg	25	6	0	25	100.00%
Thallium	Metal	Soil	mg/kg	25	2	0	25	100.00%
Vanadium	Metal	Soil	mg/kg	25	25	0	25	100.00%
Zinc	Metal	Soil	mg/kg	25	25	0	25	100.00%
Aroclor 1016	PCB	Soil	mg/kg	13	0	0	13	100.00%
Aroclor 1221	PCB	Soil	mg/kg	13	0	0	13	100.00%
Aroclor 1232	PCB	Soil	mg/kg	13	0	0	13	100.00%
Aroclor 1242	PCB	Soil	mg/kg	13	0	0	13	100.00%
Aroclor 1248	PCB	Soil	mg/kg	13	4	0	13	100.00%
Aroclor 1254	PCB	Soil	mg/kg	13	6	0	13	100.00%
Aroclor 1260	PCB	Soil	mg/kg	13	7	0	13	100.00%
Aroclor 1262	PCB	Soil	mg/kg	13	0	0	13	100.00%
Aroclor 1268	PCB	Soil	mg/kg	13	0	0	13	100.00%
PCBs (total)	PCB	Soil	mg/kg	13	8	0	13	100.00%
1,1-Biphenyl	SVOC	Soil	mg/kg	25	10	0	25	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2,4,5-Trichlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2,4,6-Trichlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2,4-Dichlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2,4-Dimethylphenol	SVOC	Soil	mg/kg	25	1	8	17	68.00%
2,4-Dinitrophenol	SVOC	Soil	mg/kg	25	0	10	15	60.00%
2,4-Dinitrotoluene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
2,6-Dinitrotoluene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
2-Chloronaphthalene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
2-Chlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2-Methylnaphthalene	SVOC	Soil	mg/kg	25	25	0	25	100.00%
2-Methylphenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
2-Nitroaniline	SVOC	Soil	mg/kg	25	0	0	25	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Soil	mg/kg	25	2	8	17	68.00%
3,3'-Dichlorobenzidine	SVOC	Soil	mg/kg	25	0	0	25	100.00%
4-Chloroaniline	SVOC	Soil	mg/kg	25	0	0	25	100.00%
4-Nitroaniline	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Acenaphthene	SVOC	Soil	mg/kg	25	21	0	25	100.00%
Acenaphthylene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Acetophenone	SVOC	Soil	mg/kg	25	6	0	25	100.00%
Anthracene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Benzaldehyde	SVOC	Soil	mg/kg	25	11	13	12	48.00%
Benzo[a]anthracene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Benzo[a]pyrene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Benzo[b]fluoranthene	SVOC	Soil	mg/kg	25	24	0	25	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Benzo[g,h,i]perylene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Benzo[k]fluoranthene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
bis(2-chloroethoxy)methane	SVOC	Soil	mg/kg	25	0	0	25	100.00%
bis(2-Chloroethyl)ether	SVOC	Soil	mg/kg	25	0	0	25	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Soil	mg/kg	25	0	0	25	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Soil	mg/kg	25	12	0	25	100.00%
Caprolactam	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Carbazole	SVOC	Soil	mg/kg	25	12	0	25	100.00%
Chrysene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Dibenz[a,h]anthracene	SVOC	Soil	mg/kg	25	23	0	25	100.00%
Diethylphthalate	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Di-n-butylphthalate	SVOC	Soil	mg/kg	25	1	0	25	100.00%
Di-n-ocytlphthalate	SVOC	Soil	mg/kg	25	1	0	25	100.00%
Fluoranthene	SVOC	Soil	mg/kg	25	25	0	25	100.00%
Fluorene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Hexachlorobenzene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Hexachlorobutadiene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Hexachlorocyclopentadiene	SVOC	Soil	mg/kg	25	0	1	24	96.00%
Hexachloroethane	SVOC	Soil	mg/kg	25	1	0	25	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Soil	mg/kg	25	24	0	25	100.00%
Isophorone	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Naphthalene	SVOC	Soil	mg/kg	25	25	0	25	100.00%
Nitrobenzene	SVOC	Soil	mg/kg	25	0	0	25	100.00%
N-Nitroso-di-n-propylamine	SVOC	Soil	mg/kg	25	0	0	25	100.00%
N-Nitrosodiphenylamine	SVOC	Soil	mg/kg	25	0	0	25	100.00%
Pentachlorophenol	SVOC	Soil	mg/kg	25	0	8	17	68.00%
Phenanthrene	SVOC	Soil	mg/kg	25	25	0	25	100.00%
Phenol	SVOC	Soil	mg/kg	25	2	8	17	68.00%
Pyrene	SVOC	Soil	mg/kg	25	25	0	25	100.00%
Diesel Range Organics	TPH	Soil	mg/kg	25	25	0	25	100.00%
Gasoline Range Organics	TPH	Soil	mg/kg	25	4	0	25	100.00%
1,1,1-Trichloroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,1,2,2-Tetrachloroethane	VOC	Soil	mg/kg	25	0	1	24	96.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,1,2-Trichloroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,1-Dichloroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,1-Dichloroethene	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2,3-Trichlorobenzene	VOC	Soil	mg/kg	25	1	0	25	100.00%
1,2,4-Trichlorobenzene	VOC	Soil	mg/kg	25	1	0	25	100.00%
1,2-Dibromo-3-chloropropane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2-Dibromoethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2-Dichlorobenzene	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2-Dichloroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2-Dichloroethene (Total)	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,2-Dichloropropane	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,3-Dichlorobenzene	VOC	Soil	mg/kg	25	0	0	25	100.00%
1,4-Dichlorobenzene	VOC	Soil	mg/kg	25	0	0	25	100.00%
2-Butanone (MEK)	VOC	Soil	mg/kg	25	5	0	25	100.00%
2-Hexanone	VOC	Soil	mg/kg	25	1	0	25	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Soil	mg/kg	25	1	0	25	100.00%
Acetone	VOC	Soil	mg/kg	25	23	0	25	100.00%
Benzene	VOC	Soil	mg/kg	25	6	0	25	100.00%
Bromodichloromethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
Bromoform	VOC	Soil	mg/kg	25	0	0	25	100.00%
Bromomethane	VOC	Soil	mg/kg	25	0	9	16	64.00%
Carbon disulfide	VOC	Soil	mg/kg	25	0	0	25	100.00%
Carbon tetrachloride	VOC	Soil	mg/kg	25	0	0	25	100.00%
Chlorobenzene	VOC	Soil	mg/kg	25	0	0	25	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Chloroethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
Chloroform	VOC	Soil	mg/kg	25	1	0	25	100.00%
Chloromethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
cis-1,2-Dichloroethene	VOC	Soil	mg/kg	25	0	0	25	100.00%
cis-1,3-Dichloropropene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Cyclohexane	VOC	Soil	mg/kg	25	1	0	25	100.00%
Dibromochloromethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
Dichlorodifluoromethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
Ethylbenzene	VOC	Soil	mg/kg	25	5	0	25	100.00%
Isopropylbenzene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Methyl Acetate	VOC	Soil	mg/kg	25	0	1	24	96.00%
Methyl tert-butyl ether (MTBE)	VOC	Soil	mg/kg	25	0	0	25	100.00%
Methylene Chloride	VOC	Soil	mg/kg	25	0	0	25	100.00%
Styrene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Tetrachloroethene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Toluene	VOC	Soil	mg/kg	25	25	0	25	100.00%
trans-1,2-Dichloroethene	VOC	Soil	mg/kg	25	0	0	25	100.00%
trans-1,3-Dichloropropene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Trichloroethene	VOC	Soil	mg/kg	25	0	0	25	100.00%
Trichlorofluoromethane	VOC	Soil	mg/kg	25	0	0	25	100.00%
Vinyl chloride	VOC	Soil	mg/kg	25	0	0	25	100.00%
Xylenes	VOC	Soil	mg/kg	25	3	0	25	100.00%
1,4-Dioxane	VOC/SVOC	Soil	mg/kg	25	0	11	14	56.00%
1,1,1-Trichloroethane	VOC	Air	ug/m3	3	2	0	3	100.00%
1,1,2,2-Tetrachloroethane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,1,2-Trichloroethane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,1-Dichloroethane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,1-Dichloroethene	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2,3-Trichlorobenzene	VOC	Air	ug/m3	3	3	0	3	100.00%
1,2,4-Trichlorobenzene	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2-Dibromo-3-chloropropane	VOC	Air	ug/m3	3	3	0	3	100.00%
1,2-Dibromoethane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2-Dichlorobenzene	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2-Dichloroethane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2-Dichloroethene (Total)	VOC	Air	ug/m3	3	0	0	3	100.00%
1,2-Dichloropropane	VOC	Air	ug/m3	3	0	0	3	100.00%
1,4-Dichlorobenzene	VOC	Air	ug/m3	3	0	0	3	100.00%
2-Butanone (MEK)	VOC	Air	ug/m3	3	3	0	3	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Air	ug/m3	3	3	0	3	100.00%
Acetone	VOC	Air	ug/m3	3	3	0	3	100.00%
Benzene	VOC	Air	ug/m3	3	3	0	3	100.00%
Bromodichloromethane	VOC	Air	ug/m3	3	3	0	3	100.00%
Bromoform	VOC	Air	ug/m3	3	0	0	3	100.00%
Bromomethane	VOC	Air	ug/m3	3	0	0	3	100.00%
Carbon disulfide	VOC	Air	ug/m3	3	3	0	3	100.00%
Carbon tetrachloride	VOC	Air	ug/m3	3	0	0	3	100.00%
Chlorobenzene	VOC	Air	ug/m3	3	0	0	3	100.00%
Chloroethane	VOC	Air	ug/m3	3	0	0	3	100.00%
Chloroform	VOC	Air	ug/m3	3	3	0	3	100.00%
Chloromethane	VOC	Air	ug/m3	3	3	0	3	100.00%
cis-1,2-Dichloroethene	VOC	Air	ug/m3	3	0	0	3	100.00%
cis-1,3-Dichloropropene	VOC	Air	ug/m3	3	0	0	3	100.00%
Dibromochloromethane	VOC	Air	ug/m3	3	0	0	3	100.00%
Ethylbenzene	VOC	Air	ug/m3	3	3	0	3	100.00%
Isopropylbenzene	VOC	Air	ug/m3	3	0	0	3	100.00%
Methyl tert-butyl ether (MTBE)	VOC	Air	ug/m3	3	0	0	3	100.00%
Methylene Chloride	VOC	Air	ug/m3	3	3	0	3	100.00%
Styrene	VOC	Air	ug/m3	3	2	0	3	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Results	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Tetrachloroethene	VOC	Air	ug/m3	3	3	0	3	100.00%
Toluene	VOC	Air	ug/m3	3	3	0	3	100.00%
trans-1,2-Dichloroethene	VOC	Air	ug/m3	3	0	0	3	100.00%
trans-1,3-Dichloropropene	VOC	Air	ug/m3	3	0	0	3	100.00%
Trichloroethene	VOC	Air	ug/m3	3	1	0	3	100.00%
Vinyl chloride	VOC	Air	ug/m3	3	0	0	3	100.00%
Xylenes	VOC	Air	ug/m3	3	3	0	3	100.00%
1,4-Dioxane	VOC/SVOC	Air	ug/m3	3	0	0	3	100.00%

APPENDIX C

Clearance Checklist-Closure Report

20 Acre RoRo Automotive Yard

Prepared for:

MCM Management Corporation
1430 Sparrows Point Blvd
Sparrows Point, MD 21219

Prepared by:

Jenkins Environmental, Inc.
8600 LaSalle Rd Suite 509
Towson, MD 21286

April 15, 2016

JEI No.: 016-028

Table of Contents

Section 1.0

Clearance Checklist & Certification

Sub-Grade Structure Clearance Checklist
Sparrows Point Facility – Demolition and Backfill

Sub-Grade Structure ID#: SGS 52-56 & 61 Checklist Completed By **M. Cirri**

Building Location: **See BOF/CSC EXHIBITS 2 & 5**

GPS Coordinates: **SGS-52 : N 39° 12.965; W076° 29.236**

SGS-53 : N 39° 12.974; W076° 29.232

SGS-54 : N 39° 12.956; W076° 29.242

SGS-55 : N 39° 12.963; W076° 29.179

SGS-56 : N 39° 12.965; W076° 29.236

SGS-61 : N 39° 12.964; W076° 29.213

Sub-Grade Structure Dimensions:

SGS #	Description	Approximate Dimensions
SGS-52	Emergency Reladling Track Scale Pit (CEI-127)	28' x 19' x 9' deep
	Emergency Reladling Pit (CEI-128)	20' x 24' x 17' deep
SGS-53	Reladling Track Scale Pit (CEI-125)	49' x 28' x 2.3' deep
	Reladling Pit (CEI-126)	39' x 25' x 26' deep
SGS-54	Freight Elevator Pit (CEI-129)	20' x 19' x 9.5' deep
	Passenger Elevator Pit (CEI-130)	9' x 10' x 5.5' deep
SGS-55	Track Hopper Conveyor Tunnel (CEI-115)	62' x 8' x 7.5' deep
	Track Hopper Pit (CEI-116)	27' x 19' x 18' deep
SGS-56	Track Yard Scale Pit (CEI-117)	40' x 11' x 9.3'
	Stack #1 Sump Pit (CEI-124)	5.5' x 2.5' x 7' deep
	Scrubber Pit (CEI-212)	73' x 35' x 11'
SGS-61	Misc. Pits	10' x 32' x 8' deep 7' x 7' x 8' deep
Other	Electrical Vault	8' x 10' x 11.5' deep
	Misc. Small Pit	4' x 4' x 4' deep
	South Side Trench	1' x 185' x 4' deep
	Sanitary Pump Station Pad	15' x 13' x 2' deep

Pumping Dates: ______**3/15/16 - 3/16/16**_____________________

Date Sub-Grade Structure Cleared for Inspection: **3/17/16**

Sub-Grade Structure Clearance Checklist

Sparrows Point Facility – Demolition and Backfill

Sub-Grade Structure Inspection by JEI

Sub-Grade Structure Inspection Date(s): **2/18; 2/19; 2/29; 3/7; 3/15; 3/17; 3/30; 3/31**

Condition of Groundwater in SGS: **Generally murky and opaque; no surface sheen observed.**

Visual Inspection Observations (attach photos): **The equipment located in these buildings was removed for either resale or salvage. The condition of the SGS's was the result of the equipment removal and not caused by the MCM demolition of the building. Miscellaneous metal and debris were observed in the SGSs. Metal was removed from the sub grade structure and went to scrap recycling and any non-recyclable debris went to Greys Landfill in accordance with Greys Landfill Operations Manual. Concrete walls in SGS 52, 53, 54 and 55 were observed to be generally in good condition and not in need of any significant cleaning prior to backfill. Water from the SGS 52 - 55 was pumped to through a temporary pipe conveyance to the Caster pit which in turn was pumped to the existing waste water sewer system which discharges into the Tin Mill Canal and continues to the HCWWTP. SGS 56 was primarily compromised of the former BOF Scrubber Pit which had been filled in during previous site demolition work. The pit was excavated and material taken to Grey's Landfill in accordance with Pre-Approval for Disposal under Mill Operations (i.e. scrubber pit material in the past was routinely hauled to Grey's Landfill during active Mill operations). There was no water or any other contaminant of concern in SGS 56 that required testing. On 3/31/16 a utility/electrical vault (SGS 61) discovered during SGS backfill prep work. There was a small amount of water was present in the bottom of the structure, no environmental issues were observed and as a matter of site safety and precaution the structure was backfilled immediately under the supervision of Century Engineering's engineer.**

Backfilling of the SGS 52 -56 began on 3/21/16 and was completed on 4/1/16.

Sub-Grade Structure Sampling

Date Sampled: **2/18/16**

Chain of Custody #: **16021902** Sample #: **0165-028-335 to 338** Turnaround: **Standard**

No. of Samples: **Four (4)**

Media Sampled: **Combination of rainwater and groundwater infiltrating structure**

Date Results Received: **2/26/16**

Result Evaluated and QC checked by: **M. Cirri** __________________

Approval for Submission to MDE by (MCM or JEI): **B. Bonnano/M. Cirri**

Sample Collection: **Grab water samples from several locations within the SGSs were collected and composited for analysis. Water in the SGS was observed to be a heterogeneous quiescent oil- water mixture. Oil was present as a combination of surface film, emulsion and solution. Disposable Teflon bailers and/or 40 oz. wide mouth Amber Packer bottles were used to collect samples.**

Sub-Grade Structure Clearance Checklist
Sparrows Point Facility – Demolition and Backfill

Samples to be analyzed for volatile organic compounds (VOCs) were placed in 40-ml septum vials with screw caps with a Teflon7-lined silicone disk (septum) in the cap to prevent contamination of the sample by the cap. Samples were preserved with HCL. Triplicate samples were prepared from the SGS. 40 ml vials are placed on ice for transport to the laboratory. Oil & Grease and Semi-Volatiles samples were contained each in separate one (1) Liter Amber bottles and placed on ice for transport to the laboratory. PCBs and metals samples were placed in separate unpreserved 250 ml Nalgene HDPE bottles.

MDE Review for Sub-Grade Structure Clearance

Date Analytical Results submitted to MDE: **3/17/16**

MDE Review by: _**Barbara Brown, MDE-LRP-VCP Section Head**__Response date: __**3/17/16**

MDE Approval Date: ____**3/17/16 (See Attached Email Dated 3/17/16)**___

Sub-Grade Structure Backfilling

Date Sub-Grade Structure Backfill Started: **3/21/16**__________________

Date Sub-Grade Structure Backfill Completed: **4/1/16** ___________________________

Stockpile ID(s) for Material Used for Backfilling: **See Century Engineering Geo-Technical Reports - Attached.**

Certification Statement

I hereby affirm that I am familiar with the Sparrows Point Terminal Property and that I or my agents, (M.J. Cirri/J.C. Cirri) have visited and examined Sub-grade Structures (SGS) closure sites at the Sparrows Point Terminal facility located in Baltimore County, Maryland. I affirm this Closure Report has been prepared in accordance with good practices, including consideration of applicable standards and that information provided by MCM Management Corporation in relation to matters of waste disposal is reliable. Furthermore, I affirm that procedures for required inspections and testing have been established by MCM and that the Sub grade Structure Backfill Closure Report observations indicate general conformance with the terms of the Enhanced Scope of Work (9/09/14) and work was done in a sound professional manner.

By: ______________________

C. William Ruth, P.E.
Jenkins Environmental, Inc.

Date: 4/14/16

By: ______________________

Michael J. Cirri, President
Jenkins Environmental, Inc.

Date: 4/14/16

STATE OF MARYLAND
C. WILLIAM RUTH
No. 31219
PROFESSIONAL ENGINEER

Section 2.0

Pumping & Backfilling Authorizations

Authorization Certificate
for
Sub Grade Structure (SGS) Pumping

On 3/04 2016, Mike Vogler, Sr. VP Operations, an authorized
(Month/Day) (Name/Print)

representative of TPA reviewed laboratory Certificates of Analysis for
(Company Name)

Samples 016-028-335 thru 338 collected from SGS(s) No.(s) **52-55** and conducted a visual inspection of the referenced structures. The laboratory test results and associated inspection find the water acceptable for pumping to the Humphrey's Creek Waste Water Treatment Plant.

Pumping Authorization Granted by:

M. Vogler	SVP Site Op.	3/4/16
(Signature)	(Title)	(Date)

Witnessed by:

Michael J. Cini	**Jenkins Env. Inc.**	**3/04/16**
(Signature)	(Company)	(Date)

JENKINS
ENVIRONMENTAL, INC.

8600 LaSalle Road • Suite 509 • Towson, MD 21286

Michael Cirri

From: Barbara Brown -MDE- [barbara.brown1@maryland.gov]
Sent: Thursday, March 17, 2016 4:36 PM
To: Michael Cirri
Cc: Jennifer Sohns -MDE-; Brandon Bonanno; George Perdikakis
Subject: Re:

Hello Mike

Based on a review of the inspection and testing documents for SGS 52-56 you may proceed with the backfilling operation with approved clean fill material.

If you have any questions please contact me.

Barbara Brown

On Thu, Mar 17, 2016 at 3:32 PM, Michael Cirri <mcirri@jeinc.org> wrote:

Barbara:

Attached are inspection and testing documents for SGS 52 – 56 located in Parcel 7-1 (new Automotive Yard). We are seeking the Department's approval to proceed with backfilling. I conducted a final inspection today and found the structures to be adequately cleaned. Removal of debris from pit bottoms has been completed. Following backfill the structures will be capped with by an asphalt automobile storage lot.

We are seeking approval to backfill as soon as possible. In order to maintain the current schedule backfilling must be completed on or before 4/1/16.

Let me know if you have any questions.

Regards,

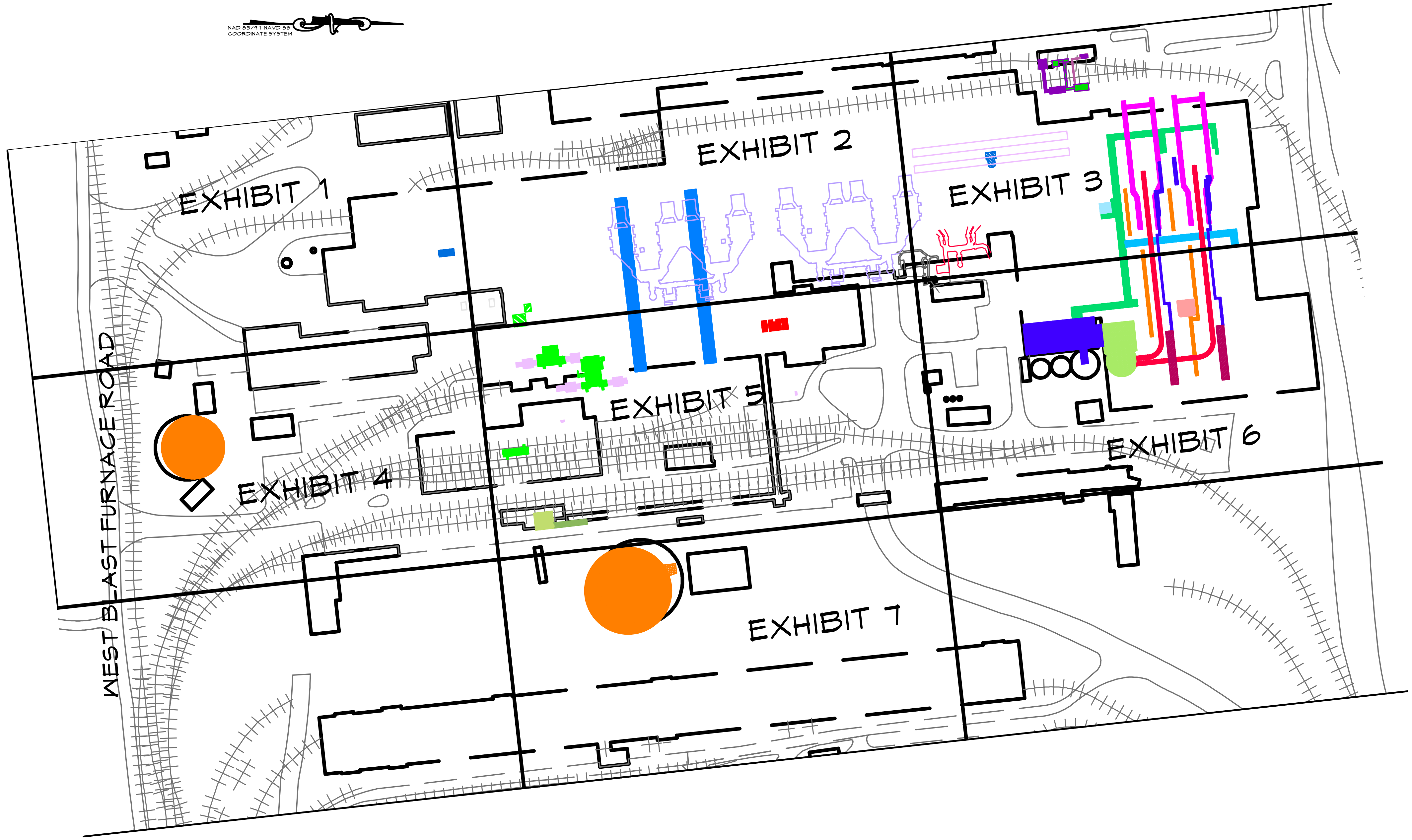
Mike

Michael J. Cirri

President/Chief Financial Officer

Section 3.0

Site Map Exhibits



PLAN

SCALE: 1" = 200'

0 200' 400'

PROGRESS PRINT

FROM REVIEW OF RECORD DRAWINGS
NOT YET FIELD VERIFIED

SPARROWS POINT FACILITY

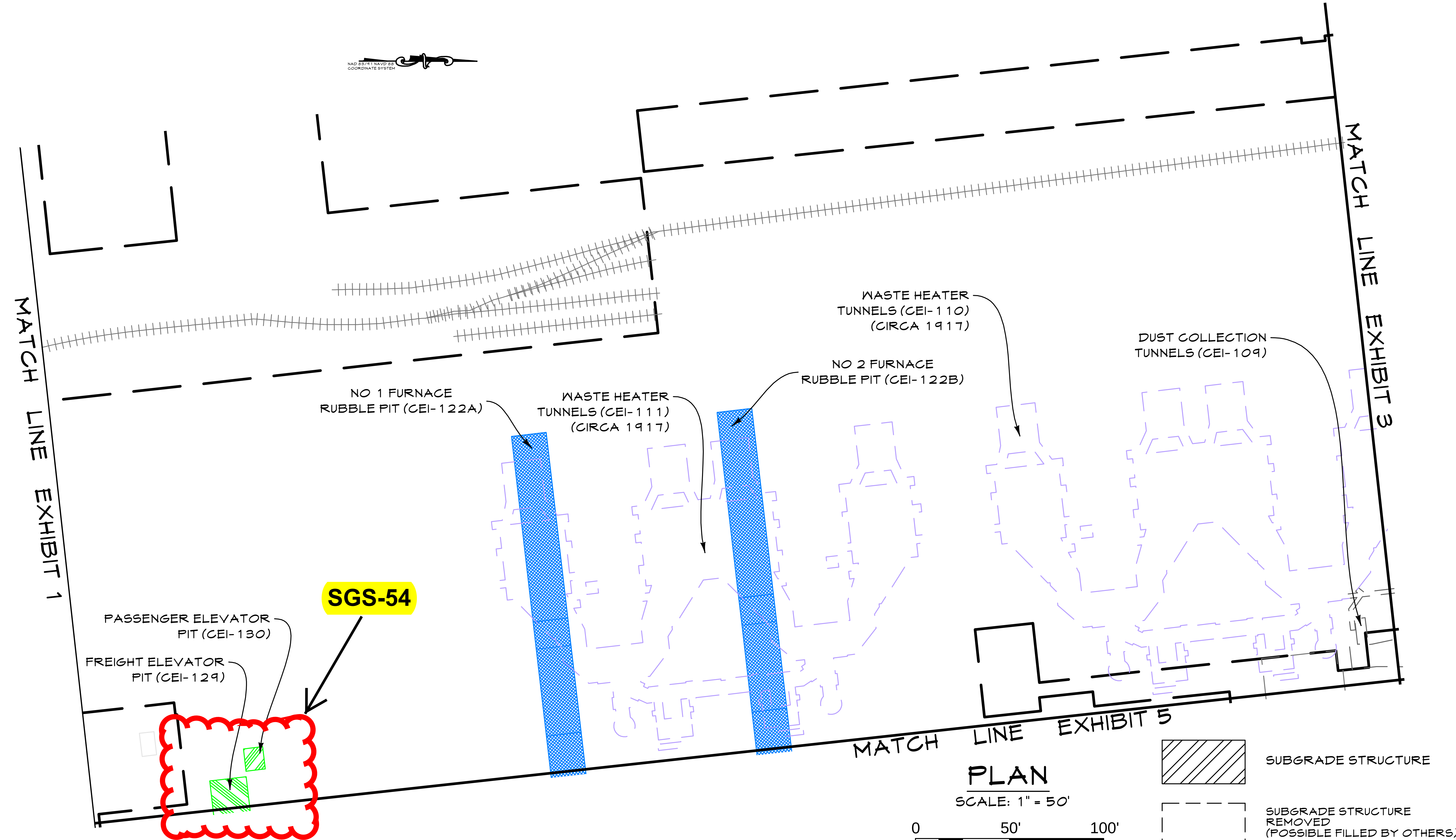
BASIC OXYGEN FURNACE & CONTINUOUS SLAB CASTER
SUBGRADE STRUCTURE LOCATION EXHIBIT KEY

Job No. 1511117.01	Scale: 1" = 200'	Date: 2-17-16	Drawn By: R.A.L.	Checked By: R.G.B.	Sheet:

MCM

JENKINS ENVIRONMENTAL, INC.

CENTURY ENGINEERING



PROGRESS PRINT

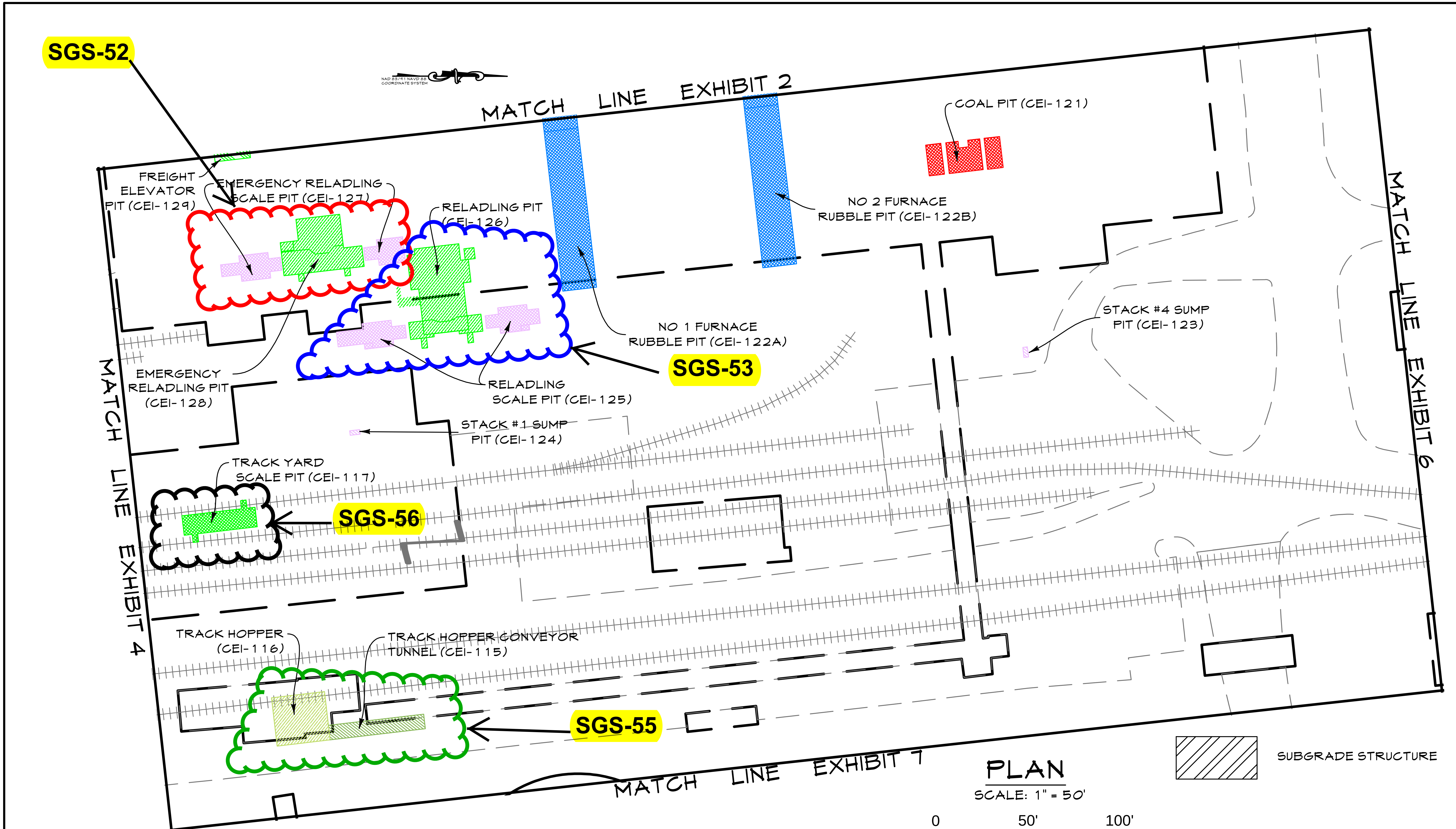
FROM REVIEW OF RECORD DRAWINGS
NOT YET FIELD VERIFIED

SPARROWS POINT FACILITY

BASIC OXYGEN FURNACE & CONTINUOUS SLAB CASTER SUBGRADE STRUCTURE LOCATION EXHIBIT 2

MCM
JENKINS ENVIRONMENTAL, INC.
CENTURY ENGINEERING

Job No. 1511117.01	Scale: 1" = 50'	Date: 2-17-16	Drawn By: R.A.L.	Checked By: R.G.B.	Sheet:



0 50' 100'

SPARROWS POINT FACILITY

BASIC OXYGEN FURNACE & CONTINUOUS SLAB CASTER
SUBGRADE STRUCTURE LOCATION EXHIBIT 5

MCM

JENKINS ENVIRONMENTAL, INC.

CENTURY ENGINEERING

PROGRESS PRINT

FROM REVIEW OF RECORD DRAWINGS
NOT YET FIELD VERIFIED

Job No. 1511117.01	Scale: 1" = 50'	Date: 2-17-16	Drawn By: R.A.L.	Checked By: R.G.B.	Sheet:

Section 4.0

Photographs

BASIC OXYGEN FURNACE
SGS 52 – 56 & 61

SGS-52 (CEI 127/128):	N 39° 12.965 W076° 29.236
SGS-53 (CEI 125/126):	N 39° 12.974 W076° 29.232
SGS-54 (CEI 129/130):	N 39° 12.956 W076° 29.242
SGS-55 (CEI 115/116):	N 39° 12.963 W076° 29.179
SGS-56 (CEI 117/124/212):	N 39° 12.964 W076° 29.213
SGS-61:	N 39° 12.964 W076° 29.213

SGS-52 Emergency Relading Pit & Track Scale

SGS-52 Emergency Relading Pit & Track Scale

SGS-52 Emergency Relading Pit & Track Scale

SGS-53 Relading Pit & Track Scale

SGS-53 Relading Pit & Track Scale

SGS-53 Relading Pit & Track Scale

SGS-54 Freight & Passenger Elevator Pits

SGS-54 Freight & Passenger Elevator Pits

SGS-54 Freight & Passenger Elevator Pits

SGS-55 Track Hopper Pit & Conveyor

SGS-55 Track Hopper Pit & Conveyor

SGS-55 Track Hopper Pit & Conveyor

SGS-56 Track Yard Scale Pit/BOF Pit

SGS-56 Track Yard Scale Pit/BOF Pit

SGS-56 Storm Water Inlet

SGS-61 Utility Vault

SGS 61 Minimal GW Infiltration

SGS 61

SGS 61 Cleanout Work

SGS 61 - Backfilling

Section 5.0

Laboratory Certificates of Analysis

CALIBER ANALYTICAL SERVICES

Certificate of Analysis

Jenkins Environmental, Inc.
8600 LaSalle Road
York Building, Suite 509
Towson, MD 21286

Date Sampled: 02/18/16 10:05
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-335 **Matrix:** Water **Lab ID:** 16021902-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Oil & Grease, total recoverable (HEM)							
Oil & Grease	ND	mg/L	5	EPA 1664	02/20/16	02/22/16 10:12	LMJ
Polychlorinated Biphenyls							
Aroclor 1016	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1221	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1232	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1242	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1248	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1254	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Aroclor 1260	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 11:56	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Bis (2-chloroethyl) ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Chlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Bis (2-chloroisopropyl) ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Acetophenone	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
N-Nitroso-di-n-propylamine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Hexachloroethane	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Nitrobenzene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Isophorone	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Nitrophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4-Dimethylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Bis (2-chloroethoxy) methane	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4-Dichlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Naphthalene`	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Chloroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Hexachlorobutadiene`	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Caprolactam	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Chloro-3-methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Methylnaphthalene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Hexachlorocyclopentadiene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4,6-Trichlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4,5-Trichlorophenol	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
1,1-Biphenyl	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Chloronaphthalene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2-Nitroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Dimethyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,6-Dinitrotoluene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH

8851 Orchard Tree Lane Towson, Maryland 21286
tel: 410.825.1151 fax: 410.825.2126 www.caslabs.net

CALIBER ANALYTICAL SERVICES

Certificate of Analysis

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8600 LaSalle Road
York Building, Suite 509
Towson, MD 21286

Date Sampled: 02/18/16 10:05
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-335 Matrix: Water Lab ID: 16021902-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Acenaphthylene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
3-Nitroaniline	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Acenaphthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4-Dinitrophenol	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Nitrophenol	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Dibenzofuran	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
2,4-Dinitrotoluene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Diethyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Fluorene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Chlorophenyl phenyl ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Nitroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4,6-Dinitro-2-methylphenol	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
N-Nitrosodiphenylamine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
4-Bromophenyl phenyl ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Hexachlorobenzene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Atrazine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Pentachlorophenol	ND	ug/L	29	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Phenanthrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Carbazole	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Di-n-butyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Butyl benzyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
3,3-Dichlorobenzidine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Benzo[a]anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Chrysene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Di-n-octyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Benzo[b]fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Benzo[k]fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Benzo[a]pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Dibenz[a,h]anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Benzo[g,h,i]perylene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 11:45	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Chloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Vinyl chloride	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:13	GFH

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Caliber Analytical Services

Certificate of Analysis

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8600 LaSalle Road
York Building, Suite 509
Towson, MD 21286

Date Sampled: 02/18/16 10:05
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-335 Matrix: Water Lab ID: 16021902-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Bromomethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Chloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Trichlorofluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Acetone	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Carbon disulfide	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Methyl acetate	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Methylene chloride	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 12:13	GFH
trans-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Methyl t-butyl ether (MTBE)	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
cis-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
2-Butanone (MEK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Chloroform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1,1-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Cyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Carbon tetrachloride	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Benzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Trichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Methylcyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2-Dichloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Bromodichloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
cis-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Toluene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:13	GFH
trans-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1,2-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Tetrachloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
2-Hexanone (MBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Dibromochloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2-Dibromoethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Chlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Ethylbenzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:13	GFH
m&p-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
o-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Styrene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Bromoform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH

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Date Sampled: 02/18/16 10:05
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-335 **Matrix:** Water **Lab ID:** 16021902-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Isopropylbenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,1,2,2-Tetrachloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,3-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,4-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2-Dibromo-3-chloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
1,2,4-Trichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Naphthalene	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
tert-Butanol (TBA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Diisopropyl ether (DIPE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
tert-Amyl methyl ether (TAME)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
tert-Amyl alcohol (TAA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:13	GFH
Total Metals							
Aluminum	**270**	ug/L	50	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Antimony	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Arsenic	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Barium	**12**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Beryllium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Cadmium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Calcium	**27,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:46	MEL
Chromium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Cobalt	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Copper	**8.5**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Iron	**2,100**	ug/L	100	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Lead	**28**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Magnesium	**11,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:46	MEL
Manganese	**290**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Mercury	ND	ug/L	1	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Nickel	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Potassium	**66,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:46	MEL
Selenium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Silver	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Sodium	**84,000**	ug/L	100	EPA 6020A	02/22/16	02/23/16 11:04	MEL
Thallium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Vanadium	**6.1**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:11	MEL
Zinc	**2,500**	ug/L	500	EPA 6020A	02/22/16	02/22/16 12:46	MEL

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Date Sampled: 02/18/16 10:05
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-335 Matrix: Water Lab ID: 16021902-01

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Total Petroleum Hydrocarbons - (C10-C28) DRO							
Diesel Range Organics	ND	mg/L	0.48	EPA 8015C	02/22/16	02/24/16 11:36	AC

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

ND - Not Detected at a concentration greater than or equal to the LLQ.

Approved by: Matt Cohen

QC Chemist

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Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-336 Matrix: Water Lab ID: 16021902-02

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Oil & Grease, total recoverable (HEM)							
Oil & Grease	ND	mg/L	5	EPA 1664	02/20/16	02/22/16 10:12	LMJ
Polychlorinated Biphenyls							
Aroclor 1016	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1221	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1232	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1242	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1248	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1254	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Aroclor 1260	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:25	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Bis (2-chloroethyl) ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Chlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Bis (2-chloroisopropyl) ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Acetophenone	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
N-Nitroso-di-n-propylamine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Hexachloroethane	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Nitrobenzene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Isophorone	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Nitrophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4-Dimethylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Bis (2-chloroethoxy) methane	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4-Dichlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Naphthalene`	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Chloroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Hexachlorobutadiene`	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Caprolactam	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Chloro-3-methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Methylnaphthalene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Hexachlorocyclopentadiene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4,6-Trichlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4,5-Trichlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
1,1-Biphenyl	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Chloronaphthalene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2-Nitroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Dimethyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,6-Dinitrotoluene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-336 **Matrix:** Water **Lab ID:** 16021902-02

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Acenaphthylene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
3-Nitroaniline	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Acenaphthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4-Dinitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Nitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Dibenzofuran	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
2,4-Dinitrotoluene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Diethyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Fluorene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Chlorophenyl phenyl ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Nitroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4,6-Dinitro-2-methylphenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
N-Nitrosodiphenylamine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
4-Bromophenyl phenyl ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Hexachlorobenzene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Atrazine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Pentachlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Phenanthrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Carbazole	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Di-n-butyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Butyl benzyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
3,3-Dichlorobenzidine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Benzo[a]anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Chrysene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Di-n-octyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Benzo[b]fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Benzo[k]fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Benzo[a]pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Dibenz[a,h]anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Benzo[g,h,i]perylene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 12:23	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Chloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Vinyl chloride	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:42	GFH

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Date Sampled: 02/18/16 10:09
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-336 Matrix: Water Lab ID: 16021902-02

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Bromomethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Chloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Trichlorofluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Acetone	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Carbon disulfide	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Methyl acetate	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Methylene chloride	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 12:42	GFH
trans-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Methyl t-butyl ether (MTBE)	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
cis-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
2-Butanone (MEK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Chloroform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1,1-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Cyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Carbon tetrachloride	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Benzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Trichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Methylcyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2-Dichloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Bromodichloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
cis-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Toluene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:42	GFH
trans-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1,2-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Tetrachloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
2-Hexanone (MBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Dibromochloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2-Dibromoethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Chlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Ethylbenzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 12:42	GFH
m&p-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
o-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Styrene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Bromoform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-336 Matrix: Water Lab ID: 16021902-02

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Isopropylbenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,1,2,2-Tetrachloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,3-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,4-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2-Dibromo-3-chloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
1,2,4-Trichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Naphthalene	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
tert-Butanol (TBA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Diisopropyl ether (DIPE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
tert-Amyl methyl ether (TAME)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
tert-Amyl alcohol (TAA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 12:42	GFH
Total Metals							
Aluminum	ND	ug/L	50	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Antimony	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Arsenic	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Barium	**11**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Beryllium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Cadmium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Calcium	**24,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:51	MEL
Chromium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Cobalt	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Copper	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Iron	**180**	ug/L	100	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Lead	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Magnesium	**38,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:51	MEL
Manganese	**13**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Mercury	ND	ug/L	1	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Nickel	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Potassium	**60,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:51	MEL
Selenium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Silver	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Sodium	**110,000**	ug/L	100	EPA 6020A	02/22/16	02/23/16 11:24	MEL
Thallium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Vanadium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL
Zinc	**180**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:42	MEL

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-336   Matrix: Water   Lab ID: 16021902-02

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Total Petroleum Hydrocarbons - (C10-C28) DRO							
Diesel Range Organics	ND	mg/L	0.39	EPA 8015C	02/22/16	02/24/16 12:11	AC

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.

Approved by: Matt Cohen
QC Chemist

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Jenkins Environmental, Inc.
8600 LaSalle Road
York Building, Suite 509
Towson, MD 21286

Date Sampled: 02/18/16 10:17
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-337 **Matrix:** Water **Lab ID:** 16021902-03

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Oil & Grease, total recoverable (HEM)							
Oil & Grease	ND	mg/L	5	EPA 1664	02/20/16	02/22/16 10:13	LMJ
Polychlorinated Biphenyls							
Aroclor 1016	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1221	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1232	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1242	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1248	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1254	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Aroclor 1260	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 12:53	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Bis (2-chloroethyl) ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Chlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Bis (2-chloroisopropyl) ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Acetophenone	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
N-Nitroso-di-n-propylamine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Hexachloroethane	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Nitrobenzene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Isophorone	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Nitrophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4-Dimethylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Bis (2-chloroethoxy) methane	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4-Dichlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Naphthalene`	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Chloroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Hexachlorobutadiene`	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Caprolactam	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Chloro-3-methylphenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Methylnaphthalene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Hexachlorocyclopentadiene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4,6-Trichlorophenol	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4,5-Trichlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
1,1-Biphenyl	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Chloronaphthalene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2-Nitroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Dimethyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,6-Dinitrotoluene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH

8851 Orchard Tree Lane Towson, Maryland 21286
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Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-337 **Matrix:** Water **Lab ID:** 16021902-03

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Acenaphthylene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
3-Nitroaniline	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Acenaphthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4-Dinitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Nitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Dibenzofuran	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
2,4-Dinitrotoluene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Diethyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Fluorene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Chlorophenyl phenyl ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Nitroaniline	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4,6-Dinitro-2-methylphenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
N-Nitrosodiphenylamine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
4-Bromophenyl phenyl ether	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Hexachlorobenzene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Atrazine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Pentachlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Phenanthrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Carbazole	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Di-n-butyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Butyl benzyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
3,3-Dichlorobenzidine	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Benzo[a]anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Chrysene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Di-n-octyl phthalate	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Benzo[b]fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Benzo[k]fluoranthene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Benzo[a]pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Dibenz[a,h]anthracene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Benzo[g,h,i]perylene	ND	ug/L	11	EPA 8270C	02/24/16	02/25/16 13:01	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Chloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Vinyl chloride	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:12	GFH

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Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-337 Matrix: Water Lab ID: 16021902-03

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Bromomethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Chloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Trichlorofluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Acetone	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Carbon disulfide	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Methyl acetate	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Methylene chloride	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 13:12	GFH
trans-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Methyl t-butyl ether (MTBE)	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
cis-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
2-Butanone (MEK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Chloroform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1,1-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Cyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Carbon tetrachloride	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Benzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Trichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Methylcyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2-Dichloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Bromodichloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
cis-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Toluene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:12	GFH
trans-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1,2-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Tetrachloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
2-Hexanone (MBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Dibromochloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2-Dibromoethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Chlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Ethylbenzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:12	GFH
m&p-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
o-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Styrene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Bromoform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH

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Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-337 Matrix: Water Lab ID: 16021902-03

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Isopropylbenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,1,2,2-Tetrachloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,3-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,4-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2-Dibromo-3-chloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
1,2,4-Trichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Naphthalene	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
tert-Butanol (TBA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Diisopropyl ether (DIPE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
tert-Amyl methyl ether (TAME)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
tert-Amyl alcohol (TAA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:12	GFH
Total Metals							
Aluminum	ND	ug/L	50	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Antimony	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Arsenic	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Barium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Beryllium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Cadmium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Calcium	ND	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:57	MEL
Chromium	**150**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Cobalt	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Copper	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Iron	ND	ug/L	100	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Lead	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Magnesium	**26,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:57	MEL
Manganese	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Mercury	ND	ug/L	1	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Nickel	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Potassium	**83,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 12:57	MEL
Selenium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Silver	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Sodium	**46,000**	ug/L	100	EPA 6020A	02/22/16	02/23/16 11:28	MEL
Thallium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Vanadium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL
Zinc	**6.4**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:48	MEL

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-337 **Matrix:** Water **Lab ID:** 16021902-03

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Total Petroleum Hydrocarbons - (C10-C28) DRO							
Diesel Range Organics	ND	mg/L	0.48	EPA 8015C	02/22/16	02/24/16 12:11	AC

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.

Approved by: Matt Cohen
QC Chemist

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Date Sampled: 02/18/16 10:31
Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-338 Matrix: Water Lab ID: 16021902-04

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Oil & Grease, total recoverable (HEM)							
Oil & Grease	ND	mg/L	5	EPA 1664	02/20/16	02/22/16 10:13	LMJ
Polychlorinated Biphenyls							
Aroclor 1016	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1221	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1232	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1242	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1248	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1254	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Aroclor 1260	ND	ug/L	2	EPA 8082	02/22/16	02/24/16 13:22	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Bis (2-chloroethyl) ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Chlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Bis (2-chloroisopropyl) ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Acetophenone	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
N-Nitroso-di-n-propylamine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Hexachloroethane	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Nitrobenzene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Isophorone	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Nitrophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4-Dimethylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Bis (2-chloroethoxy) methane	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4-Dichlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Naphthalene`	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Chloroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Hexachlorobutadiene`	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Caprolactam	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Chloro-3-methylphenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Methylnaphthalene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Hexachlorocyclopentadiene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4,6-Trichlorophenol	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4,5-Trichlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
1,1-Biphenyl	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Chloronaphthalene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2-Nitroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Dimethyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,6-Dinitrotoluene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH

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8600 LaSalle Road		Date Received:	02/19/16 13:05
York Building, Suite 509		Date Issued:	02/26/16
Towson, MD 21286			

Project:	BOF Ladle Pits		
Site Location:	Sparrows Point, MD		
Project Number:	2016-028	SDG Number:	16021902

Field Sample ID: 016-028-338 **Matrix:** Water **Lab ID:** 16021902-04

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Acenaphthylene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
3-Nitroaniline	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Acenaphthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4-Dinitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Nitrophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Dibenzofuran	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
2,4-Dinitrotoluene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Diethyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Fluorene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Chlorophenyl phenyl ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Nitroaniline	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4,6-Dinitro-2-methylphenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
N-Nitrosodiphenylamine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
4-Bromophenyl phenyl ether	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Hexachlorobenzene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Atrazine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Pentachlorophenol	ND	ug/L	26	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Phenanthrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Carbazole	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Di-n-butyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Butyl benzyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
3,3-Dichlorobenzidine	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Benzo[a]anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Chrysene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Di-n-octyl phthalate	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Benzo[b]fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Benzo[k]fluoranthene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Benzo[a]pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Dibenz[a,h]anthracene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Benzo[g,h,i]perylene	ND	ug/L	10	EPA 8270C	02/24/16	02/25/16 13:39	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Chloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Vinyl chloride	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:43	GFH

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-338 Matrix: Water Lab ID: 16021902-04

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Bromomethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Chloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Trichlorofluoromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Acetone	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Carbon disulfide	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Methyl acetate	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Methylene chloride	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 13:43	GFH
trans-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Methyl t-butyl ether (MTBE)	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
cis-1,2-Dichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
2-Butanone (MEK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Chloroform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1,1-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Cyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Carbon tetrachloride	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Benzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2-Dichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Trichloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Methylcyclohexane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2-Dichloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Bromodichloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
cis-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Toluene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:43	GFH
trans-1,3-Dichloropropene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1,2-Trichloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Tetrachloroethene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
2-Hexanone (MBK)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Dibromochloromethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2-Dibromoethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Chlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Ethylbenzene	ND	ug/L	1	EPA 8260B	02/26/16	02/26/16 13:43	GFH
m&p-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
o-Xylene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Styrene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Bromoform	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH

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Date Received: 02/19/16 13:05
Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-338 **Matrix:** Water **Lab ID:** 16021902-04

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Isopropylbenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,1,2,2-Tetrachloroethane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,3-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,4-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2-Dichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2-Dibromo-3-chloropropane	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
1,2,4-Trichlorobenzene	ND	ug/L	5	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Naphthalene	ND	ug/L	10	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
tert-Butanol (TBA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Diisopropyl ether (DIPE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
tert-Amyl methyl ether (TAME)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
tert-Amyl alcohol (TAA)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/L	25	EPA 8260B	02/26/16	02/26/16 13:43	GFH
Total Metals							
Aluminum	ND	ug/L	50	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Antimony	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Arsenic	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Barium	**6.9**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Beryllium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Cadmium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Calcium	**13,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 13:04	MEL
Chromium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Cobalt	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Copper	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Iron	**430**	ug/L	100	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Lead	**5.4**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Magnesium	**13,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 13:04	MEL
Manganese	**15**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Mercury	ND	ug/L	1	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Nickel	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Potassium	**58,000**	ug/L	10000	EPA 6020A	02/22/16	02/22/16 13:04	MEL
Selenium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Silver	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Sodium	**140,000**	ug/L	100	EPA 6020A	02/22/16	02/23/16 11:32	MEL
Thallium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Vanadium	ND	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL
Zinc	**150**	ug/L	5	EPA 6020A	02/22/16	02/22/16 13:55	MEL

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Date Issued: 02/26/16

Project: BOF Ladle Pits
Site Location: Sparrows Point, MD
Project Number: 2016-028

SDG Number: 16021902

Field Sample ID: 016-028-338 **Matrix:** Water **Lab ID:** 16021902-04

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Total Petroleum Hydrocarbons - (C10-C28) DRO							
Diesel Range Organics	ND	mg/L	0.42	EPA 8015C	02/22/16	02/24/16 12:46	AC

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.

Approved by: Matt Cohen
QC Chemist

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Chain of Custody Record

Customer:	JENKINS ENVIRONMENTAL
Contact/Report to:	M. CIRRI
Phone:	410-828-9888
Fax:	410-828-9899

E-mail address:	MCIRRI@JEINC.ORG
Project Name:	BOF LADLE PITS
Project Number:	2016-028
Location:	SPARROWS POINT

SDG Number:	16021902
Sampled by:	MJC
PO Number:	

Analysis Requested

Lab Number	Field Sample ID	Date Sampled	Time Sampled	No. of Bottles	Matrix	TAL METALS 6020A	PCB's 8082	SVOC's 8270C	VOC's 8260B	TPH-DRO 8015B (HCL)	TPH-OIL & GREASE 9071B					Sampling Remarks/ Comments
	016-028-335	2/18/16	1005	7	WATER	✓	✓	✓	✓	✓	✓					SGS-52 (CEI 127/128)
	016-028-336	2/18/16	1009	7	WATER	✓	✓	✓	✓	✓	✓					SGS-53 (CEI 125/126)
	016-028-337	2/18/16	1017	7	WATER	✓	✓	✓	✓	✓	✓					SGS-54 (CEI 129/130)
	016-028-338	2/18/16	1031	7	WATER	✓	✓	✓	✓	✓	✓					SGS-55 (CEI 116)

Relinquished by:	M. Cirri	Date/Time:	2/19/16 1305
Received by:	M. Colburn	Date/Time:	2/19/16 1305
Relinquished by:		Date/Time:	
Received by:		Date/Time:	
Relinquished by:		Date/Time:	
Received by:		Date/Time:	

Deliverables: I II III CLP EDD

Receipt Temperature: Temp:____ On Ice

Turnaround Time: STD Next Day 2-Day Other

Custody Seals: Sample Cooler Delivered by client

Comments/Special Instructions: RESULTS BY 2/26/16

Section 6.0

Backfill Specifications, Inspection & Closure Reports (Century Engineering)

20 Acre Automotive Yard (RoRo Site)

Demolition & Backfill Plan for Subgrade Structures

Subgrade Structures:

Open Pits (Less than 10’ Deep)

SGS-52	CEI-127 - Emergency Reladling Track Scale Pit: Open Pit 28’ x 19’ x 9’ depth (174 CY)
SGS-53	CEI-125 – Reladling Track Scale Pit: Open Pit 49’ x 28’ x 2.3’ depth (117 CY)
SGS-54	CEI-129 – Freight Elevator Pit: Open Pit 20’ x 19’ x 9.5’ depth (131 CY)
	CEI-130 – Passenger Elevator Pit: Open Pit 9’ x 10’ x 5.5’ (19 CY)
SGS-55	CEI-115 – Track Hopper Conveyor Tunnel: Sloping open pit with open end to surface 62’ x 8’ x 7.5’ depth (137 CY)
SGS-56	CEI-117 - Track Yard Scale Pit: Open Pit 40’ x 11’ x 9.3’ (147 CY)
Other	CEI-124 – Stack #1 Sump Pit: Open Pit 5.5’ x 4’ x 2.5’ depth (4 CY)

Open Pits (Deeper Pits)

SGS-52	CEI-128 – Emergency Reladling Pit: Open Pit 20’ x 24’ x 17’ depth (303 CY)
SGS-53	CEI-126 – Reladling Pit: Open Pit 39’ x 25’ x 26’ depth (926 CY)
SGS-55	CEI-116 – Track Hopper Pit: Open Pit 27’ x 19’ x 18’ Depth (344 CY)

Demolition:

1. Make 1 hole in bottom slab (approx.. 4’ x 4’) in bottom slab near center for each open pit having a depth less than 10 feet. Hole in slab is not needed for the Track Hopper Conveyor Tunnel, since it slopes down and connects to the Track Hopper Pit.
2. The very small Stack #1 Sump Pit should be completely demolished and removed rather than backfilled.
3. The deeper pits will not have hole made in bottom slab (too deep and confined for hoe-ram to access).
4. Demolition where required to make in notch in sidewall of subgrade structure for equipment access by constructing ramp from outside the subgrade structure. The notch in the sidewall should be made sufficiently wide for equipment access and to sufficient depth for equipment to spread and compact the backfill (see “Backfilling”).
5. Perform any additional demolition for obstructions inside the pits that will interfere with the placement and compaction of the backfill.

Dewatering:

1. Dewater pits to allow for demolition of holes in bottom slab in the shallow pits, any additional demolition that is required, and for placement and compaction of the backfill.

Backfilling:

Open Pits (Less than 10’ Deep)

1. Place #57 Slag Aggregate in holes made in bottom slab.
2. Place 12” of #57 Slag Aggregate over complete area of bottom slab
3. Place 12” filter course over #57 Aggregate. Use either #8 slag aggregate (spread and uncompacted) or CR-6 Slag Aggregate (compacted to 95% of Modified Proctor max. dry density).
4. Place and compact Conventional Backfill in 8” layers to final grade. Except for the top 12”, the Conventional Backfill could consist of either Select Granular Backfill (Slag Tailings) or Miscellaneous Backfill (Back River Stockpiles). Compact to 95% of Modified Proctor max. dry density.
5. Top 12” should consist of Select Granular Backfill (Slag Tailings) compacted to 95 percent.
6. Backfill ramp areas outside pits using and same backfill materials and methods used for inside the pits.

Open Pits (Deeper Pits)

1. Place #3 Slag Aggregate in the pits to a depth of 10 feet below the surface grade. Place the aggregate by dumping from a bucket of an excavator.
2. Access equipment into the pit to spread and level the surface of the #3 Aggregate.
3. Place 12” of #57 Slag Aggregate over the #3 Slag Aggregate.
4. Place 12” filter course over #57 Aggregate. Use either #8 slag aggregate (spread and uncompacted) or CR-6 Slag Aggregate (compacted to 95% of Modified Proctor max. dry density).
5. Place and compact Conventional Backfill in 8” layers to final grade. Except for the top 12”, the Conventional Backfill could consist of either Select Granular Backfill (Slag Tailings) or Miscellaneous Backfill (Back River Stockpiles). Compact to 95% of Modified Proctor max. dry density.
6. Top 12” should consist of Select Granular Backfill (Slag Tailings) compacted to 95 percent.
7. Backfill ramp areas outside pits using and same backfill materials and methods used for inside the pits.

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 1

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-54) DATE: 3/21/2016

WORK SHIFT: FROM: 8:15 am TO: 2:45 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:45 and met Brandon and Contractor at office. Had brief meeting to review the backfill plan for the subgrade structures within the 20 acre RoRo Automotive Yard.
- The contractor to start working on the Elevator Pits (SGS-54). There is one 20'x 20' x 10' deep pit and one 10.5' x 9.5' x 5.5' deep pit.
- A 4' x 4' hole was made in the bottom of the larger pit. There was rebar protruding into the hole that was cut off.
- MCM made similar hole in floor of small pit. The protruding rebar was removed.
- The holes in the floors were filled with #57 Blast Furnace Slag aggregate. The #57 slag was then spread over the floor of the larger pit (24" thickness) and the smaller pit (12" thickness).
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 2

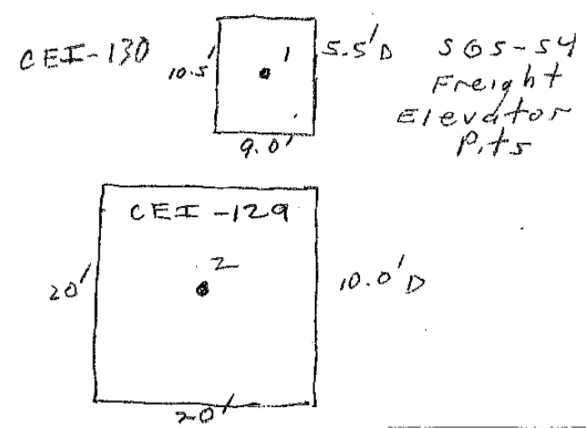
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-54) DATE: 3/22/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 50° 12 P.M. 60° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:30 for backfill inspection of Subgrade Structures within the 20 acre RoRo Automotive Yard. The Contractor is in the process of backfilling the 2 elevator pits of SGS-54.
- The groundwater had risen in the 10' deep pit overnight to 7' below ground level. To get the fill above the mater so that conventional backfill could be placed and compacted, an additional 1 foot layer of open graded #8 slag aggregate was placed over the #57 stone layer.
- An attempt was made to use the Back River stockpiles (Clayey Sand) to backfill the pits. The soil was too moist and could not achieve compaction. The first lift was removed from the smaller pit. Slag Tailings will be used as material is drier and moisture is not a problem.
- Slag aggregate (BOF Steel Slag) tailings were used to backfill the remaining depth of both elevator pits. Compaction testing of the conventional backfill was performed as the pits were backfilled. See attached compaction test results. Backfill was placed in approx. 8" lifts and each lift was compacted. At minimum, density testing was performed on every other lift.
- MCM also did minor backfilling of 2 shallow pits at SGS-52, which is the Emergency Reladling Track Scale Pit and the Emergency Reladling Pit. Two 2' x 2' x 2' deep depressions at the east end were backfilled with compacted Slag Tailings.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-54) (Elevator Pits CEI-129 & CEI-130) DATE: 3/22/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148 MOISTURE: 604

TEST NO		1-A	1-B	1-C	2-A	2-B	2-C	2-D	2-E
LOCATION OR STATION	Small Pit CEI-130	→			Large Pit CEI-129	→			
OFFSET									
ELEVATION	-3.0	-2.3	-0.8	Grade	-5.3	-4.5	-3.8	-2.0	Grade
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	6"
DENSITY COUNT	1397	872	859	837	770	832	758	829	824
WET DENSITY PCF	130.4	151.6	152.3	153.5	157.1	153.7	157.8	153.9	154.1
MOISTURE COUNT	216	152	138	133	14	149	149	143	146
MOISTURE CONTENT %	18.1	9.8	8.6	8.1	8.7	9.4	9.1	8.9	9.1
DRY DENSITY PCF	110.5	138.1	140.3	142.0	144.6	140.5	144.6	141.3	141.3
MAX DRY DENSITY PCF	123.2	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	89.7 Fail	95.3 Pass	96.7 Pass	97.9 Pass	99.7 Pass	96.9 Pass	99.8 Pass	97.5 Pass	97.4 Pass

REMARKS: First test in small pit was made using Back River stockpiles. The soil was too moist and pumped. It was decided to remove the first lift and use the Steel Slag tailings to backfill both pits.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 3

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52) DATE: 3/23/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:30 for backfill inspection of Subgrade Structures within the 20 acre RoRo Automotive Yard. The Contractor will begin work on backfilling the Emergency Reladling Pit and the Emergency Reladling Track Scale Pit of SGS-52.
- The Emergency Reladling Pits is approximately 20 feet deep. No hole was made in bottom slab. The pit is too deep and confined for spreading in lifts and compacting with roller. It will be filled with open graded #3 Slag to a depth of 10' below the surface, then 2' of #57 slag, topped by 1 foot of #8 slag. The open graded slag will be placed in layers without compaction. The remaining depth will be backfilled with Steel Slag Tailings placed in lifts and compacted.
- The Emergency Reladling Track Scale has 2 pits that are 9 feet deep. A 4' x 4' hole was made in the bottom of the each pit. The holes were filled with #57 Slag, which was then placed over the bottom to a depth of 7.5 feet below the surface. A layer of #8 slag was then placed to a depth of 6.5 feet. The backfilling will be completed using the Slag tailings placed in lifts and compacted.
- Compaction testing was performed for all of the Slag Tailings backfill. See Nuclear Density Test Sheet attached. Backfill was placed in approx.. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- All of the pits of SGS-52 were backfilled.
- The contractor began work on the SGS-53 Reladling Pit. This pit is 26 feet deep. Open graded slag will be used for the initial backfill because the pit is too deep and confined for spreading in lifts and compacting with roller. The #3 Slag was in short supply, so #57 slag will be used to a depth of 10 feet below the surface. This work will be started tomorrow.
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

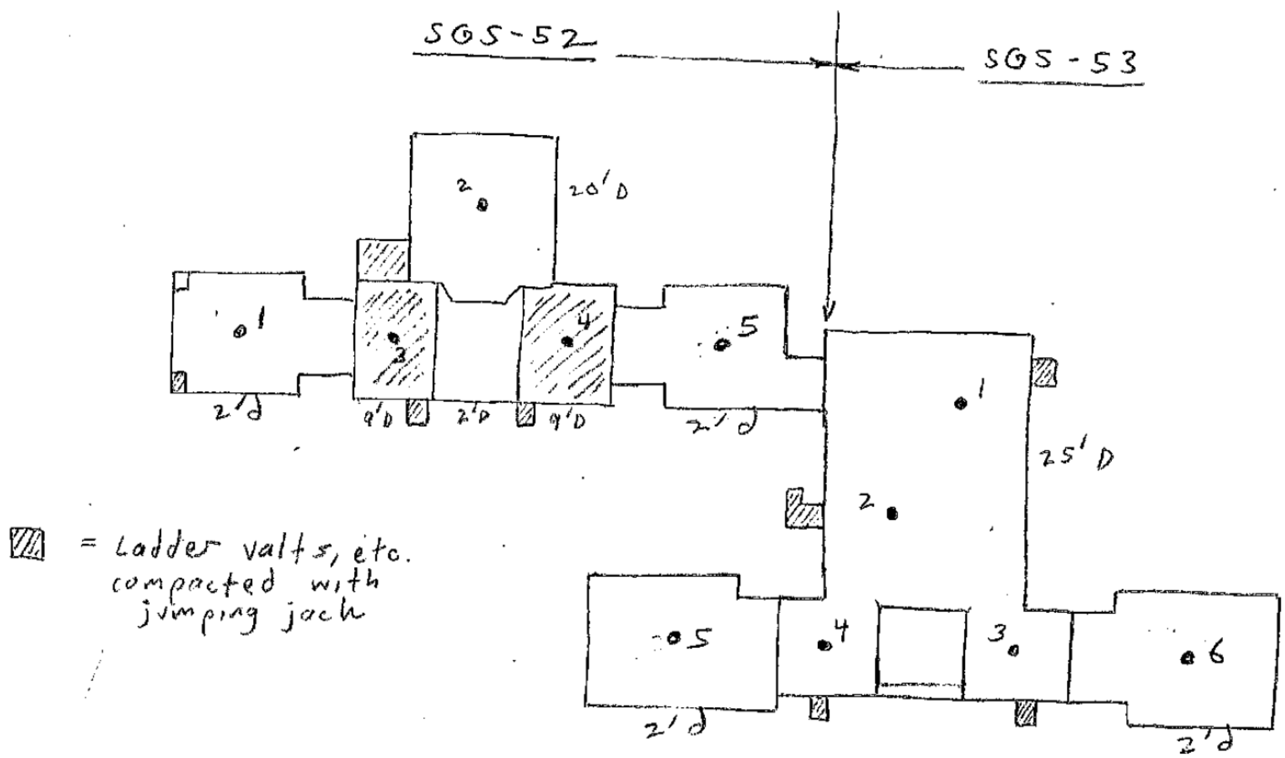
DAILY REPORT

PROJECT:	Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52)	REPORT NO:	3
		DATE:	3/23/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	1	2-A	2-B	2-C	2-E	2-F	2-G		
LOCATION OR STATION	SGS-52 CEI-127	(See Sketch) CEI-128	→	→	→	→	→	→	→
OFFSET									
ELEVATION	-1.0	-5.3	-4.5	-3.7	-3.0	-1.5	Grade		
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"		
DENSITY COUNT	530	823	636	647	604	626	626		
WET DENSITY PCF	151.7	154.2	165.4	164.8	167.6	166.2	166.2		
MOISTURE COUNT	141	136	179	144	198	164	168		
MOISTURE CONTENT %	8.9	8.3	10.9	8.3	12.1	9.7	10.0		
DRY DENSITY PCF	139.4	142.4	149.2	152.2	149.5	151.5	151.1		
MAX DRY DENSITY PCF	145.0	145.0	150.0	150.0	150.0	150.0	150.0		
OPT MOISTURE CONT. %	11.6	9.5	9.0	9.0	9.0	9.0	9.0		
% COMPACTION REQ'D	95	95	95	95	95	95	95		
% COMPACTION OBTAINED	96.1 Pass	98.2 Pass	99.5 Pass	101.5 Pass	99.7 Pass	101.0 Pass	100.7 Pass		

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	3-A	3-B	3-C	3-D	3-E	4-A	4-B	4-C	4-D
LOCATION OR STATION	SGS-52 CEI-128	(See Sketch)	→	→	→	→	→	→	→
OFFSET									
ELEVATION	-5.5	-4.7	-3.2	-1.7	Grade	-5.5	-4.7	-3.2	-1.7
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	8"	6"
DENSITY COUNT	584	632	604	574	732	591	565	376	618
WET DENSITY PCF	169.3	165.8	167.7	169.9	159.6	168.7	170.7	165.0	166.7
MOISTURE COUNT	103	149	178	180	134	168	164	171	178
MOISTURE CONTENT %	9.4	8.6	10.6	10.6	7.8	9.8	9.4	10.3	10.7
DRY DENSITY PCF	154.7	152.7	151.6	153.6	148.0	153.6	156.0	149.6	150.6
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	103.1 Pass	101.8 Pass	101.1 Pass	102.4 Pass	98.7 Pass	102.4 Pass	104.0 Pass	99.7 Pass	100.4 Pass

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit) DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148 MOISTURE: 604

TEST NO	4-E		5						
LOCATION OR STATION	SGS-52 CEI-128		SGS-52 CEI-127						
OFFSET									
ELEVATION	Grade		Grade						
SOURCE DEPTH	6"		6"						
DENSITY COUNT	751		694						
WET DENSITY PCF	158.5		162.1						
MOISTURE COUNT	128		165						
MOISTURE CONTENT %	7.5		9.5						
DRY DENSITY PCF	147.5		148.0						
MAX DRY DENSITY PCF	150.0		150.0						
OPT MOISTURE CONT. %	9.5		9.0						
% COMPACTION REQ'D	95		95						
% COMPACTION OBTAINED	98.3 Pass		98.7 Pass						

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 4

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-53) DATE: 3/24/2016

WORK SHIFT: FROM: 8:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 57° 12 P.M. 72° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor is working on backfilling SGS-53 Reladling Pit (CEI-126) and Reladling Pit Track Scale (CEI-125)
- #57 Slag aggregate was used to fill the 22 foot deep pit to 10 feet below the surface. The surface of the stone was tamped with the bucket of the excavator. A layer (1.5 ft. thick) of #8 Slag Aggregate was placed on the #57 stone as a filter course.
- Steel Slag tailings will be used as compacted backfill from -8.5 feet to the surface. A Ramex drum roller was used to compact the backfill within the pit. There are some small ladder vaults that are too small for the drum roller where the lifts were compacted using a jumping jack.
- Compaction testing was performed on the slag tailings using a nuclear moisture-density gauge (see sheets attached). Backfill was placed in approx. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- MCM also began placement of the open graded backfill material in the Scrubber Tank System (CEI-212) beginning with the east section. Both sides are 16.5 feet deep as measured from the north wall. The east section received #3 slag backfill from -16.5 to -14.5 feet below grade, #57 slag from -14.5' to -11.0', and #8 slag from -11.0' to -10.0' below grade.
- No other work performed today.
- MCM is not working tomorrow – Good Friday.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

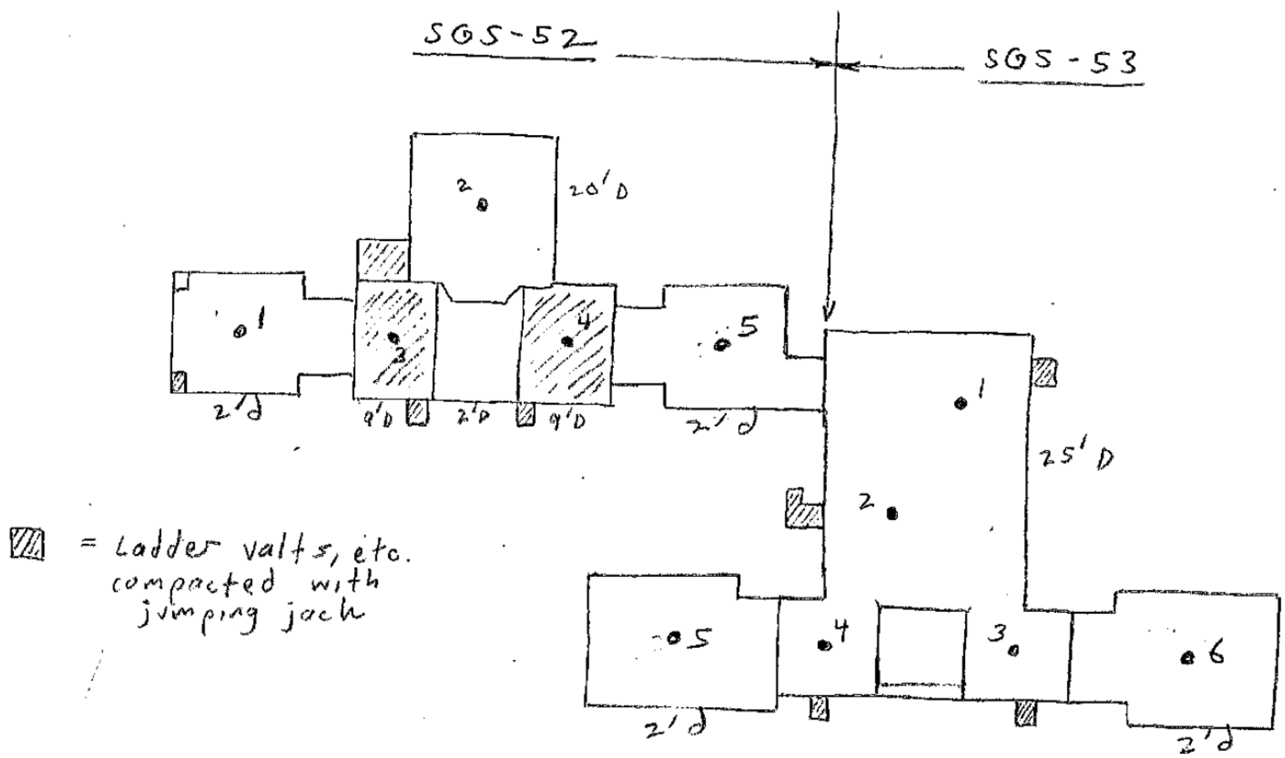
REPORT NO: 4

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52)   DATE: 3/24/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-53) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/24/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	1-A	1-B	1-C	1-D	2-A	2-B	2-C	2-D	3-A
LOCATION OR STATION	SGS-53 CEI-126	(See Sketch)	→	→	→	→	→	→	→
OFFSET									
ELEVATION	-7.3	-4.3	-1.3	Grade	-7.3	-4.3	-1.3	Grade	-6.0
SOURCE DEPTH	6"	6"	8"	8"	6"	6"	8"	8"	6"
DENSITY COUNT	876	791	462	517	839	768	473	563	876
WET DENSITY PCF	151.4	156.0	157.1	153.0	153.4	157.2	156.2	149.6	151.4
MOISTURE COUNT	156	141	148	132	133	147	147	128	156
MOISTURE CONTENT %	10.1	8.6	9.1	8.1	8.1	9.0	9.1	7.9	10.1
DRY DENSITY PCF	137.5	143.6	144.0	141.5	141.8	144.3	143.2	138.6	137.5
MAX DRY DENSITY PCF	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	11.6
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	94.8 Pass	99.0 Pass	99.3 Pass	97.6 Pass	97.8 Pass	99.5 Pass	98.7 Pass	95.6 Pass	94.8 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-53) (Reladling Pit CEI-126 & Track Scale CEI-125)

DATE: 3/24/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	3-B	3-C	3-D	4-A	4-B	4-C	4-D	5	6
LOCATION OR STATION	SGS-53 CEI-126	(See Sketch)	→	→	→	→	→	SGS-53 CEI-125	See Sketch
OFFSET	Reladling Pit							Track Scale	
ELEVATION	-3.3	-1.8	Grade	-6.0	-3.3	-1.8	Grade	-0.8	-0.8
SOURCE DEPTH	6"	8"	6"	6"	6"	8"	6"	6"	6"
DENSITY COUNT	791	462	869	839	768	473	938	802	836
WET DENSITY PCF	156.0	157.1	152.0	153.4	157.2	156.2	148.7	155.4	153.5
MOISTURE COUNT	141	148	130	133	147	147	124	144	143
MOISTURE CONTENT %	8.6	9.1	8.0	8.1	9.0	9.1	7.7	8.9	8.8
DRY DENSITY PCF	143.6	144.0	140.8	141.8	144.3	143.2	138.1	142.7	141.1
MAX DRY DENSITY PCF	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	99.0 Pass	99.3 Pass	97.1 Pass	97.8 Pass	99.5 Pass	97.0 Pass	95.2 Pass	98.4 Pass	97.3 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 5

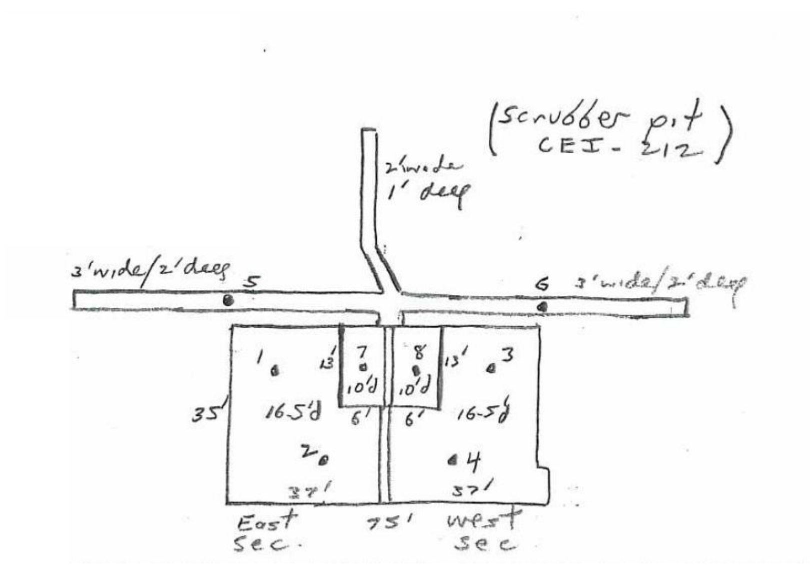
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56) DATE: 3/28/2016

WORK SHIFT: FROM: 8:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: 5:30 pm TO: 6:30 pm TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor is working on backfilling SGS-56 Scrubber Pit (CEI-212) with the steel slag tailings starting at the east end.
- Open graded slag was placed in the west section as follows: #3 slag from -16.5’ to -12.0’, #57 slag from -12.0’ to -9.5’, and #8 slag from -9.5’ to -8.5’. The compacted tailings will be placed from -8.5’ to grade.
- Ran one-point proctor test on material where the percent compaction was above 100 percent. The one point indicated a dry density of 149.8 pcf, which is the same as the most recent Proctor test done in the lab.
- Compaction testing of the slag tailings was performed using a nuclear density gauge (see test sheet attached). Backfill was placed in approx. 8” lifts and each lift was compacted. Density testing was performed on every other lift.
- MCM also began clean-up of the Hopper Pit and Tunnel (SGS-55) and started placement of the #3 Slag.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)

DATE: 3/28/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148

MOISTURE: 600

TEST NO	1-A	1-B	1-B(1)	1-C	1-D	2-A	2-B	2-C	2-D
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch)	→						
OFFSET	East Side (South)	→				East Side (North)	→		
ELEVATION	-9.0	-7.0	-7.0	-5.5	-3.8	-9.0	-7.0	-5.5	-3.8
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	6"
DENSITY COUNT	751	970	873	657	713	900	872	579	750
WET DENSITY PCF	158.2	145.4	151.5	163.9	160.5	150.3	152.6	159.6	158.2
MOISTURE COUNT	145	136	146	160	133	136	135	148	135
MOISTURE CONTENT %	8.8	9.8	10.0	11.1	9.0	8.6	9.7	9.9	9.3
DRY DENSITY PCF	145.5	132.5	137.7	147.6	147.2	138.4	139.1	145.5	144.7
MAX DRY DENSITY PCF	145.0	145.0	145.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	100.3 Pass	91.4 Fail	95.0 Pass	98.4 Pass	98.1 Pass	95.5 Pass	95.9 Pass	97.0 Pass	96.5 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212) DATE: 3/28/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	3-A	3-B	3-C	3-D	4-A	4-B	4-C	4-D	
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch)							
OFFSET	West Side (South)				West Side (North)				
ELEVATION	-7.5	-6.0	-4.5	-1.5	-7.5	-6.0	-4.5	-1.5	
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	
DENSITY COUNT	757	609	597	687	573	645	691	692	
WET DENSITY PCF	157.8	167.4	168.1	162.5	170.0	164.8	161.7	161.6	
MOISTURE COUNT	145	157	168	138	155	100	161	140	
MOISTURE CONTENT %	10.2	10.8	11.5	8.2	10.2	11.0	11.3	8.3	
DRY DENSITY PCF	143.1	151.1	150.9	150.2	154.2	148.4	145.2	149.2	
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	
% COMPACTION OBTAINED	95.4 Pass	100.7 Fail	100.6 Pass	100.0 Pass	102.8 Pass	98.9 Pass	96.8 Pass	99.5 Pass	

REMARKS: Ran one-point on test 3-C sample - result matched Sample #2 Proctor.
Contractor filled only up to -1.0 fet below the higher west wall.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 6

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56) DATE: 3/29/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor completed the backfill of the two large sections of the Scrubber Pit (CEI-212) to -1.0 feet below the top of the North Wall. Started backfilling the 2 smaller pits on the south side of yje main scrubber pit.
- Waterway trenches just outside the south wall were also cleaned out of all rubble and debris.
- Small pit dimensions are 13' x 6' x 10' deep.
- Making holes in the bottom slab for each were attempted, but the slab was too thick to break through. Placed #57 Slag to -8.5' and #8 slag from -8.5' to -7.5'.
- The trenched on the south side were backfilled with compacted steel slag tailings (see attached test sheet). Backfill was placed in approx. 8" lifts and each lift compacted.
- MCM also continued placement of open graded slag aggregate in the SGS-55 Hopper Pit and Ramp, which received #3 slag from -28' to -11.5', #57 slag from -11.5' to -10', and #8 slag from -10.0' to -9.1'.
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212) DATE: 3/29/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-E	2-E		5	6				
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch)		3' Trench	3' Trench				
OFFSET	East Side (South)	East Side (North)		East Side	West Side				
ELEVATION	-1.5	-1.5		-1.0	-1.0				
SOURCE DEPTH	6"	6"		6"	6"				
DENSITY COUNT	587	655		729	756				
WET DENSITY PCF	168.8	165.2		159.4	157.7				
MOISTURE COUNT	175	158		149	148				
MOISTURE CONTENT %	12.0	10.5		10.5	10.2				
DRY DENSITY PCF	150.8	149.5		144.3	143.1				
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0				
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0				
% COMPACTION REQ'D	95	95		95	95				
% COMPACTION OBTAINED	100.5 Pass	99.7 Pass		99.5 Pass	98.7 Pass				

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)   DATE: 3/29/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148   MOISTURE: 600

TEST NO	7-A	7-B	7-C	8-A	8-B	8-C			
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch) →		3' Trench	3' Trench				
OFFSET	Small Tank (East)	→		Small Tank (west)	→				
ELEVATION	-4.5	-3.0	-1.0	-4.5	-3.0	-1.0			
SOURCE DEPTH	6"	6"	6"	6"	6"	6"			
DENSITY COUNT	654	748	749	598	738	771			
WET DENSITY PCF	164.2	158.4	158.1	168.1	158.9	156.8			
MOISTURE COUNT	156	133	141	165	148	138			
MOISTURE CONTENT %	10.7	9.2	8.6	11.2	10.4	8.4			
DRY DENSITY PCF	148.3	145.1	145.6	151.1	143.9	144.7			
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0			
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0			
% COMPACTION REQ'D	95	95	95	95	95	95			
% COMPACTION OBTAINED	102.0 Pass	100.1 Pass	97.1 Pass	100.7 Pass	95.9 Pass	96.5 Pass			

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 7

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-55)

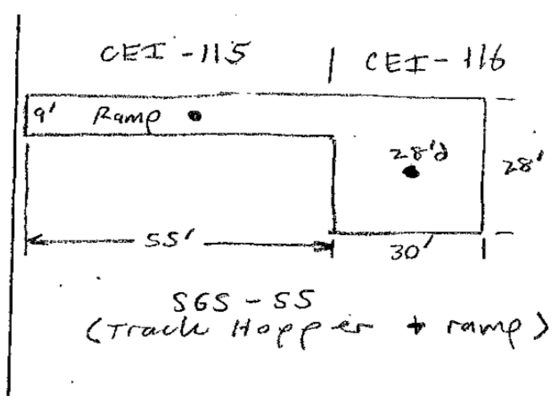
DATE: 3/30/2016

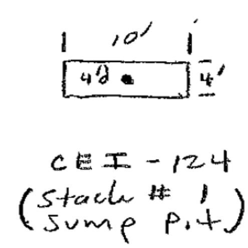
WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM started and completed backfill on the Hopper Pit and Ramp (SGS-55) using the compacted Slag tailings.
- Also worked on preparing an electrical vault not shown on the plans.
- Noted that CEI-117 Track Yard Scale Pit that is shown on plans is no longer present.
- Another small vault (4' x 4' x 4' deep) was noted just south of the electrical vault.
- After discussion with Mike Cerri (environmental), permission was given to backfill the 2 small vaults.
- The electrical vault received #57 slag from -11.5' to -9.5' and #8 Slag from -9.5' to -8.5'. The small pit had #57 slag from -4.0 to -3.0' (No hole made in bottom) due to small size.
- Compaction testing performed on the Slag Tailings backfill (see attached test sheets). Backfill was placed in approx.. 8" layers and each lift compacted. Density testing was performed on every other lift.
- No other work performed today.





COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 7

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-55)

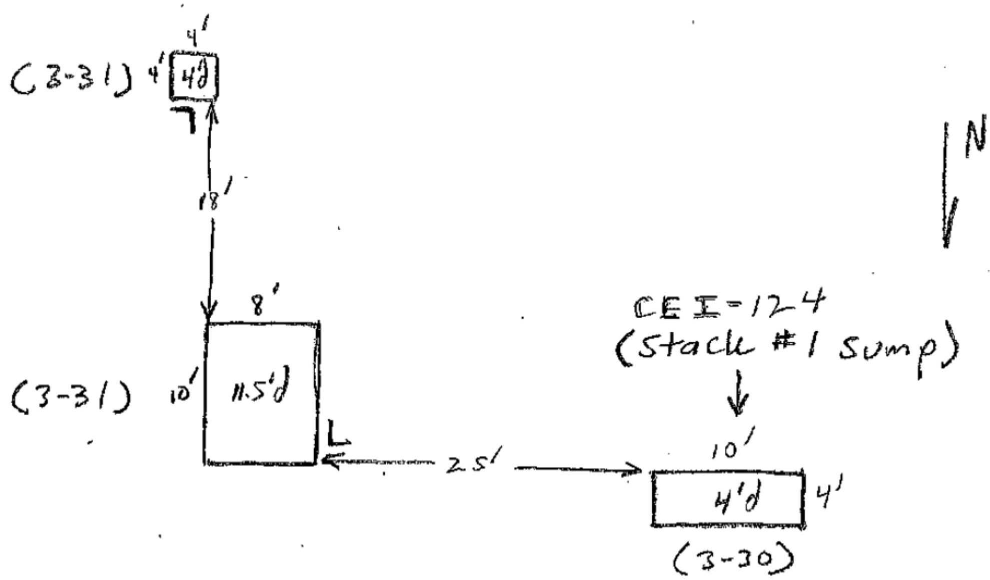
DATE: 3/30/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

Location of Electric vault pit and 4'x4'x4' pit relative to CEI-124 & Backfilled (3-30/31-16)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212) DATE: 3/30/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-A	1-B	1-C	1-D	1-E	1-F			
LOCATION OR STATION	SGS-55 CEI-116	(See Sketch)	→	→	→	→			
OFFSET									
ELEVATION	-7.2	-5.8	-4.5	-3.0	-1.5	Grade			
SOURCE DEPTH	6"	6"	6"	6"	6"	6"			
DENSITY COUNT	665	679	704	786	726	719			
WET DENSITY PCF	163.4	162.6	160.9	156.1	159.7	160.3			
MOISTURE COUNT	171	148	158	134	139	149			
MOISTURE CONTENT %	12.1	10.2	11.1	9.5	9.6	8.9			
DRY DENSITY PCF	145.7	147.6	144.8	142.6	145.7	147.2			
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0			
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0			
% COMPACTION REQ'D	95	95	95	95	95	95			
% COMPACTION OBTAINED	97.1 Pass	98.4 Pass	96.5 Pass	95.1 Pass	97.1 Pass	98.1 Pass			

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)   DATE: 3/30/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148   MOISTURE: 600

TEST NO	2-A	2-B	2-C	2-D	2-F				
LOCATION OR STATION	Ramp CEI-115	(See Sketch)	→	→	→				
OFFSET									
ELEVATION	-6.0	-4.5	-2.5	-1.3	Grade				
SOURCE DEPTH	6"	6"	6"	6"	6"				
DENSITY COUNT	602	692	754	733	701				
WET DENSITY PCF	163.6	161.7	157.9	159.2	161.5				
MOISTURE COUNT	157	149	152	155	133				
MOISTURE CONTENT %	10.1	10.3	10.9	10.8	7.7				
DRY DENSITY PCF	147.6	146.6	142.5	143.7	150.0				
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0				
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0				
% COMPACTION REQ'D	95	95	95	95	95				
% COMPACTION OBTAINED	98.4 Pass	97.7 Pass	95.0 Pass	95.8 Pass	100.0 Pass				

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 8

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56)

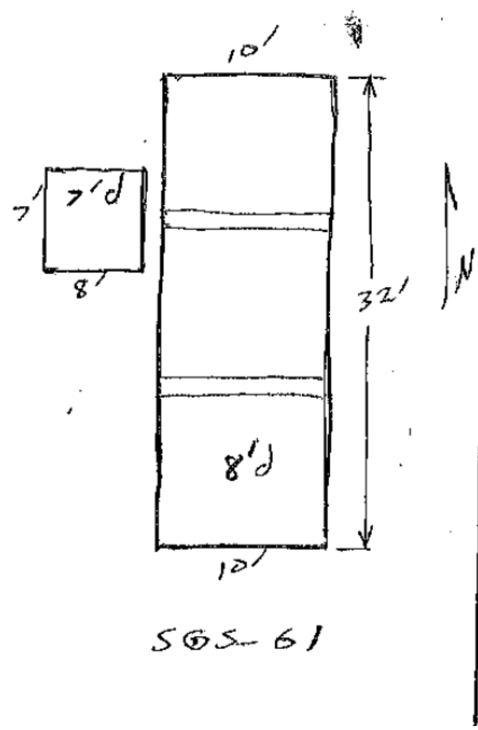
DATE: 3/31/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 62° 12 P.M. 70° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM backfilled the CEI-124 Stack #1 Sump Pit, Electrical Vault and small pit with the compacted Slag tailings.
- Compaction testing was performed using a nuclear gauge (see attached test sheet). Backfill was placed in approx. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- MCM began clean-out of SGS-61 located at or beyond the eastern boundary of the 20 acre parcel. Groundwater entered the pit to -6.5 feet below grade. Due to the presence of groundwater, #3 Slag was placed to -6.0', and #57 Slag from-6.0' to -5.0'. 1 foot of CR-6 was placed and compacted as a substitute filter layer for the #8 Slag. No backfilling today with the slag tailings.
- No other work performed today.



COMMENTS:

INSPECTOR: Chris Jacobs

CENTURY CONTRACT NO: 151117.00

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (CEI 124 Sump Pit and Vaults) DATE: 3/31/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-A	1-B							
LOCATION OR STATION	SGS-56 CEI-124	(See Sketch)		Electric Vault	→	→	4'x4'x4' Pit	→	
OFFSET									
ELEVATION	-1.5'	Grade		-5.0	-3.5	-1.7	-2.0	Grade	
SOURCE DEPTH	6"	6"		8"	6"	6"	6"	6"	
DENSITY COUNT	626	592		446	761	680	778	567	
WET DENSITY PCF	166.7	164.6		158.2	157.3	162.3	156.4	165.5	
MOISTURE COUNT	169	163		141	156	151	142	162	
MOISTURE CONTENT %	11.5	11.3		8.5	9.8	9.1	8.7	10.8	
DRY DENSITY PCF	149.5	147.9		145.8	143.3	148.8	143.8	149.4	
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0	150.0	150.0	150.0	
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0	9.0	9.0	9.0	
% COMPACTION REQ'D	95	95		95	95	95	95	95	
% COMPACTION OBTAINED	99.7 Pass	98.6 Pass		97.2 Pass	95.5 Pass	99.2 Pass	95.9 Pass	99.6 Pass	

REMARKS: Each structure had 1 density test at center

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 9

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-61) DATE: 4/1/2016

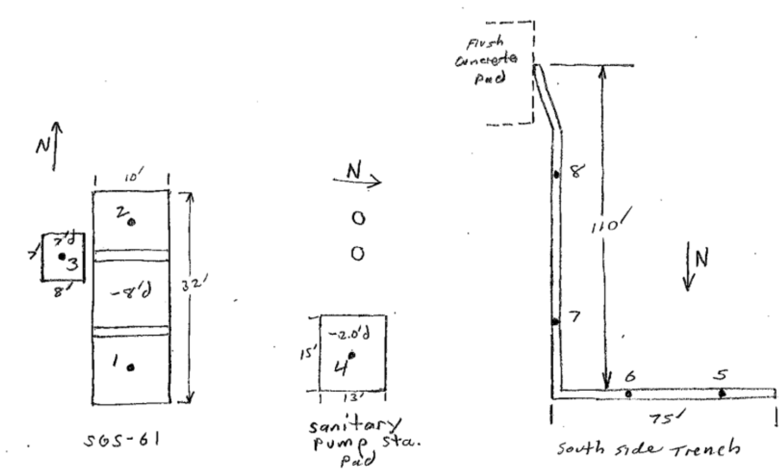
WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 58° 12 P.M. 72° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM completed the backfill of SGS-61 with the compacted Steel Slag Tailings.
- Also worked on backfilling a shallow pit at the Sanitary Sewer Pump Station. The pit is 15’ x 13’ x 2’ deep with the bottom removed to slag subgrade material. The pit was also backfilled with compacted slag tailings.
- Also backfilled a 1’ x 4’ deep concrete trench located about 200’ south of the 20 acre parcel. The 110’ long trench was cleaned out and a 75’ long section that was previously backfilled with CR-6 slag that was hard was left in place. The trench was backfilled with the steel slag tailings. Backfill was placed in approx. 8” lifts and each lift compacted. Density testing was performed on every other lift.
- No other work performed today.

structures backfilled on 4-1 8



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-61) (CEI 124 Sump Pit and Vaults) DATE: 4/1/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-A	1-B	1-C	2-A	2-B	2-C	3-A	3-B	3-C
LOCATION OR STATION	SGS-61 See Sketch	→	→	→	→	→	→	→	→
OFFSET									
ELEVATION	-3.3	-1.7	Grade	-3.3	-1.7	Grdae	-3.3	-1.7	Grade
SOURCE DEPTH	6"	6"	6"	6"	8"	6"	6"	6"	6"
DENSITY COUNT	723	647	695	686	379	722	752	684	714
WET DENSITY PCF	159.6	164.5	161.9	161.9	164.4	160.2	157.9	162.0	160.7
MOISTURE COUNT	158	154	138	149	161	131	144	185	147
MOISTURE CONTENT %	9.8	9.1	8.0	8.9	9.7	7.6	8.8	9.4	8.7
DRY DENSITY PCF	145.4	150.7	149.9	148.6	149.9	148.9	145.1	148.1	147.7
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	96.9 Pass	100.5 Pass	99.9 Pass	99.1 Pass	100.0 Pass	99.3 Pass	96.7 Pass	98.8 Pass	98.5 Pass

REMARKS: Each structure had 1 density test at center

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-61) (CEI 124 Sump Pit and Vaults) DATE: 4/1/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

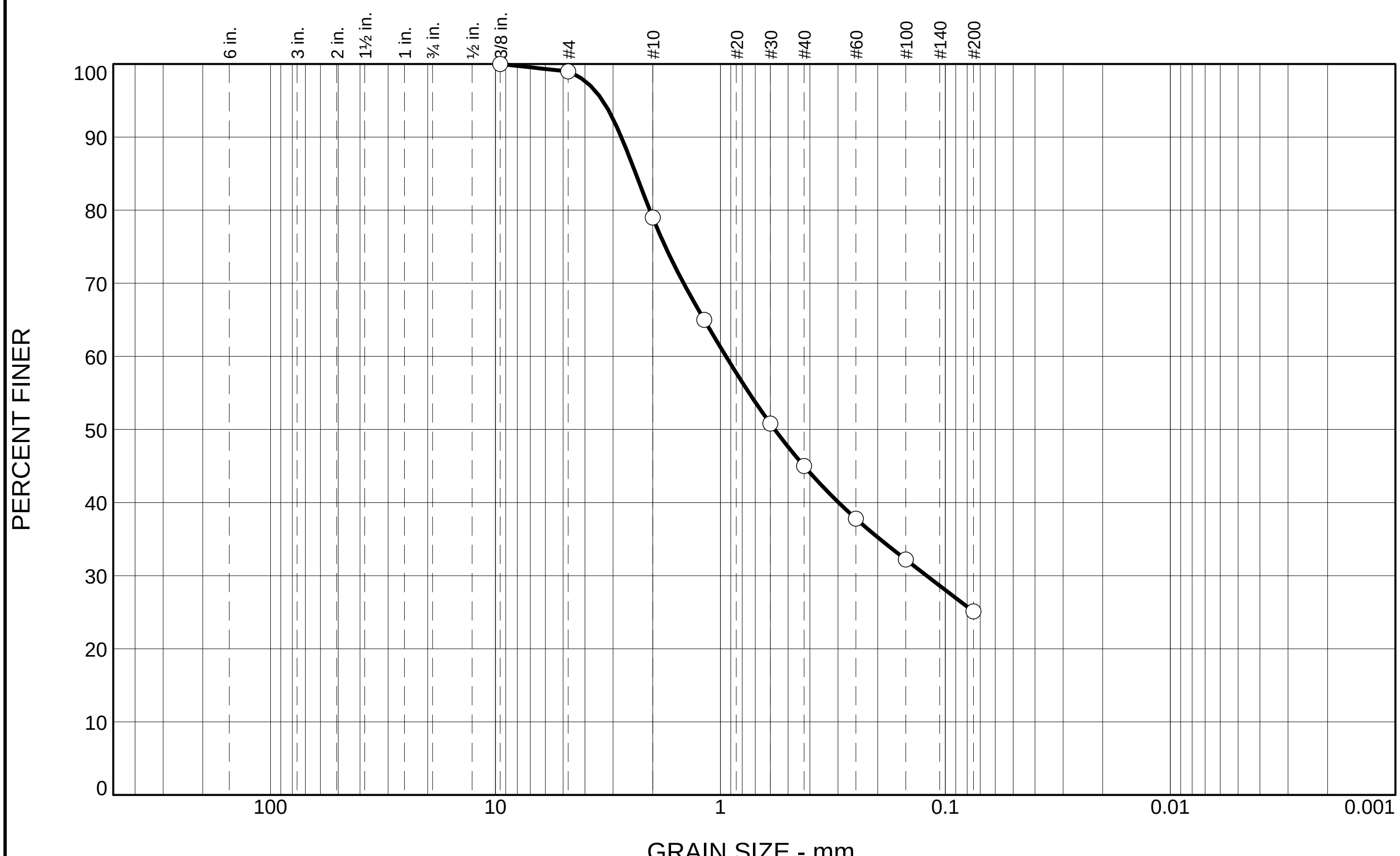
TEST NO	4-A	4-B		5	6	7-A	7-B	8-B	8-B
LOCATION OR STATION	SGS-61 See Sketch	→		1.0' Wide Trench	See Sketch	→			
OFFSET									
ELEVATION	-1.0	Grade		Grade	Grade	-2.0	Grade	-2.0 Grade	Grade
SOURCE DEPTH	10"	8"		8"	8"	8"	6"	8"	6"
DENSITY COUNT	208	355		394	445	413	711	456	726
WET DENSITY PCF	164.5	166.9		163.0	158.2	161.2	160.3	157.3	159.4
MOISTURE COUNT	183	178		156	152	149	152	142	157
MOISTURE CONTENT %	11.3	10.8		9.4	9.4	9.0	146.7	8.7	9.7
DRY DENSITY PCF	147.8	150.7		149.0	144.7	147.9		144.8	145.3
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95		95	95	95	95	95	95
% COMPACTION OBTAINED	98.5 Pass	100.4 Pass		99.3 Pass	96.4 Pass	98.6 Pass	97.8 Pass	96.5 Pass	96.9 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	20.0	34.0	19.9	25.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.0		
#10	79.0		
#16	65.0		
#30	50.8		
#40	45.0		
#60	37.8		
#100	32.2		
#200	25.1		

* (no specification provided)

Soil Description

Steel Slag Tailings (Samples 1/13/16)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 2.7578 D_{85}= 2.3788 D_{60}= 0.9443
D_{50}= 0.5742 D_{30}= 0.1212 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sampled 1/13/17 from SGS-43b backfill material

Source of Sample: Steel Slag Tailings
Sample Number: 1

Date: 1/17/16

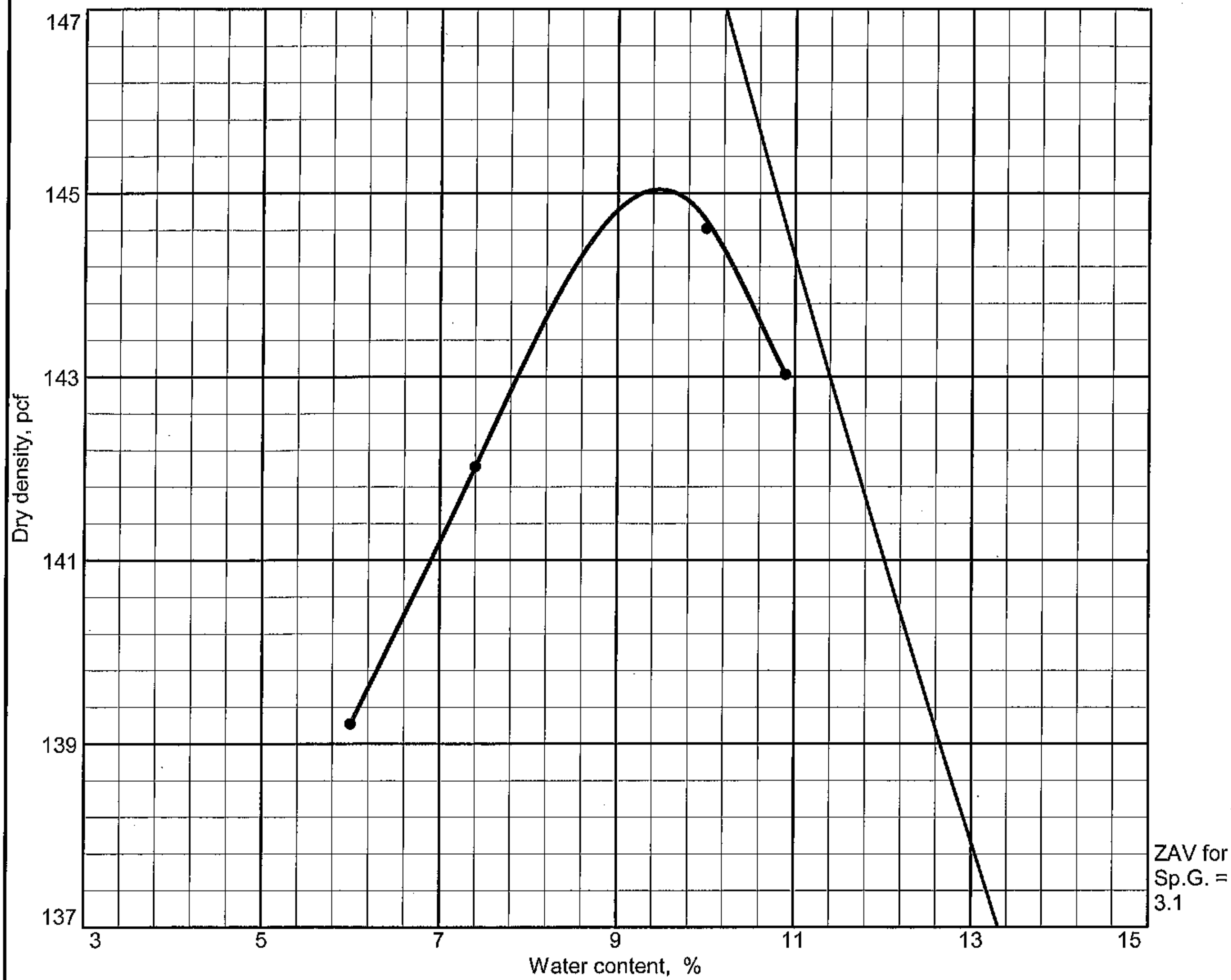
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: United Eng. **Checked By:** PAD

COMPACTION TEST REPORT



Test specification: ASTM D 1557-00 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	1.0	25.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 145.0 pcf Optimum moisture = 9.5 %	Steel Slag Tailings (Samples 1/13/16)

Project No. 151117.00 **Client:** MCM Management Corp.

Project: Sparrows Point Terminals-Subgrade Structures

● **Source:** Steel Slag Tailings **Sample No.:** 1

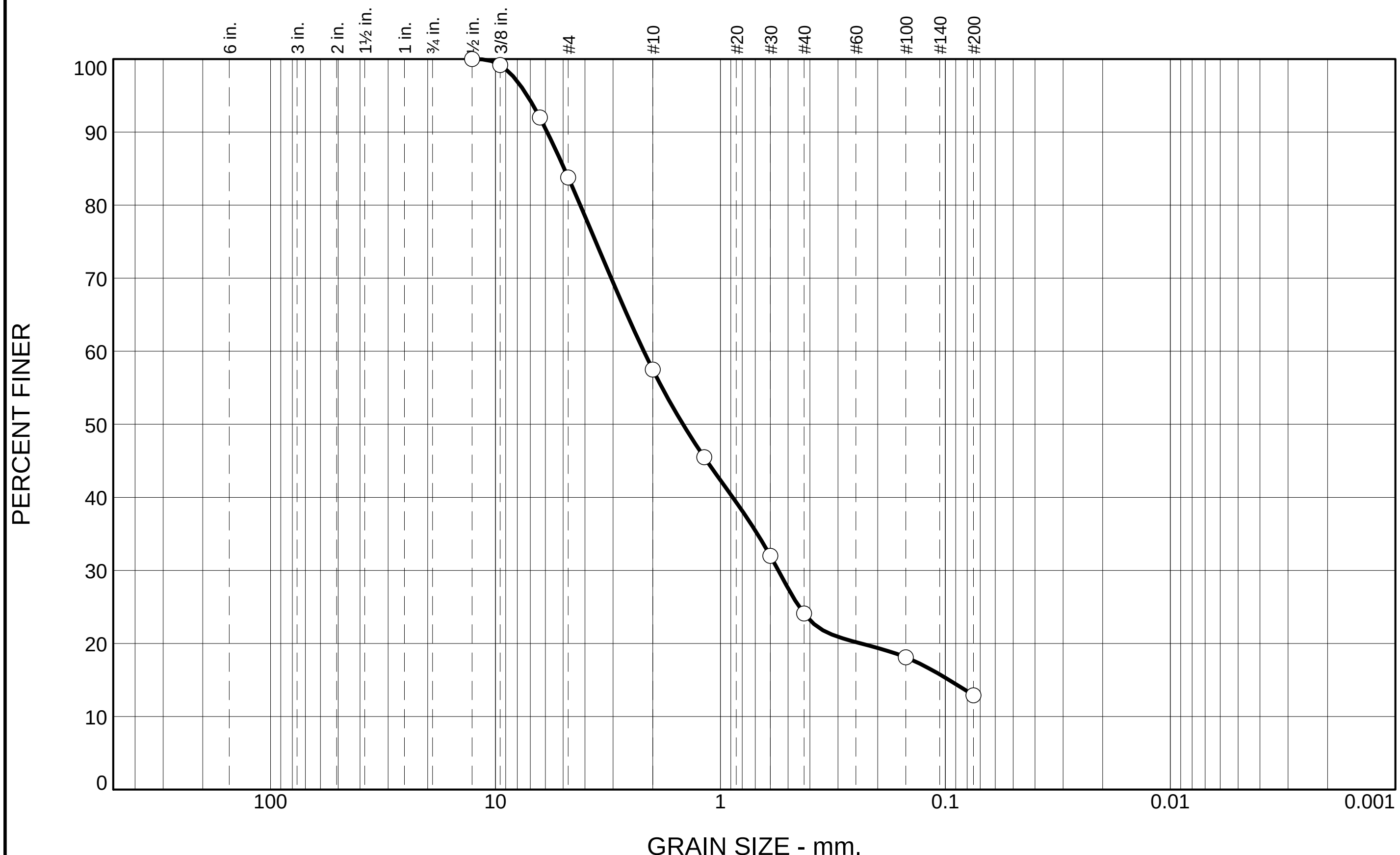
Century Engineering, Inc.

Hunt Valley, MD

Remarks:

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.2	26.3	33.4	11.2	12.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
.375	99.2		
.25	92.0		
#4	83.8		
#10	57.5		
#16	45.5		
#30	32.0		
#40	24.1		
#100	18.1		
#200	12.9		

* (no specification provided)

Soil Description

Gray Steel Slag #10 Tailings (Sampled 3/23/16)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 5.8832 D_{85}= 4.9425 D_{60}= 2.1911
D_{50}= 1.4666 D_{30}= 0.5531 D_{15}= 0.0963
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Natural Moisture =8.8%

Source of Sample: Steel Slag Tailings (SGS-52 Backfill)
Sample Number: Bag
Date: 4/5/16

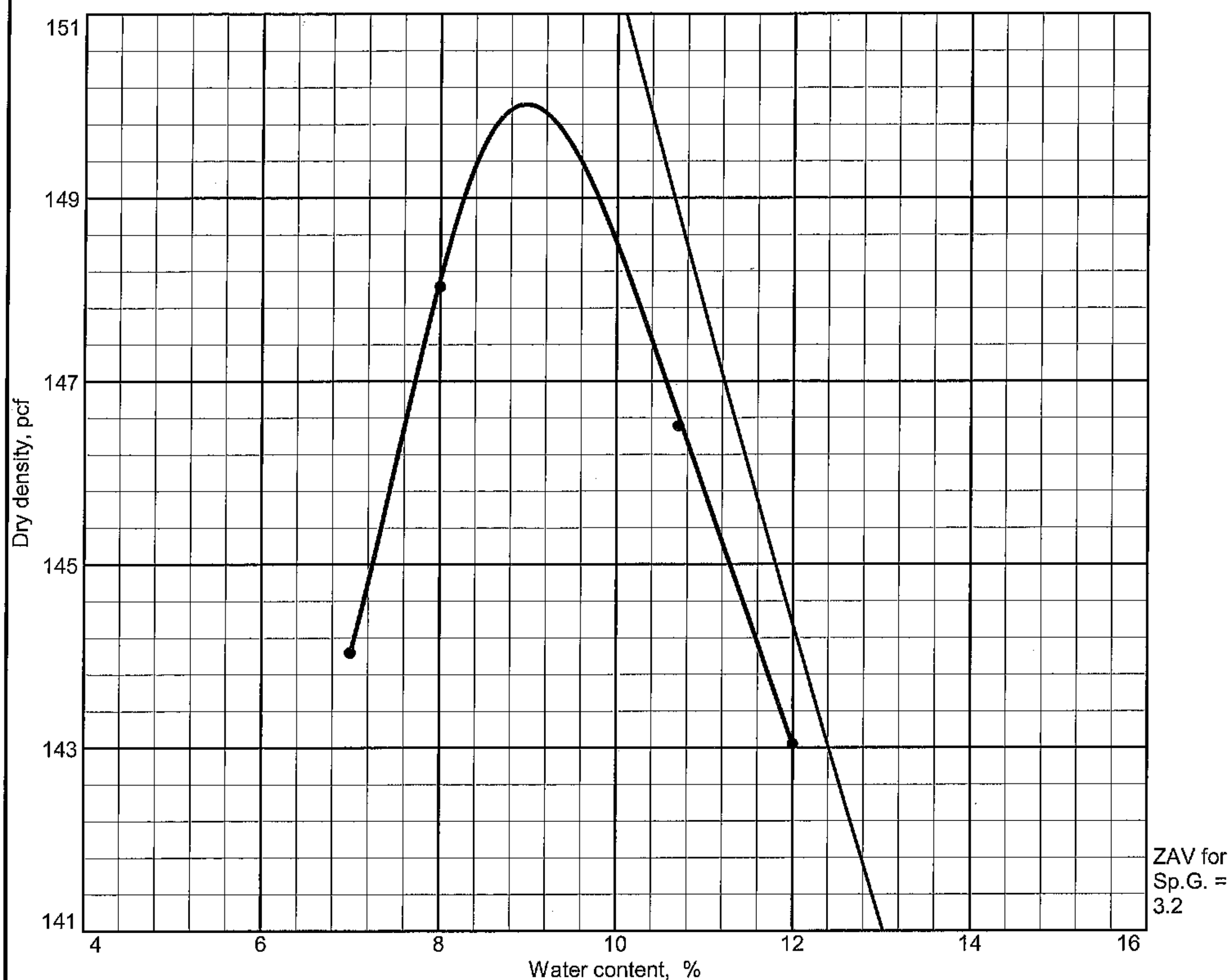
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: United **Checked By:** PAD

COMPACTION TEST REPORT



Test specification: AASHTO T 180 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	16.2	12.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 150.0 pcf Optimum moisture = 9.0 %	Gray Steel Slag #10 Tailings (Sampled 3/23/ 16)

Project No. 151117.00 **Client:** MCM Management Corp.

Project: Sparrows Point Terminals-Subgrade Structures

● **Source:** Steel Slag Tailings (SGS-52 **Sample No.:** Bag

Remarks:

Century Engineering, Inc.

Hunt Valley, MD

Figure

April 12, 2016

MCM Management Corp.
1430 Sparrows Point Blvd.
Truck Dock 341A
Sparrows Point, Maryland 21219

Attn: Mr. Brandon Bonanno
Vice President Operations

Re: Sparrows Point Facility
Backfill Certification for 20 Acre RoRo Automotive Yard
Sparrows Point, Maryland
CEI Project No. 151117.00

Dear Mr. Bonanno:

Century Engineering, Inc. has performed inspections and testing for the backfilling of the subgrade structures that are within the 20 acre RoRo (Roll-on Roll-off) Automotive Yard. The following subgrade structures were backfilled:

SGS #	Description	Approximate Dimensions
SGS-52	Emergency Reladling Track Scale Pit (CEI-127)	28’ x 19’ x 9’ deep
	Emergency Reladling Pit (CEI-128)	20’ x 24’ x 17’ deep
SGS-53	Reladling Track Scale Pit (CEI-125)	49’ x 28’ x 2.3’ deep
	Reladling Pit (CEI-126)	39’ x 25’ x 26’ deep
SGS-54	Freight Elevator Pit (CEI-129)	20’ x 19’ x 9.5’ deep
	Passenger Elevator Pit (CEI-130)	9’ x 10’ x 5.5’ deep
SGS-55	Track Hopper Conveyor Tunnel (CEI-115)	62’ x 8’ x 7.5’ deep
	Track Hopper Pit (CEI-116)	27’ x 19’ x 18’ deep
SGS-56	Track Yard Scale Pit (CEI-117)	40’ x 11’ x 9.3’
	Stack #1 Sump Pit (CEI-124)	5.5’ x 2.5’ x 7’ deep
	Scrubber Pit (CEI-212)	73’ x 35’ x 11’
SGS-61	Misc. Pits	10’ x 32’ x 8’ deep 7’ x 7’ x 8’ deep
Other	Electrical Vault	8’ x 10’ x 11.5’ deep
	Misc. Small Pit	4’ x 4’ x 4’ deep
	South Side Trench	1’ x 185’ x 4’ deep
	Sanitary Pump Station Pad	15’ x 13’ x 2’ deep

The inspections and testing were performed to verify that the backfilling was accomplished in accordance with the “Backfill Plan” described in Addendum No. 2 of the Sparrow Point Enhanced Scope of Work Document dated September 9, 2014.

The inspections and testing were performed during March 21, 2016 to April 1, 2016 and consisted of the following:

- Performing laboratory testing on the Structural Backfill materials to verify compliance with the Backfill Plan.
- Visual inspection of placement of the Miscellaneous Backfill to verify that such materials were of the proper type and were placed below the minimum depth.
- Visually inspecting the preparation and any required demolition (holes in bottom slabs) of the subgrade structures and placement of open-graded filter courses prior to the placement of the dense graded and compacted Structural Backfill.
- Inspecting the placement of the Structural Backfill and performing compaction testing using a nuclear moisture-density gauge.

Based on our inspections and testing, we certify that the backfilling of the above referenced Subgrade Structures was accomplished in a sound and professional manner and in general accordance with the requirements of the Backfill Plan.

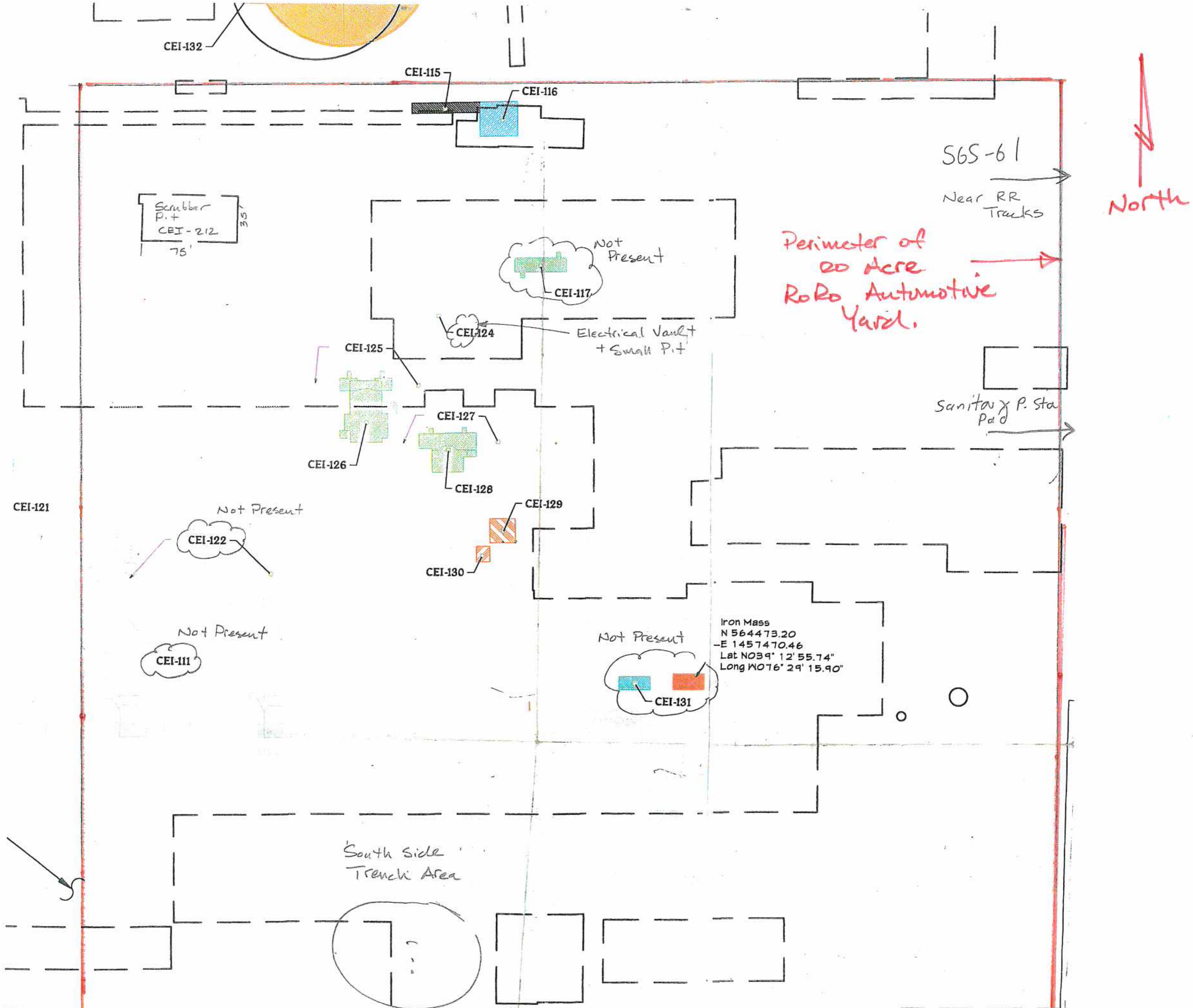
Our field inspection and lab testing reports are attached. Please contact us if you have any questions or need additional information.

Very truly yours,

CENTURY ENGINEERING, INC.

Paul A. D’Amato, P.E.
Sr. Geotechnical Engineer

Personal Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 12018, Expiration 6/21/16.



Basic Oxygen Furnace Subgrade Structures

NO.	NAME	IN SCOPE	OUT SCOPE	REMARKS

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 1

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-54) DATE: 3/21/2016

WORK SHIFT: FROM: 8:15 am TO: 2:45 pm WEATHER: Partly Cloudy

FROM: ____ TO: ____ TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:45 and met Brandon and Contractor at office. Had brief meeting to review the backfill plan for the subgrade structures within the 20 acre RoRo Automotive Yard.
- The contractor to start working on the Elevator Pits (SGS-54). There is one 20'x 20' x 10' deep pit and one 10.5' x 9.5' x 5.5' deep pit.
- A 4' x 4' hole was made in the bottom of the larger pit. There was rebar protruding into the hole that was cut off.
- MCM made similar hole in floor of small pit. The protruding rebar was removed.
- The holes in the floors were filled with #57 Blast Furnace Slag aggregate. The #57 slag was then spread over the floor of the larger pit (24" thickness) and the smaller pit (12" thickness).
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

DAILY REPORT

REPORT NO: 2

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-54)

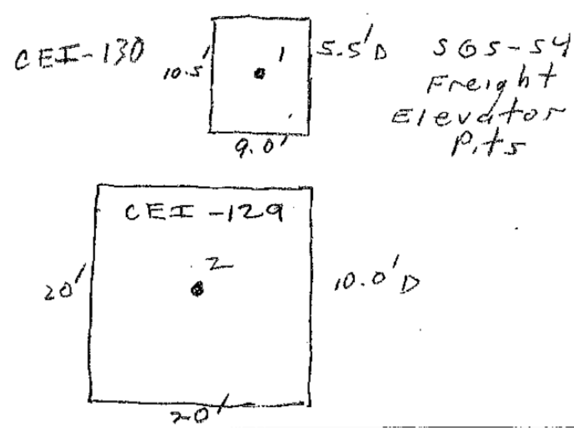
DATE: 3/22/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 50° 12 P.M. 60° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:30 for backfill inspection of Subgrade Structures within the 20 acre RoRo Automotive Yard. The Contractor is in the process of backfilling the 2 elevator pits of SGS-54.
- The groundwater had risen in the 10' deep pit overnight to 7' below ground level. To get the fill above the mater so that conventional backfill could be placed and compacted, an additional 1 foot layer of open graded #8 slag aggregate was placed over the #57 stone layer.
- An attempt was made to use the Back River stockpiles (Clayey Sand) to backfill the pits. The soil was too moist and could not achieve compaction. The first lift was removed from the smaller pit. Slag Tailings will be used as material is drier and moisture is not a problem.
- Slag aggregate (BOF Steel Slag) tailings were used to backfill the remaining depth of both elevator pits. Compaction testing of the conventional backfill was performed as the pits were backfilled. See attached compaction test results. Backfill was placed in approx. 8" lifts and each lift was compacted. At minimum, density testing was performed on every other lift.
- MCM also did minor backfilling of 2 shallow pits at SGS-52, which is the Emergency Reladling Track Scale Pit and the Emergency Reladling Pit. Two 2' x 2' x 2' deep depressions at the east end were backfilled with compacted Slag Tailings.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-54) (Elevator Pits CEI-129 & CEI-130)

DATE: 3/22/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO		1-A	1-B	1-C	2-A	2-B	2-C	2-D	2-E
LOCATION OR STATION	Small Pit CEI-130	→			Large Pit CEI-129	→			
OFFSET									
ELEVATION	-3.0	-2.3	-0.8	Grade	-5.3	-4.5	-3.8	-2.0	Grade
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	6"
DENSITY COUNT	1397	872	859	837	770	832	758	829	824
WET DENSITY PCF	130.4	151.6	152.3	153.5	157.1	153.7	157.8	153.9	154.1
MOISTURE COUNT	216	152	138	133	14	149	149	143	146
MOISTURE CONTENT %	18.1	9.8	8.6	8.1	8.7	9.4	9.1	8.9	9.1
DRY DENSITY PCF	110.5	138.1	140.3	142.0	144.6	140.5	144.6	141.3	141.3
MAX DRY DENSITY PCF	123.2	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	89.7 Fail	95.3 Pass	96.7 Pass	97.9 Pass	99.7 Pass	96.9 Pass	99.8 Pass	97.5 Pass	97.4 Pass

REMARKS: First test in small pit was made using Back River stockpiles. The soil was too moist and pumped. It was decided to remove the first lift and use the Steel Slag tailings to backfill both pits.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 3

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52) DATE: 3/23/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Arrived at site at 8:30 for backfill inspection of Subgrade Structures within the 20 acre RoRo Automotive Yard. The Contractor will begin work on backfilling the Emergency Reladling Pit and the Emergency Reladling Track Scale Pit of SGS-52.
- The Emergency Reladling Pits is approximately 20 feet deep. No hole was made in bottom slab. The pit is too deep and confined for spreading in lifts and compacting with roller. It will be filled with open graded #3 Slag to a depth of 10' below the surface, then 2' of #57 slag, topped by 1 foot of #8 slag. The open graded slag will be placed in layers without compaction. The remaining depth will be backfilled with Steel Slag Tailings placed in lifts and compacted.
- The Emergency Reladling Track Scale has 2 pits that are 9 feet deep. A 4' x 4' hole was made in the bottom of the each pit. The holes were filled with #57 Slag, which was then placed over the bottom to a depth of 7.5 feet below the surface. A layer of #8 slag was then placed to a depth of 6.5 feet. The backfilling will be completed using the Slag tailings placed in lifts and compacted.
- Compaction testing was performed for all of the Slag Tailings backfill. See Nuclear Density Test Sheet attached. Backfill was placed in approx.. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- All of the pits of SGS-52 were backfilled.
- The contractor began work on the SGS-53 Reladling Pit. This pit is 26 feet deep. Open graded slag will be used for the initial backfill because the pit is too deep and confined for spreading in lifts and compacting with roller. The #3 Slag was in short supply, so #57 slag will be used to a depth of 10 feet below the surface. This work will be started tomorrow.
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 3

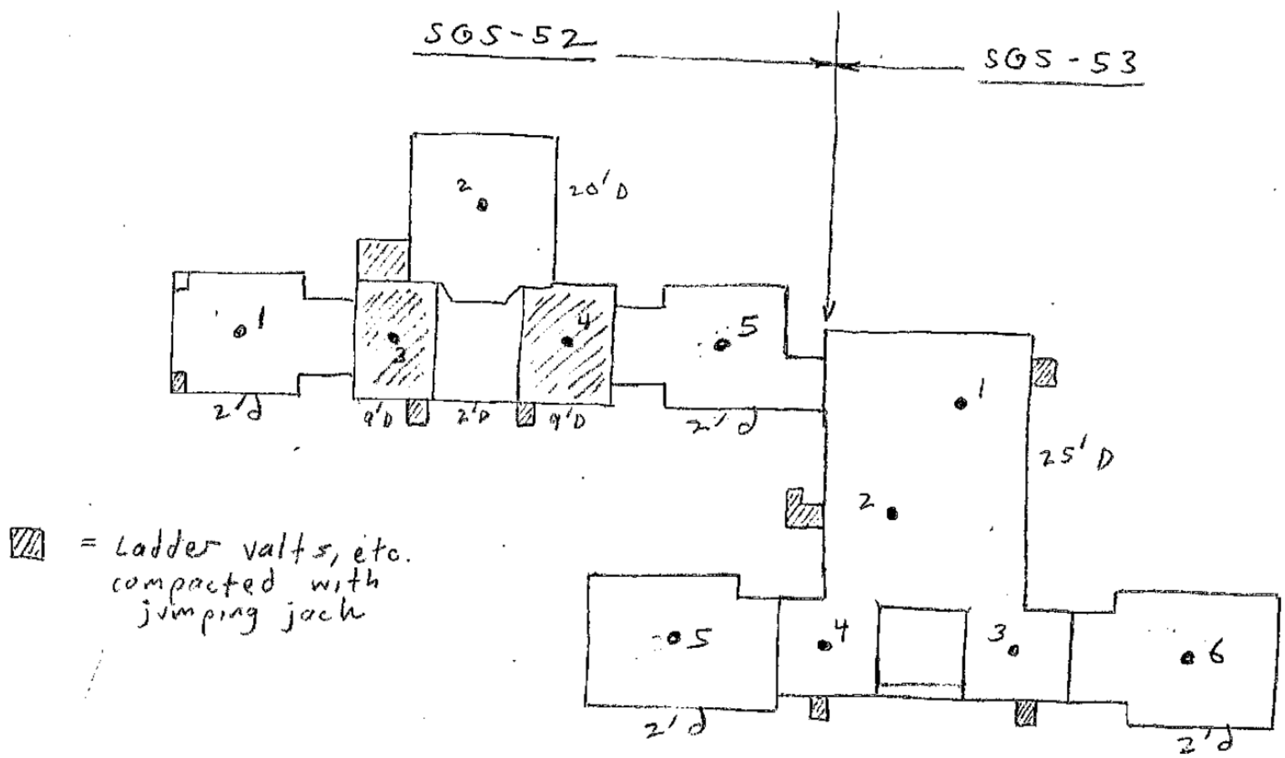
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52)

DATE: 3/23/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. ___°

WORK IN PROGRESS: (Location and Description, Equipment in Use)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	1	2-A	2-B	2-C	2-E	2-F	2-G		
LOCATION OR STATION	SGS-52 CEI-127	(See Sketch) CEI-128							
OFFSET									
ELEVATION	-1.0	-5.3	-4.5	-3.7	-3.0	-1.5	Grade		
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"		
DENSITY COUNT	530	823	636	647	604	626	626		
WET DENSITY PCF	151.7	154.2	165.4	164.8	167.6	166.2	166.2		
MOISTURE COUNT	141	136	179	144	198	164	168		
MOISTURE CONTENT %	8.9	8.3	10.9	8.3	12.1	9.7	10.0		
DRY DENSITY PCF	139.4	142.4	149.2	152.2	149.5	151.5	151.1		
MAX DRY DENSITY PCF	145.0	145.0	150.0	150.0	150.0	150.0	150.0		
OPT MOISTURE CONT. %	11.6	9.5	9.0	9.0	9.0	9.0	9.0		
% COMPACTION REQ'D	95	95	95	95	95	95	95		
% COMPACTION OBTAINED	96.1 Pass	98.2 Pass	99.5 Pass	101.5 Pass	99.7 Pass	101.0 Pass	100.7 Pass		

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	3-A	3-B	3-C	3-D	3-E	4-A	4-B	4-C	4-D
LOCATION OR STATION	SGS-52 CEI-128	(See Sketch)	→	→	→	→	→	→	→
OFFSET									
ELEVATION	-5.5	-4.7	-3.2	-1.7	Grade	-5.5	-4.7	-3.2	-1.7
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	8"	6"
DENSITY COUNT	584	632	604	574	732	591	565	376	618
WET DENSITY PCF	169.3	165.8	167.7	169.9	159.6	168.7	170.7	165.0	166.7
MOISTURE COUNT	103	149	178	180	134	168	164	171	178
MOISTURE CONTENT %	9.4	8.6	10.6	10.6	7.8	9.8	9.4	10.3	10.7
DRY DENSITY PCF	154.7	152.7	151.6	153.6	148.0	153.6	156.0	149.6	150.6
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	103.1 Pass	101.8 Pass	101.1 Pass	102.4 Pass	98.7 Pass	102.4 Pass	104.0 Pass	99.7 Pass	100.4 Pass

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-52) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit) DATE: 3/23/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148 MOISTURE: 604

TEST NO	4-E		5						
LOCATION OR STATION	SGS-52 CEI-128		SGS-52 CEI-127						
OFFSET									
ELEVATION	Grade		Grade						
SOURCE DEPTH	6"		6"						
DENSITY COUNT	751		694						
WET DENSITY PCF	158.5		162.1						
MOISTURE COUNT	128		165						
MOISTURE CONTENT %	7.5		9.5						
DRY DENSITY PCF	147.5		148.0						
MAX DRY DENSITY PCF	150.0		150.0						
OPT MOISTURE CONT. %	9.5		9.0						
% COMPACTION REQ'D	95		95						
% COMPACTION OBTAINED	98.3 Pass		98.7 Pass						

REMARKS: The measured dry density for the slag tailings was above the Proctor maximum Dry Density. No visual chang in material, but difference could be due to variation in residual ore content. Took Bag Sample to lab to perform new Proctor Test. Result was 150.0 pcf @ 9.5% optimum moisture. Test values were still high.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

DAILY REPORT

REPORT NO: 4

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-53) DATE: 3/24/2016

WORK SHIFT: FROM: 8:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 57° 12 P.M. 72° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor is working on backfilling SGS-53 Reladling Pit (CEI-126) and Reladling Pit Track Scale (CEI-125)
- #57 Slag aggregate was used to fill the 22 foot deep pit to 10 feet below the surface. The surface of the stone was tamped with the bucket of the excavator. A layer (1.5 ft. thick) of #8 Slag Aggregate was placed on the #57 stone as a filter course.
- Steel Slag tailings will be used as compacted backfill from -8.5 feet to the surface. A Ramex drum roller was used to compact the backfill within the pit. There are some small ladder vaults that are too small for the drum roller where the lifts were compacted using a jumping jack.
- Compaction testing was performed on the slag tailings using a nuclear moisture-density gauge (see sheets attached). Backfill was placed in approx. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- MCM also began placement of the open graded backfill material in the Scrubber Tank System (CEI-212) beginning with the east section. Both sides are 16.5 feet deep as measured from the north wall. The east section received #3 slag backfill from -16.5 to -14.5 feet below grade, #57 slag from -14.5' to -11.0', and #8 slag from -11.0' to -10.0' below grade.
- No other work performed today.
- MCM is not working tomorrow – Good Friday.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

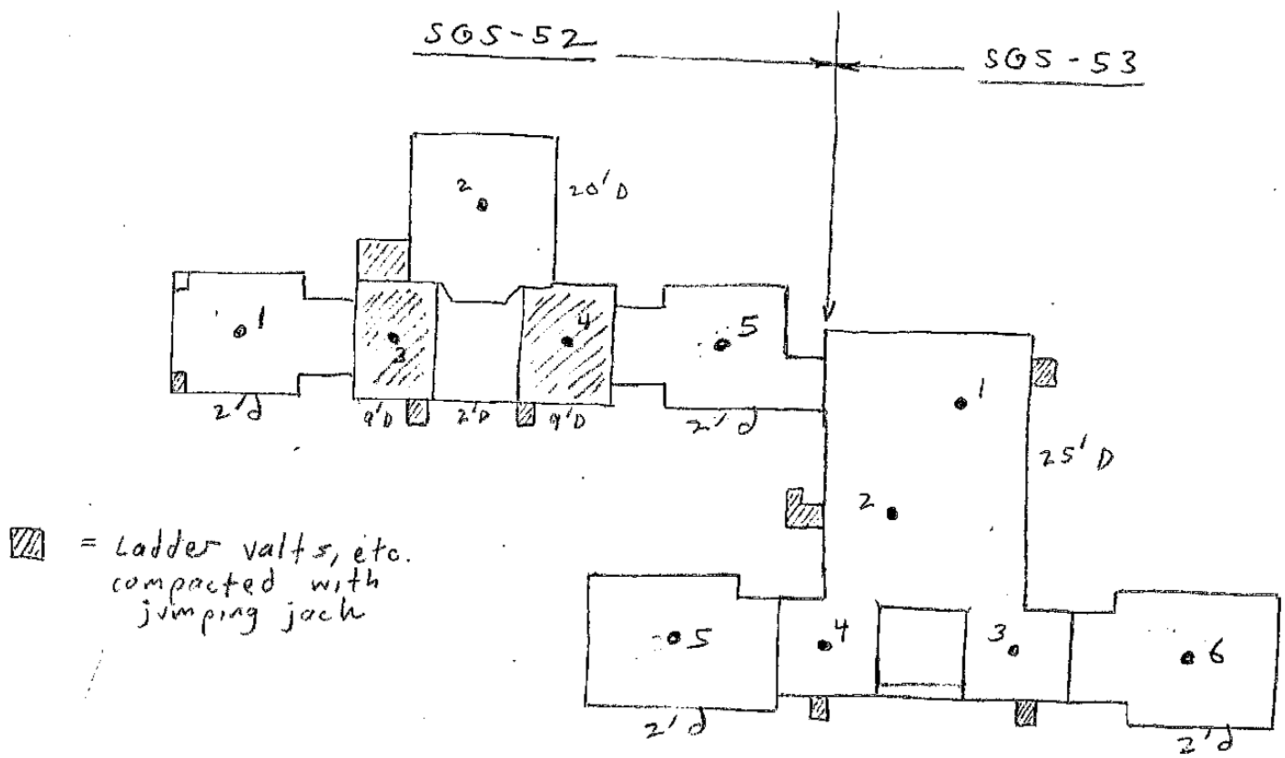
REPORT NO: 4

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-52) DATE: 3/24/2016

WORK SHIFT: FROM: 8:15 am TO: 4:45 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 55° 12 P.M. 67° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-53) (Emergency Reladling Pit and Emergency Reladling Track Scale Pit)

DATE: 3/24/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148

MOISTURE: 604

TEST NO	1-A	1-B	1-C	1-D	2-A	2-B	2-C	2-D	3-A
LOCATION OR STATION	SGS-53 CEI-126	(See Sketch)							
OFFSET									
ELEVATION	-7.3	-4.3	-1.3	Grade	-7.3	-4.3	-1.3	Grade	-6.0
SOURCE DEPTH	6"	6"	8"	8"	6"	6"	8"	8"	6"
DENSITY COUNT	876	791	462	517	839	768	473	563	876
WET DENSITY PCF	151.4	156.0	157.1	153.0	153.4	157.2	156.2	149.6	151.4
MOISTURE COUNT	156	141	148	132	133	147	147	128	156
MOISTURE CONTENT %	10.1	8.6	9.1	8.1	8.1	9.0	9.1	7.9	10.1
DRY DENSITY PCF	137.5	143.6	144.0	141.5	141.8	144.3	143.2	138.6	137.5
MAX DRY DENSITY PCF	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	11.6
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	94.8 Pass	99.0 Pass	99.3 Pass	97.6 Pass	97.8 Pass	99.5 Pass	98.7 Pass	95.6 Pass	94.8 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-53) (Reladling Pit CEI-126 & Track Scale CEI-125) DATE: 3/24/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1924

GAUGE SERIAL NO.: 24148 MOISTURE: 604

TEST NO	3-B	3-C	3-D	4-A	4-B	4-C	4-D	5	6
LOCATION OR STATION	SGS-53 CEI-126	(See Sketch)	→	→	→	→	→	SGS-53 CEI-125	See Sketch
OFFSET	Reladling Pit							Track Scale	
ELEVATION	-3.3	-1.8	Grade	-6.0	-3.3	-1.8	Grade	-0.8	-0.8
SOURCE DEPTH	6"	8"	6"	6"	6"	8"	6"	6"	6"
DENSITY COUNT	791	462	869	839	768	473	938	802	836
WET DENSITY PCF	156.0	157.1	152.0	153.4	157.2	156.2	148.7	155.4	153.5
MOISTURE COUNT	141	148	130	133	147	147	124	144	143
MOISTURE CONTENT %	8.6	9.1	8.0	8.1	9.0	9.1	7.7	8.9	8.8
DRY DENSITY PCF	143.6	144.0	140.8	141.8	144.3	143.2	138.1	142.7	141.1
MAX DRY DENSITY PCF	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
OPT MOISTURE CONT. %	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	99.0 Pass	99.3 Pass	97.1 Pass	97.8 Pass	99.5 Pass	97.0 Pass	95.2 Pass	98.4 Pass	97.3 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 5

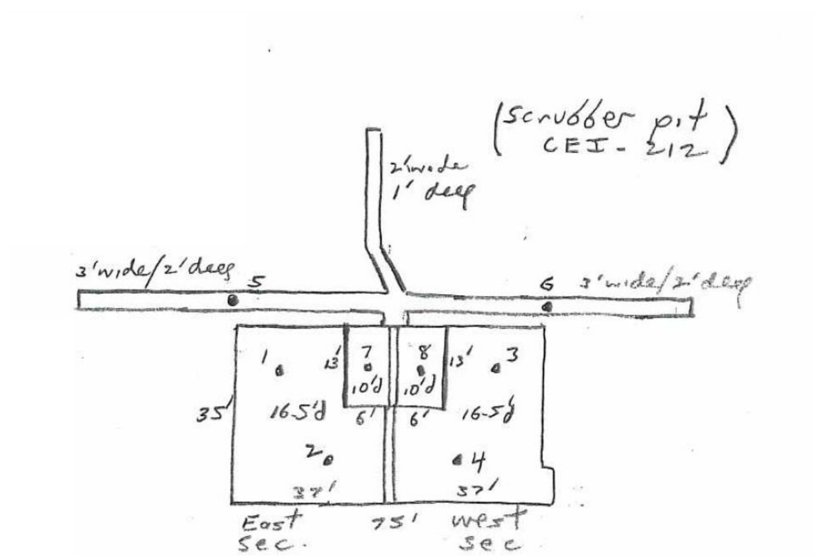
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56) DATE: 3/28/2016

WORK SHIFT: FROM: 8:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: 5:30 pm TO: 6:30 pm TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor is working on backfilling SGS-56 Scrubber Pit (CEI-212) with the steel slag tailings starting at the east end.
- Open graded slag was placed in the west section as follows: #3 slag from -16.5’ to -12.0’, #57 slag from -12.0’ to -9.5’, and #8 slag from -9.5’ to -8.5’. The compacted tailings will be placed from -8.5’ to grade.
- Ran one-point proctor test on material where the percent compaction was above 100 percent. The one point indicated a dry density of 149.8 pcf, which is the same as the most recent Proctor test done in the lab.
- Compaction testing of the slag tailings was performed using a nuclear density gauge (see test sheet attached). Backfill was placed in approx. 8” lifts and each lift was compacted. Density testing was performed on every other lift.
- MCM also began clean-up of the Hopper Pit and Tunnel (SGS-55) and started placement of the #3 Slag.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)   DATE: 3/28/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148   MOISTURE: 600

TEST NO	1-A	1-B	1-B(1)	1-C	1-D	2-A	2-B	2-C	2-D
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch) →							
OFFSET	East Side (South)	→				East Side (North)	→		
ELEVATION	-9.0	-7.0	-7.0	-5.5	-3.8	-9.0	-7.0	-5.5	-3.8
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	6"
DENSITY COUNT	751	970	873	657	713	900	872	579	750
WET DENSITY PCF	158.2	145.4	151.5	163.9	160.5	150.3	152.6	159.6	158.2
MOISTURE COUNT	145	136	146	160	133	136	135	148	135
MOISTURE CONTENT %	8.8	9.8	10.0	11.1	9.0	8.6	9.7	9.9	9.3
DRY DENSITY PCF	145.5	132.5	137.7	147.6	147.2	138.4	139.1	145.5	144.7
MAX DRY DENSITY PCF	145.0	145.0	145.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	11.6	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	100.3 Pass	91.4 Fail	95.0 Pass	98.4 Pass	98.1 Pass	95.5 Pass	95.9 Pass	97.0 Pass	96.5 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212) DATE: 3/28/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	3-A	3-B	3-C	3-D	4-A	4-B	4-C	4-D	
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch)							
OFFSET	West Side (South)				West Side (North)				
ELEVATION	-7.5	-6.0	-4.5	-1.5	-7.5	-6.0	-4.5	-1.5	
SOURCE DEPTH	6"	6"	6"	6"	6"	6"	6"	6"	
DENSITY COUNT	757	609	597	687	573	645	691	692	
WET DENSITY PCF	157.8	167.4	168.1	162.5	170.0	164.8	161.7	161.6	
MOISTURE COUNT	145	157	168	138	155	100	161	140	
MOISTURE CONTENT %	10.2	10.8	11.5	8.2	10.2	11.0	11.3	8.3	
DRY DENSITY PCF	143.1	151.1	150.9	150.2	154.2	148.4	145.2	149.2	
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	
% COMPACTION OBTAINED	95.4 Pass	100.7 Fail	100.6 Pass	100.0 Pass	102.8 Pass	98.9 Pass	96.8 Pass	99.5 Pass	

REMARKS: Ran one-point on test 3-C sample - result matched Sample #2 Proctor.
Contractor filled only up to -1.0 fet below the higher west wall.

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 6

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56) DATE: 3/29/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- Contractor completed the backfill of the two large sections of the Scrubber Pit (CEI-212) to -1.0 feet below the top of the North Wall. Started backfilling the 2 smaller pits on the south side of yje main scrubber pit.
- Waterway trenches just outside the south wall were also cleaned out of all rubble and debris.
- Small pit dimensions are 13' x 6' x 10' deep.
- Making holes in the bottom slab for each were attempted, but the slab was too thick to break through. Placed #57 Slag to -8.5' and #8 slag from -8.5' to -7.5'.
- The trenched on the south side were backfilled with compacted steel slag tailings (see attached test sheet). Backfill was placed in approx. 8" lifts and each lift compacted.
- MCM also continued placement of open graded slag aggregate in the SGS-55 Hopper Pit and Ramp, which received #3 slag from -28' to -11.5', #57 slag from -11.5' to -10', and #8 slag from -10.0' to -9.1'.
- No other work performed today.

COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212) DATE: 3/29/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-E	2-E		5	6				
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch) →		3' Trench	3' Trench				
OFFSET	East Side (South)	East Side (North)		East Side	West Side				
ELEVATION	-1.5	-1.5		-1.0	-1.0				
SOURCE DEPTH	6"	6"		6"	6"				
DENSITY COUNT	587	655		729	756				
WET DENSITY PCF	168.8	165.2		159.4	157.7				
MOISTURE COUNT	175	158		149	148				
MOISTURE CONTENT %	12.0	10.5		10.5	10.2				
DRY DENSITY PCF	150.8	149.5		144.3	143.1				
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0				
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0				
% COMPACTION REQ'D	95	95		95	95				
% COMPACTION OBTAINED	100.5 Pass	99.7 Pass		99.5 Pass	98.7 Pass				

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)

DATE: 3/29/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148

MOISTURE: 600

TEST NO	7-A	7-B	7-C	8-A	8-B	8-C			
LOCATION OR STATION	SGS-56 CEI-212	(See Sketch) →	→	→ 3' Trench	→ 3' Trench	→	→	→	→
OFFSET	Small Tank (East)	→	→	Small Tank (west)	→	→			
ELEVATION	-4.5	-3.0	-1.0	-4.5	-3.0	-1.0			
SOURCE DEPTH	6"	6"	6"	6"	6"	6"			
DENSITY COUNT	654	748	749	598	738	771			
WET DENSITY PCF	164.2	158.4	158.1	168.1	158.9	156.8			
MOISTURE COUNT	156	133	141	165	148	138			
MOISTURE CONTENT %	10.7	9.2	8.6	11.2	10.4	8.4			
DRY DENSITY PCF	148.3	145.1	145.6	151.1	143.9	144.7			
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0			
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0			
% COMPACTION REQ'D	95	95	95	95	95	95			
% COMPACTION OBTAINED	102.0 Pass	100.1 Pass	97.1 Pass	100.7 Pass	95.9 Pass	96.5 Pass			

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 7

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-55)

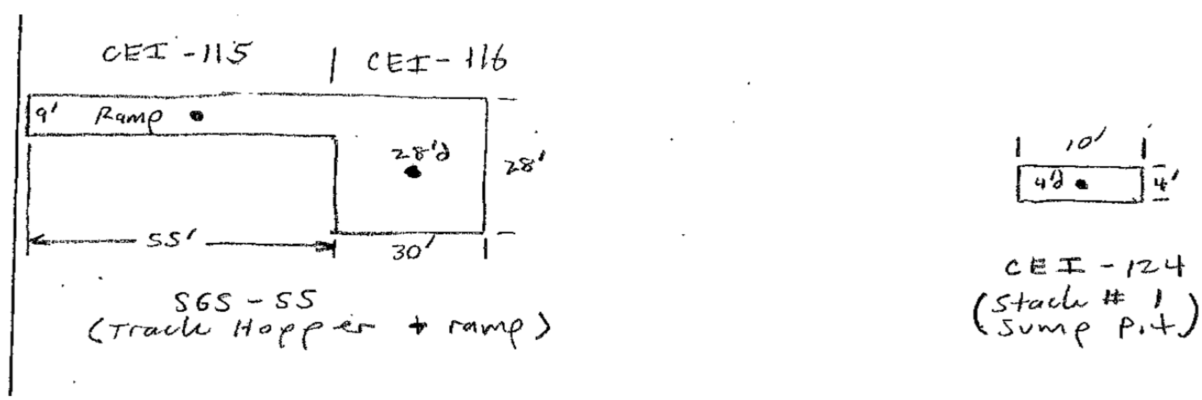
DATE: 3/30/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: TO: TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM started and completed backfill on the Hopper Pit and Ramp (SGS-55) using the compacted Slag tailings.
- Also worked on preparing an electrical vault not shown on the plans.
- Noted that CEI-117 Track Yard Scale Pit that is shown on plans is no longer present.
- Another small vault (4' x 4' x 4' deep) was noted just south of the electrical vault.
- After discussion with Mike Cerri (environmental), permission was given to backfill the 2 small vaults.
- The electrical vault received #57 slag from -11.5' to -9.5' and #8 Slag from -9.5' to -8.5'. The small pit had #57 slag from -4.0 to -3.0' (No hole made in bottom) due to small size.
- Compaction testing performed on the Slag Tailings backfill (see attached test sheets). Backfill was placed in approx.. 8" layers and each lift compacted. Density testing was performed on every other lift.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 7

PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-55)

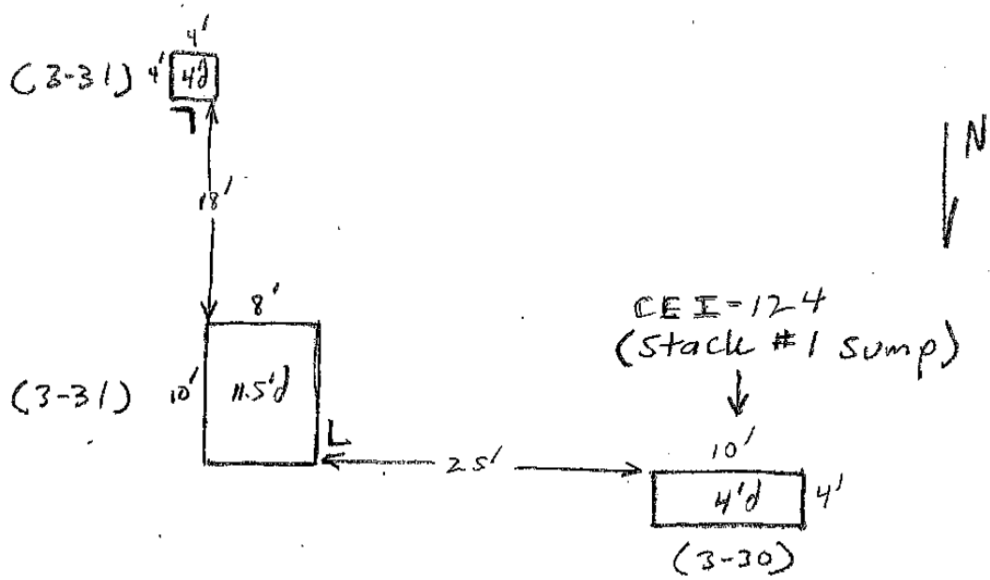
DATE: 3/30/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ____ TO: ____ TEMP. 8 A.M. 45° 12 P.M. 55° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

Location of Electric vault pit and 4'x4'x4' pit
relative to CEI-124 &
Backfilled (3-30/31-16)



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)
DATE: 3/30/2016
CLIENT: MCM
CEI PROJECT NO.: 151117.00
DENSITY: 1911
GAUGE SERIAL NO.: 24148
MOISTURE: 600

TEST NO	1-A	1-B	1-C	1-D	1-E	1-F			
LOCATION OR STATION	SGS-55 CEI-116	(See Sketch)	→	→	→	→			
OFFSET									
ELEVATION	-7.2	-5.8	-4.5	-3.0	-1.5	Grade			
SOURCE DEPTH	6"	6"	6"	6"	6"	6"			
DENSITY COUNT	665	679	704	786	726	719			
WET DENSITY PCF	163.4	162.6	160.9	156.1	159.7	160.3			
MOISTURE COUNT	171	148	158	134	139	149			
MOISTURE CONTENT %	12.1	10.2	11.1	9.5	9.6	8.9			
DRY DENSITY PCF	145.7	147.6	144.8	142.6	145.7	147.2			
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0			
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0			
% COMPACTION REQ'D	95	95	95	95	95	95			
% COMPACTION OBTAINED	97.1 Pass	98.4 Pass	96.5 Pass	95.1 Pass	97.1 Pass	98.1 Pass			

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (Scrubber Pit CEI-212)

DATE: 3/30/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148

MOISTURE: 600

TEST NO	2-A	2-B	2-C	2-D	2-F				
LOCATION OR STATION	Ramp CEI-115	(See Sketch)	→	→	→				
OFFSET									
ELEVATION	-6.0	-4.5	-2.5	-1.3	Grade				
SOURCE DEPTH	6"	6"	6"	6"	6"				
DENSITY COUNT	602	692	754	733	701				
WET DENSITY PCF	163.6	161.7	157.9	159.2	161.5				
MOISTURE COUNT	157	149	152	155	133				
MOISTURE CONTENT %	10.1	10.3	10.9	10.8	7.7				
DRY DENSITY PCF	147.6	146.6	142.5	143.7	150.0				
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0				
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0				
% COMPACTION REQ'D	95	95	95	95	95				
% COMPACTION OBTAINED	98.4 Pass	97.7 Pass	95.0 Pass	95.8 Pass	100.0 Pass				

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 8

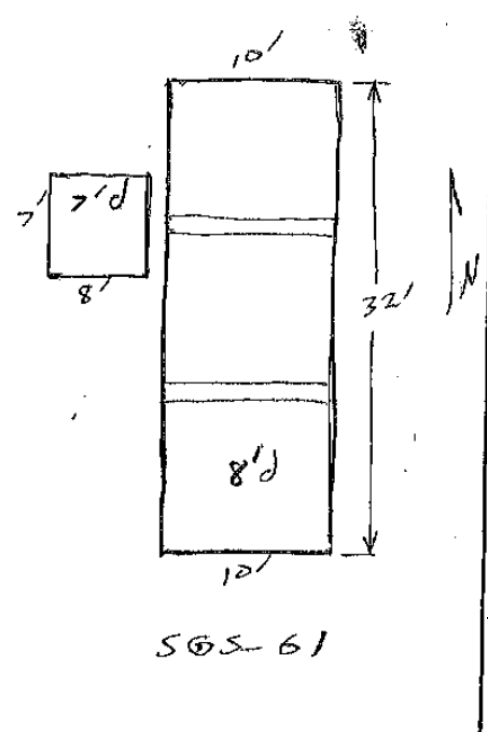
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-56) DATE: 3/31/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ____ TO: ____ TEMP. 8 A.M. 62° 12 P.M. 70° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM backfilled the CEI-124 Stack #1 Sump Pit, Electrical Vault and small pit with the compacted Slag tailings.
- Compaction testing was performed using a nuclear gauge (see attached test sheet). Backfill was placed in approx. 8" lifts and each lift compacted. Density testing was performed on every other lift.
- MCM began clean-out of SGS-61 located at or beyond the eastern boundary of the 20 acre parcel. Groundwater entered the pit to -6.5 feet below grade. Due to the presence of groundwater, #3 Slag was placed to -6.0', and #57 Slag from-6.0' to -5.0'. 1 foot of CR-6 was placed and compacted as a substitute filter layer for the #8 Slag. No backfilling today with the slag tailings.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-56) (CEI 124 Sump Pit and Vaults) DATE: 3/31/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

TEST NO	1-A	1-B							
LOCATION OR STATION	SGS-56 CEI-124	(See Sketch)		Electric Vault	→	→	4'x4'x4' Pit	→	
OFFSET									
ELEVATION	-1.5'	Grade		-5.0	-3.5	-1.7	-2.0	Grade	
SOURCE DEPTH	6"	6"		8"	6"	6"	6"	6"	
DENSITY COUNT	626	592		446	761	680	778	567	
WET DENSITY PCF	166.7	164.6		158.2	157.3	162.3	156.4	165.5	
MOISTURE COUNT	169	163		141	156	151	142	162	
MOISTURE CONTENT %	11.5	11.3		8.5	9.8	9.1	8.7	10.8	
DRY DENSITY PCF	149.5	147.9		145.8	143.3	148.8	143.8	149.4	
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0	150.0	150.0	150.0	
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0	9.0	9.0	9.0	
% COMPACTION REQ'D	95	95		95	95	95	95	95	
% COMPACTION OBTAINED	99.7 Pass	98.6 Pass		97.2 Pass	95.5 Pass	99.2 Pass	95.9 Pass	99.6 Pass	

REMARKS: Each structure had 1 density test at center

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING

DAILY REPORT

REPORT NO: 9

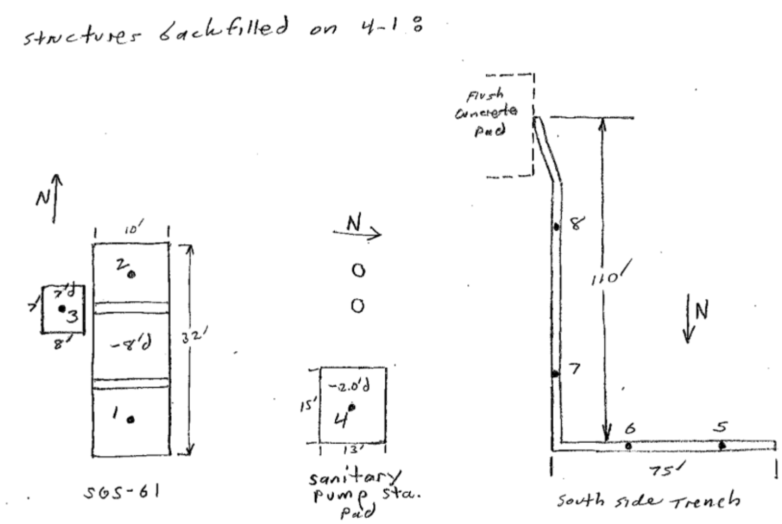
PROJECT: Sparrows Point Terminals - 20 Acre RoRo Site (SGS-61) DATE: 4/1/2016

WORK SHIFT: FROM: 7:30 am TO: 4:30 pm WEATHER: Partly Cloudy

FROM: ______ TO: ______ TEMP. 8 A.M. 58° 12 P.M. 72° 4 P.M. °

WORK IN PROGRESS: (Location and Description, Equipment in Use)

- MCM completed the backfill of SGS-61 with the compacted Steel Slag Tailings.
- Also worked on backfilling a shallow pit at the Sanitary Sewer Pump Station. The pit is 15’ x 13’ x 2’ deep with the bottom removed to slag subgrade material. The pit was also backfilled with compacted slag tailings.
- Also backfilled a 1’ x 4’ deep concrete trench located about 200’ south of the 20 acre parcel. The 110’ long trench was cleaned out and a 75’ long section that was previously backfilled with CR-6 slag that was hard was left in place. The trench was backfilled with the steel slag tailings. Backfill was placed in approx. 8” lifts and each lift compacted. Density testing was performed on every other lift.
- No other work performed today.



COMMENTS:

INSPECTOR: **Chris Jacobs**

CENTURY CONTRACT NO: **151117.00**

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-61) (CEI 124 Sump Pit and Vaults)

DATE: 4/1/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148

MOISTURE: 600

TEST NO	1-A	1-B	1-C	2-A	2-B	2-C	3-A	3-B	3-C
LOCATION OR STATION	SGS-61 See Sketch	→							
OFFSET									
ELEVATION	-3.3	-1.7	Grade	-3.3	-1.7	Grdae	-3.3	-1.7	Grade
SOURCE DEPTH	6"	6"	6"	6"	8"	6"	6"	6"	6"
DENSITY COUNT	723	647	695	686	379	722	752	684	714
WET DENSITY PCF	159.6	164.5	161.9	161.9	164.4	160.2	157.9	162.0	160.7
MOISTURE COUNT	158	154	138	149	161	131	144	185	147
MOISTURE CONTENT %	9.8	9.1	8.0	8.9	9.7	7.6	8.8	9.4	8.7
DRY DENSITY PCF	145.4	150.7	149.9	148.6	149.9	148.9	145.1	148.1	147.7
MAX DRY DENSITY PCF	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95	95	95	95	95	95	95	95
% COMPACTION OBTAINED	96.9 Pass	100.5 Pass	99.9 Pass	99.1 Pass	100.0 Pass	99.3 Pass	96.7 Pass	98.8 Pass	98.5 Pass

REMARKS: Each structure had 1 density test at center

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

CENTURY ENGINEERING, INC.

NUCLEAR DENSITY TEST DATA SHEET

PROJECT: Sparrows Point Terminals - 20 acre RoRo Auto Yard (SGS-61) (CEI 124 Sump Pit and Vaults) DATE: 4/1/2016

CLIENT: MCM

CEI PROJECT NO.: 151117.00

DENSITY: 1911

GAUGE SERIAL NO.: 24148 MOISTURE: 600

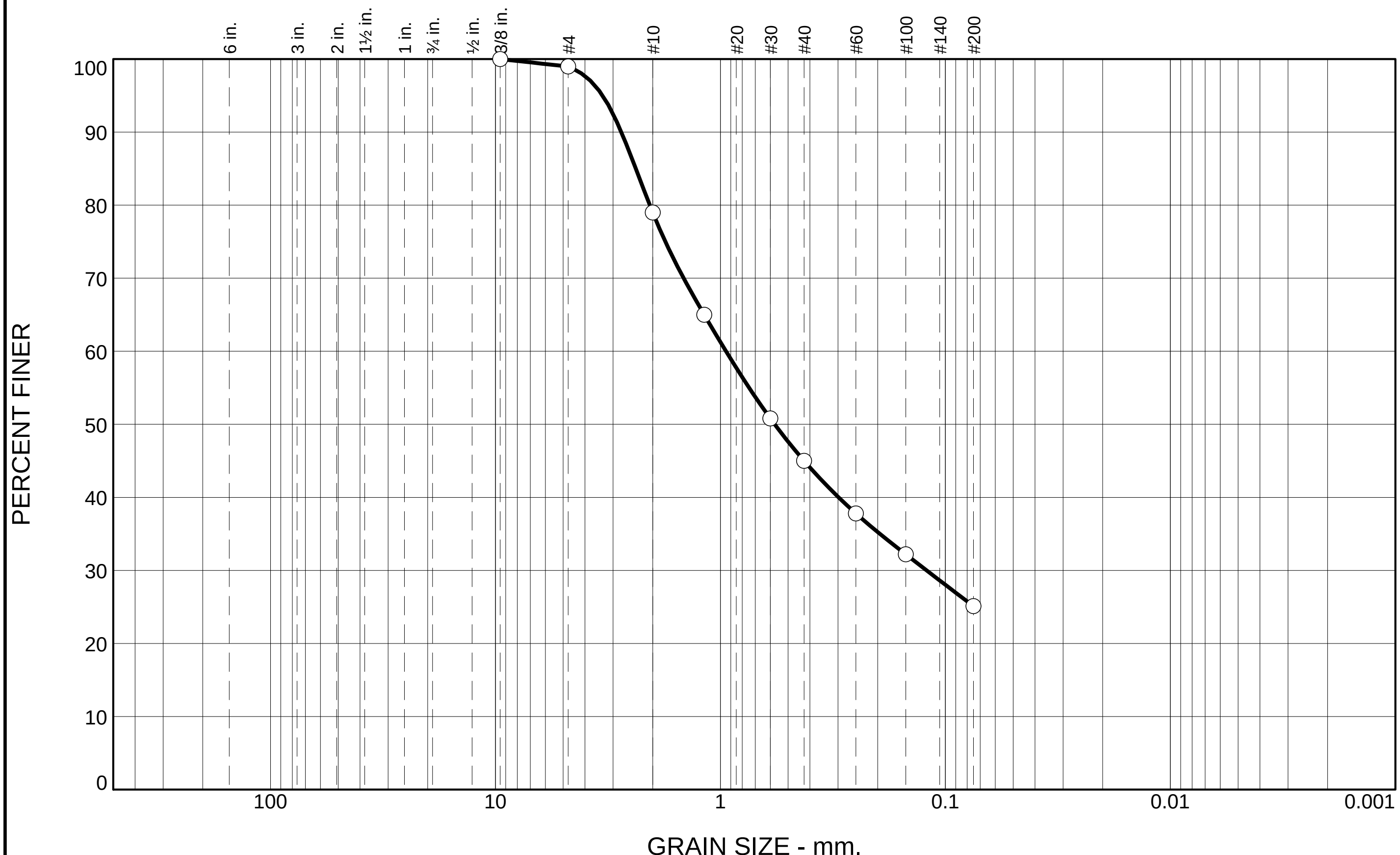
TEST NO	4-A	4-B		5	6	7-A	7-B	8-B	8-B
LOCATION OR STATION	SGS-61 See Sketch	→		1.0' Wide Trench	See Sketch	→			
OFFSET									
ELEVATION	-1.0	Grade		Grade	Grade	-2.0	Grade	-2.0 Grade	Grade
SOURCE DEPTH	10"	8"		8"	8"	8"	6"	8"	6"
DENSITY COUNT	208	355		394	445	413	711	456	726
WET DENSITY PCF	164.5	166.9		163.0	158.2	161.2	160.3	157.3	159.4
MOISTURE COUNT	183	178		156	152	149	152	142	157
MOISTURE CONTENT %	11.3	10.8		9.4	9.4	9.0	146.7	8.7	9.7
DRY DENSITY PCF	147.8	150.7		149.0	144.7	147.9		144.8	145.3
MAX DRY DENSITY PCF	150.0	150.0		150.0	150.0	150.0	150.0	150.0	150.0
OPT MOISTURE CONT. %	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0
% COMPACTION REQ'D	95	95		95	95	95	95	95	95
% COMPACTION OBTAINED	98.5 Pass	100.4 Pass		99.3 Pass	96.4 Pass	98.6 Pass	97.8 Pass	96.5 Pass	96.9 Pass

REMARKS:

TECHNICIAN: C.Jacobs

CLIENT'S REPRESENTATIVE:

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	20.0	34.0	19.9	25.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.0		
#10	79.0		
#16	65.0		
#30	50.8		
#40	45.0		
#60	37.8		
#100	32.2		
#200	25.1		

* (no specification provided)

Soil Description

Steel Slag Tailings (Samples 1/13/16)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 2.7578 D_{85}= 2.3788 D_{60}= 0.9443
D_{50}= 0.5742 D_{30}= 0.1212 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sampled 1/13/17 from SGS-43b backfill material

Source of Sample: Steel Slag Tailings
Sample Number: 1

Date: 1/17/16

Century Engineering, Inc.

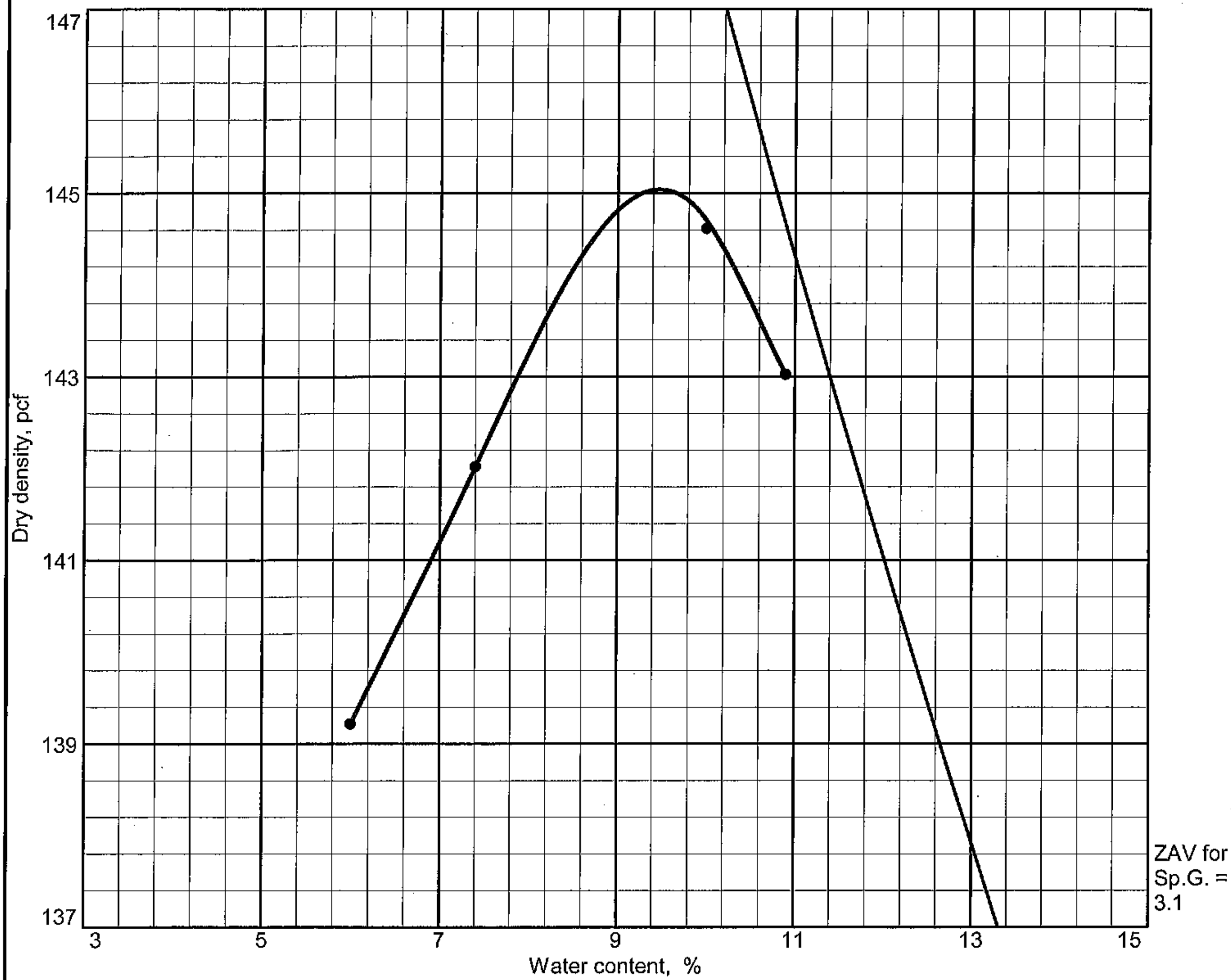
Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures

Project No: 151117.00 **Figure**

Tested By: United Eng. **Checked By:** PAD

COMPACTION TEST REPORT



Test specification: ASTM D 1557-00 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	1.0	25.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 145.0 pcf Optimum moisture = 9.5 %	Steel Slag Tailings (Samples 1/13/16)

Project No. 151117.00 **Client:** MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures

● **Source:** Steel Slag Tailings **Sample No.:** 1

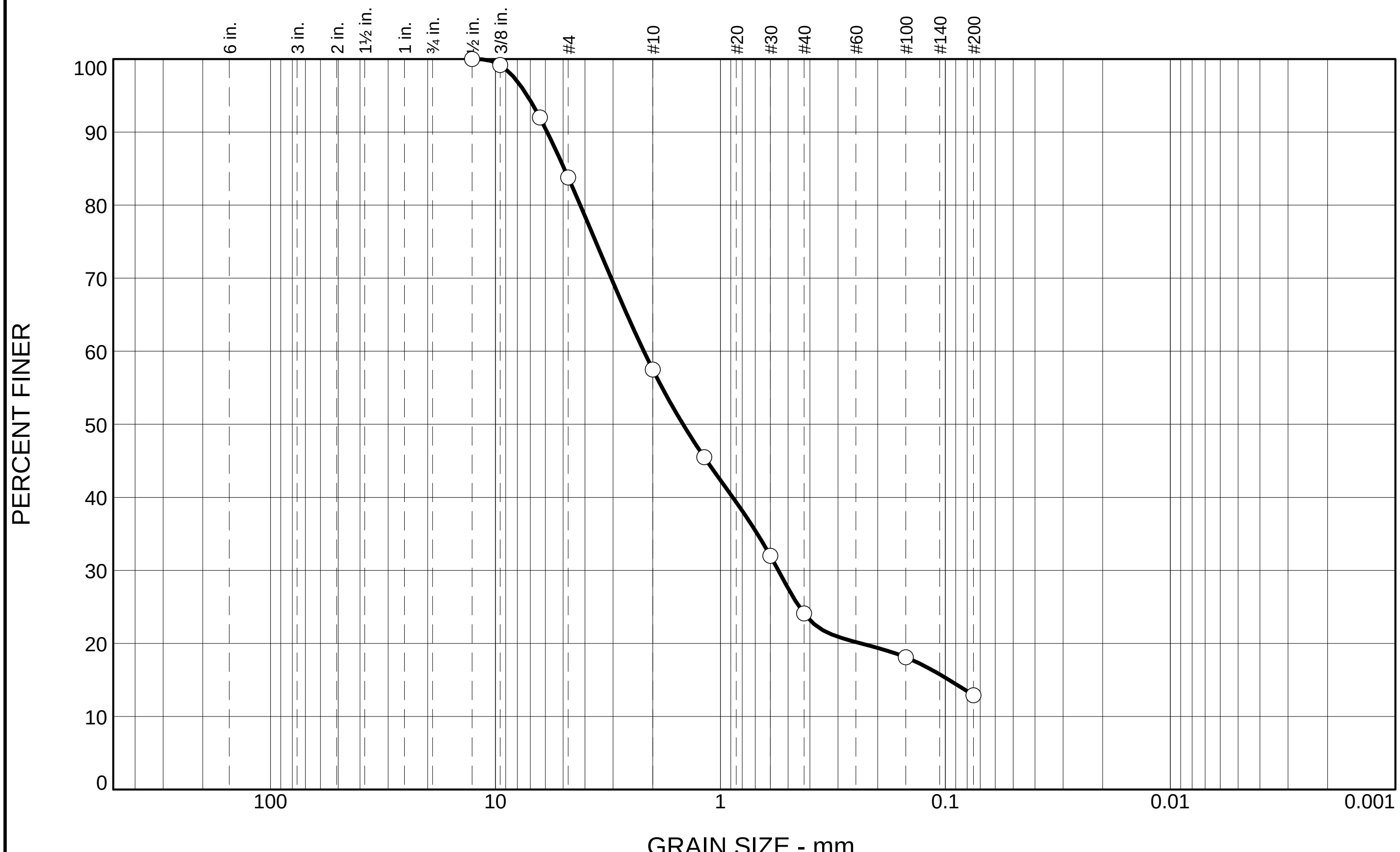
Remarks:

Century Engineering, Inc.

Hunt Valley, MD

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.2	26.3	33.4	11.2	12.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
.375	99.2		
.25	92.0		
#4	83.8		
#10	57.5		
#16	45.5		
#30	32.0		
#40	24.1		
#100	18.1		
#200	12.9		

* (no specification provided)

Soil Description

Gray Steel Slag #10 Tailings (Sampled 3/23/16)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 5.8832 D_{85}= 4.9425 D_{60}= 2.1911
D_{50}= 1.4666 D_{30}= 0.5531 D_{15}= 0.0963
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Natural Moisture =8.8%

Source of Sample: Steel Slag Tailings (SGS-52 Backfill)
Sample Number: Bag
Date: 4/5/16

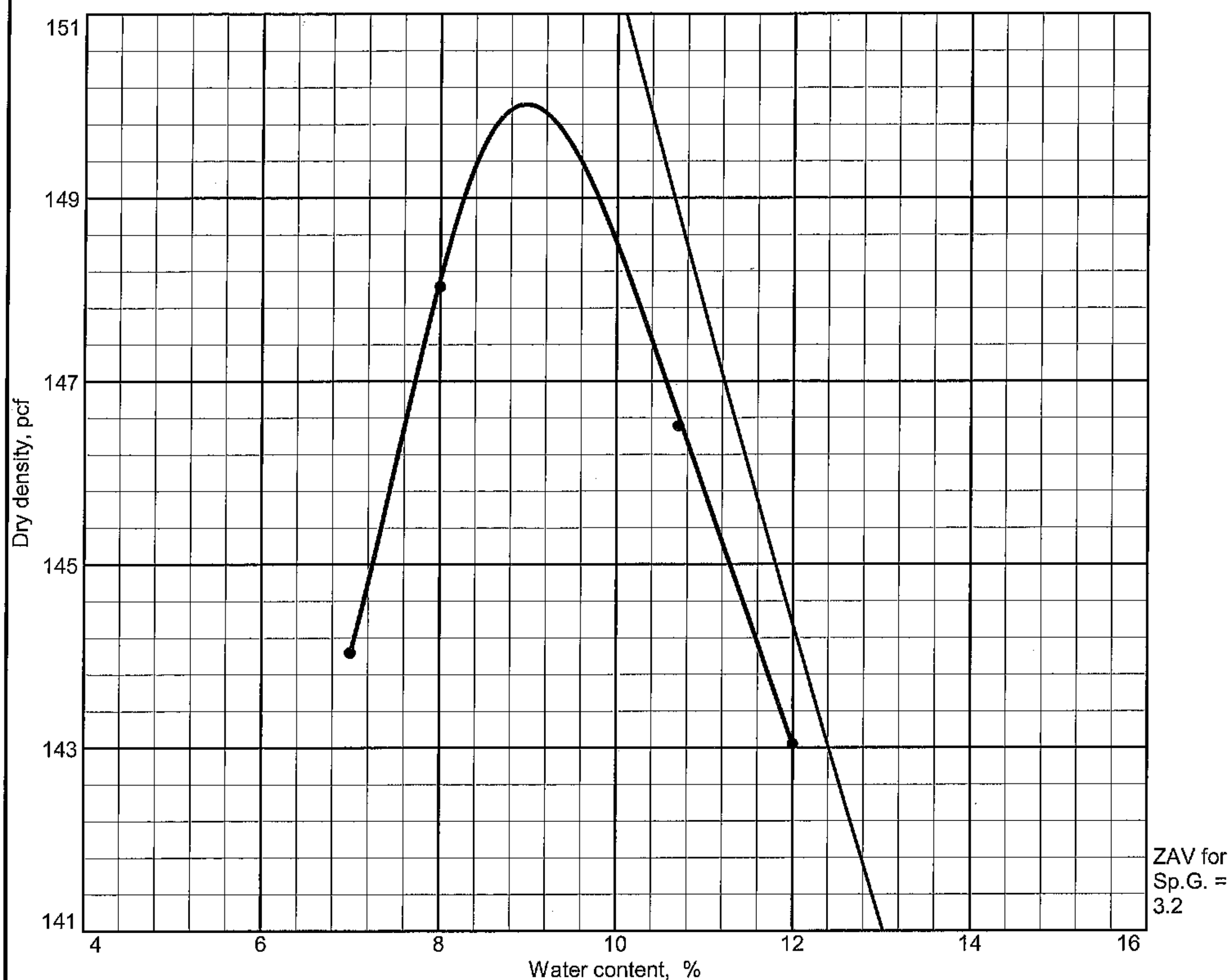
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: United **Checked By:** PAD

COMPACTION TEST REPORT



Test specification: AASHTO T 180 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	16.2	12.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 150.0 pcf Optimum moisture = 9.0 %	Gray Steel Slag #10 Tailings (Sampled 3/23/16)

Project No. 151117.00 **Client:** MCM Management Corp.

Project: Sparrows Point Terminals-Subgrade Structures

● **Source:** Steel Slag Tailings (SGS-52 **Sample No.:** Bag

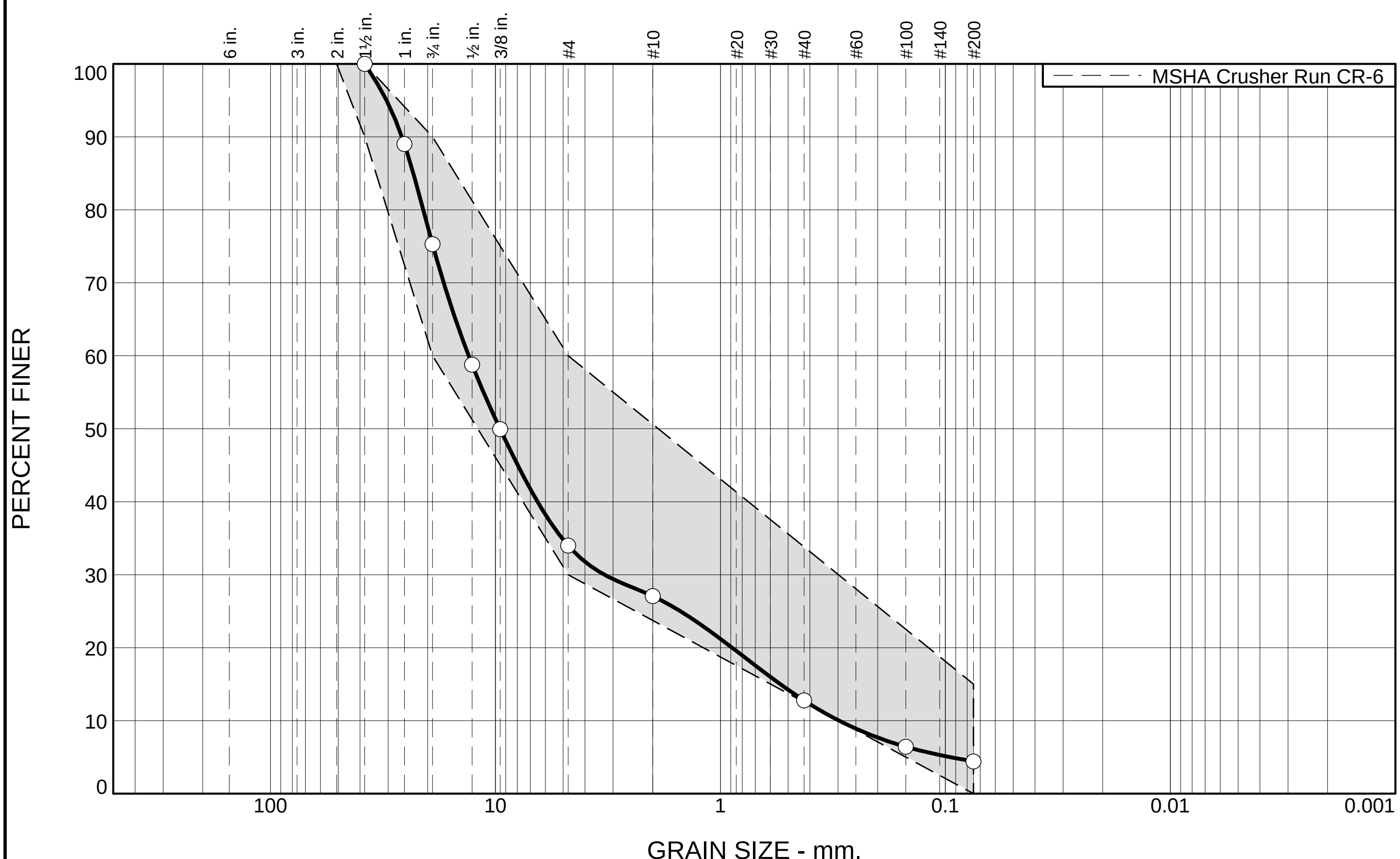
Remarks:

Century Engineering, Inc.

Hunt Valley, MD

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	24.7	41.3	6.9	14.3	8.4	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0	90.0 - 100.0	
1	89.0		
.75	75.3	60.0 - 90.0	
.50	58.8		
.375	50.0		
#4	34.0	30.0 - 60.0	
#10	27.1		
#40	12.8		
#100	6.4		
#200	4.4	0.0 - 15.0	

* MSHA Crusher Run CR-6

Soil Description

Brown/Gray f-c GRAVEL, some f-c Sand, trace Silt (Slag Aggregate)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 26.0374 D_{85}= 23.1836 D_{60}= 13.1538
D_{50}= 9.5417 D_{30}= 3.2811 D_{15}= 0.5420
D_{10}= 0.2970 C_u= 44.29 C_c= 2.76

Classification

USCS= GW AASHTO= A-1-a

Remarks

Sampled 8/3/15

Source of Sample: CR-6 Blast Furnace Slag
Sample Number: 1

Date: 8-25-15

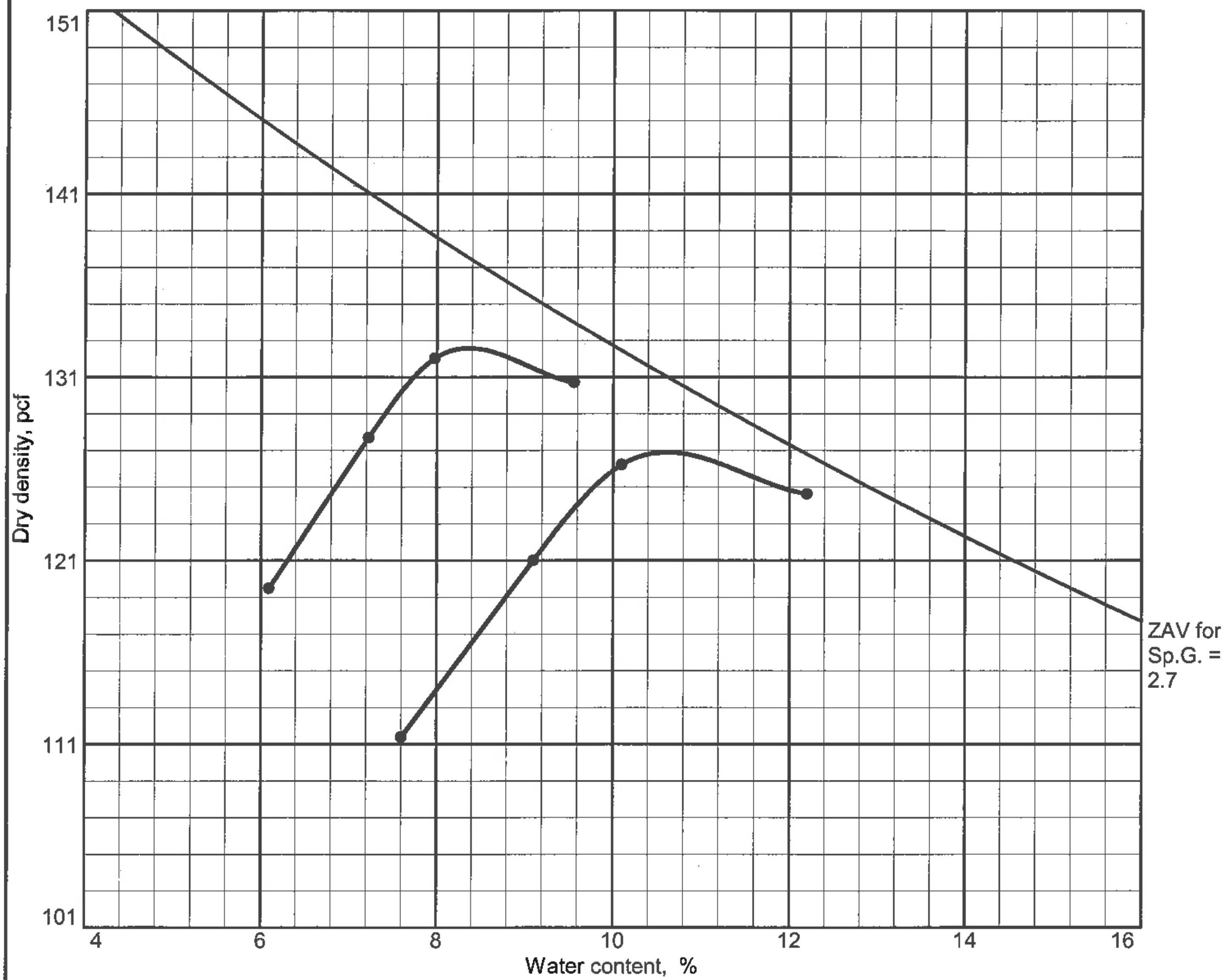
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: CJ **Checked By:** PAD

COMPACTION TEST REPORT



Test specification: ASTM D 1557-00 Method C Modified
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GW	A-1-a			NV	NP	24.7	4.4

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 132.6 pcf	126.9 pcf	Brown/Gray f-c GRAVEL, some f-c Sand, trace Silt (CR-6 Blast Furnace Slag)
Optimum moisture = 8.4 %	10.6 %	

Project No. 151117.00 **Client:** MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures

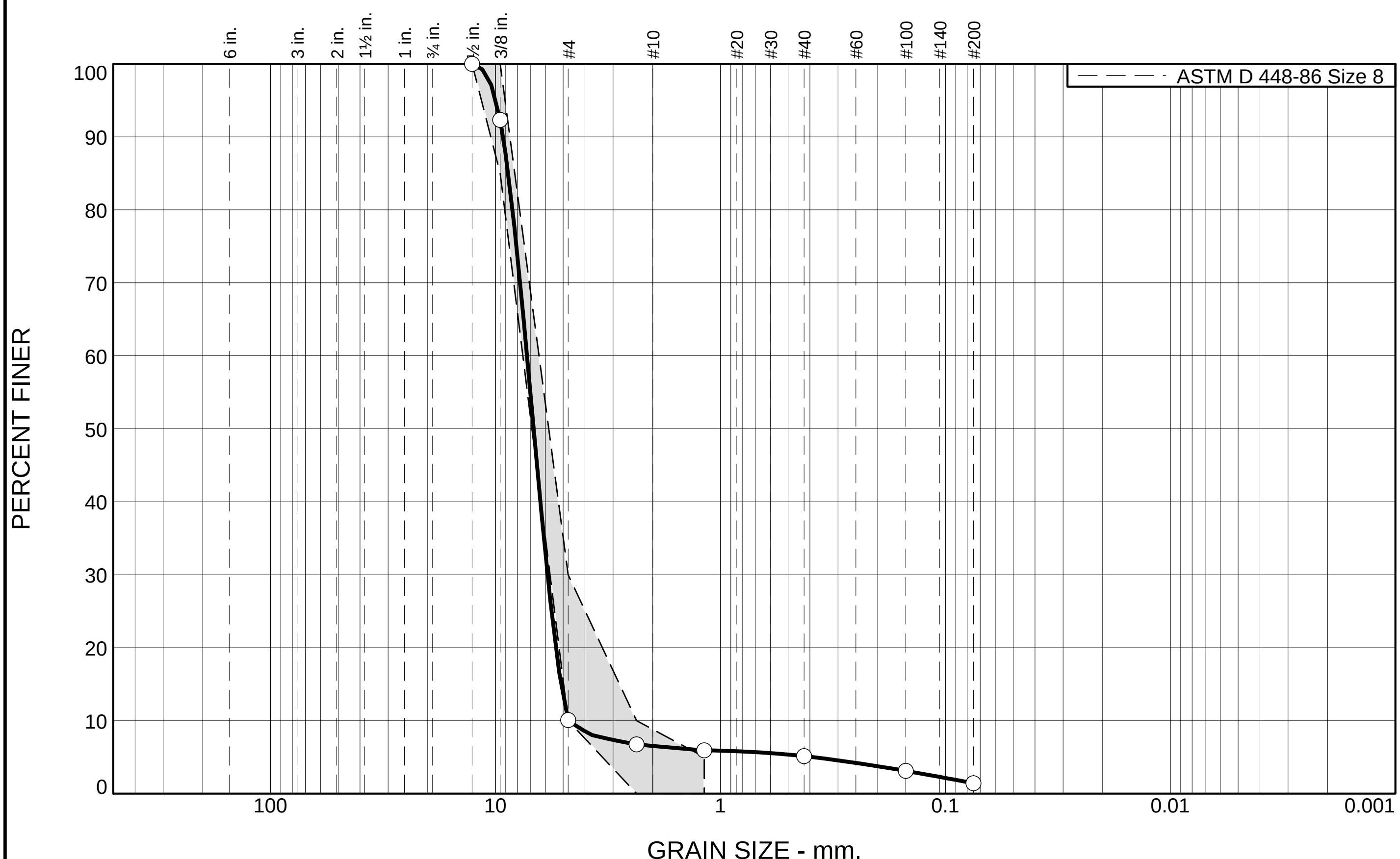
● **Source:** CR-6 Blast Furnace Slag **Sample No.:** 1

Century Engineering, Inc.
Hunt Valley, MD

Remarks:
Curve corrected for 24.7% material larger than 3/4"

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	89.9	3.6	1.4	3.7	1.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0	100.0 - 100.0	
.375	92.3	85.0 - 100.0	
#4	10.1	10.0 - 30.0	
#8	6.8	0.0 - 10.0	
#16	5.9	0.0 - 5.0	X
#40	5.1		
#100	3.1		
#200	1.4		

* ASTM D 448-86 Size 8

Soil Description

Gray Fine GRAVEL, trace of f-c Sand (#8 Blast Furnace Slag)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 9.2456 D_{85}= 8.7729 D_{60}= 7.2366
D_{50}= 6.7610 D_{30}= 5.8654 D_{15}= 5.1110
D_{10}= 4.7132 C_u= 1.54 C_c= 1.01

Classification

USCS= GP AASHTO= A-1-a

Remarks

Sample Taken 8/3/15 from on-site stockpile

Source of Sample: #8 Blast Furnace Slag
Sample Number: 1 (Bag)

Date: 8-27-15

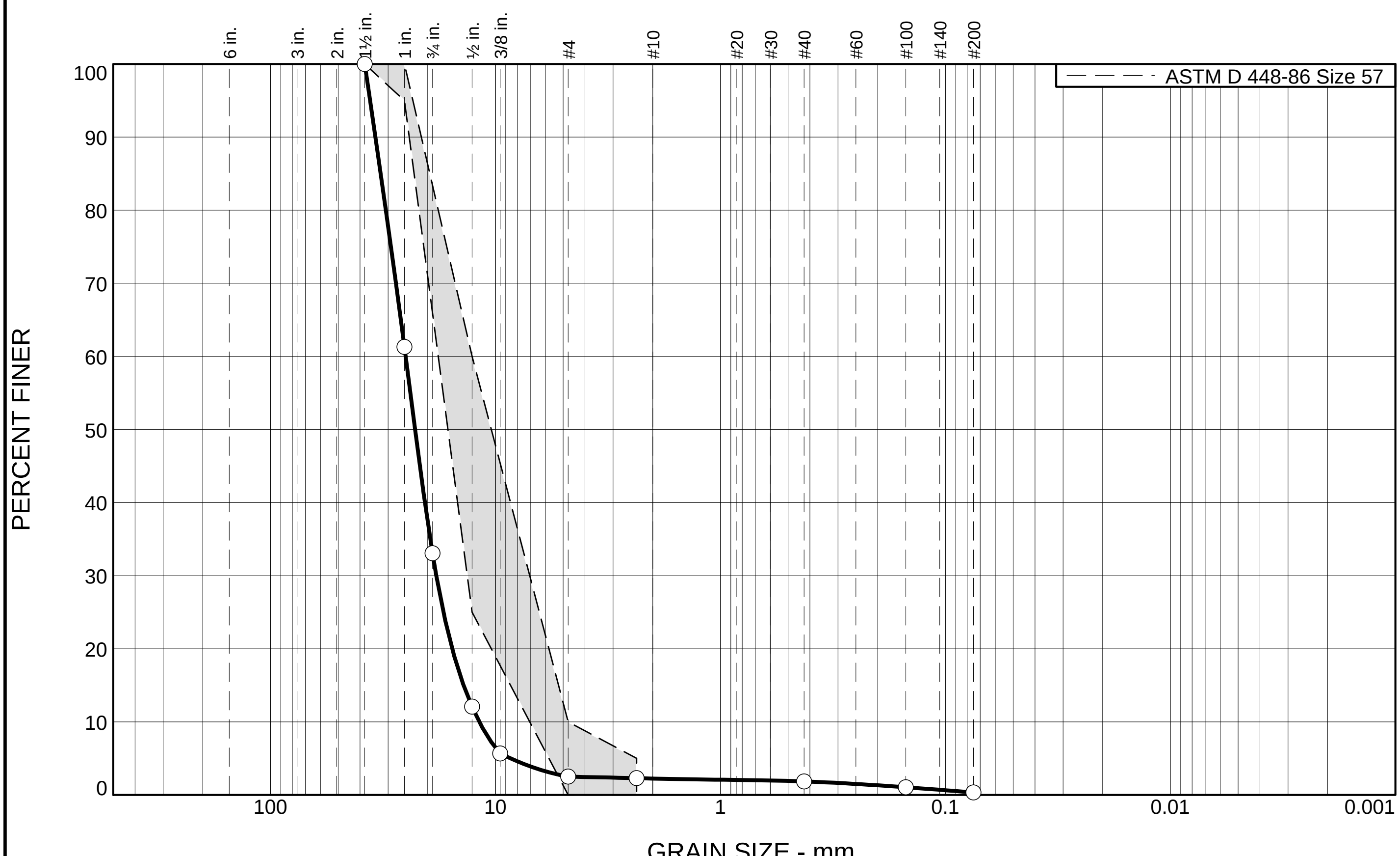
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: CJ **Checked By:** PAD

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	66.9	30.6	0.3	0.4	1.5	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0	100.0 - 100.0	
1	61.3	95.0 - 100.0	X
.75	33.1		
.50	12.1	25.0 - 60.0	X
.375	5.7		
#4	2.5	0.0 - 10.0	
#8	2.3	0.0 - 5.0	
#40	1.8		
#100	1.0		
#200	0.3		

* ASTM D 448-86 Size 57

Soil Description

Brown/Gray f-c GRAVEL, trace of Fine Sand (#57 Blast Furnace Slag)

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 34.1822 D_{85}= 32.3948 D_{60}= 25.0782
D_{50}= 22.7730 D_{30}= 18.3185 D_{15}= 13.8613
D_{10}= 11.7995 C_u= 2.13 C_c= 1.13

Classification

USCS= GP AASHTO= A-1-a

Remarks

Sample taken 8/3/15 from on-site stockpile

Source of Sample: #57 Blast Furnace Slag
Sample Number: 1 (Bag)

Date: 8-27-15

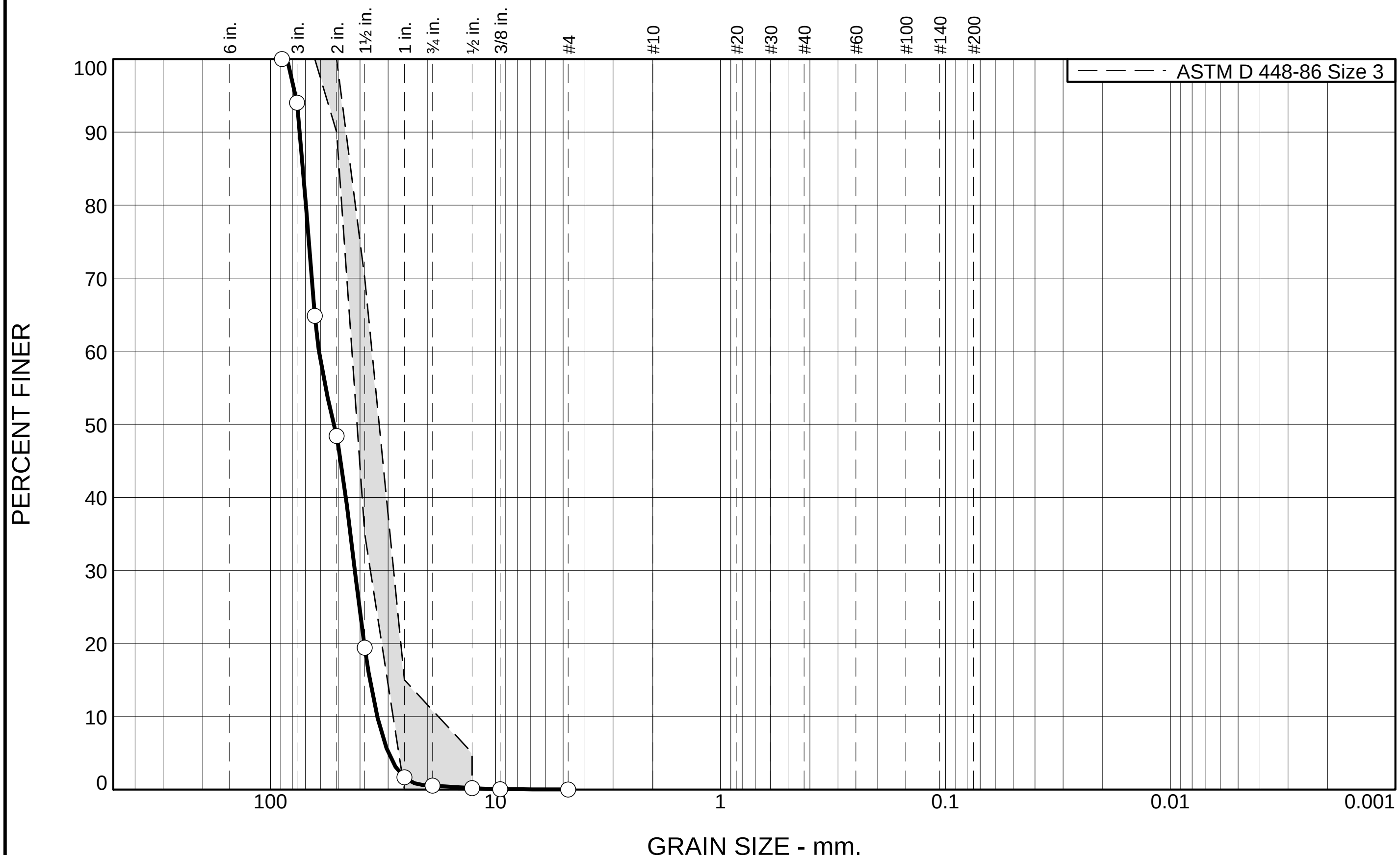
Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: CJ **Checked By:** PAD

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
6.0	93.5	0.5	0.0	0.0	0.0	0.0	0.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.5	100.0		
3.0	94.0		
2.5	64.8	100.0 - 100.0	X
2	48.4	90.0 - 100.0	X
1.5	19.4	35.0 - 70.0	X
1	1.7	0.0 - 15.0	
.75	0.5		
.5	0.2	0.0 - 5.0	
.375	0.0		
#4	0.0		

* ASTM D 448-86 Size 3

Soil Description

Brownish Gray, Coarse SLAG AGGREGATE

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 73.8543 D_{85}= 71.5618 D_{60}= 60.8885
D_{50}= 52.0772 D_{30}= 42.1627 D_{15}= 36.1733
D_{10}= 33.5500 C_u= 1.81 C_c= 0.87

Classification

USCS= GP AASHTO= A-1-a

Remarks

Sample contains 6.0% +3.0 in.

Sample Taken 8/3/15 from on-site stockpile

Source of Sample: #3 Blast Furnace Slag
Sample Number: Bag

Date: 8-7-15

Century Engineering, Inc.

Hunt Valley, MD

Client: MCM Management Corp.
Project: Sparrows Point Terminals-Subgrade Structures
Project No: 151117.00 **Figure**

Tested By: CJ **Checked By:** PAD

APPENDIX D

INDEX OF SHEETS

TRADEPOINT ATLANTIC

PERMIT PLANS
MARCH 9, 2016

TRADEPOINT ATLANTIC

CIVIL PERMIT PLANS
FOR:
AUTOMOTIVE & RO-RO DISTRIBUTION FACILITY
LOCATED IN:
SPARROWS POINT
BALTIMORE, MARYLAND

APPROVAL STAMPS

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

APPROVED FOR GRADING

Date

STORMWATER MANAGEMENT REQUIRED

Baltimore County Soil Conservation District

APPROVED FOR SEDIMENT CONTROL

DATE

DISTRICT OFFICIAL

PLAN NO.

Technical Review for the District by:

If a grading permit has not been obtained within two years of this aproval, this plan shall be re-submitted to the district.

APPROVED: Chief

STORMWATER ENGINEERING
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

Baltimore County Soil Conservation District

APPROVED FOR STORMWATER MANAGEMENT

DISTRICT OFFICIAL DATE PLAN NO.

TECHNICAL REVIEW FOR DISTRICT

BY:

DATE

BALTO. CO. DEPT. OF ENVIRONMENTAL
PROTECTION AND SUSTAINABILITY

OWNER'S / DEVELOPER'S CERTIFICATION - GRADING

I / We certify that all grading on this site will be done in accordance with the current grading requirements as set forth by the Baltimore County Department of Environmental Protection and Sustainability and with the requirements specified in Article 33, Title 5 of the Baltimore County Code.

Signature Owner / Developer | Date

Print Name | Title

OWNER'S / DEVELOPER'S CERTIFICATION - AIR QUALITY

I acknowledge that I am responsible under the Code of Maryland Regulations (26.11.06.03) to prevent particulate matter from becoming airborne due to grading, land clearing, excavation, construction or other related activities. I have received a copy of the "Guidelines to the Air Pollution Regulations for Controlling Excessive ABP (dust) on Activity Sites" which includes a copy of COMAR 26.11.06.03. I will contact the Environmental Health Section at 410-887-3775 at least three days prior to beginning work.

Signature Owner / Developer | Date

Print Name | Title

I / We hereby certify that any clearing, grading, construction and/or development will be done pursuant to this plan and that any responsible personnel involved in this project will have a Certicate of Attendance at a Maryland Department of the Environment approved training program for the control of sediment and erosion before beginning the project. I / We also certify that the site will be inspected at the end of each working day, and that any needed maintenance will be completed so as to insure that all sediment control practices are left in operational condition. I / We authorize the right of entry for periodic on-site evaluation by the Baltimore County Soil Conservation District Board of Supervisors or their authorized agents.

Signature Owner / Developer | Date

Print Name | Title

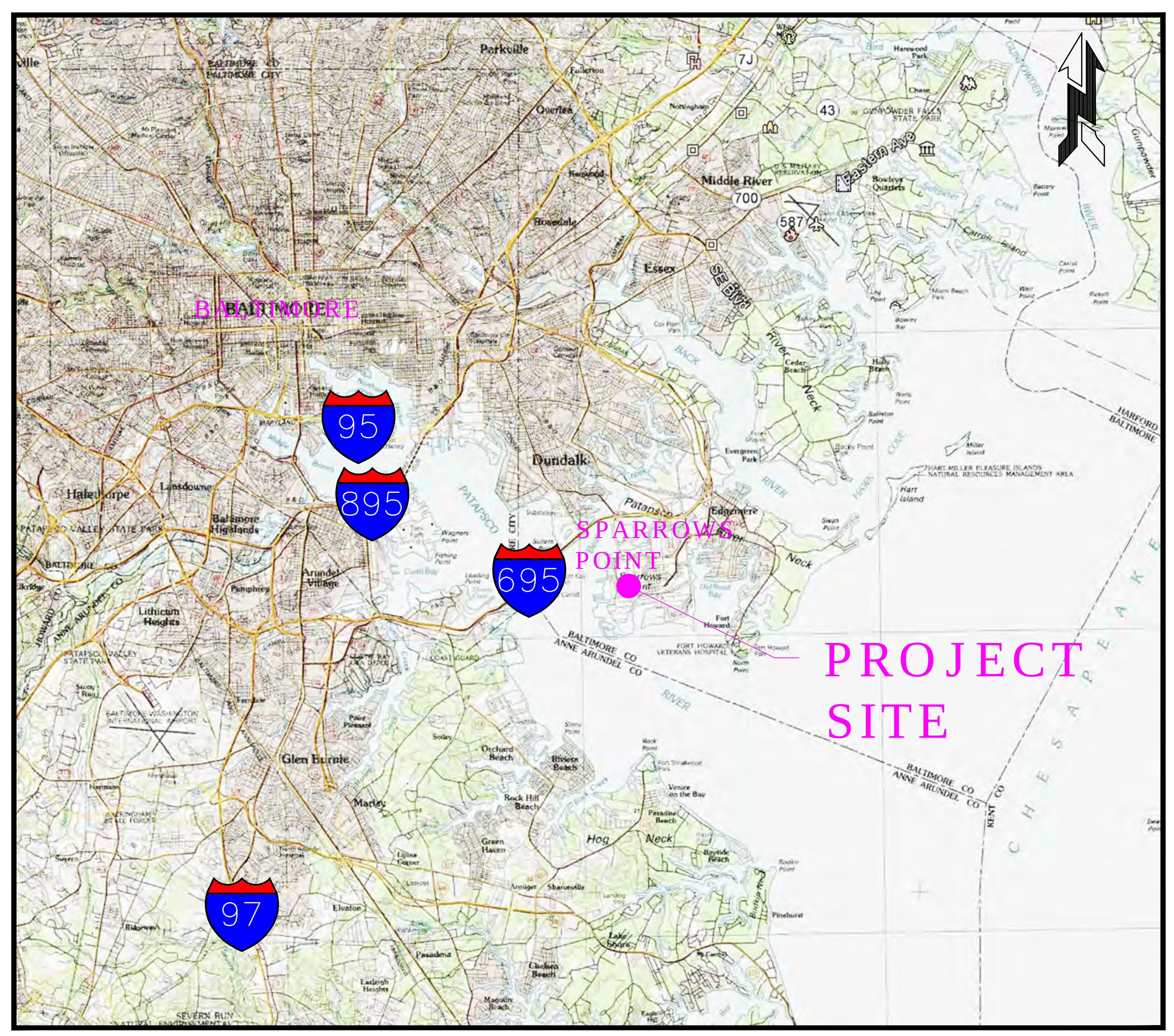
CONSULTANT'S CERTIFICATION

I certify that this plan of erosion and sediment control represents a practical and workable plan based on my personal knowledge of this site, and that this plan was prepared in accordance with the requirements of the Baltimore County Soil Conservation District and the current State of Maryland Specifications for Soil Erosion and Sediment Control. I have reviewed this erosion and sediment control plan with the owner / developer.

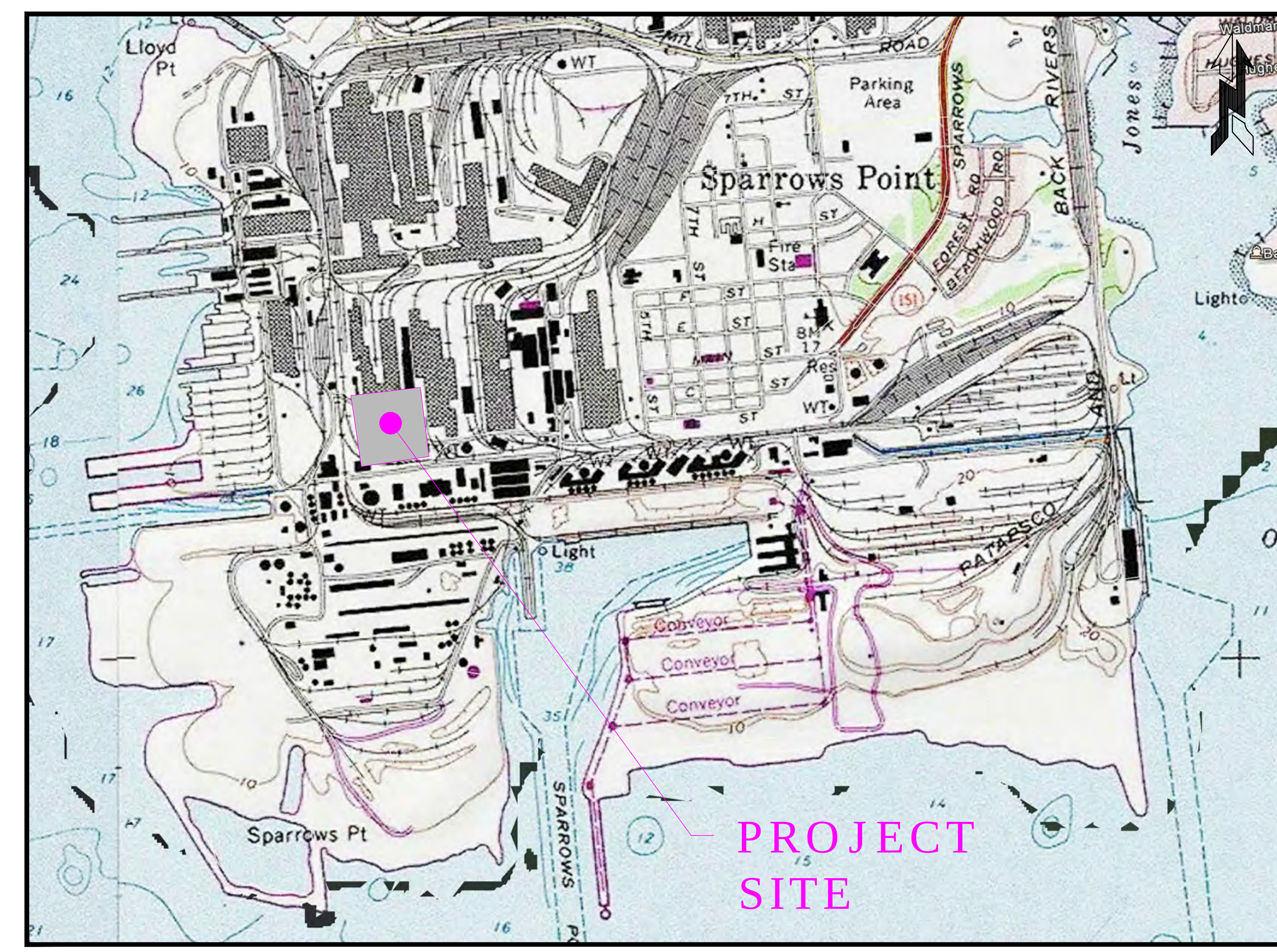
Signature | Date

JAMES W. SMITH | 17314

Print Name | MD License Number



VICINITY MAP
APPROX. SCALE: 1"=5 MILES



LOCATION MAP
APPROX. SCALE: 1"=2000'

PROFESSIONAL CERTIFICATION	
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 17314, EXPIRATION DATE 4/14/2017	
ENGINEER: JAMES W. SMITH	DESIGN BY: MJC
AS-BUILT PER RECORD PRINT	DRAWN BY: EBB
BY: DATE:	CHKD BY: JWS

PASHA

TRANSDEVELOPMENT GROUP

JMT

72 LOVETON CIRCLE | SPARKS, MD 21152
P: (410) 329-3100 | F: (410) 472-2200 | www.jmt.com

DESIGN AND DRAWING BASED ON
MARYLAND COORDINATE SYSTEM
HORIZONTAL - NAD 83/91
VERTICAL - NAVD 88

BENCHMARK	BENCHMARK
TRAVERSE PT#990	STATION: GIS-1A
BA CO. CONCRETE MONUMENT	NAIL
ELEV. 590.13	ELEV. 10.99
N 626417.31 E 1366537.50	N 562923.39 E 1455314.56

TOTAL AREA DISTURBED = ??.?? AC.±

G-001

LIST OF ABBREVIATIONS

A.A.S.H.T.O. – AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIAL
ABT. – ABUTMENT
AC. – ACRES
ACCEL. – ACCELERATION
ACCORD. – ACCORDANCE
AHD. OR AH. – AHEAD
APPROX. – APPROXIMATE
AVE. – AVENUE
& – AND
BC – BOTTOM OF CURB
BIT. – BITUMINOUS
BK. – BACK
℞ – BASELINE
BLDG. – BUILDING
B.M. – BENCH MARK
BR. – BRICK
C.B. – CATCH BASIN
℄ – CENTER LINE
CL. – CLASS
C.M.P. – CORRUGATED METAL PIPE
COMB. – COMBINATION
CON. – CONTROL
CONC. – CONCRETE
CONN. – CONNECTION
CONSTR. – CONSTRUCTION
CONT. – CONTRACT
C.S.F. – CHANNEL SILT FENCE
C.Y. – CUBIC YARD
C&G – CURB & GUTTER
D.I. – DROP INLET
DIA. – DIAMETER
E. – EAST
EA. – EACH
ED. – EDGE
ELEC. – ELECTRIC
ELEV. OR EL. – ELEVATION
E.P. – EDGE OF PAVEMENT
EX. OR EXIST. – EXISTING
EXP. – EXPANSION
EXT. – EXTENSION
F – FILL
FH – FIRE HYDRANT
FM – FORCE MAIN
FOUND. – FOUNDATION
FT. – FEET/FOOT
GA. – GAUGE
G.A.B. – GRADED AGGREGATE BASE
G.E. – GRADING ELEVATION

HDWL. – HEADWALL
H.D.S. – HEADLIGHT SIGHT DISTANCE
HORZ. – HORIZON
H.P. – HIGH POINT (PROFILE)
HR. – HOUR
HS. – HOUSE
H.S.D. – HEADLIGHT SIGHT DISTANCE
I.B. – INTERCEPTOR BERN
IN. – INCHES
INV. – INVERT
I.S.T. – INLET SEDIMENT TRAP
L – LENGTH (CURVE DATA), FEET
LBS. – POUNDS
L.F. – LINEAR FEET
L.O.W. – LIMIT OF WORK
L.P. – LIGHT POLE
LP – LOW POINT
L.S. – LUMP SUM
LT. – LEFT OF BASELINE
M – MAINLINE
MAC. – MACADAM
MAX. – MAXIMUM
MD. – MARYLAND
MED. – MEDIAN
M.H. – MANHOLE
MI. – MILE
MIN. – MINIMUM
MOD. – MODIFIED
MON. – MONUMENT
M.P.H. – MILE PER HOUR
N. – NORTH
N.B.R. – NORTHBOUND ROAD
N.C. – NORMAL CROWN
N.G.S. – NATIONAL GEODETIC SURVEY
N.I.C. – NOT IN CONTRACT
NO. – NUMBER
N&C – NAIL AND CAP
OBS. DR. – OBSERVATION DRIVE
O.E.G. – OPEN END GRATE
℞ – PROPERTY LINE
PAVT. – PAVEMENT
P.D. – PERIMETER DIKE
POB – POINT OF BEGINNING
POE – POINT OF END
PROP. – PROPOSED
PT – POINT
P.T.T. – PER TREATED TON

R – RADIUS (CURVE DATA), FEET
R.C.P. – REINFORCED CONCRETE PIPE
R.C.C.P – REINFORCED CEMENT CONCRETE PIPE
RD. – ROAD
REINF. – REINFORCED
RELOC. – RELOCATED
RET. – RETAINING WALL
RNDG. – ROUNDING
RT. – RIGHT OF BASELINE
RTE. – ROUTE
R/W – RIGHT–OF–WAY
S – SURVEY LINE
S. – SOUTH
SAN. – SANITARY
S.B.D. – STRAW BALE DIKE
S.B.D.C. – STRAW BALE DITCH CHECK
S.B.R. – SOUTHBOUND ROAD
S.C. – SPIRAL TO CURVE
S.C.E. – STABILIZED CONSTRUCTION ENTRANCE
S.D. – STORM DRAIN
S.D.D. – SURFACE DRAIN DITCH
SED. – SEDIMENT
S.F. – SQUARE FEET
S.G. – SINGLE GRATE
SHLD. – SHOULDER
SHT. – SHEET
S.S.D. – STOPPING SIGHT DISTANCE
ST. – STREET
S.T. – SPIRAL TO TANGENT
STA. – STATION
STD. – STANDARD
STRUCT. – STRUCTURE
STY. – STORY
SURV. – SURVEY
S.Y. – SQUARE YARDS
SE – SUPERELEVATION
SW – SIDEWALK
T. – TANGENT (CURVE DATA), FEET
T.B. – TEMPORARY BERM
TELE. – TELEPHONE
TEMP. – TEMPORARY
TRANS. – TRANSITION
TRAV. – TRAVERSE
T.S.O.S. – TEMPORARY RIP RAP OUTLET STRUCTURE
T.S.T. – TEMPORARY SEDIMENT TRAP
TYP. – TYPICAL
T.C. – TOP OF CURB
T./G – TOP OF GRATE
T.R. – TOP OF RIM
UD – UNDERDRAIN
U.G. – UNDERGROUND
U.G.E. – UNDERGROUND ELECTRIC
U.O.N. – UNLESS OTHERWISE NOTED
UTIL – UTILITY
VAR. – VARIES
V.C. – VERTICAL CURVE
VERT. – VERTICAL
VIC. – VICINITY
V.P.D. – VEHICLES PER DAY
W. – WEST
W.B.R. – WESTBOUND ROAD
W.V. – WATERVALVE
W/ – WITH
W/O – WITHOUT
X–ING – CROSSING

LEGEND

	EXISTING	PROPOSED
SANITARY SEWER MANHOLE		
STORM DRAIN MANHOLE		
SANITARY CLEANOUT		
DECIDUOUS TREE		
CONIFEROUS TREE		
SIGN POST		
ELECTRIC POLE		
LIGHT POLE		
TELEPHONE MANHOLE		
ELECTRIC MANHOLE		
WATER MANHOLE		
WATER METER		
GAS METER		
FIRE HYDRANT		
WOODS/TREELINE		
WOOD FENCE		
TRAVERSE CONTROL POINT		
FULL DEPTH PAVEMENT		
MILLING AND OVERLAY		
CONCRETE DRIVEWAY		
CONCRETE SIDEWALK		
FULL DEPTH PAVEMENT REMOVAL		
GRADED AGGREGATE BASE		
BASELINE OF CONSTRUCTION		10 20
CONCRETE CURB AND GUTTER		
HMA CURB		
RIGHT OF WAY		
TEMPOARARY CONSTRUCTION EASEMENT (TCE)	N/A	
DRAINAGE EASEMENT		N/A
REVERTIBLE SLOPE EASEMENT		
INLET		
STORM DRAIN		
DITCH		
CUT LINE		
FILL LINE		
TEST PIT		
MANHOLE		
EXISTING GROUND		
PARK BOUNDARY		
WETLANDS		
FOREST BUFFER		FB
100–YEAR FLOODPLAIN		
WETLAND BUFFER		B

GENERAL NOTES

1. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS OWN SATISFACTION, NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICE MAINS AND CONNECTIONS AND ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF HIS CONSTRUCTION WITH THE CONSTRUCTION OF OTHER CONTRACTORS OCCURING ON SITE AND NEARBY.
3. THE CONTRACTOR SHALL CALL "MISS UTILITY " (1–800–257–7777) A MINIMUM OF 72 HOURS PRIOR TO BEGINNING ANY EXCAVATION.
4. IT SHALL BE UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK.
5. THE CONTRACTOR SHALL NOTIFY TRANSPOINT ATLANTIC (410)–###–#### AT LEAST THREE (3) DAYS PRIOR TO BEGINNING CONSTRUCTION.
6. THE CONTRACTOR SHALL ADJUST MANHOLES, WATER METERS, WATER VALVES, HAND BOXES, AND OTHER APPURTENANCES TO FINAL GRADE.
7. UNLESS OTHERWISE NOTED, PIPE ELEVATIONS REFER TO THE INVERT.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION TO THIS PLAN PRIOR TO ANY FIELD CHANGES BEING MADE. ANY CHANGE TO THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER OR HIS REPRESENTATIVE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. ALL WORK SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" ISSUED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
10. DIMENSIONS AND CALLOUTS FOR ARE TO PAVEMENT EDGE OR FACE OF CURB, UNLESS NOTED OTHERWISE.
11. THE CONTRACTOR SHALL USE EXTREME CAUTION IN CROSSING EXISTING UTILITY (WATER, GAS, SANITARY, ETC,) LINES WHICH ARE DETERMINED TO HAVE LESS THAN 6" CLEARANCE. THE ENGINEER SHALL DIRECT THE CONTRACTOR TO PROVIDE EITHER A SAND CUSHION OR PLASTIC FOAM SPACERS IN SHEET FORM TO PREVENT ONE UTILITY FROM BEARING DIRECTLY UPON ANOTHER IN LOW CLEARANCE SITUATIONS. COST IS TO BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT OF PROPOSED PIPE.
12. EARTH MATERIAL SHALL REMAIN ON SITE, ALL OTHER SALVAGED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE WORKSITE UPON COMPLETION OF WORK ON THIS CONTRACT. WHERE REFERENCE IS MADE TO STANDARDS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO HAVE IN HIS POSSESSION THE BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS, STANDARD DETAILS FOR CONSTRUCTION AND THE MARYLAND STATE HIGHWAY ADMINISTRATION BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES WITH THE LATEST UP–TO–DATE STANDARDS AS OF THE DATE OF ADVERTISEMENT OF THIS PROJECT. MDSHA STANDARDS SHALL BE USED WHERE SPECIFICALLY REFERENCED
13. HORIZONTAL CONTROL: THIS PROJECT IS ORIENTED TO CONFORM TO THE MARYLAND STATE PLANE COORDINATE SYSTEM, NAD 83 / 91.
14. VERTICAL CONTROL: THE LOCATION AND ELEVATION OF BENCH MARKS ARE SHOWN ON THE PLANS. ALL ELEVATIONS ARE IN FEET AND ARE BASED ON THE U.S. COAST AND GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1988 (NAVD 88).
15. PIPE CULVERTS AND STORM DRAINS: THE LOCATION AND LENGTH OF PIPES SHALL BE VERIFIED BY THE CONTRACTOR BEFORE ORDERING.
16. DITCHES: TYPE AND INVERT ELEVATIONS OF DITCHES ARE NOTED ON THE PLANS. DITCHES WILL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND/OR STANDARD PLATES.
17. THE CONTRACTOR MUST PROTECT ALL IN PLACE ACTIVE UNDERGROUND UTILITIES UNLESS OTHER TREATMENT IS CALLED FOR.
18. LANDSCAPING: UNLESS OTHERWISE NOTED, ALL GRADED AREAS NOT OTHERWISE SURFACED SHALL RECEIVE 2" TOPSOIL, SEED AND MULCH.
19. INVERT ELEVATIONS: ALL INVERT ELEVATIONS ARE APPROXIMATE AND MAY BE VARIED TO SUIT FIELD CONDITIONS AT THE DIRECTION OF THE ENGINEER. THE CONTRACTOR SHALL VERIFY ALL PROPOSED INLET AND MANHOLE LOCATIONS AND EXISTING UTILITY CROSSING ELEVATIONS PRIOR TO FABRICATION OF PRECAST DRAINAGE STRUCTURES. ALL CONFLICTS SHALL BE REPORTED TO THE ENGINEER.
20. LAYOUT INFORMATION SHOWN ON THE PLANS FOR STORM DRAIN STRUCTURES IS DEFINED AS FOLLOWS:
    A. STATION AND OFFSET FOR INLETS LOCATED ALONG PROPOSED CURB LINES IS GIVEN TO THE CENTER OF THE INLET STRUCTURE AT THE GUTTERLINE. FOR COG TYPE INLETS THE CENTER OF THE STRUCTURE SHALL BE DEFINED AS THE CENTER OF THE INLET STRUCTURE EXCLUDING THE CURB TROUGH SECTIONS. STATION AND OFFSETS FOR ENDWALLS AND END SECTIONS SHALL BE THE CENTERLINE AT THE END OF THE PIPE. ALL OTHER STORM DRAIN STRUCTURES SHALL BE TO THE GEOMETRIC CENTERLINE OF THE STRUCTURE.
    B. STATIONING FOR THE OFFSET CURB INLETS IS GIVEN AT THE GEOMETRIC CENTER OF THE INLET. OFFSETS ARE GIVEN AT THE GUTTER LINE (FACE OF CURB).
    C. TOP ELEVATIONS (T.C. OR T.R.) FOR CURB TYPE INLETS IS GIVEN AT THE TOP OF CURB AT THE STRUCTURE CENTERLINE STATION. T.R. ELEVATIONS FOR MANHOLES AND OTHER STORM DRAIN STRUCTURES IS GIVEN FOR THE FRAME AND COVER OR GRATE.
    THE CONTRACTOR SHALL VERIFY ALL STORM DRAIN LAYOUT INFORMATION PRIOR TO INSTALLATION. ANY DISCREPANCIES SHOULD BE IMMEDIATELY REPORTED TO THE ENGINEER.
21. THE CONTRACTOR IS REQUIRED TO INSPECT THE SITE PRIOR TO BOTH BIDDING AND CONSTRUCTION. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE OWNER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR PROCEED WITH THE WORK, MAKING FIELD CORRECTIONS OR MAKING ADJUSTMENTS WITHOUT NOTIFYING BCPS OF ANY DISCREPANCIES, THEN THE CONTRACTOR ASUMES ALL RESPONSIBILITIES FOR THOSE RESULTING CHANGES.
22. MEASUREMENTS ARE NOT TO BE SCALED FROM PLANS.
23. ALL SURVEY AND STAKEOUT TO PERFORMED BY A LICENSED SURVEYOR.
24. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
25. ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
26. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT OR OTHER FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
27. STORMWATER MANAGEMENT HAS BEEN ADDRESSED/APPROVED BY/THROUGH (PAYMENT OF A FEE IN LIEU TO THE BALTIMORE COUNTY STORMWATER MANAGEMENT FUND / STORMWATER MANAGEMENT VARIANCE / STORMWATER MANAGEMENT EXEMPTION / ENVIRONMENTAL SITE DESIGN)

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LICENSE NO. 17314 , EXPIRATION DATE 4/14/2017
ENGINEER: JAMES W. SMITH | DESIGN BY: MJC
DRAWN BY: EBB
AS–BUILT PER RECORD PRINT
BY:
DATE: | CHKD BY: JWS

TRADEPOINT ATLANTIC | PASHA | TRANSDEVELOPMENT GROUP

PROJECT	civ
FILE	civil cov
CTB	tdg-lw.ctb
DESIGNER	COLLINS
EDIT DATE	3/8/2016
SAVE TIME	1:38:32 PM
PLOT DATE	3/8/2016
PLOT TIME	1:40:31 PM

ABBREVIATIONS, LEGEND & NOTES
20 AC. AUTOMOTIVE YARD
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER
SPARROWS POINT, MARYLAND
G-002

Project: Q:\Clients\TD Group\893 Pasha Sparrows Point File Name: 893SLSP3C-Sparrow Point Planning.dwg Sheet: Overall Designer: JEFF Edit Time: 2/23/2016 11:10:46 AM Plot Time:2/23/2016 11:11:05 AM

NO.	DATE	NOTES
		VERSION
2	22 FEB 16	REVISION
1	4 FEB 16	ORIGINAL

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	893
FILE	893SLSP3C
CTB	tdg-lw.ctb
DESIGNER	JEFF
EDIT DATE	2/23/2016
SAVE TIME	11:10:46 AM
PLOT DATE	2/23/2016
PLOT TIME	11:11:05 AM

OVERALL SITE PLAN & EXISTING CONDITIONS

AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

C-001

SITE SUMMARY

90° VEHICLE BAYS:	2,398
SITE AREA (FENCED):	20 ACRES

Project: Q:\Clients\TD Group\893 Pasha Sparrows Point File Name: 893SLSP3C-Sparrow Point Planning.dwg Sheet: Site20Ac Designer: JEFF Edit Time: 2/23/2016 11:10:46 AM Plot Time:2/23/2016 11:11:13 AM

VERSION

NO.	DATE	NOTES
2	22 FEB 16	REVISION
1	4 FEB 16	ORIGINAL

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

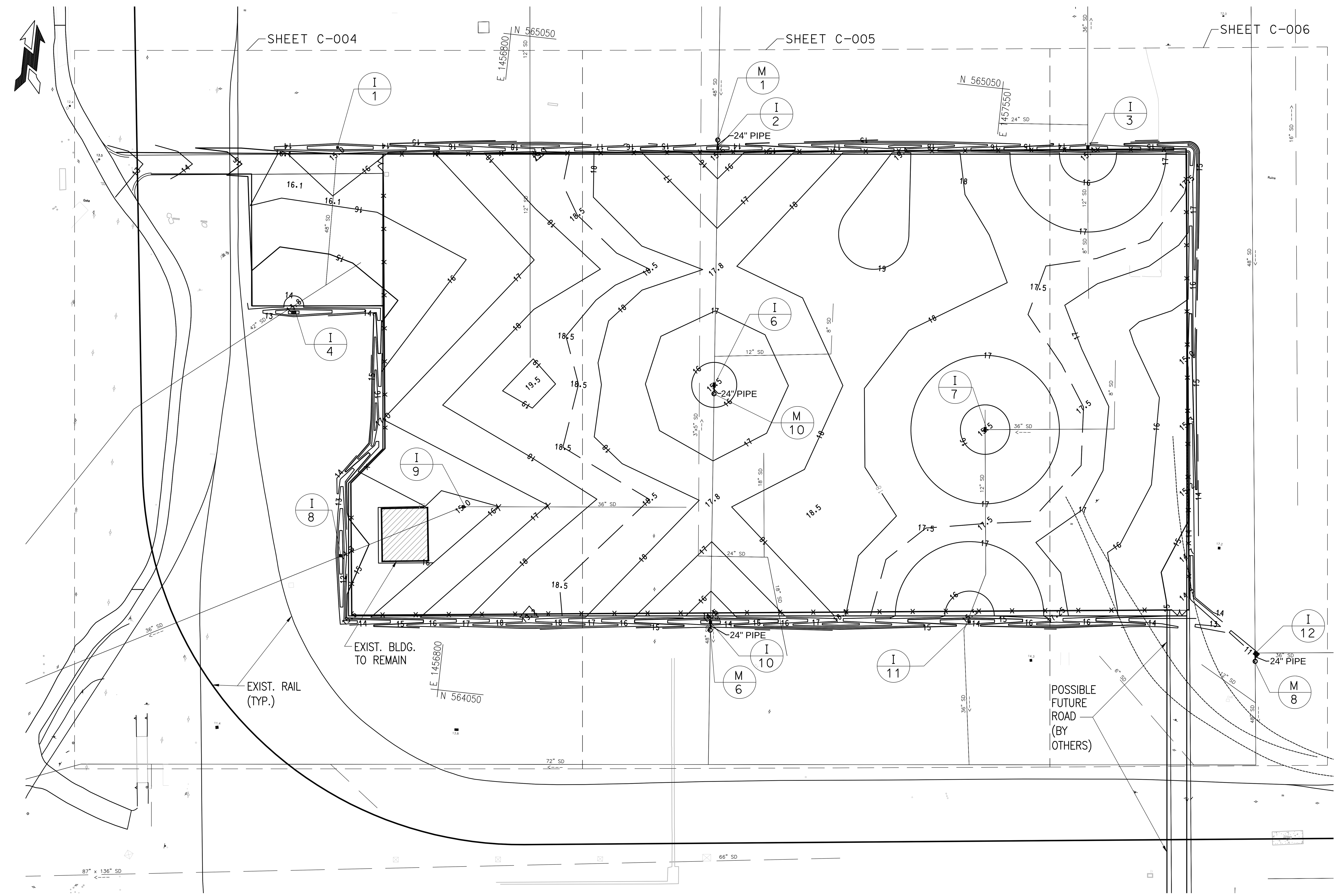
PROJECT	893
FILE	893SLSP3C
CTB	tdg-lw.ctb
DESIGNER	JEFF
EDIT DATE	2/23/2016
SAVE TIME	11:10:46 AM
PLOT DATE	2/23/2016
PLOT TIME	11:11:13 AM

SITE PLAN
20 AC. AUTOMOTIVE YARD
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

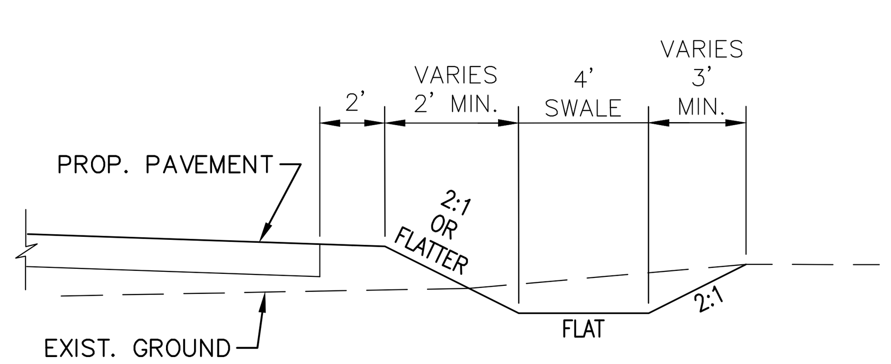
C-002

Plot Time:3/10/2016 3:43:33 PM Edit Time: 3/10/2016 3:43:00 PM Designer: COLLINS Sheet: C-003 File Name: PGR_SparrowPoint_Site.dwg Project: Q:\SMD160182_001_Trade_Point_AutomobilCADD

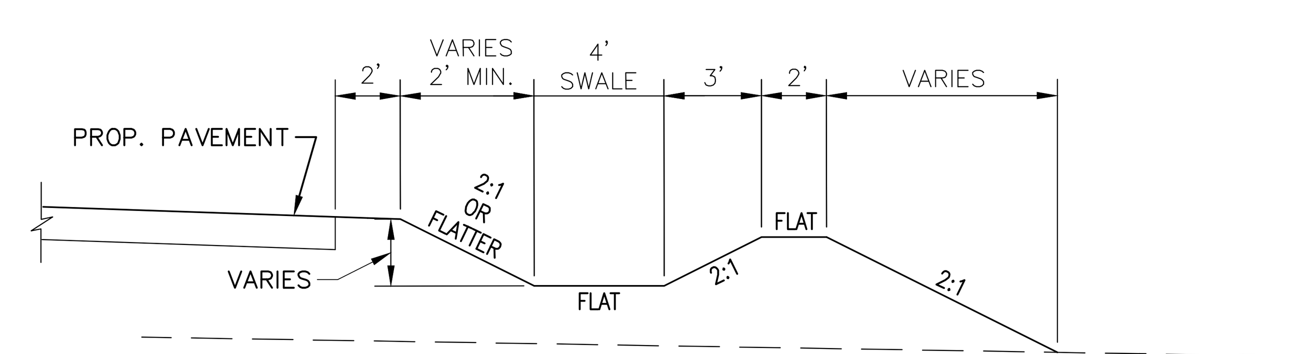


STRUCTURE	TYPE	BALT. Co. STANDARD	REMARK	NORTHING	EASTING	TOP ELEV.
I–1	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	INSTALL ON EXIST. 48" SD	564850.8826	1456561.9171	12.1
I–2	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	8' OF 24" PIPE TO M–1	564913.7718	1457130.4104	12.6
M–1	PRECAST TYPE C MANHOLE	PLATE D–3.02A	INSTALL ON EXIST. 48" SD	564921.7718	1457130.0000	15.0
I–3	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	INSTALL ON EXIST. 36" SD	564975.6859	1457688.1626	12.4
I–4	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	INSTALL ON EXIST. 42" SD	564604.3740	1456518.6449	10.8
I–6	PRECAST STD. TYPE 'S' INLET DOUBLE GRATE	PLATE D–2.20	8' OF 24" PIPE TO M–1	564555.3951	1457165.0417	15.5
M–10	PRECAST TYPE C MANHOLE	PLATE D–3.02A	INSTALL ON EXIST. 48" SD	564547.3951	1457165.5000	15.6
I–7	PRECAST STD. TYPE 'S' INLET DOUBLE GRATE	PLATE D–2.20	INSTALL ON EXIST. 36" SD	1457580.4631	564533.3798	15.5
I–8	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	INSTALL ON EXIST. 36" SD	1456645.1449	564242.4185	10.5
I–9	PRECAST STD. TYPE 'S' INLET DOUBLE GRATE	PLATE D–2.20	INSTALL ON EXIST. 36" SD	1456807.3186	564330.4672	15.0
I–10	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	8' OF 24" PIPE TO M–1	1456645.1449	564242.4185	12.7
M–6	PRECAST TYPE C MANHOLE	PLATE D–3.02A	INSTALL ON EXIST. 48" SD	1456637.1449	564242.9000	14.5
I–11	PRECAST STD. TYPE 'S' INLET DOUBLE GRATE	PLATE D–2.20	INSTALL ON EXIST. 48" SD	1457588.0210	564251.9230	14.0
I–12	TYPE 'S' INLET DOUBLE GRATE TANDEM YARD & MEDIAN APPLICATIONS	PLATES D–2.19 A & B	8' OF 24" PIPE TO M–1	1456671.8719	564448.2191	11.5
M–8	PRECAST TYPE C MANHOLE	PLATE D–3.02A	INSTALL ON EXIST. 48" SD	1456663.8719	564448.0000	12.3

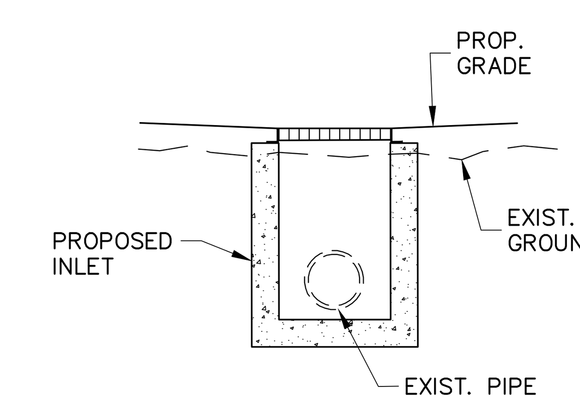
STORM DRAIN SCHEDULE



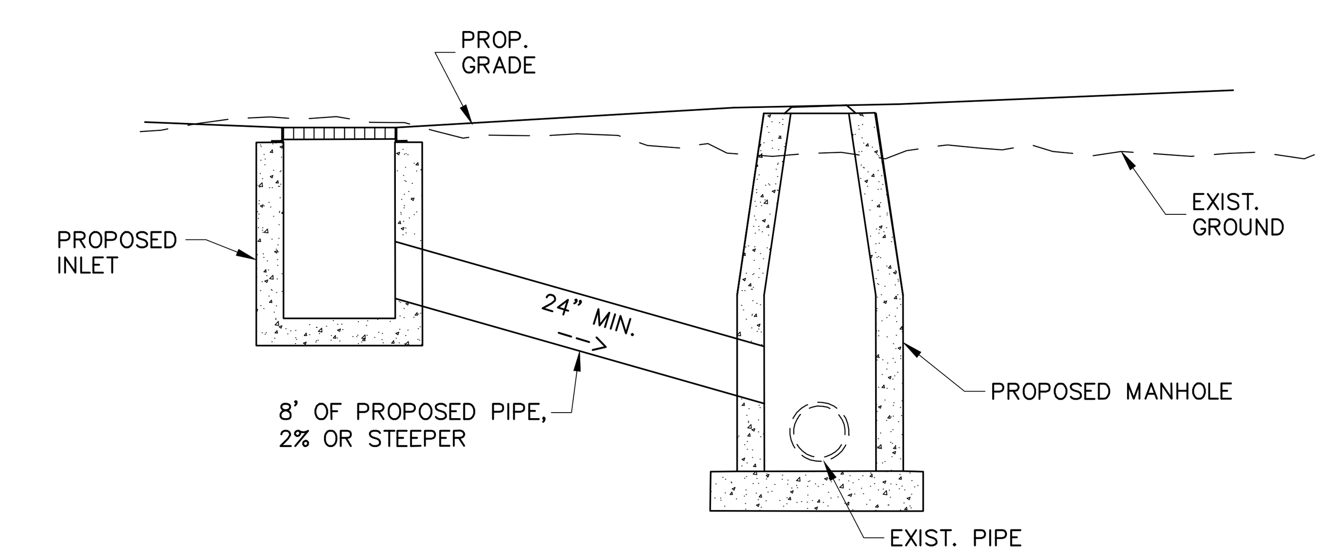
EDGE SWALE DETAIL - CUT
NOT TO SCALE



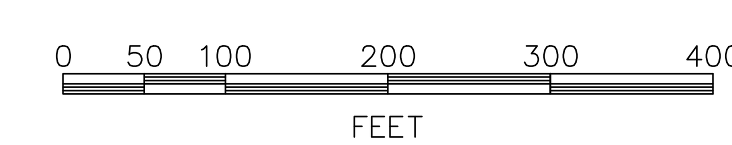
EDGE SWALE DETAIL - FILL
NOT TO SCALE



INLET ON EXISTING DRAINAGE PIPE 42" OR SMALLER
NOT TO SCALE



MANHOLE ON EXISTING PIPE LARGER THAN 42"
NOT TO SCALE



DESIGN AND DRAWING BASED ON MARYLAND COORDINATE SYSTEM
HORIZONTAL - NAD 83/91
VERTICAL - NAVD 88

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LICENSE NO. 17314, EXPIRATION DATE 4/14/2017
ENGINEER: JAMES W. SMITH
DESIGN BY: MJC
DRAWN BY: EBB
CHKD BY: JWS
AS-BUILT PER RECORD PRINT
BY:
DATE:

TRADEPOINT ATLANTIC
PASHA
TRANSDEVELOPMENT GROUP

PROJECT	pGR
FILE	pGR_Sparr
CTB	tdg-lw.ctb
DESIGNER	COLLINS
EDIT DATE	3/10/2016
SAVE TIME	3:43:00 PM
PLOT DATE	3/10/2016
PLOT TIME	3:43:33 PM

OVERALL GRADING AND DRAINAGE PLAN
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

C-003

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LICENSE NO. 17314 EXPIRATION DATE 4/14/2017

ENGINEER: JAMES W. SMITH

DESIGN BY: MJC
DRAWN BY: EBB
CHKD BY: JWS

AS-BUILT PER RECORD PRINT
BY:
DATE:

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	pGR
FILE	pGR_Sparr
CTB	tdg-lw.ctb
DESIGNER	COLLINS
EDIT DATE	3/10/2016
SAVE TIME	3:53:39 PM
PLOT DATE	3/10/2016
PLOT TIME	4:05:17 PM

GRADING PLAN
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

C-004

MATCH LINE – SEE SHEET C–004

MATCH LINE – SEE SHEET C–006

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0 20 40 80 120 160
FEET

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HORIZONTAL - NAD 83/91
VERTICAL - NAVD 88

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LICENSE NO. 17314 EXPIRATION DATE 4/14/2017
ENGINEER: JAMES W. SMITH
DESIGN BY: MJC
DRAWN BY: EBB
CHKD BY: JWS
AS–BUILT PER RECORD PRINT
BY:
DATE:

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	pGR
FILE	pGR_Sparr
CTB	tdg-lw.ctb
DESIGNER	COLLINS
EDIT DATE	3/10/2016
SAVE TIME	3:01:28 PM
PLOT DATE	3/10/2016
PLOT TIME	3:04:55 PM

GRADING PLAN
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

C-005

Project: Q:\SMD160182_001_Trade_Point_Automobil\CADD File Name: PGR_SparrowPoint_Site.dwg Sheet: C-005 Designer: COLLINS Edit Time: 3/10/2016 3:01:28 PM Plot Time:3/10/2016 3:04:55 PM

MATCH LINE – SEE SHEET C-005

0 20 40 80 120 160
FEET

DESIGN AND DRAWING BASED ON
MARYLAND COORDINATE SYSTEM
HORIZONTAL - NAD 83/91
VERTICAL - NAVD 88

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LICENSE NO. 17314, EXPIRATION DATE 4/14/2017

ENGINEER: JAMES W. SMITH
DESIGN BY: MJC
DRAWN BY: EBB
CHKD BY: JWS
AS-BUILT PER RECORD PRINT
BY:
DATE:

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

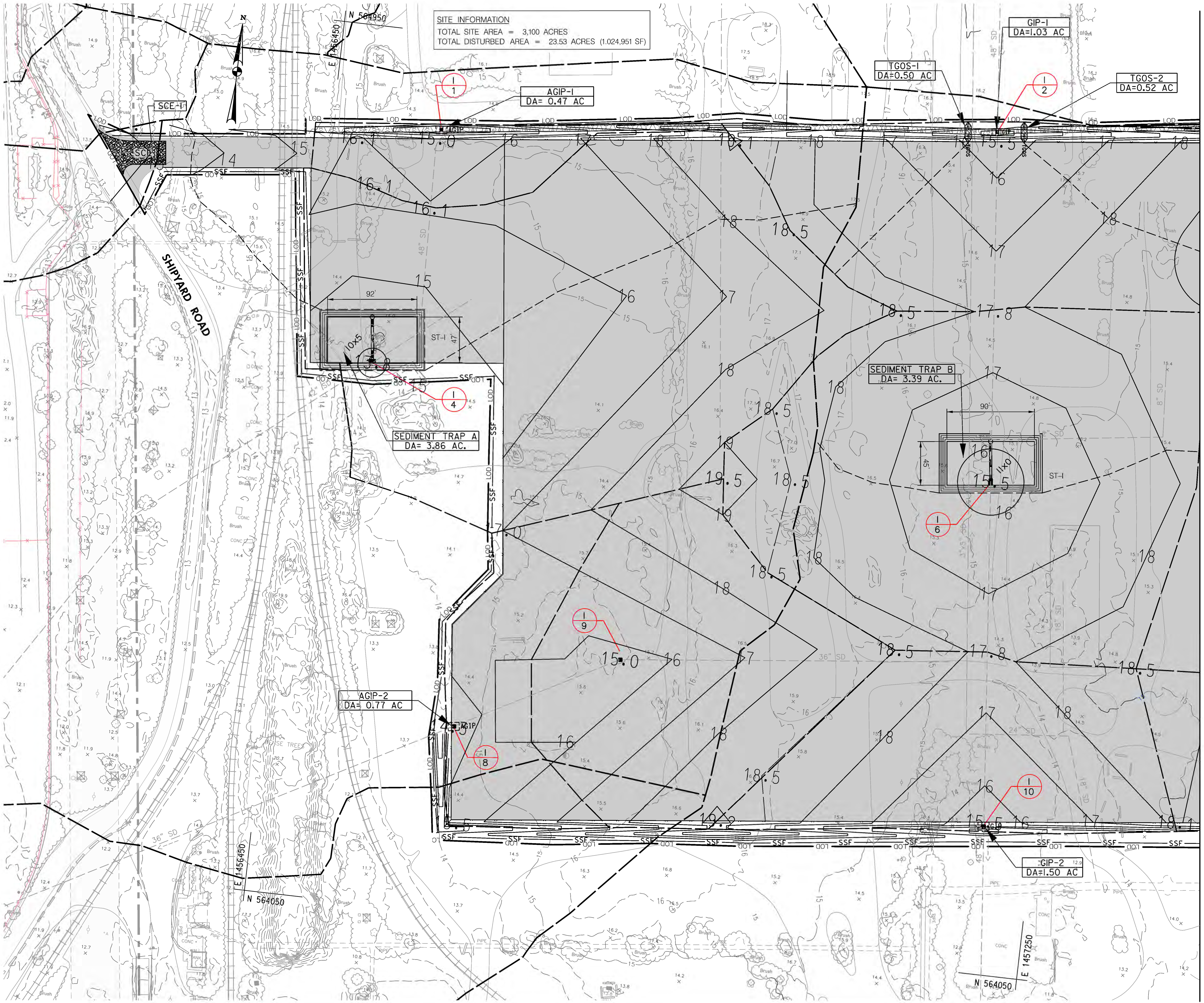
PROJECT	pGR
FILE	pGR_Sparr
CTB	tdg-lw.ctb
DESIGNER	COLLINS
EDIT DATE	3/10/2016
SAVE TIME	3:53:39 PM
PLOT DATE	3/10/2016
PLOT TIME	3:54:31 PM

GRADING PLAN
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

C-006

Project: Q:\SMD\160182_001_Trade_Point_Automobil\CADD File Name: PGR_SparrowPoint_Site.dwg Sheet: C-006 Designer: COLLINS Edit Time: 3/10/2016 3:53:39 PM Plot Time:3/10/2016 3:54:31 PM



NOTES:

1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
2. ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
3. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST BUFFER EASEMENT OR OTHER FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
4. STORMWATER MANAGEMENT HAS BEEN ADDRESSED/APPROVED BY /THROUGH (PAYMENT OF A FEE IN LIEU TO THE BALTIMORE COUNTY STORMWATER MANAGEMENT FUND /STORMWATER MANAGEMENT VARIANCE /STORMWATER MANAGEMENT EXEMPTION /ENVIRONMENTAL SITE DESIGN).

SEQUENCE OF OPERATIONS

1. NOTIFY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY, INSPECTION AND ENFORCEMENT DIVISION, (410)-887-3226 AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
2. IF APPLICABLE, ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE, WHERE THE LIMIT IS WITHIN 50 FEET OF THE FOREST BUFFER /CONSERVATION EASEMENT. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRE-CONSTRUCTION MEETING.
3. CLEAR AND GRUB FOR SEDIMENT AND EROSION CONTROL MEASURES OR DEVICES ONLY.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCE SCE-1. ALL TRAFFIC ASSOCIATED WITH SITE WORK MUST USE THE STABILIZED CONSTRUCTION ENTRANCE FOR INGRESS AND EGRESS.
5. INSTALL SUPER SILT FENCE.
6. NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS AND INSPECTIONS, SEDIMENT CONTROL, UPON COMPLETION OF SAID INSTALLATION
7. CONSTRUCT STORM DRAIN INLETS WHERE INDICATED.
8. CONSTRUCT PIPE OUTLET SEDIMENT TRAPS A, B AND C AND APPURTENANCES.
9. ONCE STORM DRAIN INLETS HAVE BEEN INSTALLED, CONSTRUCT AGIP-1, AGIP-2, AND GIP-1 THROUGH GIP-4.
10. EXCAVATE AND GRADE FOR DRAINAGE SWALES ON THE NORTH AND EAST SIDES OF THE SITE AND INSTALL SOIL STABILIZATION MATTING. ONLY THAT PORTION OF THE SWALES THAT CAN BE STABILIZED THE SAME DAY SHALL BE GRADED.
11. CONSTRUCT TEMPORARY GABION OUTLET STRUCTURES TGOS-1 THROUGH TGOS-4 AND TEMPORARY STONE OUTLET STRUCTURES TSOS-1 AND TSOS-2.
12. EXCAVATE FOR AND INSTALL AGGREGATE BASE FOR PROPOSED PAVED LOT.
13. ONCE ALL AREAS ARE STABILIZED TO SEDIMENT TRAPS A, B AND C, REMOVE SEDIMENT, BACKFILL TRAPS AND INSTALL PAVEMENT SUBBASE TO STABILIZE AREA.
14. INSTALL HOT MIX ASPHALT PAVING.
15. UPON STABILIZATION OF SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS.

LEGEND

	FULL DEPTH PAVEMENT
LOD	LIMIT OF DISTURBANCE
GIP	GABION INLET PROTECTION
AGIP	AT-GRADE INLET PROTECTION
SSF	SUPER SILT FENCE
TGOS	TEMPORARY GABION OUTLET STRUCTURE
TSOS	TEMPORARY STONE OUTLET STRUCTURE
	SOIL STABILIZATION MATTING
	PROPOSED CONTOUR
	EXIST. MAJOR CONTOUR
	EXIST. MINOR CONTOUR
15.5	PROPOSED SPOT GRADE
	EXISTING DRAINAGE BOUNDARY
	PROPOSED DRAINAGE BOUNDARY
	PROPOSED DEVICE DRAINAGE AREA

50' 0 50' 100'
SCALE: 1" = 50'

VERSION		
NO.	DATE	NOTES

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

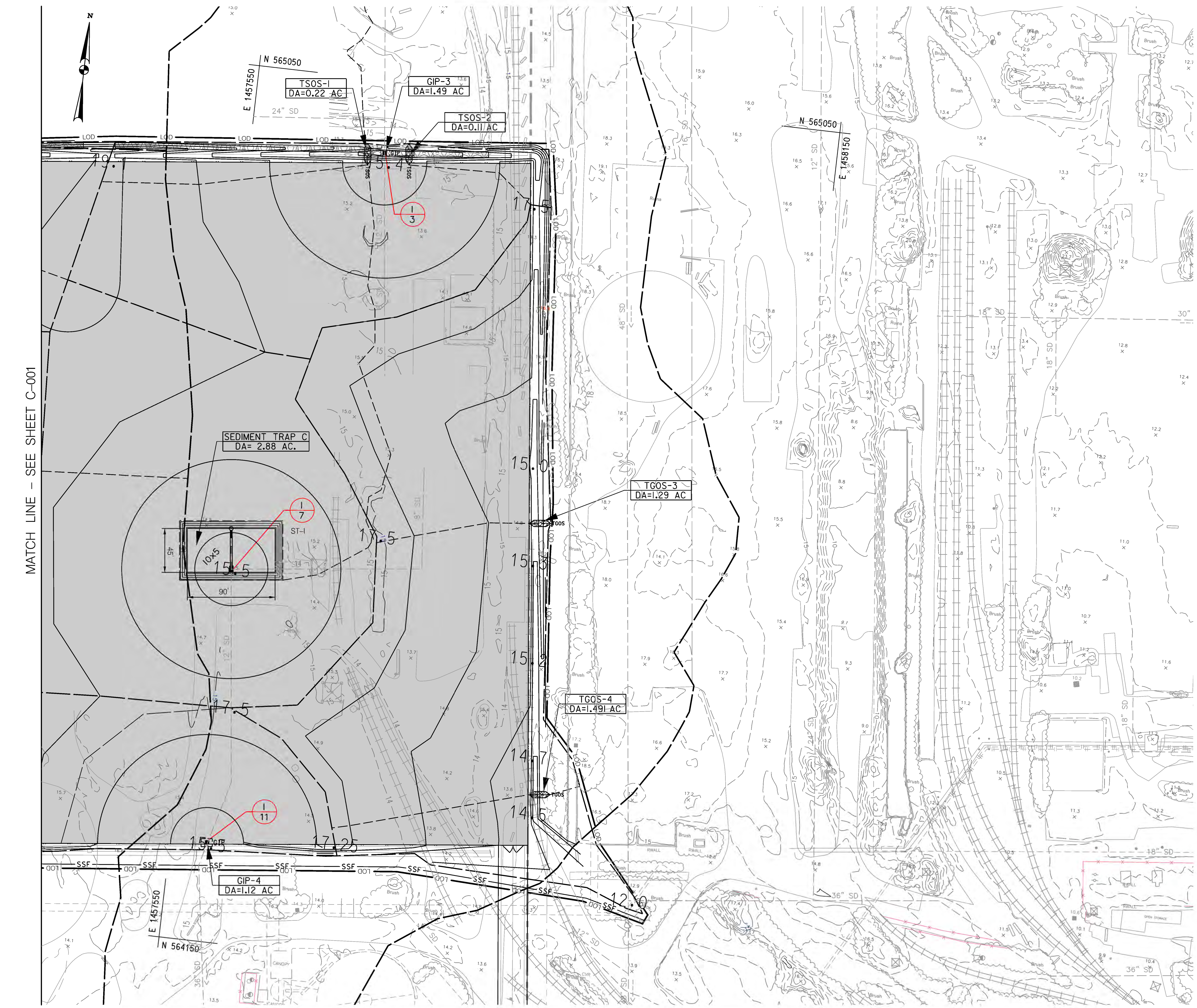
PROJECT	
FILE	
CTB	
DESIGNER	
EDIT DATE	
SAVE TIME	
PLOT DATE	
PLOT TIME	

SEDIMENT AND EROSION CONTROL PLAN

AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND

E-0001



SEDIMENT AND EROSION CONTROL PLAN NOTES

1. REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.
2. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENTS CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. CHANGES IN SEDIMENT CONTROL PRACTICES REQUIRE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT.
3. AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN: A.) THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1); AND B.) SEVEN CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.
5. ANY CHANGE TO THE GRADING PROPOSED ON THIS PLAN REQUIRES RE-SUBMISSION TO BALTIMORE COUNTY SOIL CONSERVATION DISTRICT FOR APPROVAL.
6. DUST CONTROL WILL BE PROVIDED FOR ALL DISTURBED AREAS. REFER TO "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PG. H.22, FOR ACCEPTABLE METHODS AND SPECIFICATIONS FOR DUST CONTROL.
7. ANY VARIATIONS FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT PRIOR TO THE INITIATION OF THE CHANGE.
8. EXCESS CUT OR BORROW MATERIAL SHALL GO TO, OR COME FROM, RESPECTIVELY, A SITE WITH AN OPEN GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN.
9. THE FOLLOWING ITEM MAY BE USED AS APPLICABLE: REFER TO "MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION" BY THE WATER MANAGEMENT ADMINISTRATION OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, REVISED NOVEMBER 2000, FOR STANDARD DETAILS AND DETAILS SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN FOR WATERWAY CONSTRUCTION.
10. PUMPING SEDIMENT-LADEN WATER INTO WATERS OF THE STATE IS STRICTLY PROHIBITED. ANY PORTABLE DEWATERING DEVICE MUST BE LOCATED WITHIN THE LIMIT OF DISTURBANCE.

TEMPORARY STOCKPILE NOTE

TEMPORARY STOCKPILES SHALL BE:

1. LOCATED WITHIN THE LIMIT OF DISTURBANCE (LOD).
2. DRAIN TO A FUNCTIONING SEDIMENT CONTROL DEVICE.
3. POSITIONED TO NOT IMPEDE UPON, OR IMPAIR THE FUNCTION OF SAID DEVICE.
4. POSITIONED TO NOT ALTER DRAINAGE DIVIDES.

INLET PROTECTION NOTE

THE CONTRACTOR IS REQUIRED TO INSTALL INLET PROTECTION ON ALL STORM DRAIN INLETS WITH THE EXCEPTION OF THE FOLLOWING:

*1) ANY INLET OUTFALLING DIRECTLY INTO A SEDIMENT TRAPPING DEVICE.

2) INLETS ON PRIVATE OR PUBLIC PAVED ROADWAYS OPEN TO THE PUBLIC.

ALL INLET PROTECTION WILL BE INSTALLED AS DIRECTED BY THE INSPECTOR IN ACCORDANCE WITH THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PAGE E.23 (OR AS MAY BE AMENDED). THE REMOVAL OF ANY INLET PROTECTION DEVICES WILL REQUIRE APPROVAL FROM THE INSPECTOR.

*STORM DRAINS TO BE FLUSHED PRIOR TO TRAPPING DEVICE REMOVAL.

LEGEND

	FULL DEPTH PAVEMENT
LOD	LIMIT OF DISTURBANCE
GIP	GABION INLET PROTECTION
AGIP	AT-GRADE INLET PROTECTION
SSF	SUPER SILT FENCE
TGOS	TEMPORARY GABION OUTLET STRUCTURE
TSOS	TEMPORARY STONE OUTLET STRUCTURE
	SOIL STABILIZATION MATTING
	PROPOSED CONTOUR
	EXIST. MAJOR CONTOUR
	EXIST. MINOR CONTOUR
15.5	PROPOSED SPOT GRADE
	EXISTING DRAINAGE AREA BOUNDARY
	PROPOSED DRAINAGE AREA BOUNDARY
	PROPOSED DEVICE DRAINAGE AREA

50' 0 50' 100'

SCALE: 1" = 50'

VERSION		
NO.	DATE	NOTES

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	
FILE	
CTB	
DESIGNER	
EDIT DATE	
SAVE TIME	
PLOT DATE	
PLOT TIME	

SEDIMENT AND EROSION CONTROL PLAN

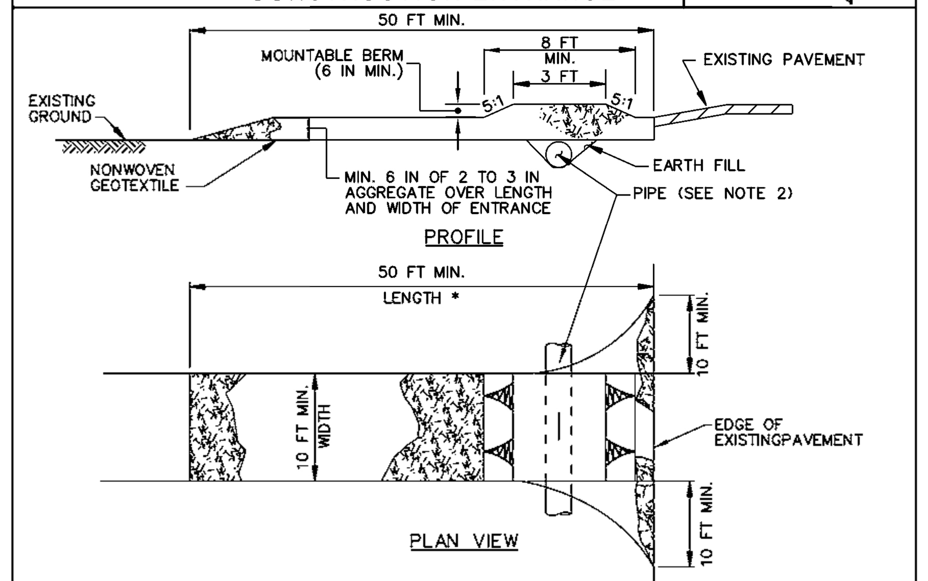
AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND

E-0002

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

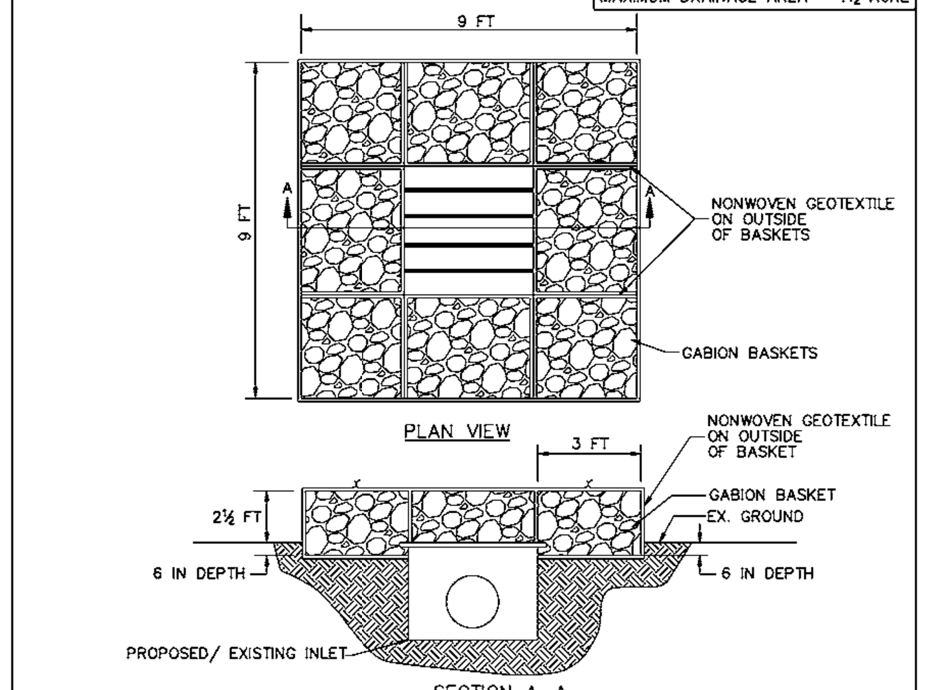
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-7 GABION INLET PROTECTION

STANDARD SYMBOL: GIP

MAXIMUM DRAINAGE AREA = 1½ ACRE



CONSTRUCTION SPECIFICATIONS

1. USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
2. WRAP 3 FEET x 3 FEET GABION BASKETS (LENGTH VARIABLE) WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVERLAPPING AT THE TOP AND FASTEN THE GEOTEXTILE AT THE TOP OF THE BASKET WITH WIRE FASTENERS (HOG RINGS) AT A MAXIMUM OF 1 FOOT INTERVALS ALONG THE SEAM.
3. AVOID TEARING OR DAMAGING GEOTEXTILE.
4. ENTRENCH GABION BASKETS TO A DEPTH OF 6 INCHES.
5. PLACE AND INTERLOCK GABION BASKETS WITH NO GAPS.
6. FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR MESH.
7. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

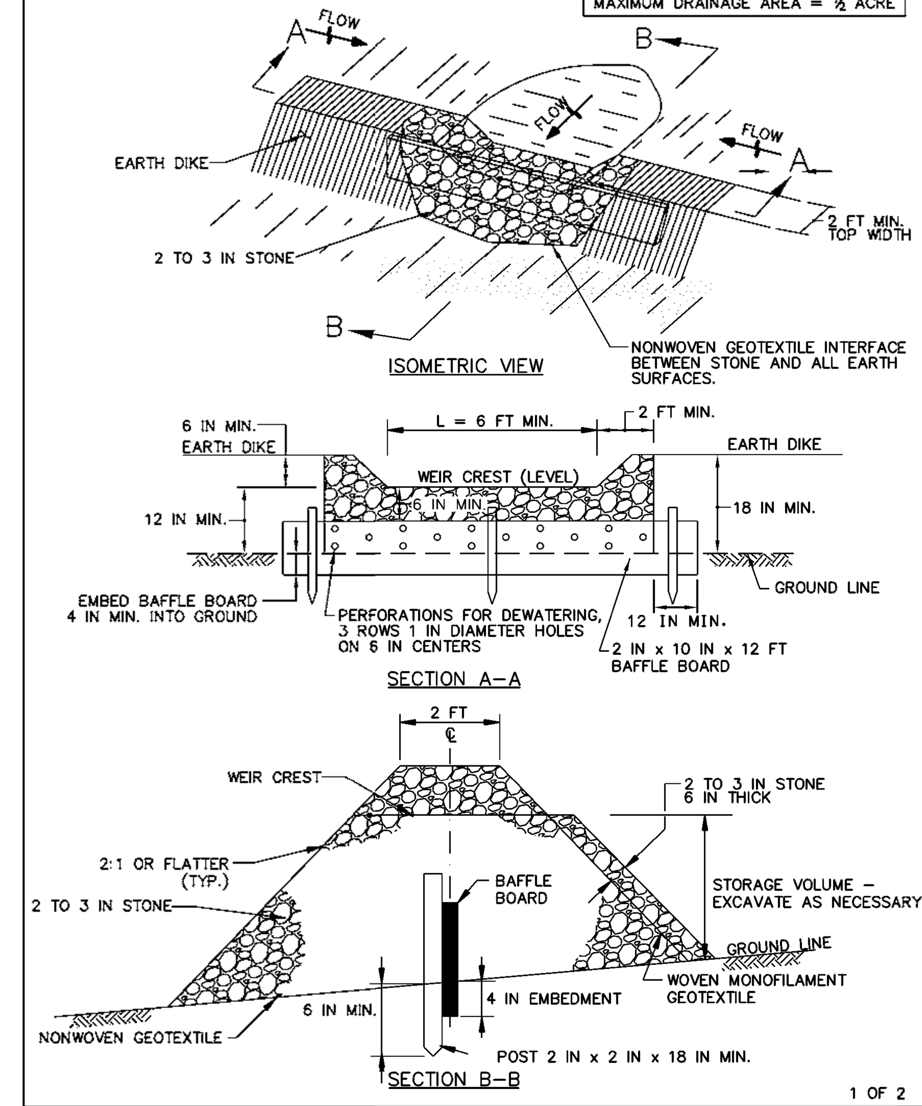
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

MAXIMUM DRAINAGE AREA = ½ ACRE



MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE NONWOVEN GEOTEXTILE ON INTERFACE BETWEEN GROUND AND STONE.
3. PERFORATE BAFFLE BOARD WITH 3 ROWS OF 1 INCH DIAMETER HOLES 6 INCHES ON CENTER. EMBED A MINIMUM OF 4 INCHES INTO GROUND, AND EXTEND BAFFEL BOARD MINIMUM OF 12 INCHES INTO EARTH DIKE.
4. USE CLEAN 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE WOVEN MONOFILAMENT GEOTEXTILE ON UPSTREAM FACE AND COVER WITH A MINIMUM OF 6 INCHES OF ADDITIONAL STONE.
5. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
6. SET WEIR CREST OF STONE 6 INCHES LOWER THAN THE TOP OF EARTH DIKE. USE MINIMUM LENGTH OF 6 FEET FOR WEIR CREST.
7. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 6 INCHES OF WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO DRAIN. MAINTAIN LINE, GRADE, AND CROSS SECTION.
8. UPON REMOVAL OF STONE OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

GEOTEXTILE FABRIC:

THE FABRIC SHALL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS, AND WILL BE ROT AND MILDEW RESISTANT. IT SHALL BE MANUFACTURED FROM FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS, AND COMPOSED OF A MINIMUM OF 85% BY WEIGHT OF POLYOLEPHINS, POLYESTERS, OR POLYAMIDES. THE GEOTEXTILE FABRIC SHALL RESIST DETERIORATION FROM ULTRVIOLET EXPOSURE.

IN ADDITION, CLASS A THROUGH E SHALL HAVE A 0.01CM./SEC. MINIMUM PERMEABILITY WHEN TESTED IN ACCORDANCE WITH MSMT 507, AND AN APPARENT MINIMUM ELONGATION OF 20 PERCENT (20%) WHEN TESTED IN ACCORDANCE WITH THE GRAB TENSILE STRENGTH REQUIREMENTS LISTED ABOVE.

SILT FENCE

CLASS F GEOTEXTILE FABRICS FOR SILT FENCE SHALL HAVE A 50 LB./IN. MINIMUM TENSILE STRENGTH AND A 20 LB./IN. MINIMUM TENSILE MODULES WHEN TESTED IN ACCORDANCE WITH MSMT 509. THE MATERIALS SHALL ALSO HAVE A 0.3 GAL./FT^2/MIN. FLOW RATE AND SEVENTY-FIVE PERCENT (75%) MINIMUM FILTERING EFFICIENCY WHEN TESTED IN ACCORDANCE WITH MSMT 322.

GEOTEXTILE FABRICS USED IN THE CONSTRUCTION OF SILT FENCE SHALL RESIST DETERIORATION FROM ULTRAVIOLET EXPOSURE. THE FABRIC SHALL CONTAIN SUFFICIENT AMOUNTS OF ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 12 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120 DEGREES F.

GEOTEXTILE FABRICS

CLASS	APPARENT OPENING SIZE MM MAX.	GRAB TENSILE BURST STRENGTH LB MIN.	BURST STRENGTH PSI MIN.
A	0.30**	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (SILT FENCE)	0.40-0.80*	90	190

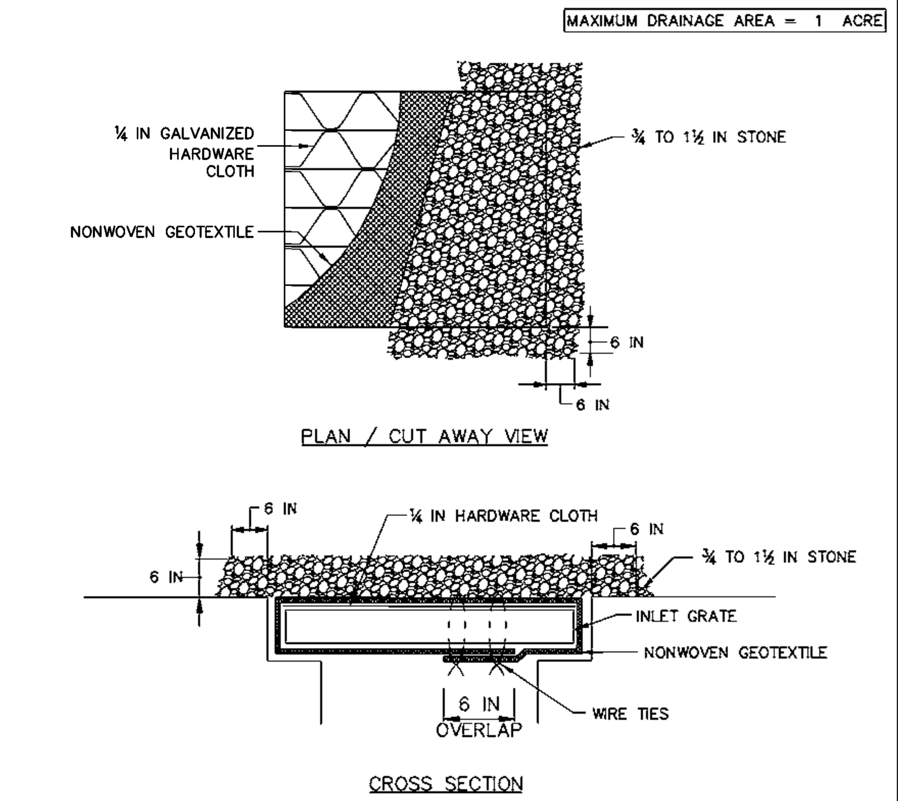
*US STD SIEVE CW - 02215 ** 0.50 MM. MAX. FOR SUPER SILT FENCE

THE PROPERTIES SHALL BE DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:
- -APPARENT OPENING SIZE MSMT 323
- -GRAB TENSILE STRENGTH ASTM D 1682: 4X8" SPECIMEN, 1X2" CLAMPS, 12"/MIN. STRAIN RATE IN BOTH PRINCIPAL DIRECTIONS OF GEOTEXTILE FABRIC.
- -BURST STRENGTH ASTM D 3786

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

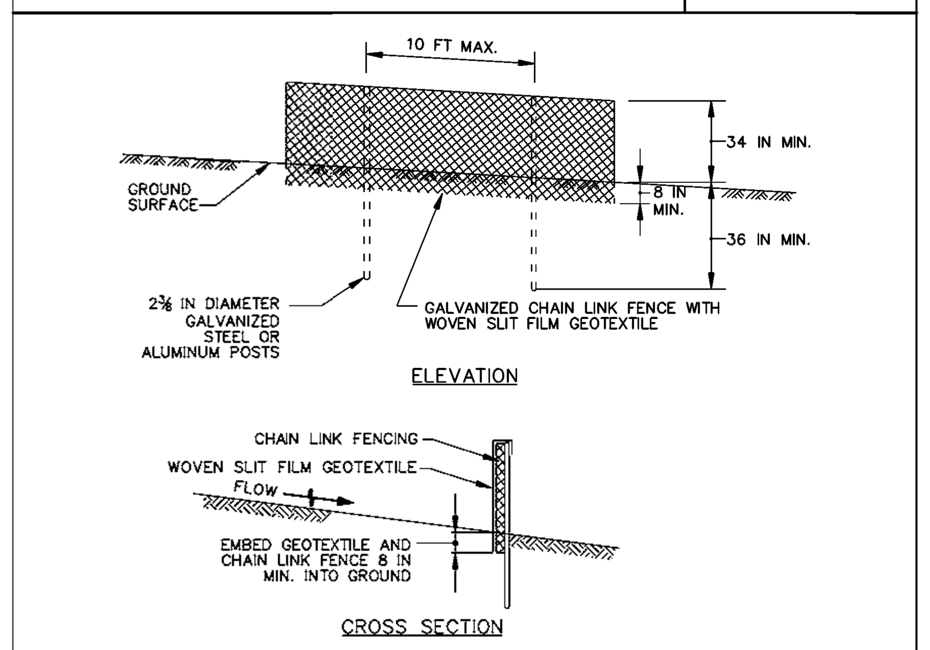
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

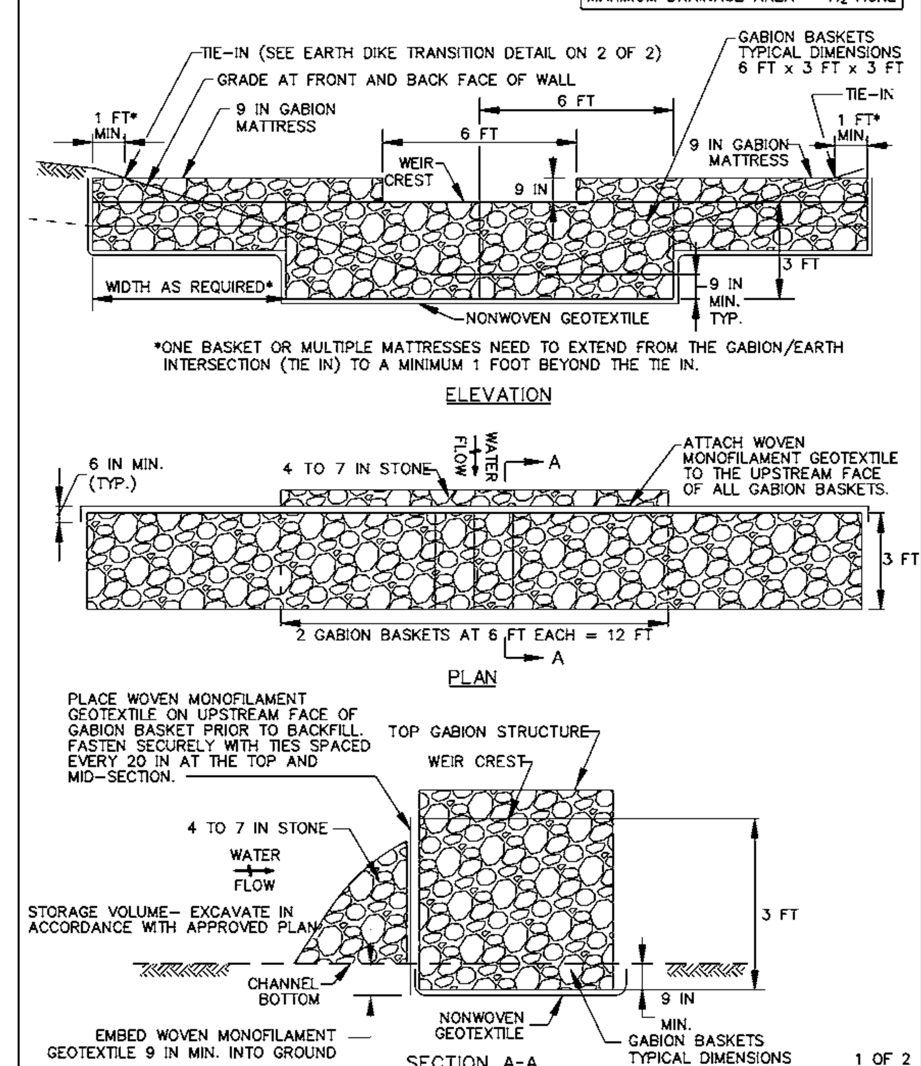
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL: TGOS

MAXIMUM DRAINAGE AREA = 1½ ACRE

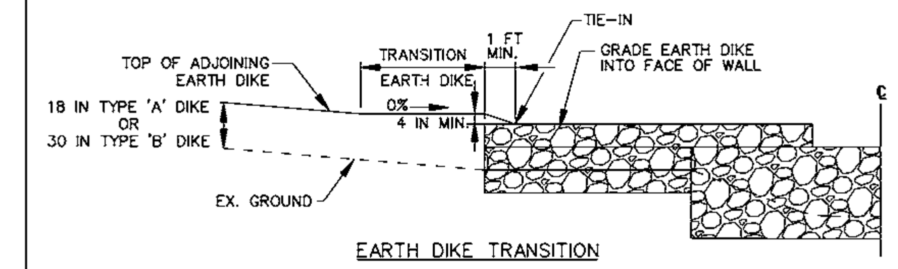


MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-8 TEMPORARY GABION OUTLET STRUCTURE

STANDARD SYMBOL: TGOS



NOTES:

1. PROVIDE TRANSITION LENGTH AND HEIGHT AS SPECIFIED ON PLAN. HEIGHT OF TRANSITION EARTH DIKE MUST EXCEED 4 INCH MINIMUM FREEBOARD ABOVE TOP OF GABION AND EXTEND AT THIS ELEVATION UNTIL IT INTERCEPTS THE TOP OF ADJOINING EARTH DIKE.
2. PROVIDE POSITIVE DRAINAGE ALONG EARTH DIKE TO GABION OUTLET STRUCTURE.
3. COMPACT FILL.
4. SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED ON PLAN. BANK PROJECTIONS OR IRREGULARITIES ARE NOT ALLOWED.

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
3. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
4. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
5. EMBED THE GABION OUTLET STRUCTURE INTO THE SOIL A MINIMUM OF 9 INCHES. PROVIDE NONWOVEN GEOTEXTILE UNDER ALL GABIONS.
6. FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WIRE MESH.
7. MAKE THE WEIR CREST OF THE GABION OUTLET STRUCTURE 9 INCHES LOWER THAN THE TOP OF THE ADJACENT GABIONS.
8. PROVIDE A MINIMUM WEIR CREST OF 6 FEET.
9. ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF GABION BASKETS AND COVER WITH 4 TO 7 INCH STONE.
10. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 12 INCHES OF THE WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO FUNCTION. MAINTAIN LINE, GRADE, AND CROSS SECTION.
11. UPON REMOVAL OF GABION OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

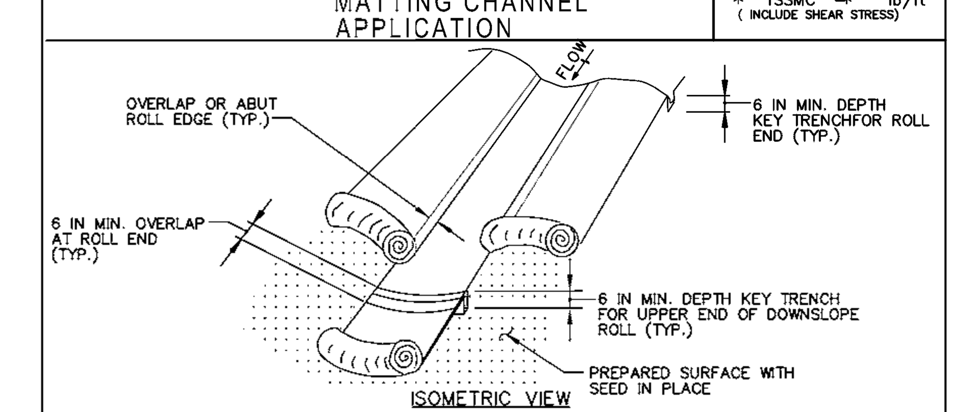
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: TSSMC → lb/ft² (INCLUDE SHEAR STRESS)



CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 ½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
7. OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle Baltimore, Maryland 21152-0949

VERSION		
NO.	DATE	NOTES

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT
FILE
CTB
DESIGNER
EDIT DATE
SAVE TIME
PLOT DATE
PLOT TIME

SEDIMENT & EROSION CONTROL DETAILS & NOTES

AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND

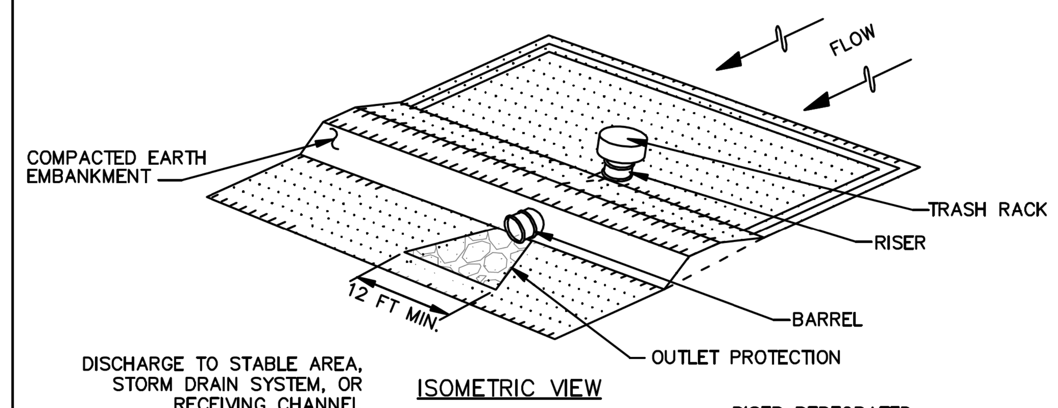
E-003

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

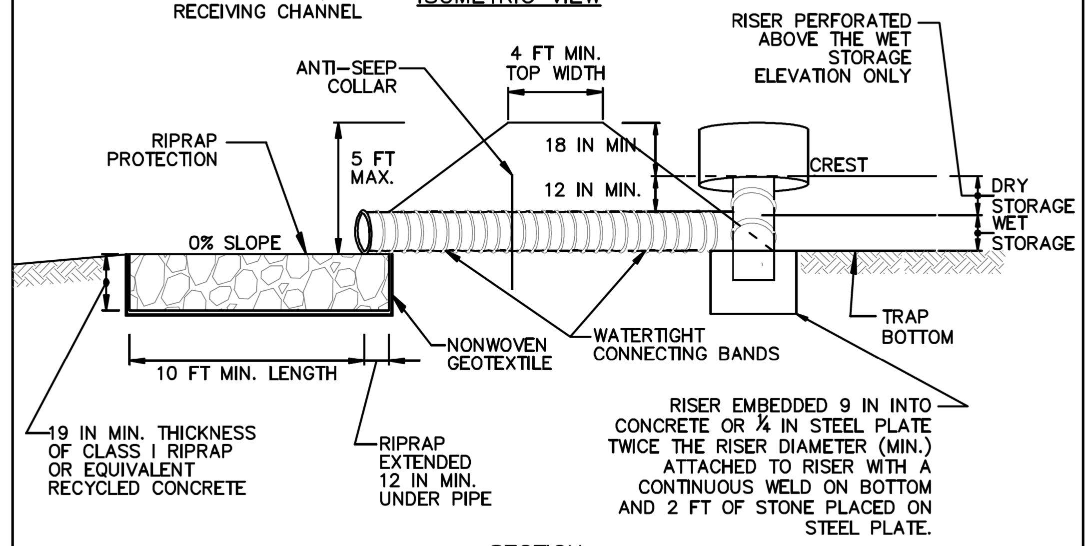
STANDARD SYMBOL

ST–I

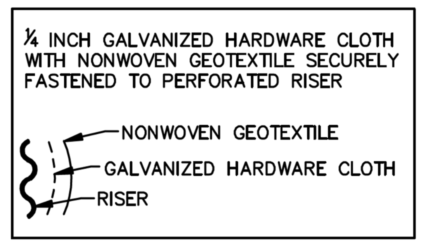
MAXIMUM DRAINAGE AREA = 5 ACRES



ISOMETRIC VIEW



SECTION



NOTE:
REFER TO DETAIL G–2–1 – TYPICAL ANTI–SEEP COLLARS
REFER TO DETAIL G–2–2 – RISER BASE
REFER TO DETAIL G–2–3 – CONCENTRIC TRASH RACK AND ANTI–VORTEX DEVICE

1 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL

ST–I

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. PERFORATE THE RISER WITH 1 INCH DIAMETER HOLES SPACED 6 INCHES ON CENTER WITH THE LOWEST PERFORATIONS AT THE WET STORAGE ELEVATION OR PROVIDE A HORIZONTAL OR VERTICAL DRAW–DOWN DEVICE PERFORATED ACCORDING TO APPROVED PLAN. DO NOT PERFORATE THE RISER WITHIN 6 INCHES OF THE TOP OF THE HORIZONTAL BARREL.
4. SET RISER/BARREL ASSEMBLY PRIOR TO EMBANKMENT CONSTRUCTION. MAKE ALL PIPE CONNECTIONS WATERTIGHT. OFFSET RISER FROM EMBANKEMENT TO ACCOMODATE PLACEMENT OF THE TRASH RACK. ANCHOR THE RISER WITH EITHER A REINFORCED CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. MAKE CONCRETE BASES AT LEAST TWICE THE RISER DIAMETER AND 18 INCHES THICK WITH THE RISER EMBEDDED 9 INCHES.
5. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
6. HAND COMPACT IN 4 INCH LAYERS FILL MATERIAL AROUND THE PIPE SPILLWAY. PLACE A MINIMUM OF 2 FEET OF HAND COMPACTED BACKFILL OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
7. CONSTRUCT TOP OF EMBANKMENT 1 FOOT MINIMUM ABOVE RISER CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
8. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
9. WRAP THE RISER WITH ¼ INCH GALVANIZED HARDWARE CLOTH THEN WRAP WITH NONWOVEN GEOTEXTILE. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE. EXTEND HARDWARE CLOTH AND GEOTEXTILE AT LEAST 6 INCHES ABOVE THE HIGHEST PERFORATIONS AND AT LEAST 6 INCHES BELOW THE LOWEST PERFORATIONS. OVERLAP, FOLD AND FASTEN WHERE ENDS OF GEOTEXTILE COME TOGETHER TO PREVENT BYPASS. REPLACE GEOTEXTILE AS NECESSARY TO PREVENT CLOGGING.
10. USE STRAPS OR CONNECTING BANDS AT THE TOP AND BOTTOM OF THE GEOTEXTILE TO HOLD THE GEOTEXTILE AND HARDWARE CLOTH IN PLACE.
11. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
12. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
13. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO THE APPROVED PLAN AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
14. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHIN 10 HOURS.
15. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
16. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

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MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL

ST–I

PIPE OUTLET SEDIMENT TRAP ST–I, TRAP NO. A		
DRAINAGE AREA – INTIAL		ACRES
DRAINAGE AREA – INTERIM		ACRES
DRAINAGE AREA – FINAL	3.86	ACRES
TOTAL STORAGE REQUIRED	13,896	CF
TOTAL STORAGE PROVIDED	15,624	CF
WET STORAGE REQUIRED	6,948	CF
WET STORAGE PROVIDED	7,133	CF
DRY STORAGE REQUIRED	6,948	CF
DRY STORAGE PROVIDED	8,491	CF
TRAP BOTTOM ELEVATION	10.50	FT
TRAP BOTTOM DIMENSIONS	92 x 47	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	13.50	FT
OUTLET (WET STORAGE) ELEVATION	12.00	FT
CLEANOUT ELEVATION	11.25	FT
TOP OF EMBANKMENT ELEVATION	14.50	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	N/A	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI–SEEP COLLAR)	CORRUGATED METAL	
RISER DIAMETER	36	IN
BARREL DIAMETER	27	IN
TRASH RACK DIAMETER	54	IN
TRASH RACK HEIGHT	33	IN
ANTI–SEEP COLLAR DIMENSIONS	N/A	FT
OUTLET PROTECTION – LENGTH	N/A	FT
OUTLET PROTECTION – WIDTH	N/A	FT
OUTLET PROTECTION – DEPTH	N/A	IN

3 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL

ST–I

PIPE OUTLET SEDIMENT TRAP ST–I, TRAP NO. B		
DRAINAGE AREA – INTIAL		ACRES
DRAINAGE AREA – INTERIM		ACRES
DRAINAGE AREA – FINAL	3.39	ACRES
TOTAL STORAGE REQUIRED	12,204	CF
TOTAL STORAGE PROVIDED	14,960	CF
WET STORAGE REQUIRED	6,102	CF
WET STORAGE PROVIDED	6,778	CF
DRY STORAGE REQUIRED	6,102	CF
DRY STORAGE PROVIDED	8,182	CF
TRAP BOTTOM ELEVATION	11.00	FT
TRAP BOTTOM DIMENSIONS	90 x 45	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	14.00	FT
OUTLET (WET STORAGE) ELEVATION	12.50	FT
CLEANOUT ELEVATION	11.75	FT
TOP OF EMBANKMENT ELEVATION	15.00	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	N/A	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI–SEEP COLLAR)	CORRUGATED METAL	
RISER DIAMETER	36	IN
BARREL DIAMETER	27	IN
TRASH RACK DIAMETER	54	IN
TRASH RACK HEIGHT	33	IN
ANTI–SEEP COLLAR DIMENSIONS	N/A	FT
OUTLET PROTECTION – LENGTH	N/A	FT
OUTLET PROTECTION – WIDTH	N/A	FT
OUTLET PROTECTION – DEPTH	N/A	IN

3 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL

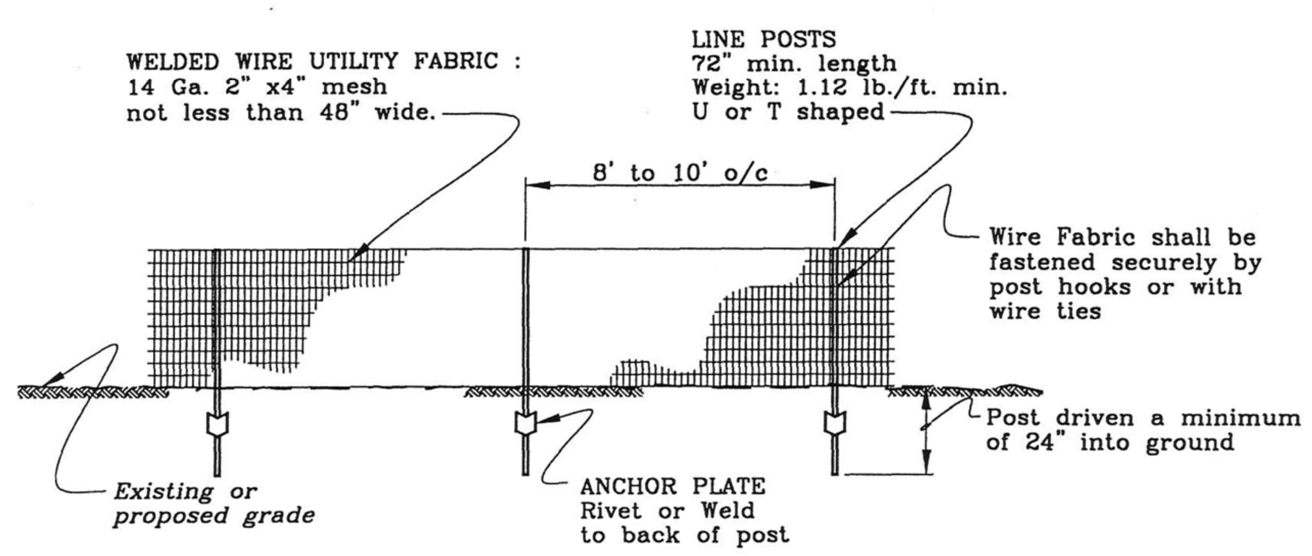
ST–I

PIPE OUTLET SEDIMENT TRAP ST–I, TRAP NO. C		
DRAINAGE AREA – INTIAL		ACRES
DRAINAGE AREA – INTERIM		ACRES
DRAINAGE AREA – FINAL	2.88	ACRES
TOTAL STORAGE REQUIRED	10,104	CF
TOTAL STORAGE PROVIDED	14,730	CF
WET STORAGE REQUIRED		CF
WET STORAGE PROVIDED	6,704	CF
DRY STORAGE REQUIRED	5,184	CF
DRY STORAGE PROVIDED	8,026	CF
TRAP BOTTOM ELEVATION	10.50	FT
TRAP BOTTOM DIMENSIONS	90 x 45	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	13.50	FT
OUTLET (WET STORAGE) ELEVATION	12.00	FT
CLEANOUT ELEVATION	11.25	FT
TOP OF EMBANKMENT ELEVATION	14.50	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	N/A	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI–SEEP COLLAR)	CORRUGATED METAL	
RISER DIAMETER	33	IN
BARREL DIAMETER	24	IN
TRASH RACK DIAMETER	48	IN
TRASH RACK HEIGHT	29	IN
ANTI–SEEP COLLAR DIMENSIONS	N/A	FT
OUTLET PROTECTION – LENGTH	N/A	FT
OUTLET PROTECTION – WIDTH	N/A	FT
OUTLET PROTECTION – DEPTH	N/A	IN

3 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



TEMPORARY SAFETY FENCE FOR SEDIMENT TRAPPING DEVICES

NOT TO SCALE

Baltimore County Department of Environmental Protection and Resource Management

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle Baltimore, Maryland 21152-0949

VERSION		
NO.	DATE	NOTES

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	
FILE	
CTB	
DESIGNER	
EDIT DATE	
SAVE TIME	
PLOT DATE	
PLOT TIME	

SEDIMENT & EROSION CONTROL DETAILS & NOTES

AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND

E-004

PERMANENT SEEDING NOTES

20.0 STANDARDS FOR VEGETATIVE STABILIZATION

DEFINITION: USING VEGETATION AS COVER FOR BARREN SOIL TO PROTECT IT FROM FORCES THAT CAUSE EROSION.

PURPOSE: VEGETATIVE STABILIZATION SPECIFICATIONS ARE USED TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL. WHEN SOIL IS STABILIZED WITH VEGETATION, THE SOIL IS LESS LIKELY TO ERODE AND MORE LIKELY TO ALLOW INFILTRATION OF RAINFALL, TEHERBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS, AND IMPROVING WILDLIFE HABITAT AND VISUAL RESOURCES.

CONDITIONS WHERE PRACTICE APPLIES: THIS PRACTICE SHALL BE USED ON DECIDED AREAS AS SPECIFIED ON THE PLANS AND MAY BE USED ON HIGHLY ERODIBLE OR CRITICALLY ERODING AREAS. THIS SPECIFICATION IS DIVIDED INTO TEMPORARY SEEDING, TO QUICKLY ESTABLISH VEGETATIVE COVER FOR SHORT DURATION (UP TO ONE YEAR), AND PERMANENT SEEDING, FOR LONG TERM VEGETATIVE COVER. EXAMPLES OF APPLICABLE AREAS FOR TEMPORARY SEEDING ARE TEMPORARY SOIL STOCKPILES, CLEARED AREAS BEING LEFT IDLE BETWEEN CONSTRUCTION PHASES, EARTH DIKES, ETC.; AND FOR PERMANENT SEEDING ARE LAWNS, DAMS, CUT AND FILL SLOPES AND OTHER AREAS AT FINAL GRADE, FORMER STOCKPILE AND STAGING AREAS, ETC.

EFFECT ON WATER QUALITY AND QUANTITIES: PLANTING VEGETATION IN DISTURBED AREAS WILL HAVE AN EFFECT ON THE WATER BUDGET, ESPECIALLY ON VOLUMES AND RATES OF RUNOFF, INFILTRATION, EVAPORATION, TRANSPIRATION, PERCOLATION, AND GROUNDWATER RECHARGE. VEGETATION, OVER TIME, WILL INCREASE ORGANIC MATTER CONTENT AND IMPROVE THE WATER HOLDING CAPACITY OF THE SOIL AND SUBSEQUENT PLANT GROWTH.

VEGETATION WILL HELP REDUCE THE MOVEMENT OF SEDIMENT, NUTRIENTS, AND OTHER CHEMICALS CARRIED, BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILATING THOSE SUBSTANCES PRESENT WITHIN THE ROOT ZONE.

SEDIMENT CONTROL DEVICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING AND VEGETATIVE ESTABLISHMENT TO PREVENT LARGE QUANTITIES OF SEDIMENT AND ASSOCIATED CHEMICALS AND NUTRIENTS FROM WASHING INTO SURFACE WATERS.

SECTION I - VEGETATIVE STABILIZATION METHODS & MATERIALS

A. SITE PREPARATION

I. INSTALL EROSION & SEDIMENT CONTROL STRUCTURES (EITHER TEMPORARY OR PERMANENT) SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, WATERWAYS, OR SEDIMENT CONTROL BASINS.

II. PERFORM ALL GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. FINAL GRADING AND SHAPING IS NOT USUALLY NECESSARY FOR TEMPORARY SEEDING.

III. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

I. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OVER 5 ACRES. SOIL ANALYSIS MAY BE PERFORMED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.

II. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS SHALL ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTEE OF THE PRODUCER.

III. LIME MATERIALS SHALL BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 50% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE) LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SEIVE AND 98-100% WILL PASS THROUGH A #20 MESH SEIVE.

IV. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3-5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C. SEEDBED PREPARATION

I. TEMPORARY SEEDING

A. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 3-5" BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISK HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPE AREAS (GREATER THAN 3:1) SHOULD BE TRACKED LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.

B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.

C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3-5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

II. PERMANENT SEEDING

A. MINUMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT:

1. SOIL PH SHALL BE BETWEEN 6.0 & 7.0.
2. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).
3. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION IS IF LOVEGRASS OR SERECIA LESPEDEZA IS TO BE PLANTED, THEN A SANDY SOIL (>30% SILT PLUS CLAY) WOULD BE ACCETABLE.
4. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.
5. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
6. IF THESE CONDITIONS CANNOT BE MET BY SOIL ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH SECTION 21 STANDARD AND SPECIFICATION FOR TOPSOIL.

B. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DRAWINGS SHALL BE MAINTAINED IN A TRUE AND EVEN GRADE, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3-5" TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREA AND TO CREATE HORIZONTAL EROSION CHECK SLOTS TO PREVENT TOPSOIL FROM SLIDING DOWN A SLOPE.

C. APPLY SOIL AMENDMENTS AS PER SOIL TEST OR AS INCLUDED ON THE PLANS.

D. MIX SOIL AMENMENTS INTO THE TOP 3-5" OF TOPSOIL BY DISKING OR OTHER SUITABLE MEANS. LAWN AREAS SHOULD BE RAKED TO SMOOTH THE SURFACE. REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE. STEEP SLOPES (> 3:1) SHOUHLD BE TRACKED BY A DOZER LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY NOT BE NECESSARY ON NEWLY DISTURBED AREAS.

D. SEED SPECIFICATIONS

I. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED SHALL BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED SHALL HAVE BEEN TESTED WITH THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON THIS JOB.

NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.

II. THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES SHALL BE A PURE CULTURE OF NITROGEN-FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS SHALL NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANT AS DIRECTED ON PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 70-80 DEGREES F CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.

E. METHODS OF SEEDING

I. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER), BROADCAST OR DROP SEEDER, OR A CULTIPACKER SEEDER.

A. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES AMOUNT WILL NOT EXCEED THE FOLLOWING: NITROGEN: MAXIMUM OF 100 LBS PER ACRE TOTAL OF SOLUBLE NITROGEN; P2O5 (PHOSPHORUS): 200 LBS/AC; K2O (POTASSIUM): 200 LBS/AC.

B. LIME - USE ONLY GROUND AGRICULTURAL LIMESTONE, (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.

C. SEED AND FERTILIZER SHALL BE MIXED ON SITE AND SEEDING SHAL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.

II. DRY SEEDING - THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.

A. SEED SPREAD DRY SHALL BE INCORPORATED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON THE TEMPORARY OR PERMANENT SEEDING SUMMARIES OR TABLES 25 OR 26. THE SEEDED AREA SHALL THEN BE ROLLED WITH WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.

B. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE APPLICATION IN EACH DIRECTION.

III. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.

A. CULTIPACKER SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 0.25 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.

B. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)

I. STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT, RYE OR OAT STRAW, REASONABLE BRIGHT IN COLOR, AND SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY AND SHALL BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW.

II. WOOD CELLULOSE FIBER MULCH (WCFM)

A. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESS INTO A UNIFORM FIBROUS PHYSICAL STATE.

B. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.

C. WCFM, INCLUDING DYE, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

D. WCFM MATERIALS SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENOUS SLURRY. THE MULCH MATERIAL SHALL FORM A BLOTTER-LIKE GROUND COVER ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.

E. WCFM MATERIAL SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHOTO-TOXIC.

F. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH TO APPROXIMATELY 10 MM, DIAMETER APPROXIMATELY 1 MM, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6% MAXIMUM AND WATER HOLDING CAPACITY OF 90% MINIMUM.

NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

G. MULCHING SEEDED AREAS - MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.

I. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH ALONE SHALL BE APPLIED AS PRESCRIBED IN THIS SECTION UNTIL THE SEEDING SEASON RETURNS AND SEEDING CAN BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS.

II. WHEN STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS / ACRE. MULCH SHALL BE APPLIED TO A UNIFORM LOOSE DEPTH OF BETWEEN 1" AND 2". MULCH APPLIED SHALL ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHOULD BE INCREASED TO 2.5 TONS PER ACRE.

III. WOOD CELLULOSE FIBER USED AS A MULCH SHALL BE APPLIED AT A NET DRY WEIGHT OF 1,500 LBS PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

H. SECURING STRAW MULCH (MULCH ANCHORING): MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING ON SIZE OF AREA AND EROSION HAZARD:

I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINUMUM OF TWO (2) INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD BE USED ON THE CONTOUR IF POSSIBLE.

II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 POUNDS / ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE PER 100 GALLONS OF WATER.

III. APPLICATION OF LIQUID BINDERS SHOULD BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINED OF AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. SYNTHETIC BINDERS - SUCH AS ACRYLIC FLR (AGRO-TACK), DCA-70, PETROSET, TERRATAX II, TERRA TACK AT, OR OTHER APPROVED EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH.

IV. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS NETTING IS USUALLY AVAILABLE IN ROLLS 4' - 15' WIDE AND 300 - 3,000 FEET LONG.

OWNER'S/DEVELOPER'S CERTIFICATION - GRADING:

I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTANABILITY AND WITH THE REQUIREMENTS SPECIFIED IN ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE.

SIGNATURE OF OWNER/DEVELOPER ______ TITLE ______ DATE ______

PRINT NAME ______

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND MEETS THE MINIMUM STANDARDS OF THE THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY ANF THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT.

SIGNATURE ______ P.E. NO. ______

PRINT NAME ______ DATE ______

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SEDIMENT & EROSION CONTROL NOTES

AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND | E-005

SECTION II - TEMPORARY SEEDING

VEGETATION - ANNUAL GRASS OR GRAIN USED TO PROVIDE COVER ON DISTURBED AREAS FOR UP TO TWELVE MONTHS. FOR LONGER DURATION OF VEGETATIVE COVER, PERMANENT SEEDING IS REQUIRED.

TEMPORARY SEEDING SUMMARY

SEED MIXTURES (HARDINESS ZONE 7a) FROM TABLE 26					FERTILIZER RATE (10-10-10)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTH		
1	RYE PLUS FOXTAIL MILLET	150	2/1 - 11/30	1"	600 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

SECTION III - PERMANENT SEEDING

SEEDING GRASS AND LEGUMES TO ESTABLISH GROUND COVER FOR A MINIMUM PERIOD OF ONE YEAR ON DISTURBED AREAS GENERALLY RECEIVING LOW MAINTENANCE.

PERMANENT SEEDING SUMMARY

SEED MIXTURES (HARDINESS ZONE 7a) FROM TABLE 25				
NO.	SPECIES	APPLICATION RATE (LB/AC)	** SEEDING DATES	SEEDING DEPTHS
3	TALL FESCUE (85%)	125	MARCH 1 THRU MAY 15 AND AUGUST 15 THRU NOV. 15	1/4"
	PERENNIAL RYEGRASS (10%)	15		
	KENTUCKY BLUEGRASS (5%)	10		

FERTILIZER RATE (10-20-20)			LIME RATE
N	P205	K20	
90 LB/AC (2.0 LB/ 1000 SF)	175 LB/AC (4 LB/ 1000 SF)	175 LB/AC (4 LB/ 1000 SF)	2 TONS/AC (100 LB/1000 SF)

NOTE: TALL FESCUE: USE A COMBINATION OF THREE OF THE FOLLOWING TYPES WITH A MINIMUM OF 15% BY WEIGHT:

BONANZA II	FALCON II	REBEL JR.
CIMARRON	GUARDIAN	TRAILBLAZER II
COYOTE	HERITAGE	WRANGLER
CROSSFIRE II	LANCER	

** NOTE: FOR DATES 5/16- 8/14 USE TEMPORARY SEEDING METHOD OR ADD 10 LBS./AC. OF MILLET TO SEED MIX NO. 3
NOTE: *FOR SITES WHERE VEGETATIVE STABILIZATION EXCEEDS 5.0 ACRES, FERTILIZER AND LIME RATES SHALL BE BASED ON SOIL TESTS. CONTRACTOR SHALL HAVE SOIL TESTED AND SUPPLY RECOMMENDED RATES TO THE SEDIMENT CONTROL INSPECTOR.

SECTION IV - SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER)

A. GENERAL SPECIFICATIONS

I. SOD SHALL BE CERTIFIED TURFGRASS SOD COMPLYING WITH BALTIMORE COUNTY DPW STANDARD SPECIFICATIONS AND GUIDELINES, SECTION 708 AND ASPA SPECIFICATIONS FOR MACHINE-CUT THICKNESS, SIZE, STRENGTH, MOISTURE CONTENT, AND MOWED HEIGHT, AND FREE OF WEEDS, INSECTS, DISEASE AND UNDESIRABLE NATIVE GRASSES. PROVIDE VIABLE SOD OF UNIFORM DENSITY , COLOR AND TEXTURE, STRONGLY ROOTED, AND CAPABLE OF VIGOROUS GROWTH AND DEVELOPMENT WHEN PLANTED. SOD MUST BE MD OR VA STATE CETIFIED. SOD LABELS SHALL BE MADE AVILABLE TO THE JOB FOREMAN AND INSPECTOR. SOD WHEN USED TO COVER LARGE AREAS SHALL BE DELIVERED IN LARGE ROLLS.

A. SPECIES: PROVIDE SOD OF GRASS SPECIES AND VARIETIES, PROPORTIONS BY WEIGHT, AND MINIMUM PERCENTAGES OF PURITY, GERMINATION AS INDICATED IN THE SEED SCHEDULE IN THIS SECTION.
B. SOD SHALL BE NO. 1 QUALITY, PREMIUM.

II. SOD SHALL BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4", PLUS OR MINUS 1/4", AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS SHALL EXCLUDE TOP GROWTH AND THATCH. INDIVIDUAL PIECES OF SOD SHALL BE CUT TO THE SUPPLIERS WIDTH AND LENGTH. MAXIUMUM ALLOWABLE DEVIATION FROM STANDARD WIDTHS AND LENGTHS SHALL BE 5 PERCENT. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.

III. STANDARD SIZE SECTIONS OF SOD SHALL BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.

IV. SOD SHALL NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.

V. SOD SHALL BE HARVESTED, DELIVERED, AND INSTALLED WITH A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD SHALL BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.

B. SOD INSTALLATION

I. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, THE SUBSOIL SHALL BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD.

II. THE FIRST ROW OF SOD SHALL BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND TIGHTLY WEDGED AGAINST EACH OTHER. LATERAL JOINTS SHALL BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT COIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.

III. WHEREVER POSSIBLE, SOD SHALL BE LAID WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. SOD SHALL BE ROLLED AND TAMPED, PEGGED OR OTHERWISE SECURED TO PREVENT SLIPPAGE ON SLOPES AND TO ENSURE SOLID CONTACT BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.

IV. SOD SHALL BE WATERED IMMEDIATELY FOLLOWING ROLLING OR TAMPING UNTIL THE UNDERSIDE OF THE NEW SID PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. THE OPERATIONS OF LAYING, TAMPING, AND IRRIGATING FOR ANY PIECE OF SOD SHALL BE COMPLETED WITHIN EIGHT HOURS.

C. SOD MAINTENANCE

I. IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHALL BE PERFORMED DAILY OR AS OFTEN AS NECESSARY DURING THE FIRST WEEK AND IN SUFFICIENT QUANTITIES TO MAINTAIN MOIST SOIL TO A DEPTH OF 4". WATERING SHOULD BE DONE DURING THE HEAT OF THE DAY TO PREVENT WILTING.

II. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.

III. THE FIRST MOWING OF SOD SHOULD NOT BE ATTMEPTED UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/3 OF THE GRASS LEAF SHALL BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2" AND 3" UNLESS OTHERWISE SPECIFIED.

SECTION V - TURFGRASS ESTABLISHMENT

AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUND, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE. AREAS TO RECEIVE SEED SHALL BE TILLLED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVELED, AND RAKED TO PREPARE PROPER SEEDBED. STONES AND DEBRIS OVER 1.5 INCHES IN DIAMETER SHALL BE REMOVED. THE RESULTING SEEDBED SHALL BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.

NOTE: CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.

A. TURFGRASS MIXTURES

I. KENTUCKY BLUEGRASS - FULL SUN MIXTURE - FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND THE EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 LBS/1000 SQUARE FEET. A MINIMUM OF THREE BLUEGRASS CULTIVARS SHOULD BE CHOSEN, RANGING FROM A MINIMUM OF 10% TO A MAXIMUM OF 35% OF THE MIXTURE BY WEIGHT.

II. KENTUCKY BLUEGRASS/PERENNIAL RYE - FULL SUN MIXTURE - FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CUTLIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE/1000 SQUARE FEET. A MINIMUM OF 3 KENTUCKY BLUEGRASS CULTIVARS MUST BE CHOSEN, WITH EACH CULTIVAR RANGING FROM 10% TO 35% OF THE MIXTURE BY WEIGHT.

III. TALL FESCUE/KENTUCKY BLUEGRASS-FULL SUN MIXTURE-FOR USE IN DROUGHT PRIME AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95%-100% CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0-5% SEEDING RATE: 5 TO 8 POUNDS/1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.

IV. KENTUCKY BLUEGRASS/FINE FESCUE - SHADE MIXTURE - FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURES INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30-40% AND CERTIFIED FESCUE AND 60-70% SEEDING RATE: 11#2TO 3 POUNDS/1000 SQUARE FEET. A MINIMUM OF 3 KENTUCKY BLUEGRASS CULTIVARS MUST BE CHOSEN, WITH EACH CULTIVAR RANGING FROM A MINIMUM OF 10% TO A MAXIMUM OF 35% OF THE MIXTURE BY WEIGHT.

NOTE: TURFGRASS VARIETIES SHOULD BE SELECTED FROM THOSE LISTED IN THE MOST CURRENTUNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MIMEO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND."

B. IDEAL TIMES OF SEEDING

WESTERN MARYLAND: MARCH 15 - JUNE 1: AUGUST 1 - OCTOBER 1 (HARDINESS ZONES - 5b, 6a)
CENTRAL MARYLAND: MARCH 1 - MAY 15, AUGUST 15 - OCTOBER 15 (HARDINESS ZONE - 6b)
SOUTHERN MARYLAND, EASTERN SHORE: MARCH 1 - MAY 15, AUGUST 15 - OCTOBER 15 (HARDINESS ZONES - 7a, 7b)

C. IRRIGATION

IF SOIL MIXTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2" - 1" EVERY 3 TO 4 DAYS, DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

D. REPAIRS AND MAINTENANCE

INSPECT ALL SEEDED AREAS FOR FAILURES AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDINGS WITHIN THE PLANTING SEASON.
i. ONCE THE VEGETATION IS ESTABLISHED, THE SITE SHALL HAVE 95% GROUNDCOVER TO BE CONSIDERED ADEQUATELY STABILIZED.
ii. IF THE STAND PROVIDES LESS THAN 40% GROUND COVERAGE, REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER, SEEDBED PREPARATION, AND SEEDING RECOMMENDATIONS.
iii. IF THE STAND PROVIDES BETWEEN 40% AND 94% GROUND COVERAGE, OVER SEEDING AND FERTILIZING USING HALF OF THE RATES ORIGINALLY APPLIED MAY BE NECESSARY.
iv. MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDINGS ARE SHOWN IN TABLE 24. FORLAWNS AND OTHER MEDIUM TO HIGH MAINTENANCE TURFGRASS AREAS, REFER TO THE UNIVERSITY OF MARYLAND PUBLICATION, "LAWN CARE IN MARYLAND", BULLETIN NO. 171.

PERMIT NOTE:
THIS CONSTRUCTION MAY REQUIRE A PERMIT FROM THE ARMY CORPS OF ENGINEERS, THE WATER MANAGEMENT ADMINISTRATION AND/OR BALTIMORE COUNTY. IT IS THE RESPONSIBILITY OF THE LANDOWNER TO CONTACT THESE THREE (3) AGENCIES TO DETERMINE IF THE PROJECT REQUIRES A PERMIT.
U.S. ARMY CORPS OF ENGINEERS - (410-962-3670)
WATER MANAGEMENT ADMINISTRATION - (410-631-3538)
BALTIMORE COUNTY ENVIRONMENTAL IMPACT REVIEW DIVISION - (410-887-3980)
BALTIMORE COUNTY INSPECTION AND ENFORCEMENT - (410-887-3226) - [GRADING REVIEW]

GENERAL NOTES (FOR EROSION & SEDIMENT CONTROL PLANS ONLY)

1. REFER TO "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN.
2. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, MINOR FIELD ADJUSTMENTS CAN AND WILL BE MADE TO INSURE THE CONTROL OF ANY SEDIMENT. CHANGES IN THE SEDIMENT PRACTICES REQUIRE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT.
3. AT THE END OF EACH WORKING DAY, ALL SEDIMENT CONTROL PRACTICES WILL BE INSPECTED AND LEFT IN OPERATIONAL CONDITION.
4. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (A) SEVEN CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1) AND (B) FOURTEEN DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE WHICH WILL REMAIN IDLE OVER FOURTEEN DAYS.
5. ANY CHANGE TO THE GRADING PROPOSED ON THIS PLAN REQUIRES RESUBMISSION TO BALTIMORE COUNTY SOIL CONSERVATION DISTRICT FOR APPROVAL.
6. DUST CONTROL SHALL BE PROVIDED FOR ALL DISTURBED AREAS. REFER TO "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PG H-30-1, FOR ACCEPTABLE METHODS AND SPECIFICATIONS FOR DUST CONTROL.
7. ANY VARIATION FROM THE SEQUENCE OF OPERATIONS STATED ON THIS PLAN REQUIRES THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT PRIOR TO THE INITIATION OF THE CHANGE.
8. EXCESS CUT OR BORROW MATERIAL SHALL GO TO OR COME FROM RESPECTIVELY, A SITE WITH AN ACTIVE GRADING PERMIT.
9. THE FOLLOWING ITEM MAY BE USED AS APPLICABLE: REFER TO "MARYLAND'S WATERWAY CONSTRUCTION GUIDELINES" BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION, REVISED NOVEMBER 2000, OR STANDARD DETAILS AND DETAILED SPECIFICATIONS OF EACH PRACTICE SPECIFIED HEREIN FOR WATERWAY CONSTRUCTION.

UTILITY NOTE:
1. CONTRACTOR SHOULD OPEN ONLY THAT SECTION OF TRENCH THAT CAN BE BACKFILLED AND STABILIZED EACH DAY. IF TRENCH MUST REMAIN OPEN LONGER THAN ONE DAY, SILT FENCE SHALL BE PLACED BELOW (DOWNSLOPE) THE TRENCH.
2. PLACE ALL EXCAVATED MATERIAL ON UPHILL SIDE OF TRENCH.
3. ANY SEDIMENT CONTROLS DISTURBED BY UTILITY CONSTRUCTING ARE TO BE REPAIRED IMMEDIATELY.

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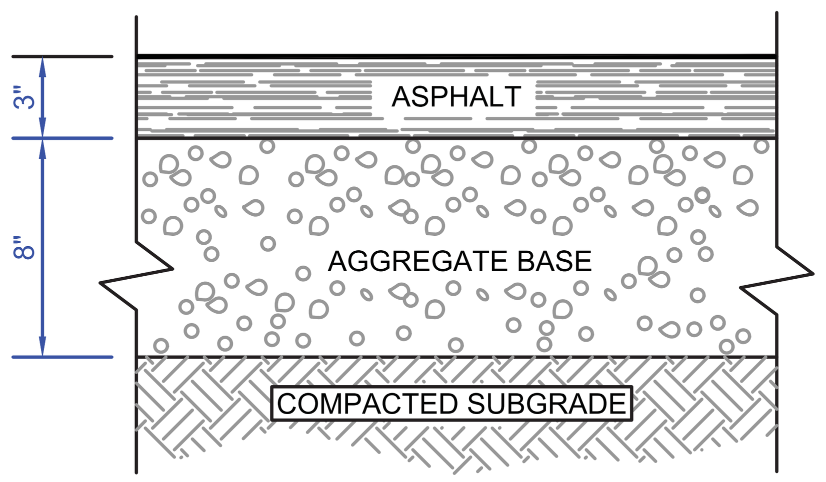
SEDIMENT & EROSION CONTROL NOTES

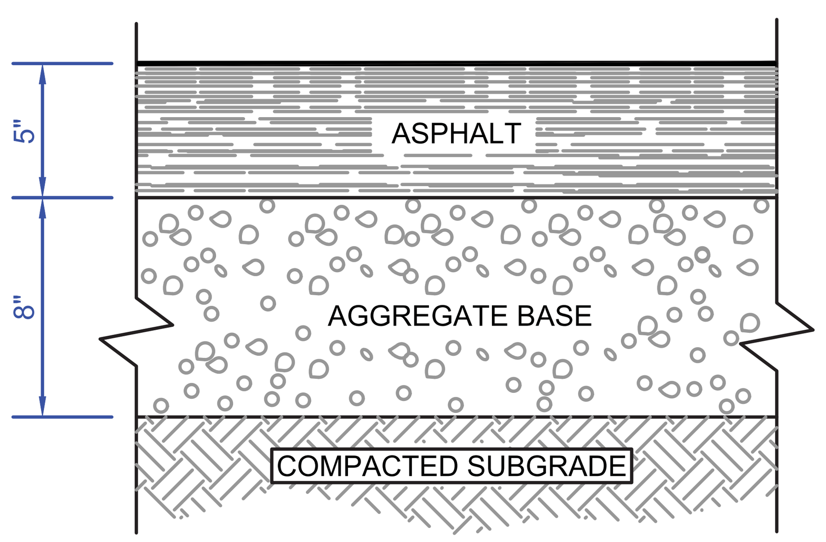
AUTOMOTIVE AND RO-RO DISTRUBUTION CENTER

SPARROWS POINT, MARYLAND

E-006



LIGHT DUTY PAVING SECTION



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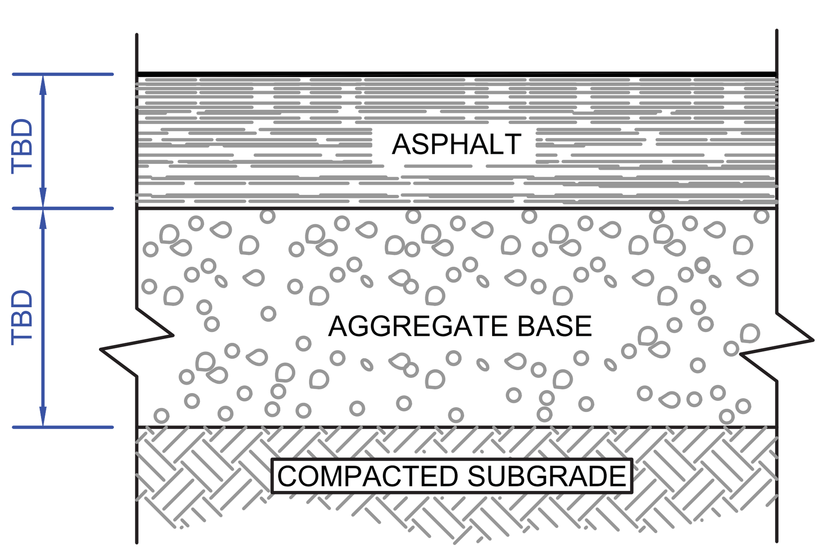

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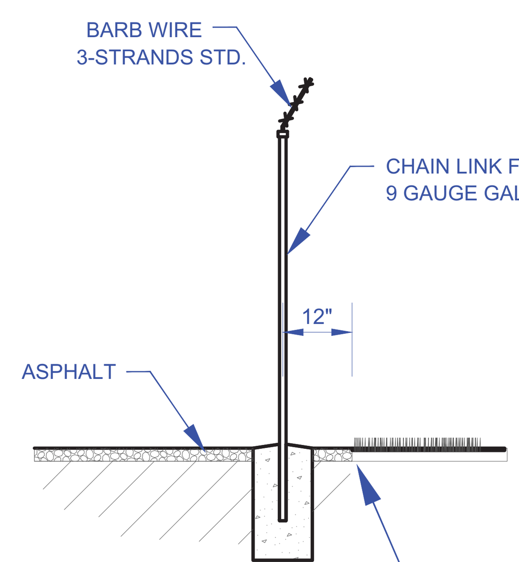

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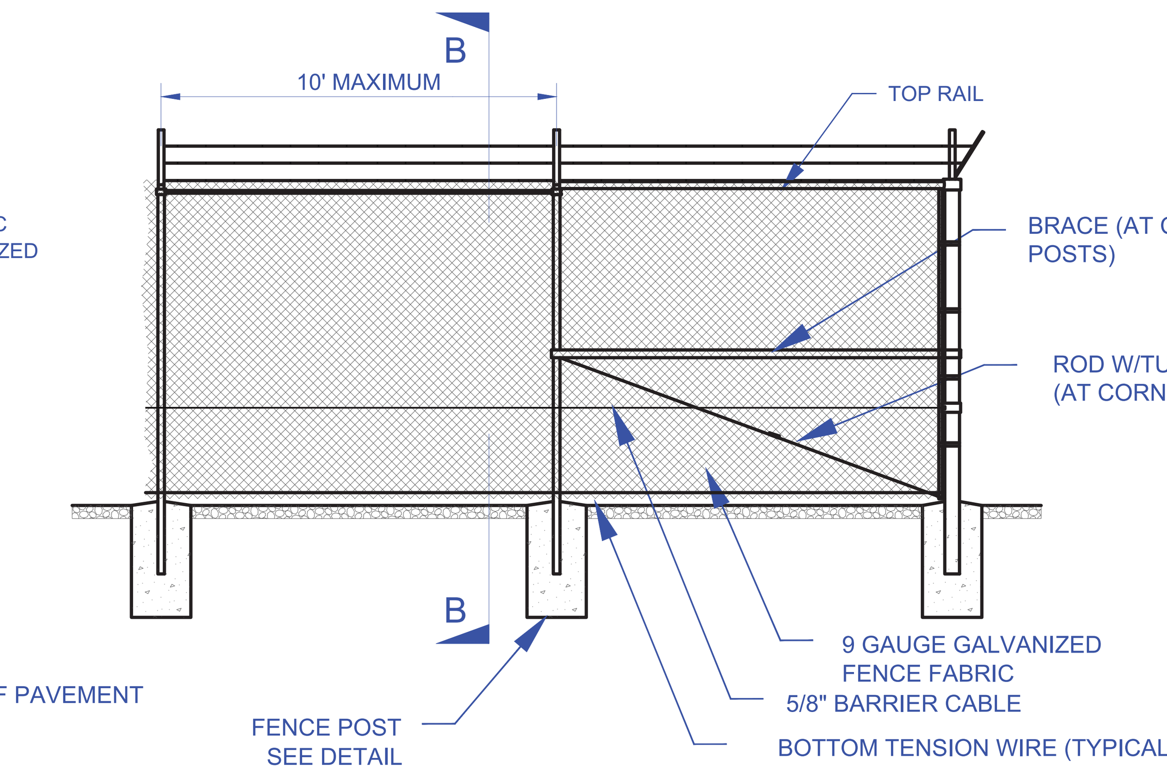

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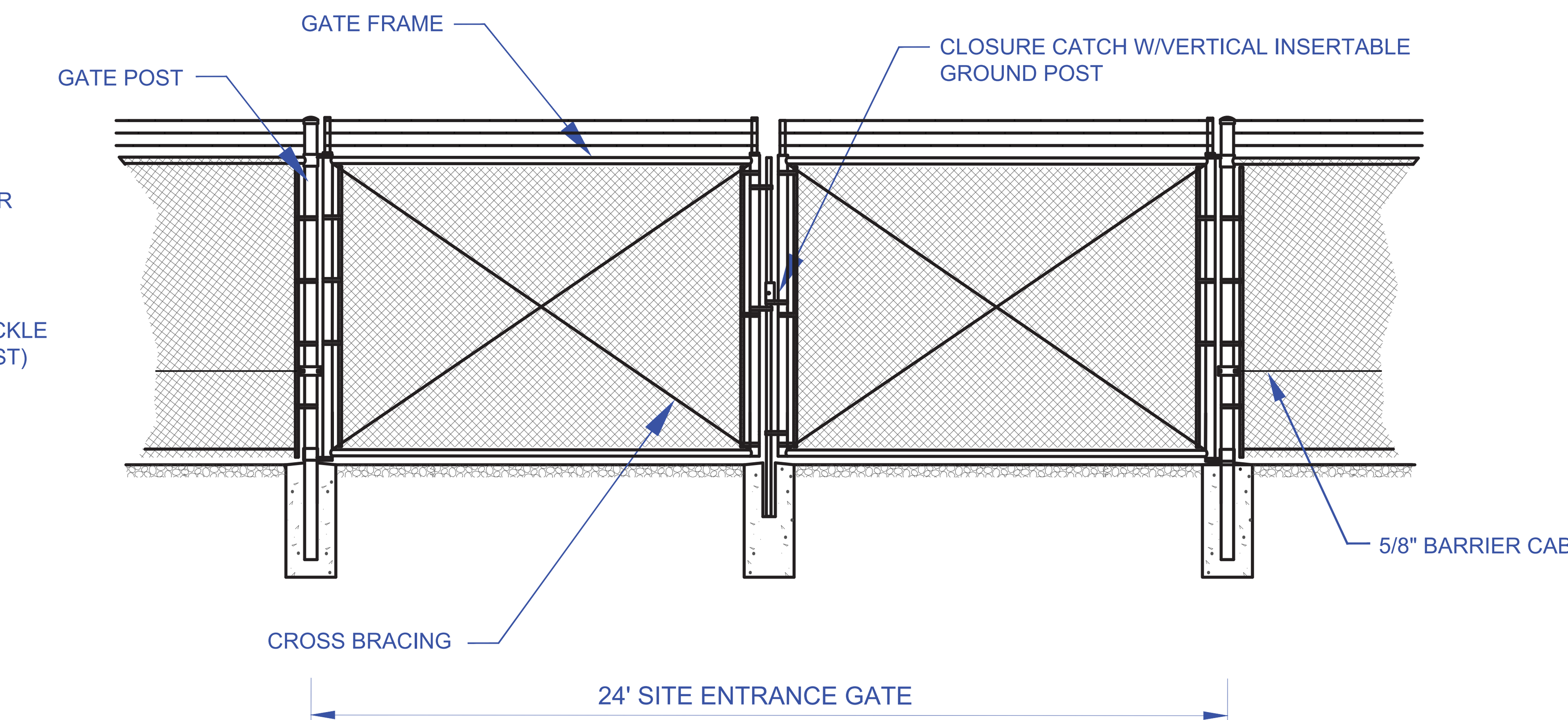
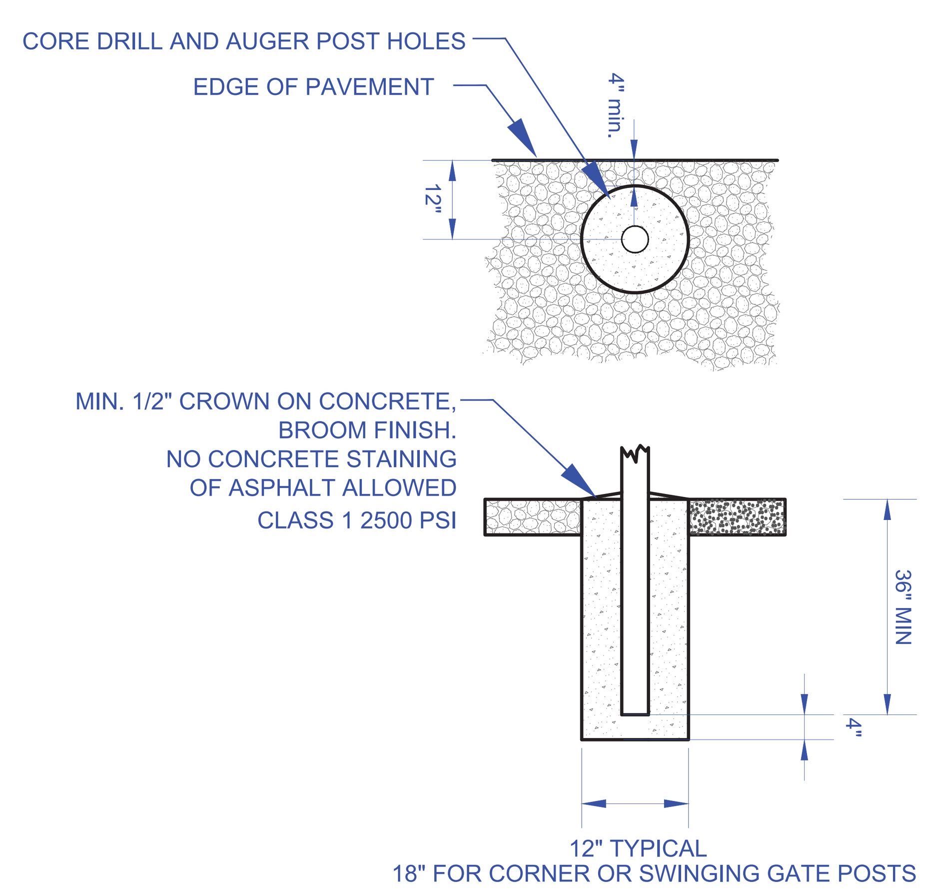
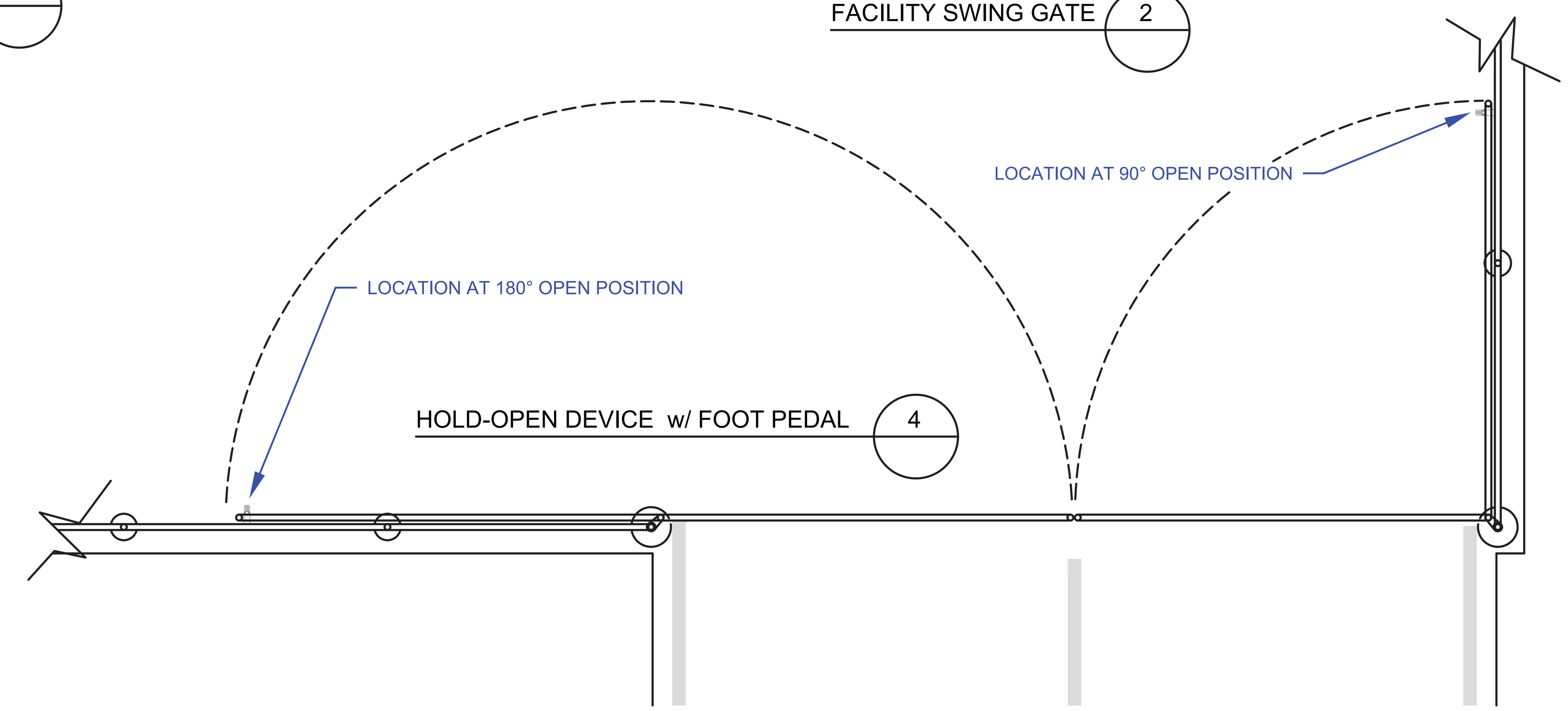


FACILITY SWING GATE 2



FENCE POLE BASES 3



HOLD-OPEN DEVICE w/ FOOT PEDAL 4

EXAMPLES: MODIFY FOR LOCAL CONDITIONS, INCLUDING APPROPRIATE GEOGRAPHICAL INFORMATION.

FENCES ARE EXAMPLES: MODIFY DESIGN FOR LOCAL CONDITIONS. MATERIALS AS SHOWN ON THIS DRAWING OR DOT SPECIFICATIONS OF THE STATE OF RECORD, WHICHEVER IS OF GREATER VALUE TO THE OWNER

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2	22 FEB 16	REVISION
1	29 JAN 16	ORIGINAL

TRADEPOINT ATLANTIC

PASHA

TRANSDEVELOPMENT GROUP

PROJECT	893
FILE	893SLSP3C
CTB	tdg-lw.ctb
DESIGNER	JEFF
EDIT DATE	2/23/2016
SAVE TIME	11:10:46 AM
PLOT DATE	2/23/2016
PLOT TIME	11:11:40 AM

DETAILS - PAVING AND FENCING

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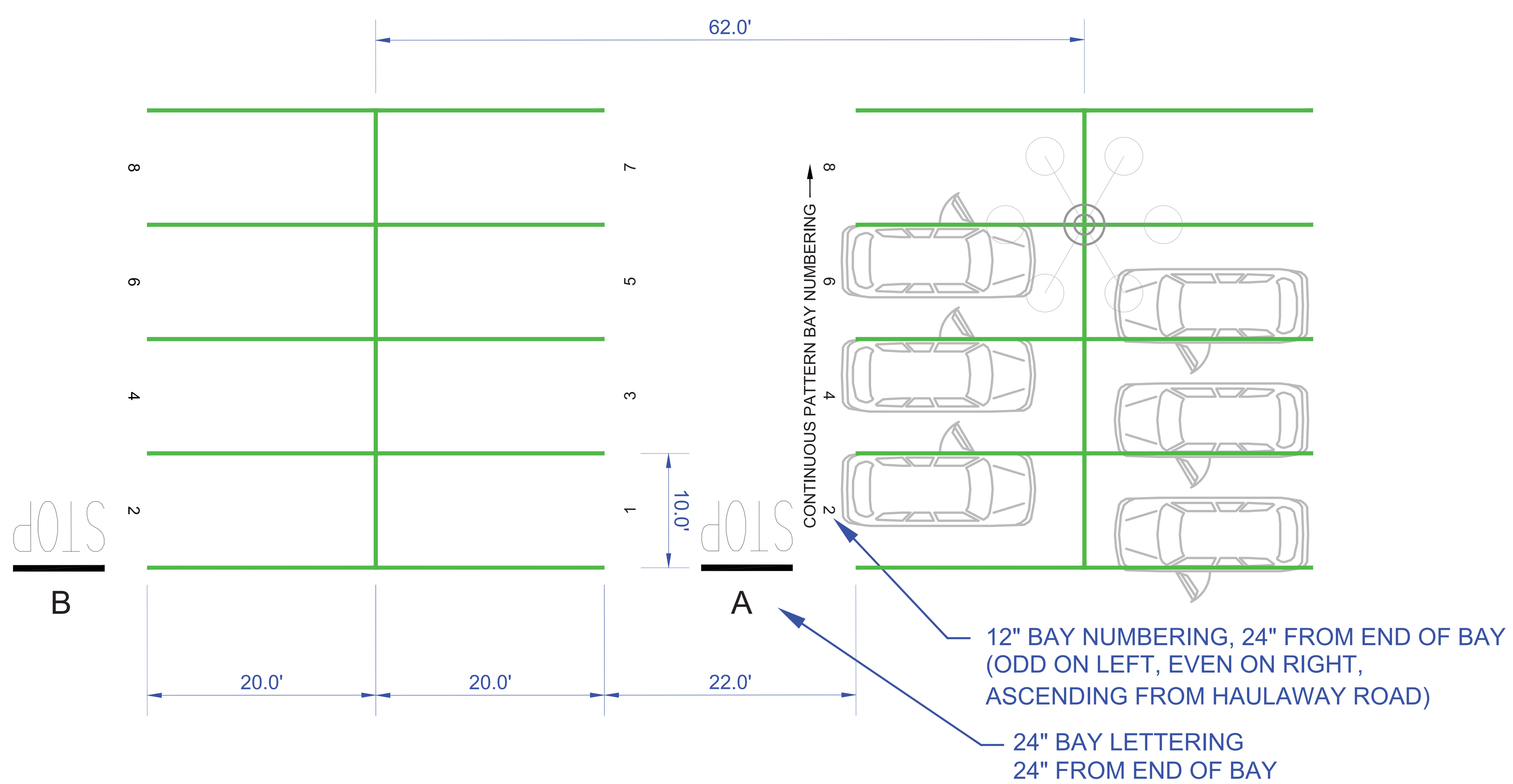
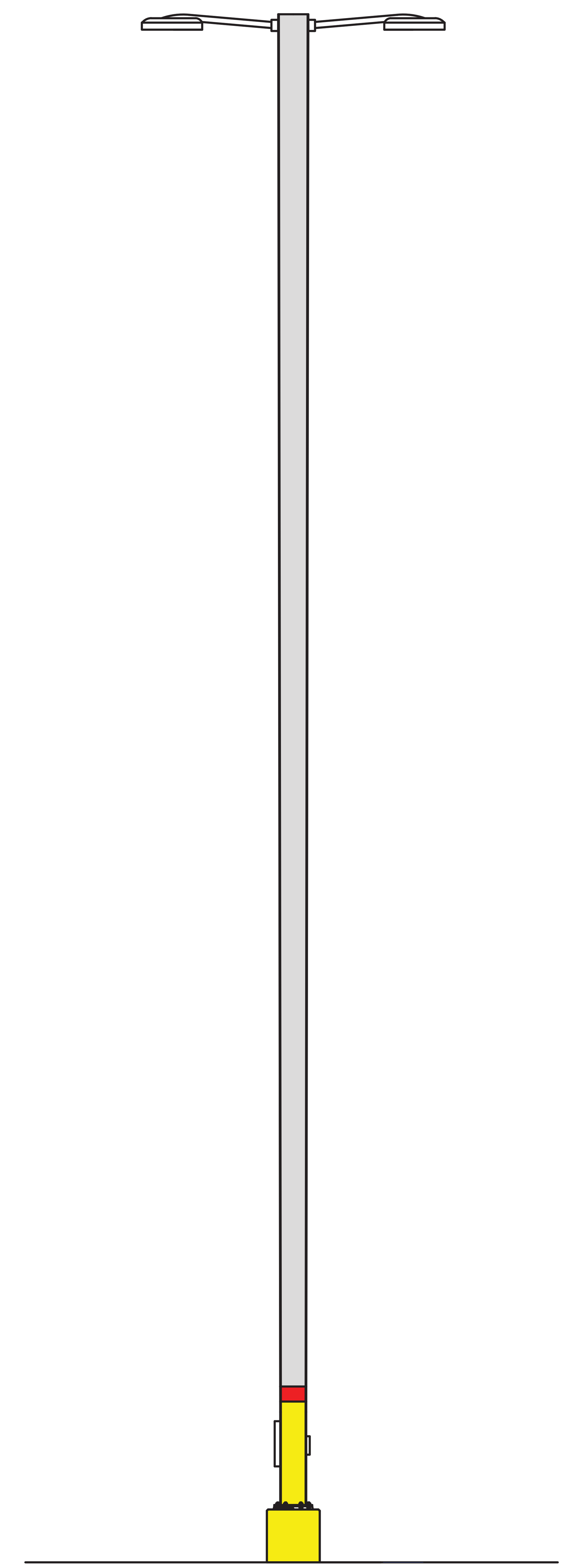
SPARROWS POINT, MARYLAND

D-001

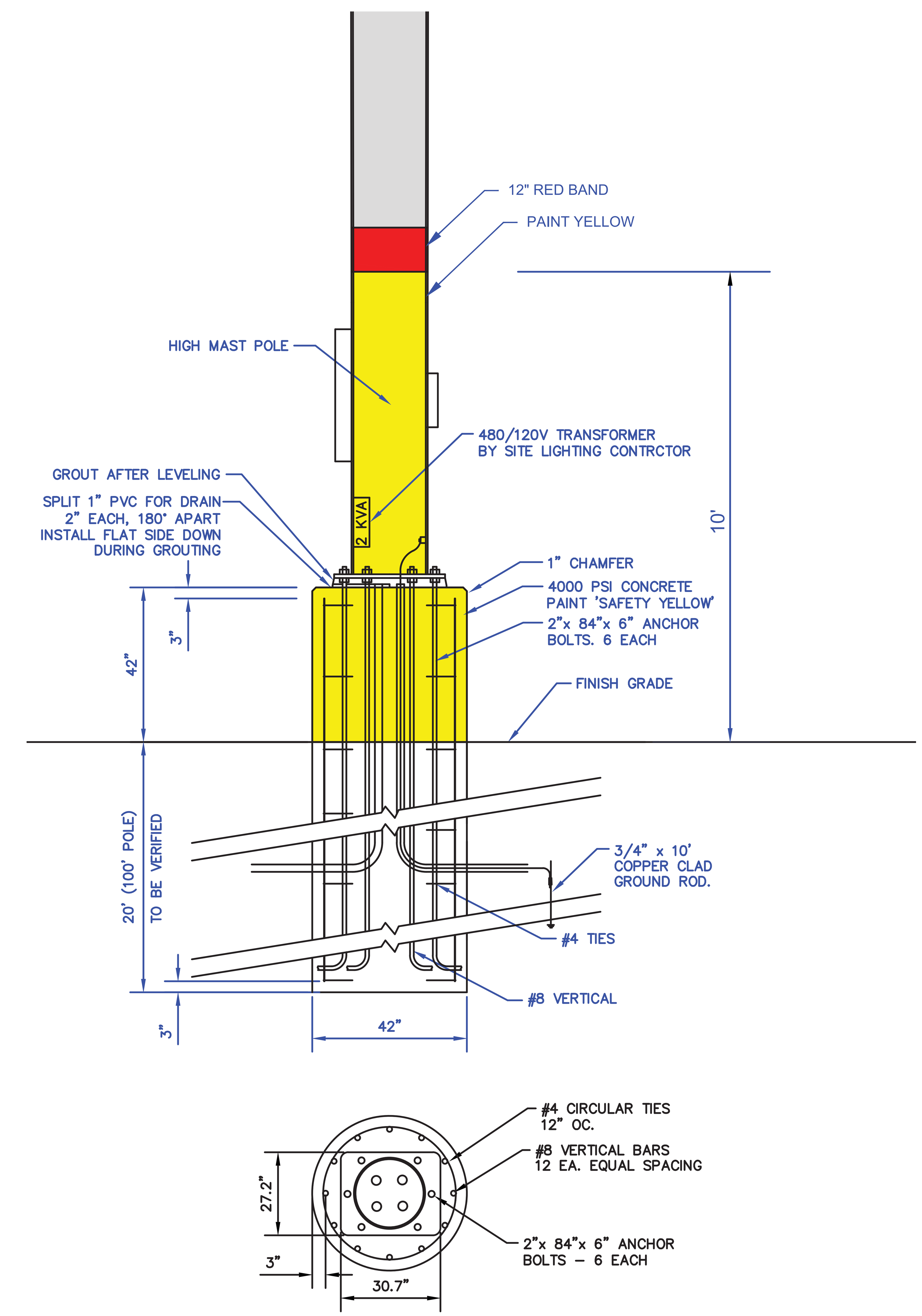
Project: Q:\Clients\TD Group\893 Pasha Sparrows Point File Name: 893SLSP3C-Sparrow Point Planning.dwg Sheet: Detail1 Designer: JEFF Edit Time: 2/23/2016 11:10:46 AM Plot Time:2/23/2016 11:11:40 AM



90° VEHICLE BAYS
NTS



HIGH MAST LIGHT POLE ELEVATION
NTS



HIGH MAST LIGHT POLE BASE
NTS

EXAMPLE: MODIFY DESIGN AS NEEDED FOR LOCAL CONDITIONS

Plot Time:2/23/2016 11:12:00 AM

Project: Q:\Clients\TD Group\893 Pasha Sparrows Point File Name: 893SLSP3C-Sparrow Point Planning.dwg Sheet: Detail2 Designer: JEFF Edit Time: 2/23/2016 11:10:46 AM

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PLOT TIME	11:12:00 AM

DETAILS - STRIPING AND LIGHT POLES
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

D-002

SCHEDULE

Symbol	QTY	Manufacturer	Catalog Number	Description	Lamp	Filename	Lumens per Lamp	LLF	Wattage
	8	Holophane	HMLED2 12 5K XX X AW	High Mast LED II 12 COB 5000K CCT Wide Type V	LED COB 5K	HMLED2_12_5K_XX_X_AW.ies	59336.9	0.9	4000
	2	Holophane	HMLED2 12 5K XX X F	High Mast LED II 12 COB 5000K CCT Narrow Type IV	LED COB 5K	HMLED2_12_5K_XX_X_F.ies	56897.98	0.9	500

Site Lighting Statistics

Avg	Max	Min	Max/Min	Avg/Min
2.3 fc	7.6 fc	0.5 fc	15.2:1	4.6:1

LIGHT LEVELS

- 5.0 F.C.
- 4.0 F.C.
- 3.0 F.C.
- 2.0 F.C.
- 1.0 F.C.
- 0.5 F.C.

Plot Time:2/23/2016 11:12:10 AM Edit Time: 2/23/2016 11:10:46 AM Designer: JEFF Sheet: Lighting File Name: 893SLSP3C-Sparrow Point Planning.dwg Project: Q:\Clients\TD Group\893 Pasha Sparrows Point

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CTB	tdg-lw.ctb
DESIGNER	JEFF
EDIT DATE	2/23/2016
SAVE TIME	11:10:46 AM
PLOT DATE	2/23/2016
PLOT TIME	11:12:10 AM

PHOTOMETRIC PLAN
AUTOMOTIVE & RO-RO DISTRIBUTION CENTER

SPARROWS POINT, MARYLAND

L-001

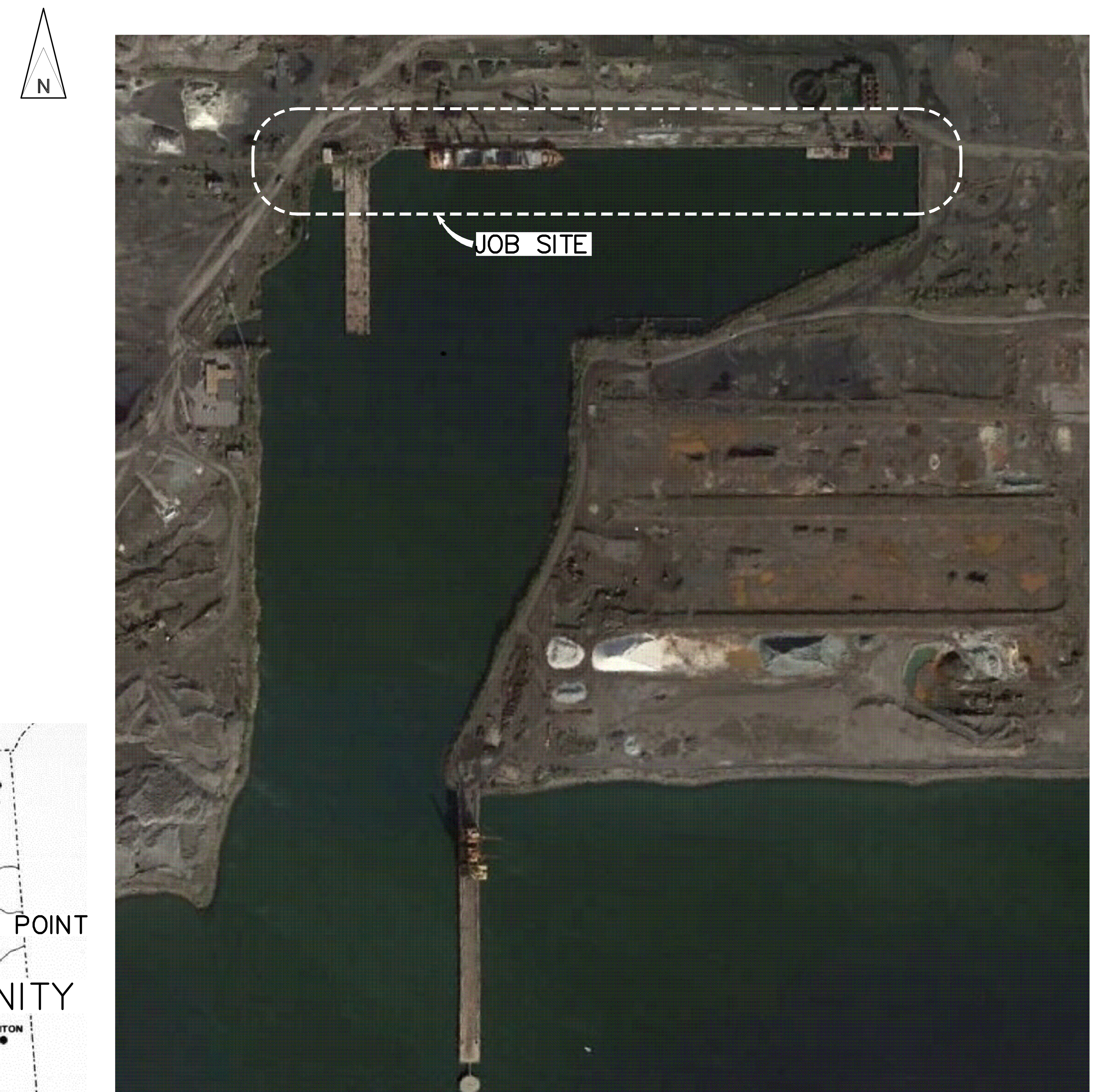
APPENDIX E

TRADEPOINT ATLANTIC

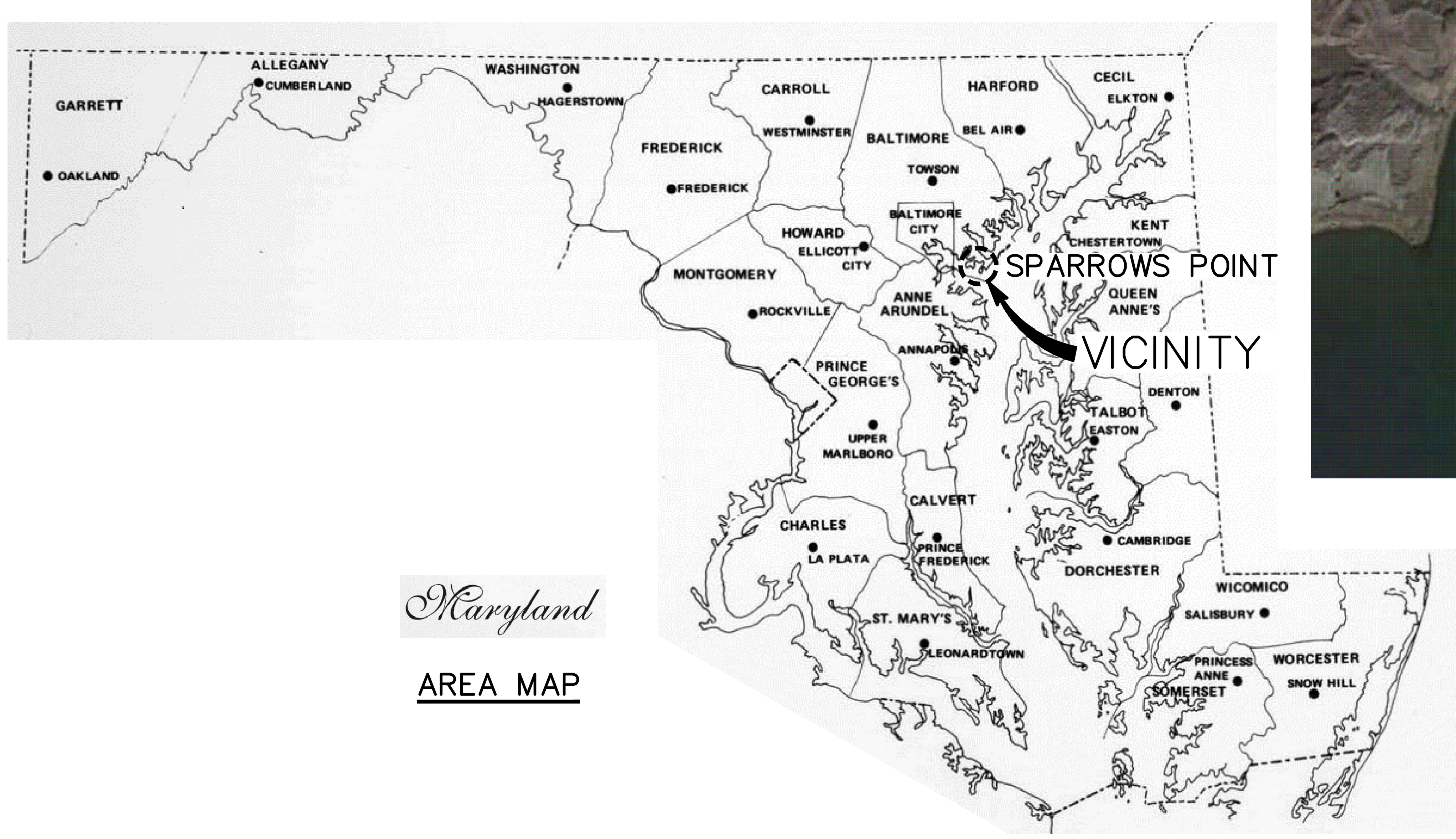
A YARD RORO STERN RAMP

SPARROWS POINT, MARYLAND

DRAWING INDEX	
DRAWING No.	COVER SHEET
CS-001	VICINITY MAP, COVER SHEET & DRAWING INDEX
GN-001	GENERAL NOTES
SP-001	SITE PLAN
GA-001	GENERAL ARRANGEMENT
GA-002	GENERAL ARRANGEMENT SECTION
F-001	FOUNDATION PLAN
F-002	FOUNDATION SECTION AND DETAIL
F-003	FOUNDATION SECTION
PP-001	PILE PLAN
PP-002	PILE ELEVATION, SECTIONS AND DETAILS



VICINITY MAP
SCALE: (N.T.S.)



Maryland

AREA MAP

May 17, 2016
ISSUED FOR CONSTRUCTION

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REV.	DESCRIPTION	BY	CHK'D	APP'D	DATE
0	ISSUED FOR CONSTRUCTION	CMZ	MMH	DRK	05/17/16

EDG CONSULTING ENGINEERS

CLIENT		
APPROVED	DRK	05/17/16
CHECKED	MMH	05/17/16
DRAWN	CMZ	03/22/16

TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
VICINITY MAP, COVER SHEET,
AND DRAWING INDEX
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. CS-001 0

GENERAL

1. DESIGN AND CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE FEDERAL/STATE/LOCAL CODES, THE PROJECT SPECIFICATIONS AND THESE GENERAL NOTES. PROJECT SPECIFICATIONS SHALL TAKE PRECEDENCE OVER GENERAL NOTES. STATE/LOCAL CODES SHALL TAKE PRECEDENCE OVER PROJECT SPECIFICATIONS AND GENERAL NOTES.

2. ALL STRUCTURES ARE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER ERECTION/CONSTRUCTION IS FULLY COMPLETED. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, SHEETING, TEMPORARY BRACING, MATTING, GUYS OR TIE DOWNS WHICH MIGHT BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER THE COMPLETION OF THE PROJECT.

3. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.

4. SHOULD ANY OF THE DETAILED INSTRUCTIONS SHOWN ON THE PLANS CONFLICT WITH THE GENERAL STRUCTURAL NOTES, THE SPECIFICATIONS OR WITH EACH OTHER, THE STRICTEST PROVISION SHALL GOVERN. COORDINATE WITH ALL DRAWINGS FOR INFORMATION RELATED TO STRUCTURAL WORK.

5. ALL EXISTING DIMENSIONS AND ELEVATIONS SHOWN ON DESIGN DRAWINGS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION OF MATERIALS. VERIFICATION SHALL BE BY SUBMITTAL OF DWGS TO OWNER WITH MEASURED DIMENSIONS & ELEVATIONS CONFIRMING OR DISPUTING INFO. SHOWN ON THE DESIGN DWGS.

6. GOVERNING CODE(S): 2012 INTERNATIONAL BUILDING CODE.

7. DRAWING SCALES INDICATED ON THE DRAWINGS REFER TO FULL SIZE DWGS. (24"x36")

8. DESIGN LOADS, ARE SHOWN BELOW.
   A. 3000 PSF AREA LOAD OR
   B. 250 TON RAMP LOAD (30' LONG LINE LOAD)

COORDINATE CONTROL

1. ALL COORDINATES SHOWN ARE CONSISTENT WITH MARYLAND STATE PLANE COORDINATES. ALL ELEVATIONS ARE NAVD88.

STRUCTURAL STEEL

1. SPECIFICATIONS: DESIGN, FABRICATION, AND ERECTION ARE TO BE GOVERNED BY THE LATEST REVISIONS OF THE FOLLOWING U.N.O.:
   A. AISC STEEL CONSTRUCTION MANUAL (ALLOWABLE STRESS DESIGN 13TH EDITION).
   B. AISC CODE OF STANDARD PRACTICE.
   C. PROJECT SPECIFICATION "STEEL PIPE AND H PILE SPECIFICATION"
   D. STRUCTURAL WELDING CODE, AWS D1.1 OF THE AMERICAN WELDING SOCIETY. WELDING PERSONNEL AND PROCEDURES ARE TO BE QUALIFIED PER AWS D1.1.

2. MATERIALS:
   A. STEEL PIPES SHALL BE ASTM A252, GRADE 3 (Fy = 45 KSI), U.N.O.
   B. STEEL H PILES SHALL BE ASTM A572, GRADE 50

3. WELDS:
   A. ALL WELDS SHALL BE WITH E70XX ELECTRODES IN ACCORDANCE WITH AWS D1.1. USE HIGHER STRENGTH ELECTRODE IF REQUIRED BY AWS D1.1.
   B. MINIMUM SIZE OF FILLET WELD SHALL BE 3/16" UNLESS NOTED OTHERWISE.

4. COATING/PAINTING:
   A. ALL STEEL SHALL BE PAINTED PER COATING SPECIFICATION AND AS INDICATED ON THE DRAWINGS.

5. INSTALLATION:
   A. PILE DRIVING SHALL BE CONTINUOUS, WITHOUT INTERRUPTION, FOR EACH PILE INSTALLATION.
   B. PRE-DRILL ACCORDING TO SPECIFICATIONS AND DRAWINGS.
   C. THE CONTRACTOR SHALL LOG EACH DRIVEN PILE AND PROVIDE A RECORD TO THE OWNER'S REPRESENTATIVE.
   D. PILE HAMMER SHALL HAVE A MINIMUM RATED ENERGY OF 70 FT-KIPS.

6. MISCELLANEOUS:
   A. OBTAIN APPROVAL OF OWNER PRIOR TO CUTTING OPENINGS IN ANY MEMBER.

REINFORCED CONCRETE - CAST-IN-PLACE

1. GENERAL
   A. CAST IN PLACE CONCRETE WORK SHALL CONFORM TO REQUIREMENTS OF ACI-301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDING" UNLESS NOTED OTHERWISE, AND PROJECT SPECIFICATIONS.

2. MATERIALS:
   A. STRUCTURAL CONCRETE SHALL BE:
      1. TYPE II
      2. NORMAL WEIGHT, MAXIMUM WATER/CEMENT RATIO SHALL BE 0.40 U.N.O.
   B. CONCRETE STRENGTHS SHALL ATTAIN A MINIMUM 28 DAYS COMPRESSIVE STRENGTH OF 5000 PSI U.N.O.
   C. CALCIUM CHLORIDE SHALL NOT BE PERMITTED NOR SHALL ANY ADMIXTURE CONTAINING CALCIUM CHLORIDE BE PERMITTED.
   D. ALUMINUM PIPE SHALL NOT BE USED WITH CONCRETE PUMPS.
   E. GROUT SHALL BE NON-SHRINK CEMENTITIOUS GROUT.
   F. REINFORCING STEEL:
      1. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60. REBAR TO BE WELDED SHALL CONFORM TO ASTM A706M.
      2. REINFORCING STEEL AND ACCESSORIES SHALL BE PLACED AS SHOWN ON PROJECT DRAWINGS AND REVIEWED SHOP DRAWINGS. PLACEMENT DETAILS NOT SHOWN ON THE DRAWINGS SHALL BE IN ACCORDANCE WITH ACI SP-66 OR ACI 318.
      3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185, DELIVERED IN FLAT SHEETS.
      4. SPIRAL REINFORCEMENT SHALL CONFORM TO ASTM A82.
   G. AGGREGATE SHALL CONFORM TO ASTM C33 WITH A MAXIMUM SIZE OF 1 1/2"
   H. BOND BREAKER MATERIAL SHALL BE RECOMMENDED BY SEALANT MANUFACTURER TO PREVENT ADHESION OF JOINT SEALANT TO BACKING OR BOTTOM OF JOINTS.
   I. HEADED STUDS SHALL CONFORM TO ASTM A108 GR 1015, FORGED STEEL, UNCOATED.
   J. ANCHOR BOLT (THREADED BOLT) MATERIAL SHALL BE ASTM F1554, GRADE 55 U.N.O.
   K. ANCHOR BOLT (THREADED BOLT) MATERIAL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153, U.N.O.
   L. EMBEDDED STEEL SHALL CONFORM TO ASTM A36, GALVANIZED U.N.O.
   M. EMBEDDED STEEL SHALL BE GALVANIZED WITH 2 OUNCE PER. SQ. FT. OF SURFACE IN ACCORDANCE WITH ASTM A123, U.N.O.

3. FORM WORK:
   A. CONSTRUCT FORMS COMPLYING WITH ACI 347, TO SIZES, SHAPES, LINES AND DIMENSIONS SHOWN AND BUILT TO OBTAIN ACCURATE ALIGNMENT, LOCATION, GRADES, LEVEL AND PLUMB WORK IN FINISHED STRUCTURES, INCLUDING ADEQUATE SUPPORTING FALSE WORK FOR OVER WATER FORMS. PROVIDE FOR OPENINGS, OFFSETS, SINKAGES, KEYWAYS, RECESSES, MOLDINGS, REGLETS, CHAMFERS, BLOCKS, SCREEDS, BULKHEADS, AND OTHER FEATURES. PROVIDE BACKUP AT JOINT TO PREVENT LEAKAGE OF CEMENT.

4. REINFORCING STEEL:
   A. ALL REINFORCING DETAILS SHALL CONFORM TO ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND CRSI'S "PLACING REINFORCING BARS" U.N.O.
   B. CONTRACTOR SHALL PROVIDE SPACERS, CHAIRS, BOLSTERS, ETC. NECESSARY TO SUPPORT REINFORCING STEEL. SUPPORT ITEMS WHICH BEAR ON EXPOSED CONCRETE SURFACES SHALL HAVE ENDS WHICH ARE PLASTIC TIPPED OR STAINLESS STEEL. CONCRETE CUBES SHALL BE USED FOR THE SUPPORT OF REINFORCING ON GRADE.
   C. REINFORCING BARS REQUIRED FOR PROPER SUPPORT OF PRINCIPAL REINFORCING SHALL BE DETAILED AND SUPPLIED BY THE CONTRACTOR, WHETHER OR NOT THEY ARE INDICATED ON THE DRAWINGS. THE MINIMUM BAR SIZE SHALL BE #4 AND MAXIMUM SPACING SHALL BE 36" O.C. FOR ALL BARS THAT NEED SUPPORT. WELDED WIRE FABRIC SHALL NOT BE USED FOR THE SUPPORT OF PRINCIPAL REINFORCING.
   D. WELDING OF REINFORCING STEEL IS NOT PERMITTED, UNLESS SHOWN ON THE DRAWINGS.

5. SPLICES
   A. LAP ALL REINFORCING BARS IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT," AND CRSI'S "PLACING REINFORCING BARS" U.N.O.
   B. SPLICES MAY NOT BE ADDED TO REINFORCING WITHOUT REVIEW AND APPROVAL OF THE OWNER'S REPRESENTATIVE.

6. JOINTS
   A. WHERE CONSTRUCTION JOINTS ARE REQUIRED BUT ARE NOT INDICATED ON THE DRAWINGS, THEY SHALL BE LOCATED BY THE CONTRACTOR, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE. ALL CONSTRUCTION JOINTS SHALL BE ARTIFICIALLY ROUGHENED AND CLEANED, WITH REINFORCING CONTINUOUS THROUGH THE JOINT.
   B. PROVIDE CONTROL JOINTS IN ALL SLABS ON GRADE AS SHOWN ON THE DRAWINGS.

7. PLACEMENT
   A. COMPLY WITH ACI 304 "GUIDE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE".
   B. FOR HOT WEATHER PLACEMENT, COMPLY WITH ACI 305 "HOT WEATHER CONCRETING".
   C. FOR COLD WEATHER PLACEMENT, COMPLY WITH ACI 306 "COLD WEATHER CONCRETING".

8. FINISH
   A. FINISH FOR ALL CONCRETE SHALL BE COARSE BROOM FINISH, U.N.O.
   B. PROVIDE 1" CHAMFER STRIPS AT ALL CORNERS ON PERMANENTLY EXPOSED FOUNDATIONS AND PIERS AND A 3/4" CHAMFER FOR CORNERS OF BEAMS, COLUMNS AND SLAB ABOVE GRADE, U.N.O.

9. CURING
   A. CURE CONCRETE IN ACCORDANCE WITH ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE" PROCEDURES.

10. CONSTRUCTION TOLERANCES
   A. CONSTRUCTION TOLERANCES SHALL BE WITHIN THE TOLERANCES SPECIFIED IN ACI 117 "STANDARD SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS".
   B. ANCHOR BOLT/ROD TOLERANCES SHALL BE WITHIN THE TOLERANCES SPECIFIED IN ACI 355.1R "ANCHORAGE TO CONCRETE".

May 17, 2016
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EDG CONSULTING ENGINEERS

CLIENT		
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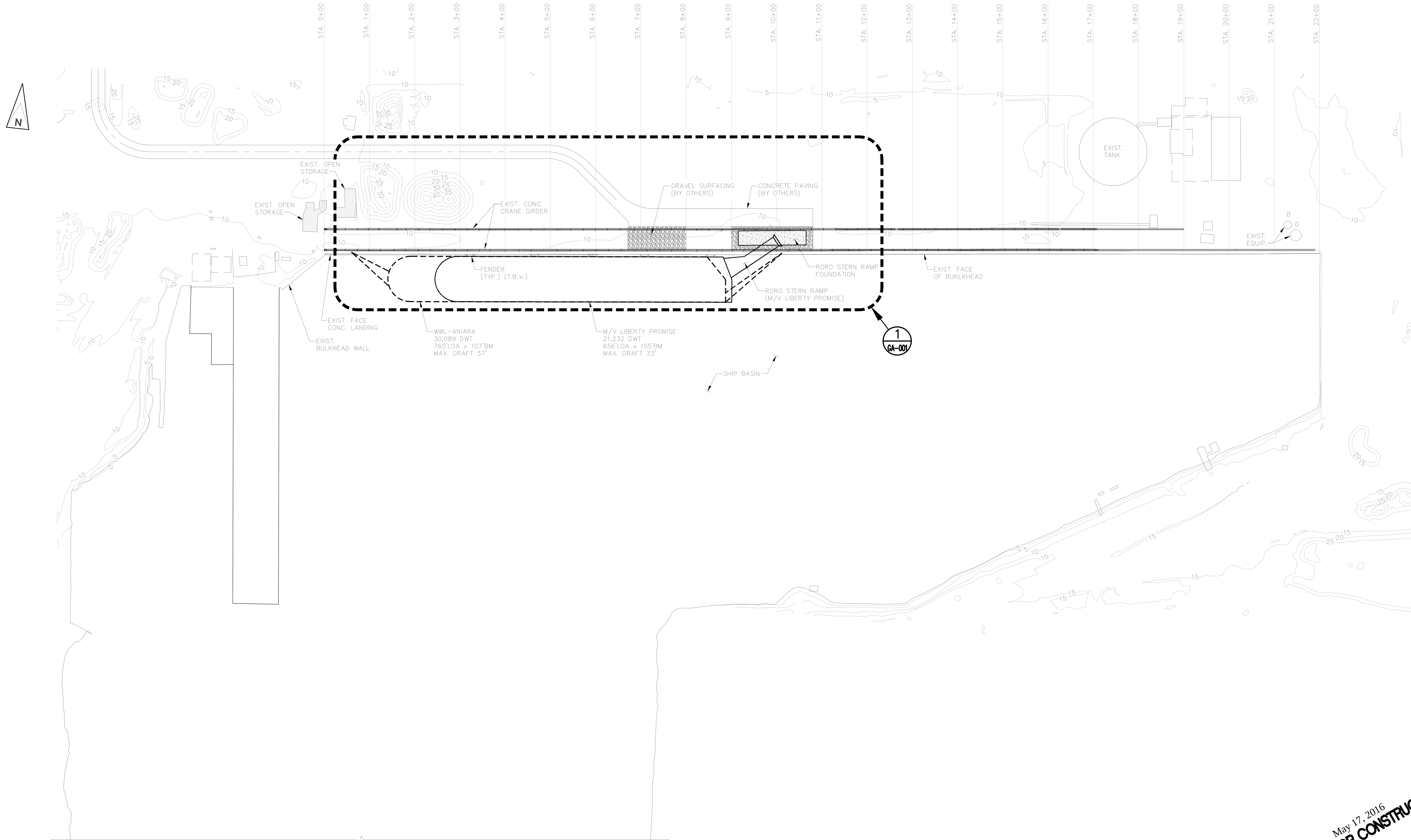
CHECKED	MMH	05/17/16
DRAWN	CMZ	03/22/16

TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
GENERAL NOTES
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. GN-001 0



SITE PLAN
SCALE: 1"=100'-0"

May 17, 2016
ISSUED FOR CONSTRUCTION

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SCALE IN FEET 1"=100'-0"

NOTES:

1. FOR DRAWING INDEX SEE DWG. NO. CS-001. FOR GENERAL NOTES SEE DWG. NO. GN-001

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TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
SITE PLAN
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. SP-001

GENERAL ARRANGEMENT (1 / SP-001)

SCALE: 1"=40'-0"

May 17, 2016
ISSUED FOR CONSTRUCTION

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SCALE IN FEET 1"=40'-0"

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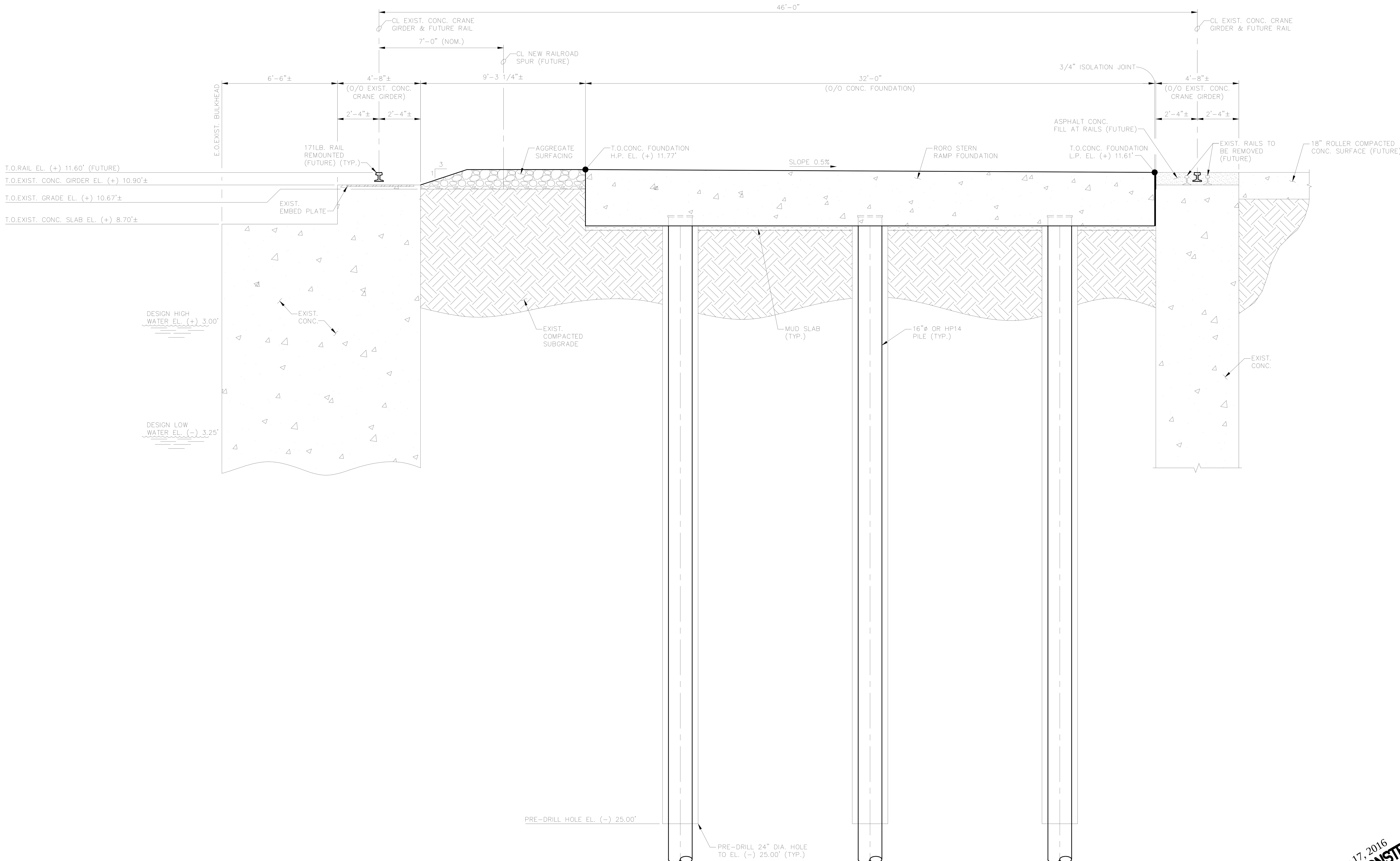
TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
GENERAL ARRANGEMENT
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. GA-001 0



SECTION A/001
SCALE: 3/8"=1'-0"

May 17, 2016
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NOTES:

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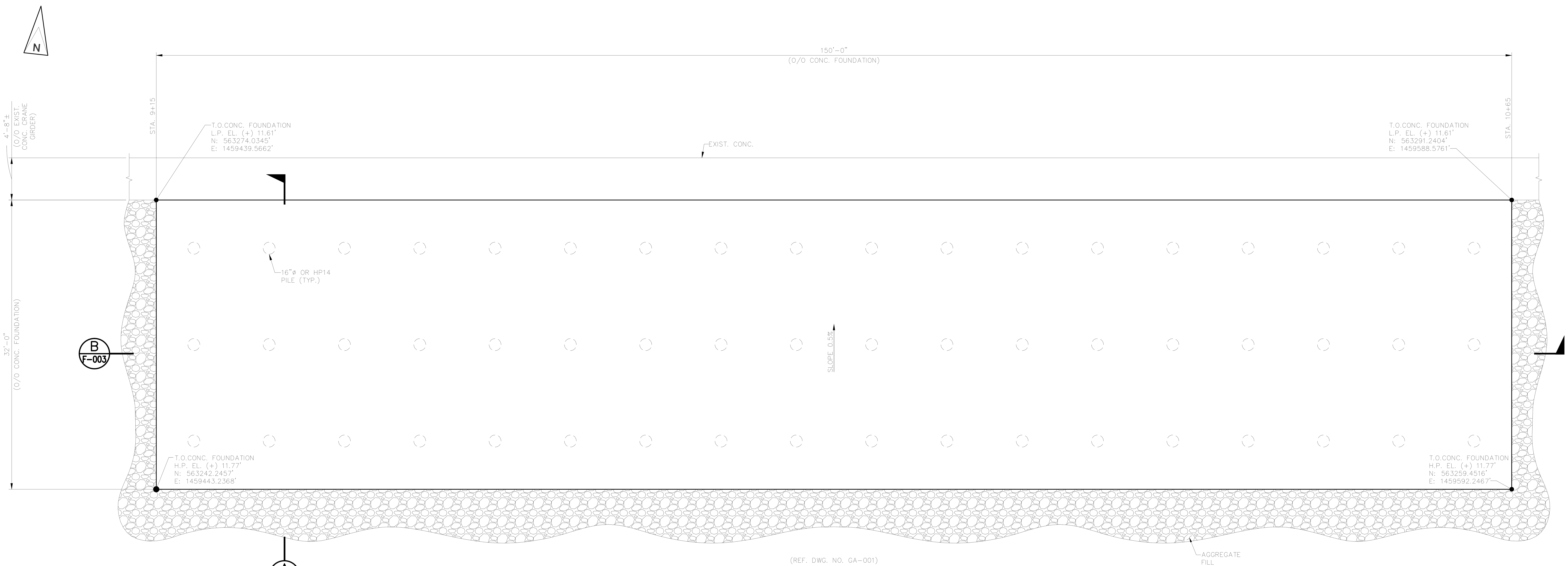
TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
GENERAL ARRANGEMENT SECTION
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. GA-002



RORO STERN FOUNDATION PLAN
SCALE: 3/16"=1'-0"

May 17, 2016
ISSUED FOR CONSTRUCTION

NOTES:

1. FOR DRAWING INDEX SEE DWG. NO. CS-001.
FOR GENERAL NOTES SEE DWG. NO. GN-001

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TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
RORO STERN FOUNDATION PLAN
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. F-001 0

SECTION A/001
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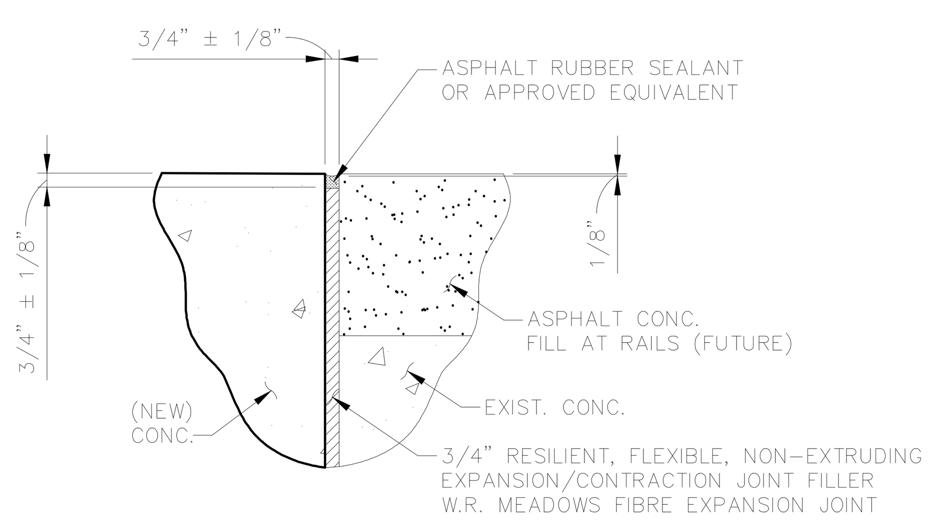

ISOLATION JOINT DETAIL 1/–
SCALE: 1 1/2"=1'-0"

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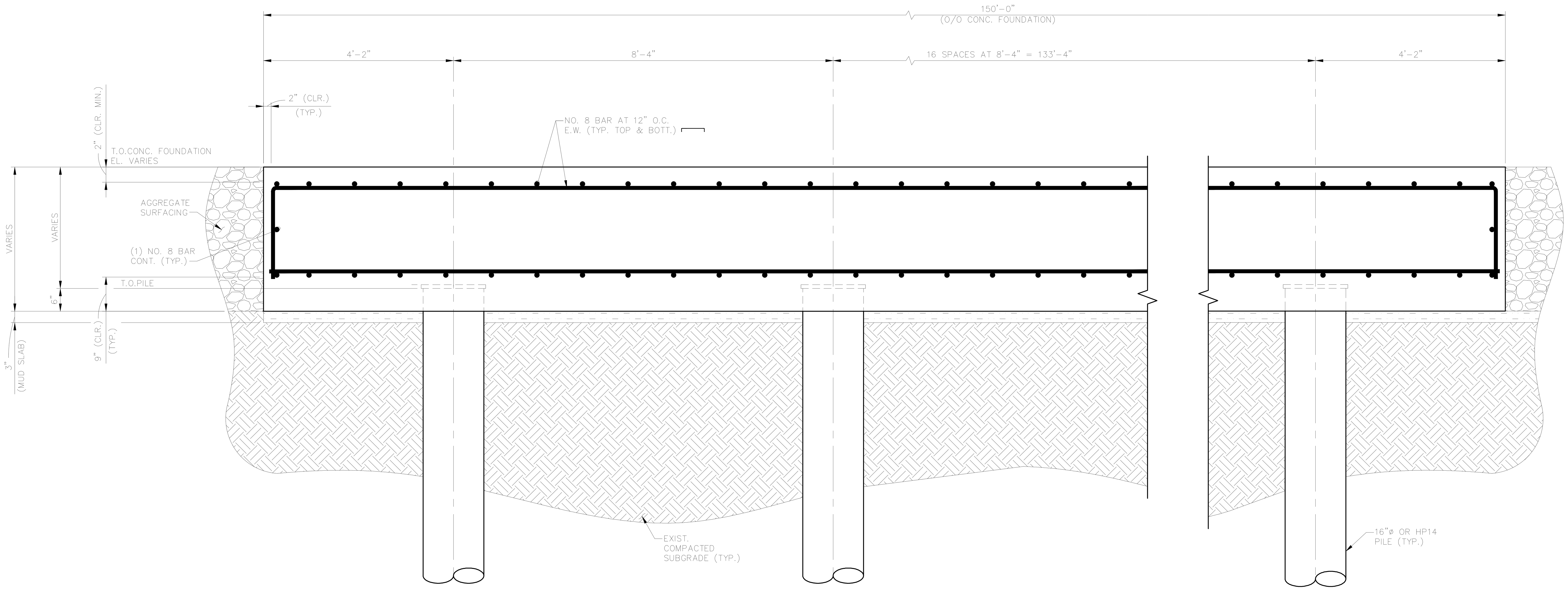
TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
RORO STERN FOUNDATION SECTION & DETAIL
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 | DWG. NO. F-002 | 0



SECTION B/001
SCALE: 3/4"=1'-0"

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TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
RORO STERN FOUNDATION SECTION
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. F-003 0

RORO STERN PILE PLAN

SCALE: 3/16"=1'-0"

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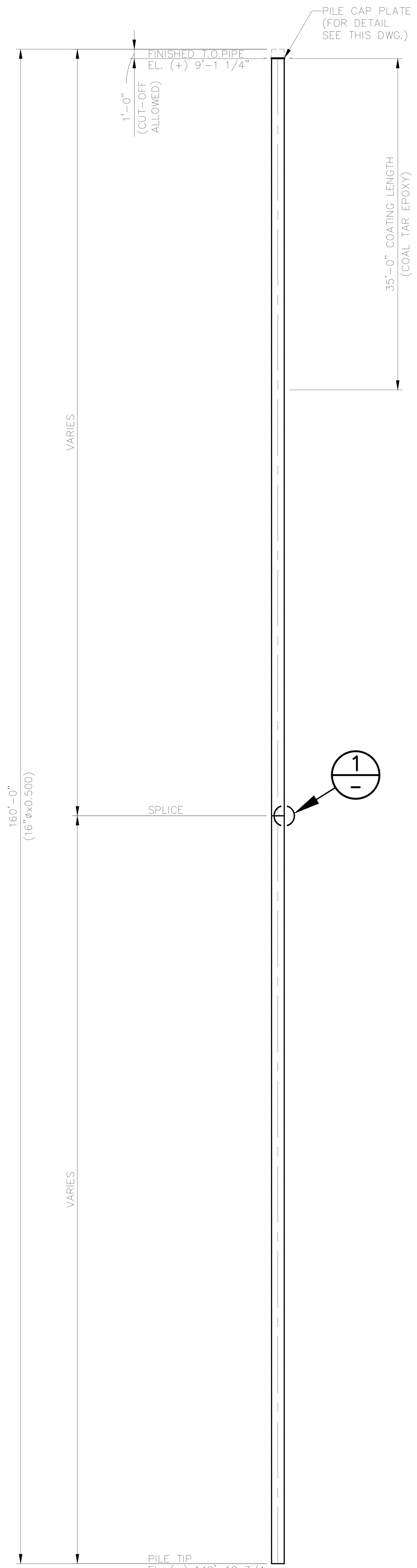
TRADEPOINT ATLANTIC

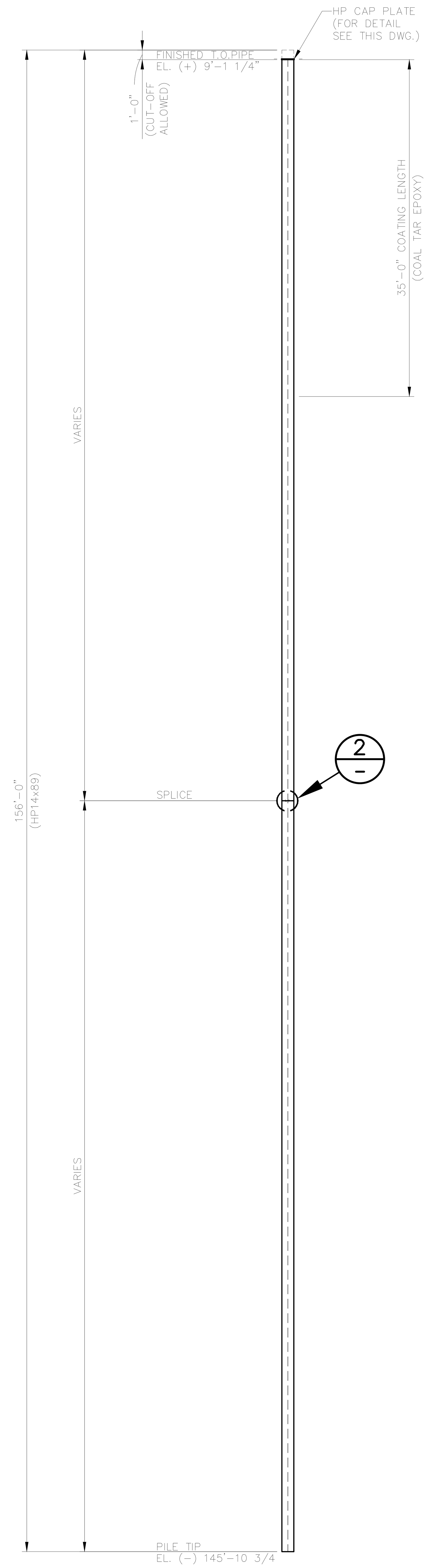
A YARD RORO STERN RAMP
RORO STERN PILE PLAN
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. PP-001 0



(REQ'D 54)
(REF. DWG. NO. PP-001)

PIPE PILE ELEVATION
SCALE: 1/8"=1'-0"



(REQ'D 54)
(REF. DWG. NO. PP-001)

HP PILE ELEVATION
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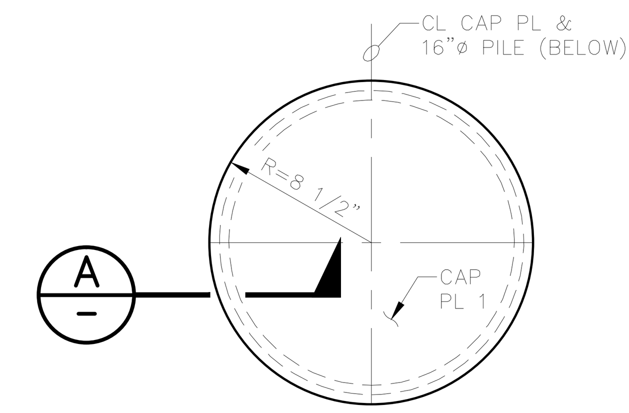
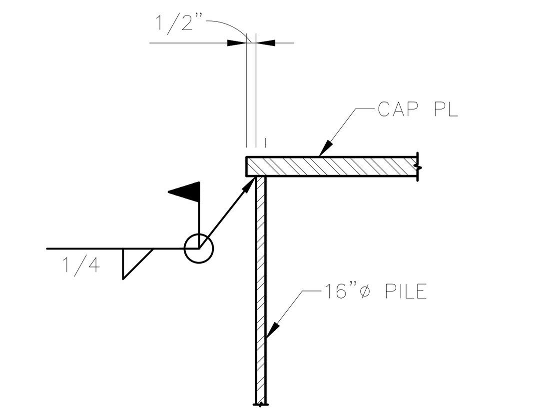


PILE CAP PLATE DETAIL
SCALE: 1 1/2"=1'-0"



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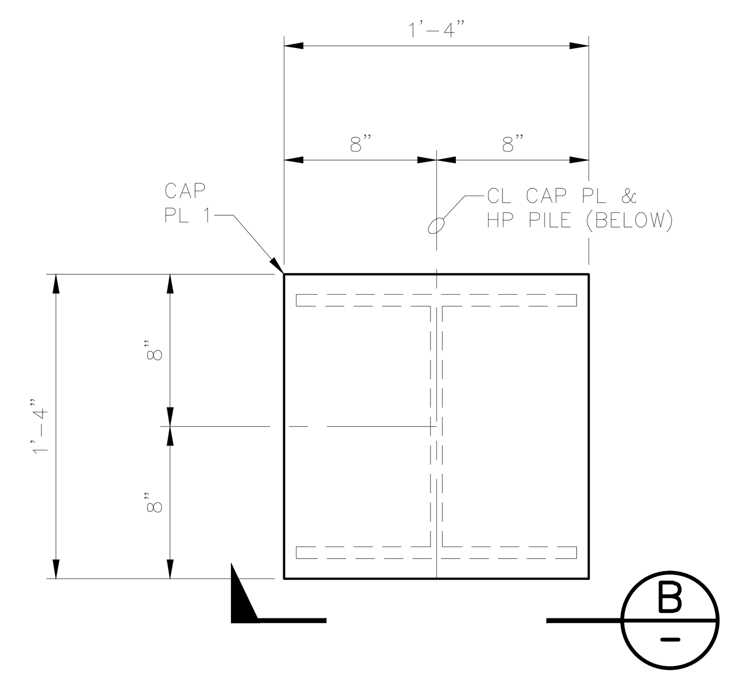

HP CAP PLATE DETAIL
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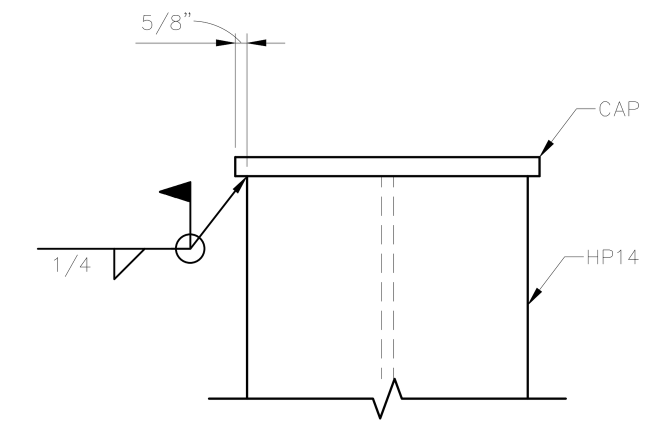

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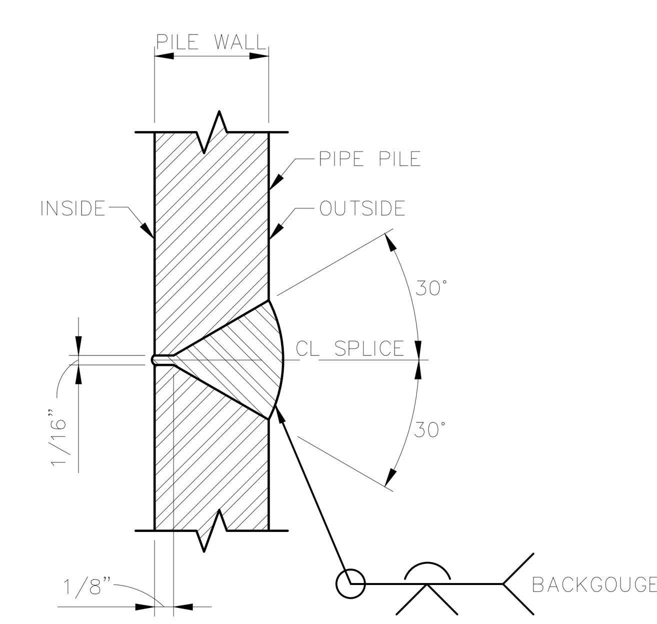

(TYPICAL SPLICE)

DETAIL 1
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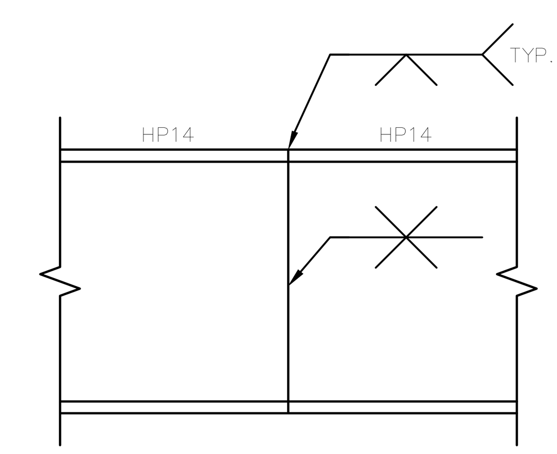

(TYPICAL SPLICE)

DETAIL 2
SCALE: 1 1/2"=1'-0"

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NOTES:

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DRAWN	CMZ	03/22/16

TRADEPOINT ATLANTIC

A YARD RORO STERN RAMP
RORO STERN PILE ELEVATION, SECTIONS & DETAILS
SPARROWS POINT, MARYLAND

JOB NO. 6378.500 DWG. NO. PP-002

APPENDIX F

KEVIN KAMENETZ
County Executive

VINCENT J. GARDINA, *Director*
Department of Environmental Protection and Sustainability

Stormwater Management

410-887-3768
FAX 410-887-4804

April 9, 2016

Justin Dunn, Director
Engineering and Planning
Tradepoint Atlantic
1600 Sparrows Point Blvd
Sparrows Point, MD 21219

RE: AUTOMOTIVE AND RO-RO DISTRIBUTION CENTER
Stormwater Management Variance
Baltimore Harbor Watershed
EPS Project I.D. M160048
EPS Tracking Number: 07-16-2193

Dear Mr. Dunn:

This office has reviewed the information submitted and finds that a stormwater management variance can be granted for this project under Section 33-4-113 (a) (2) of Title 4 of the Baltimore County Code. This section of the regulations allows a stormwater management variance to be granted if there are exceptional circumstances such that strict adherence to the provisions of this article would result in unreasonable hardship or practical difficulty and not fulfill the intent of this article.

This project is for the construction of approximately 900,000 square feet of impervious area for a vehicle storage area. This will be a temporary SWM variance for the initial phase of the redevelopment of a former steel mill site while environmental investigation, remediation and demolition efforts proceed. The next phases of development will include SWM. Although the impervious area is in excess of 5,000 square feet, runoff resulting from the project will be managed in the future.

Please contact Michael P. Doyle of my staff at 410-887-3768 should you have any questions.

Very truly yours,

Vincent J. Gardina

Vincent J. Gardina, Director
Department of Environmental Protection
& Sustainability

VJG:jcm

c: Michael P. Doyle

variance approval letter private

APPENDIX G

Screening Levels (100x PAL)

Parameter	CAS #	100x PAL	Units
1,1,1-Trichloroethane	71-55-6	3.6E+06	mg/kg
1,1,2,2-Tetrachloroethane	79-34-5	2.7E+02	mg/kg
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1.7E+07	mg/kg
1,1,2-Trichloroethane	79-00-5	5.0E+02	mg/kg
1,1-Biphenyl	92-52-4	2.0E+04	mg/kg
1,1-Dichloroethane	75-34-3	1.6E+03	mg/kg
1,1-Dichloroethene	75-35-4	1.0E+05	mg/kg
1,2,3-Trichlorobenzene	87-61-6	9.3E+04	mg/kg
1,2,4,5-Tetrachlorobenzene	95-94-3	3.5E+04	mg/kg
1,2,4-Trichlorobenzene	120-82-1	1.1E+04	mg/kg
1,2-Dibromo-3-chloropropane	96-12-8	6.4E+00	mg/kg
1,2-Dibromoethane	106-93-4	1.6E+01	mg/kg
1,2-Dichlorobenzene	95-50-1	9.3E+05	mg/kg
1,2-Dichloroethane	107-06-2	2.0E+02	mg/kg
1,2-Dichloroethene (Total)	540-59-0	2.3E+05	mg/kg
1,2-Dichloropropane	78-87-5	4.4E+02	mg/kg
1,3-Dichlorobenzene	541-73-1		mg/kg
1,3-Dichloropropene	542-75-6	8.2E+02	mg/kg
1,4-Dichlorobenzene	106-46-7	1.1E+03	mg/kg
1,4-Dioxane	123-91-1	2.4E+03	mg/kg
2,3,4,6-Tetrachlorophenol	58-90-2	2.5E+06	mg/kg
2,4,5-Trichlorophenol	95-95-4	8.2E+06	mg/kg
2,4,6-Trichlorophenol	88-06-2	2.1E+04	mg/kg
2,4-Dichlorophenol	120-83-2	2.5E+05	mg/kg
2,4-Dimethylphenol	105-67-9	1.6E+06	mg/kg
2,4-Dinitrophenol	51-28-5	1.6E+05	mg/kg
2,4-Dinitrotoluene	121-14-2	7.4E+02	mg/kg
2,6-Dinitrotoluene	606-20-2	1.5E+02	mg/kg
2-Butanone (MEK)	78-93-3	1.9E+07	mg/kg
2-Chloronaphthalene	91-58-7	6.0E+06	mg/kg
2-Chlorophenol	95-57-8	5.8E+05	mg/kg
2-Hexanone	591-78-6	1.3E+05	mg/kg
2-Methylnaphthalene	91-57-6	3.0E+05	mg/kg
2-Methylphenol	95-48-7	4.1E+06	mg/kg
2-Nitroaniline	88-74-4	8.0E+05	mg/kg
3&4-Methylphenol(m&p Cresol)	108-39-4/106-44-5	4.1E+06	mg/kg
3,3'-Dichlorobenzidine	91-94-1	5.1E+02	mg/kg
4-Chloroaniline	106-47-8	1.1E+03	mg/kg
4-Methyl-2-pentanone (MIBK)	108-10-1	5.6E+06	mg/kg
4-Nitroaniline	100-01-6	1.1E+04	mg/kg
Acenaphthene	83-32-9	4.5E+06	mg/kg

Parameter	CAS #	100x PAL	Units
Acenaphthylene	208-96-8	4.5E+06	mg/kg
Acetone	67-64-1	6.7E+07	mg/kg
Acetophenone	98-86-2	1.2E+07	mg/kg
Aluminum	7429-90-5	1.1E+08	mg/kg
Anthracene	120-12-7	2.3E+07	mg/kg
Antimony	7440-36-0	4.7E+04	mg/kg
Aroclor 1016	12674-11-2	2.7E+03	mg/kg
Aroclor 1221	11104-28-2	7.2E+01	mg/kg
Aroclor 1232	11141-16-5	7.2E+01	mg/kg
Aroclor 1242	53469-21-9	9.7E+01	mg/kg
Aroclor 1248	12672-29-6	9.4E+01	mg/kg
Aroclor 1254	11097-69-1	9.7E+01	mg/kg
Aroclor 1260	11096-82-5	9.9E+01	mg/kg
Arsenic	7440-38-2	3.0E+02	mg/kg
Barium	7440-39-3	2.2E+07	mg/kg
Benzaldehyde	100-52-7	1.2E+07	mg/kg
Benzene	71-43-2	5.1E+02	mg/kg
Benzo[a]anthracene	56-55-3	2.9E+02	mg/kg
Benzo[a]pyrene	50-32-8	2.9E+01	mg/kg
Benzo[b]fluoranthene	205-99-2	2.9E+02	mg/kg
Benzo[g,h,i]perylene	191-24-2		mg/kg
Benzo[k]fluoranthene	207-08-9	2.9E+03	mg/kg
Beryllium	7440-41-7	2.3E+05	mg/kg
bis(2-chloroethoxy)methane	111-91-1	2.5E+05	mg/kg
bis(2-Chloroethyl)ether	111-44-4	1.0E+02	mg/kg
bis(2-Chloroisopropyl)ether	108-60-1	2.2E+03	mg/kg
bis(2-Ethylhexyl)phthalate	117-81-7	1.6E+04	mg/kg
Bromodichloromethane	75-27-4	1.3E+02	mg/kg
Bromoform	75-25-2	8.6E+03	mg/kg
Bromomethane	74-83-9	3.0E+03	mg/kg
Cadmium	7440-43-9	9.8E+04	mg/kg
Calcium	7440-70-2		mg/kg
Caprolactam	105-60-2	4.0E+07	mg/kg
Carbazole	86-74-8		mg/kg
Carbon disulfide	75-15-0	3.5E+05	mg/kg
Carbon tetrachloride	56-23-5	2.9E+02	mg/kg
Chlorobenzene	108-90-7	1.3E+05	mg/kg
Chloroethane	75-00-3	5.7E+06	mg/kg
Chloroform	67-66-3	1.4E+02	mg/kg
Chloromethane	74-87-3	4.6E+04	mg/kg
Chromium	7440-47-3		mg/kg

Parameter	CAS #	100x PAL	Units
Chromium VI	18540-29-9	6.3E+02	mg/kg
Chrysene	218-01-9	2.9E+04	mg/kg
cis-1,2-Dichloroethene	156-59-2	2.3E+05	mg/kg
cis-1,3-Dichloropropene	10061-01-5		mg/kg
Cobalt	7440-48-4	3.5E+04	mg/kg
Copper	7440-50-8	4.7E+06	mg/kg
Cyanide	57-12-5	1.5E+04	mg/kg
Cyclohexane	110-82-7	2.7E+06	mg/kg
Dibenz[a,h]anthracene	53-70-3	2.9E+01	mg/kg
Dibenz[a,h]anthracene	53-70-3	2.9E+01	mg/kg
Dibromochloromethane	124-48-1	3.3E+02	mg/kg
Dichlorodifluoromethane	75-71-8	3.7E+04	mg/kg
Diesel Range Organics	DRO	6.2E+04	mg/kg
Diethylphthalate	84-66-2	6.6E+07	mg/kg
Di-n-butylphthalate	84-74-2	8.2E+06	mg/kg
Di-n-ocytlphthalate	117-84-0	8.2E+05	mg/kg
Ethylbenzene	100-41-4	2.5E+03	mg/kg
Fluoranthene	206-44-0	3.0E+06	mg/kg
Fluorene	86-73-7	3.0E+06	mg/kg
Gasoline Range Organics	GRO	6.2E+04	mg/kg
Hexachlorobenzene	118-74-1	9.6E+01	mg/kg
Hexachlorobutadiene	87-68-3	5.3E+02	mg/kg
Hexachlorocyclopentadiene	77-47-4	7.5E+02	mg/kg
Hexachloroethane	67-72-1	8.0E+02	mg/kg
Indeno[1,2,3-c,d]pyrene	193-39-5	2.9E+02	mg/kg
Iron	7439-89-6	8.2E+07	mg/kg
Isophorone	78-59-1	2.4E+05	mg/kg
Isopropylbenzene	98-82-8	9.9E+05	mg/kg
Lead	7439-92-1	8.0E+04	mg/kg
Magnesium	7439-95-4		mg/kg
Manganese	7439-96-5	2.6E+06	mg/kg
Mercury	7439-97-6	3.5E+04	mg/kg
Methyl Acetate	79-20-9	1.2E+08	mg/kg
Methyl tert-butyl ether (MTBE)	1634-04-4	2.1E+04	mg/kg
Methylene Chloride	75-09-2	1.0E+05	mg/kg
Naphthalene	91-20-3	1.7E+03	mg/kg
Nickel	7440-02-0	2.2E+06	mg/kg
Nitrobenzene	98-95-3	2.2E+03	mg/kg
N-Nitroso-di-n-propylamine	621-64-7	3.3E+01	mg/kg
N-Nitrosodiphenylamine	86-30-6	4.7E+04	mg/kg
Oil and Grease	O&G		mg/kg

Parameter	CAS #	100x PAL	Units
PCBs (total)	1336-36-3	9.7E+01	mg/kg
Pentachlorophenol	87-86-5	4.0E+02	mg/kg
Phenanthrene	85-01-8		mg/kg
Phenol	108-95-2	2.5E+07	mg/kg
Pyrene	129-00-0	2.3E+06	mg/kg
Pyrene	129-00-0	2.3E+06	mg/kg
Selenium	7782-49-2	5.8E+05	mg/kg
Silver	7440-22-4	5.8E+05	mg/kg
Styrene	100-42-5	3.5E+06	mg/kg
Tetrachloroethene	127-18-4	1.0E+04	mg/kg
Thallium	7440-28-0	1.2E+03	mg/kg
Toluene	108-88-3	4.7E+06	mg/kg
trans-1,2-Dichloroethene	156-60-5	2.3E+06	mg/kg
trans-1,3-Dichloropropene	10061-02-6		mg/kg
Trichloroethene	79-01-6	6.0E+02	mg/kg
Trichlorofluoromethane	75-69-4	3.1E+05	mg/kg
Vanadium	7440-62-2	5.8E+05	mg/kg
Vinyl chloride	75-01-4	1.7E+02	mg/kg
Xylenes	1330-20-7	2.8E+05	mg/kg
Zinc	7440-66-6	3.5E+07	mg/kg

APPENDIX H

HEALTH AND **SAFETY PLAN**

SPARROWS POINT TERMINAL
SPARROWS POINT, MARYLAND

Prepared by:

EnviroAnalytics Group

Environmental Engineers

January 2015

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

1.1 Background

The Sparrows Point Terminal site has historically been a steel making facility. It is located in Baltimore County, Maryland in the southeast corner of the Baltimore metropolitan area (approximately 9 miles from the downtown area), on the Sparrows Point Peninsula in the Chesapeake Bay watershed. The facility occupies the entire peninsula and is bounded to the west by Bear Creek; to the south by Patapsco River; and to the east by Jones Creek, Old Road Bay and residential areas of the City of Edgemere. The facility is bounded to the north by the Sparrows Point Country Club. The site is approximately 3,100 acres in size.

Pennsylvania Steel built the furnace at Sparrows Point in 1887 and the first iron was cast in 1889. Bethlehem Steel Corporation (BSC) purchased the facility in 1916 and enlarged it by building additional and plating facilities. BSC filed for bankruptcy in 2001. A series of entities has owned the site between then and now: the International Steel Group (ISG), Mittal Steel, ISG Sparrows Point, LLC, Severstal Sparrows Holding LLC, which was renamed to Severstal Sparrows Point, LLC, RG Steel Sparrows Point, LLC, and then a joint venture to Sparrows Point LLC (SP) and HRE Sparrows Point LLC. Most recently, in 2014, the property and assets were sold to Sparrows Point Terminal LLC (SPT). Environmental liability was retained by SP and work is currently being conducted by EnviroAnalytics Group, LLC (EAG) on behalf of SP.

- In addition to the current environmental investigation and remediation being conducted onsite by EAG and their consultants, there are other entities conducting work on the facility. Demolition of the remaining structures is currently ongoing at the site, and those contractors are being managed by SPT.
- The purpose of this document is to provide an overall health and safety plan (HASP) for EAG personnel and EAG directed contractors who are engaging in environmental investigation and remediation activities onsite. EAG directed contractors will also be expected to have their own Health and Safety Program, and they may opt to draft their own site specific HASP, provided it meets the requirements in this HASP.

1.2 Historic Operations

Steel manufacturing involves handling vast amounts of raw material including coke, iron ore, limestone and scrap steel, as well as recovering byproducts and managing waste materials. The operations listed below either were or are currently performed at the Sparrows Point Facility.

- Iron and steel production
- Coal chemical recovery system
- Other byproducts recovery systems
- Wastewater treatment systems
- Solid waste management
- Air pollution control

A number of site-specific environmental and hydrogeologic investigations have been prepared for the Sparrows Point facility. For the purposes of this HASP, information was obtained from the “Special Study Area Release Site Characterization” completed in 2001 by CH2MHill, as well as additional documents submitted since that time. There are five separate Special Study Areas as put forth in the Consent Decree:

- Humphrey Impoundment,
- Tin Mill Canal/Finishing Mills Areas,
- Coke Oven Area,
- Coke Point Landfill, and
- Greys Landfill.

Contaminated soils and groundwater may be present at the site. This plan was prepared based on an assessment of hazards expected to be present and a review of data from the previous site investigations and groundwater sampling events.

During the current investigations and remedial efforts, all related work will be performed in accordance with the requirements of this HASP and Occupational Safety and Health Administration (OSHA) regulations as defined in 29 Code of Federal Regulations (CFR) 1910.120 and 1926.65.

2.0 PURPOSE, SCOPE AND ORGANIZATION

This section describes the purpose, scope and organization of this HASP and the health and safety responsibilities of EAG, their employees, and their subcontractors involved in the field investigation and remediation activities at the Sparrows Point facility.

2.1 Scope

Field investigation and remediation activities for this project may include, but are not limited to:

- Groundwater sampling and monitoring,
- Groundwater and remediation well installation,
- Groundwater and remediation well repairs,
- Groundwater and remediation well closure and abandonment,
- Surface water sampling,
- Sediment sampling,
- Soil boring and subsurface soil sampling,
- Soil excavations for remedial purposes,
- Installation and operation of remediation systems for soil, soil vapor, and groundwater,
- Decommissioning and closure of remediation systems,
- Soil excavations for remedial purposes,
- Insitu soil mixing/soil stabilization,
- Exsitu soil mixing/soil stabilization,
- Dredging operations along Tin Mill Canal,
- Insitu chemical and/or biological injections, and
- Recovery of non-aqueous phase liquids (NAPL)

When EAG personnel are providing oversight of subcontractors, they will attend the safety and health briefings held by the contractor. EAG personnel will follow the requirements of this HASP, as well as any potentially more stringent requirements of the contractor's health and safety plan.

When EAG personnel are conducting tasks on their own, with or without subcontractors, they will follow the requirements of this HASP. EAG contractors, such as drillers, will also be required to follow the requirements of this HASP, as well as any more stringent requirements of the contractor's health and safety plan.

All EAG field personnel, including subcontractors to EAG, will be required to read and understand this HASP and agree to implement its provisions. All site personnel will sign the Acknowledgement Form included in **Attachment A** stating that they have read, understood, and agree to abide by the guidelines and requirements set forth in this plan.

2.2 Organization of Document

This HASP includes health and safety procedures for all generally anticipated project field activities. This plan also meets the OSHA requirements contained in the CFR, specifically 29 CFR 1910.120 and 29 CFR 1926, by including the following items:

- A description of staff organization, qualifications and responsibilities (Section 2.3),
- Hazard analysis (Section 3.0),
- Health hazard information (Section 4.0),
- Personal protective equipment (PPE), including available first aid, emergency, and safety equipment (Section 5.0),
- Employee and subcontractor training and standard safety procedures (section 6.0),
- Exposure monitoring plan (Section 7.0),
- Medical surveillance (Section 8.0),
- Site control measures and decontamination procedures for personnel and equipment (Section 9.0),
- Emergency response and contingency procedures (section 10.0), and
- Material Safety Data Sheets (MSDSs) for chemicals used on-site (**Attachment B**).

2.3 EAG Health and Safety Personnel

Personnel responsible for implementing this HASP include:

EAG Contacts for Sparrows Point Project Work	
VP Remediation, Russ Becker	(314) 686-5611
Senior Project Manager, James Calenda	(314) 620-3056
Senior Project Engineer, Elizabeth Schlaeger	(314) 307-1732
Josh Burke – Field Operations Manager	(314) 686-5623
Project Field Team Members, Jeff Wilson and Bill Trentzsch	(314) 620-3135, (314) 686-5598

3.0 HAZARD ANALYSIS

This section outlines the potential hazards related to the field activities listed in Section 2.1.

3.1 Hazard Analysis

The field activities planned for this project pose potential health and safety hazards for field team members. This section describes the hazards associated with the above-listed field activities. Detailed chemical, physical, and biological hazards information is provided in Section 4.0 (Health Hazard Information).

Hazards to which employees and subcontractors may be exposed to as a result of the above-listed activities include potential chemical exposures, lacerations, excessive noise, thermal stress, lifting of excessive weight or bulk, hand tools and heavy equipment, drilling and slips, trips and falls.

3.1.1 Chemical Hazards

Potential exposures to chemicals in the soil or groundwater include the possibility of dermal exposure (contact and/or absorption), inhalation of chemical contamination that may be encountered during sampling or during equipment decontamination activities, or ingestion of contaminants if good personal hygiene practices are not followed.

Benzene, naphthalene, and various metals are the major contaminants that have been identified in groundwater during previous investigations at the site In addition, light NAPL (LNAPL – benzene, in particular) and dense NAPL (DNAPL – naphthalene, in particular) have also been identified or are heavily suspected in various locations in the Coke Oven Area. Dissolved metals the chemicals of concern primarily located in the area of Tin Mill Canal and the Rod and Wire Mill Area. Treatment chemicals, such as sulfuric acid, are currently being used in remediation systems. All appropriate MSDS sheets will be reviewed that apply to the investigation or remedial tasks being conducted. MSDS sheets are located in **Attachment B**. It should be noted that this is a dynamic document: should any additional chemicals be introduced or discovered, the MSDS sheets will be added to **Attachment B**, as necessary.

3.1.2 Physical Hazards

The potential physical hazards associated with field activities include:

- Excessive lifting
- Slips, trips, and falls
- Working at heights
- Exposure to extreme outside temperatures and weather
- Equipment hazards
- Drilling Hazards
- Noise
- Dust and fumes
- Injury from tools, equipment, rotating parts
- Electrical hazards
- Buried and overhead hazards
- Work over water
- Driving to, from, and around the site (including working in trafficked areas)

Additional hazards may be encountered based on the various task at hand. It will be the responsibility of the site manager, with the help of field staff, to identify and address any additional hazards on a "per task or job" basis. A Job Safety Analyses (JSA) may need to be conducted prior to the start of various tasks. Safety meetings will be conducted with all staff in attendance, before the start of any new task or when any significant personnel or other changes (such as a swift change in weather, for example) occur. Updated information relating to physical hazards will be presented during these meetings in an effort to familiarize the crew with potential hazards, discuss new situations, and determine how the associated risks can be reduced. Further, good housekeeping practices will be enforced to preclude other risks resulting from clutter and inattention to detail. In addition, internal field audits will be randomly conducted to ensure adherence to all procedures are being followed.

3.1.3 Biological Hazards

Biological hazards that may be encountered when conducting field activities include the following:

- Poisonous snakes and spiders
- Ticks and tick-borne diseases
- Stinging insects such as chiggers, bees, wasps, etc.
- Various viruses and diseases spread via animal to human contact such as West Nile virus or rabies
- Various viruses and diseases spread via human to human contact such as colds or the flu
- Dermal contact with poison ivy, oak, and/or sumac
- Bloodborne pathogens when administering first aid

First aid kits will be available on-site. It is crucial to note that any site personnel who has significant allergies should communicate that information to the field team they are working with, along with the location of their auto-injector pen (such as an Epi-Pen) for use in case of going into anaphylactic shock from something that would cause such a reaction (like a bee sting, for example). Personnel who suffer from such allergies are responsible for providing their own auto-injector devices as those are typically prescription based as well as specific to their particular allergy.

4.0 HEALTH HAZARD INFORMATION

This section provides chemical hazard information for those potentially hazardous materials expected to be present at the facility. Potential physical and biological hazards are also discussed in this section.

4.1 Chemical Hazards

Exposure to chemicals through inhalation, ingestion, or skin contact may result in health hazards to field workers. Hazards associated with exposure will be evaluated using OSHA Permissible Exposure Limits (PELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). Each of these values are 8-hour, time-weighted averaged (TWAs) above which an employee cannot be exposed. EAG may also use the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) where applicable. Although the OSHA PELs are the only exposure limits enforceable by law, the most stringent of exposure limits will be used as the EAG-enforced exposure criteria during field activities.

The following is a summary of the potential hazards created by the compounds that may be encountered during field activities. Data from sampling of groundwater wells was reviewed to identify potential contaminants at the site. Contaminants of concern may include benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, metals and water treatment chemicals. Table 4-1 contains chemical information and exposure limits for various chemicals that may be expected to be present in the investigation and remediation efforts. During the recovery of NAPL, the major contaminants of concern are benzene and naphthalene. It is possible that carbon monoxide may also be encountered from the use of various internal combustion engines (vehicular or otherwise); however, it is anticipated that since any such engine will be used outdoors, it is not expected that concentrations of concern will accumulate. With the use of any such engine, the engine should be positioned such that site personnel are upwind of the engine exhaust.

If any chemicals are brought on-site, MSDS must be made available and added to **Attachment B**. Personnel must be trained in the hazards and use of chemicals.

Table 4-1
Chemical Contaminants of Potential Concern

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Benzene	PEL: 1PPM REL: 0.1 CA TLV: 0.5PPM STEL: 1PPM (NIOSH) Skin: YES	Colorless to light-yellow liquid with aromatic odor. LEL: 1.2% UEL: 7.8% VP: 75mm Fl.P: 12°F	INH ABS ING CON	Irritation of eyes, skin, nose, respiratory system, giddiness, headache, nausea, fatigue, anorexia, dermatitis, bone marrow depression
Ethylbenzene	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: 125PPM IDLH: 800PPM Skin: NO	Colorless liquid with an aromatic odor. LEL: 0.85 UEL: 6.7% IP: 8.76EV VP: 7mm Fl.P: 55°F	INH ING CON	Irritation of eyes, skin, mucous membranes; headache; dermatitis
1,1 dichloroethane	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: NA IDLH: 3000PPM Skin: NO	Colorless, oily liquid with a chloroform-like odor. LEL: 6.2% UEL: 16% IP: 11.05EV Vp: 64mm Fl.P: 56°F	INH ING CON	Irritation of eyes, CNS depression, liver, kidney, lung damage
Phenol	PEL: 5PPM REL: 5PPM, 15.6PPM (C) TLV: 5PPM STEL: NA IDLH 250PPM Skin: YES	Colorless to light pink crystalline solid with a sweet, acrid odor. LEL: 1.8% UEL: 5.9% IP: 8.12EV Vp: 0.08mm Fl.P: 175°F	INH ING CON ABS	Irritated eyes, nose, throat, anorexia, weakness, muscular ache, pain, dark urine, cyanosis, liver, kidney damage, skin burns, dermatitis, tremor, convulsions, twitch
Naphthalene	PEL: 10PPM REL: 10PPM TLV: 10PPM STEL: 15PPM IDLH: 250PPM Skin: YES	Colorless to brown solid with an odor of mothballs LEL: 0.9% UEL: 5.9% IP: 8.12EV Vp: 0.08mm Fl.P: 174°F	INH ABS ING CON	Irritation of eyes, headache, confusion, excitement, malaise, nausea, vomiting, abdominal pain, irritated bladder, profuse sweating, jaundice, hematuria, renal shutdown, dermatitis, optical neuritis, corneal damage
Toluene	PEL: 200PPM, 300PPM (C) REL: 100PPM TLV: 20PPM STEL: 150PPM IDLH: 500PPM Skin: YES	Colorless liquid with a sweet, pungent benzene-like odor. LEL: 1.1% UEL: 7.1% IP: 8.82EV VP: 21MM Fl.P: 40°F	INH ABS ING CON	Irritation of eyes, nose, fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, lacrimation, nervousness, muscle fatigue, insomnia, dermatitis, liver, kidney damage
Xylenes	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: 150PPM IDLH: 900PPM Skin: NO	Colorless liquid with an aromatic odor. LEL: 0.9% UEL: 6.7% IP: 8.40EV VP: 5MM Fl.P: 88°F	INH ABS ING CON	Irritated eyes, nose, respiratory system, headache, fatigue, dizziness, confusion, malaise, drowsiness, incoherence, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal pain, dermatitis

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Styrene	PEL: 100PPM, 200PPM (C) REL: 50PPM TLV: 20PPM STEL: 40PPM IDLH: 700PPM Skin: NO	Colorless to yellow, oily liquid with a sweet, floral odor. LEL: 0.9% UEL: 6.8% IP: 8.40eV VP: 5MM Fl.P: 88°F	INH ABS ING CON	Irritated eyes, nose, respiratory system, headache, fatigue, dizziness, confusion, malaise, drowsiness, weakness, narcosis, dermatitis
Chlorodiphenyl (54% chlorine) (11097-69-1)	PEL: 0.5mg/m³ REL: 0.001mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 5mg/m³(CA) Skin: YES	Colorless to pale yellow viscous liquid with a mild hydrocarbon odor. LEL: NA UEL: NA IP: UNKNOWN VP: 0.00006MM Fl.P: NA	INH ABS ING CON	Irritated eyes, chloracne, liver damage, reproductive effects (carcinogen)
Polynuclear aromatic hydrocarbons (PAHs) (coal tar pitch volatiles) (65996-93-2)	PEL: 0.2mg/m³ REL: 0.1mg/m³ TLV: 0.2 mg/m³ STEL: N/A IDLH: 80mg/m³(CA) Skin: NO	The pitch of coal tar is black or dark brown amorphous residue that remains after the redistillation process. LEL: N/A UEL: N/A IP: VARIES VP: VARIES Fl.P: VARIES	INH CON	Direct contact or exposure to vapors may be irritating to the eyes. Direct contact can be highly irritating to the skin and produce dermatitis. Exposure to vapors may cause nausea and vomiting. A potential human carcinogen.
Arsenic (inorganic)	PEL: 0.01mg/m³ REL: NONE TLV: 0.5 mg/m³ STEL: N/A IDLH: 5mg/m³ (CA) Skin: NO	Silver-gray or tin-white brittle odorless solid. Air odor threshold: N/D.	INH ABS CON ING	Symptoms include ulceration of nasal septum, gastrointestinal disturbances, respiratory irritation and peripheral neuropathy. Potential occupational carcinogen.
Barium	PEL: 0.5mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 50mg/m³ Skin: NO	White, odorless solid. Air odor threshold: N/D.	INH ING CON	Irritated eyes, skin, upper respiratory system, skin burns, gastroenteritis, muscle spasm, slow pulse, cardiac arrhythmia
Cadmium (elemental)	PEL: 0.005mg/m³ REL: CA TLV: 0.01mg/m³ STEL: N/A IDLH: 9mg/m³ (CA) Skin: NO	Silver-white, blue-tinged lustrous, odorless solid. Air odor threshold: N/D.	INH ING	Symptoms include pulmonary edema, cough, tight chest, head pain, chills, muscle aches, vomiting and diarrhea. Potential occupational carcinogen.
Chromium (Metal)	PEL: 1.0mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 250mg/m³ Skin: NO	Blue-white to steel-gray lustrous, brittle, hard odorless solid. Air odor threshold: N/D.	INH ING CON	Symptoms may include irritated eyes and skin, lung fibrosis.
Chromium (Chromium III inorganic compounds)	PEL: 0.5mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 25mg/m³ Skin: NO	Varies depending on specific compound.	INH ING CON	Irritation of eyes, sensitivity dermatitis

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Copper	PEL: 1mg/m³ REL: 1mg/m³ TLV: 1mg/m³ STEL: N/A IDLH: 100mg/m³ Skin: NO	Reddish, lustrous, malleable, odorless solid	INH ING CON	Irritation of eyes, nose, pharynx, nasal septum perforations, metallic taste, dermatitis
Lead (Elemental & Inorganic as Pb)	PEL: 0.05mg/m³ REL0.1mg/m³ TLV: 0.05mg/m³ STEL: N/A IDLH: 100mg/m³ Skin: NO	A heavy, ductile soft gray solid. Air odor threshold: N/D.	INH ING CON	Accumulative poison may cause weakness, insomnia, facial pallor, anorexia, malnutrition, constipation, abdominal pain, anemia, gingival lead line, paralysis of wrists and ankles, hypertension and kidney disease.
Nickel	PEL: 1mg/m³ REL: 0.015mg/m³ (Ca) TLV: 0.1mg/m³ STEL: N/A IDLH: 10mg/m³ Skin: NO	Lustrous, silvery, odorless solid. Air odor threshold: N/A VP: 0mm	INH CON ING	Sensitivity dermatitis, allergic asthma, pneumonitis
Vanadium pentoxide dust	PEL: 0.5mg/m³ (C) REL: 0.05mg/m³ (C) TLV: 0.05mg/m³ STEL: N/A IDLH: 35mg/m³ Skin: NO	Yellow-orange powder or dark gray, odorless flakes dispersed in air. VP: 0mm	INH ING CON	Irritated eyes, skin, throat, green tongue, metallic taste, eczema, cough, fine rales, wheezing, bronchitis
Zinc oxide	PEL: 5mg/m³ REL: 5mg/m³ TLV: 2mg/m³ STEL: 10mg/m³ IDLH: 500mg/m³ Skin: NO	White, lustrous solid	INH	Metal fume fever, chills, muscular ache, nausea, fever, dry throat, cough, weakness, metallic taste, headache, blurred vision, low back pain, vomiting, fatigue, malaise
Sulfuric Acid (water treatment chemical)	PEL: 1mg/m³ TLV: 0.2mg/m³ Skin: YES	Oily, colorless to slightly yellow, clear to turbid liquid	IHN ABS ING CON	Can cause irritation or corrosive burns to the upper respiratory system, lung irritation, pulmonary edema, burns to mouth throat and stomach, erode teeth, skin lesions
Antiscale (water treatment chemical)	PEL: 1mg/m³ TLV: 0.2mg/m³ Skin: YES	Liquid, colorless, clear	IHN ABS ING CON	May cause severe skin burns and eye damage, can cause cancer, fatal if inhaled, may damage organs through prolonged exposure
Antifoam (water treatment chemical)	N/E	Liquid emulsion, white, opaque	IHN ABS ING CON	May be harmful to skin, if inhaled and if swallowed
Gases				
Carbon Monoxide	PEL: 50PPM REL: 35PPM TLV: 25PPM STEL: 200PPM (C) IDLH: 1200PPM Skin: NO	Colorless, odorless gas LEL: 12.5% UEL: 74% IP: 14.01eV VP: >35atm Fl.P: N/A	INH	Headache, rapid breathing, nausea, tiredness, dizziness, confusion

NOTES:

OSHA PEL	Occupational Safety and Health administration Final Rule Limits, Permissible Exposure Limit for an eight=hour, time-weighted average
ACGIH TLV	American Conference of Governmental Industrial Hygienists, Threshold Limit Value for eight-hour, time-weighted average
STEL	Short-term Exposure Limit for a 15-minute, time-weighted average
NIOSH IDLH	National Institute for Occupational Safety and Health, Immediately Dangerous to Life or Health concentration
PPM	Part of vapor or gas per millions parts of air by volume at 25°Celsius and 760mm Hg mg/m³ (milligram of substance per cubic meter of air)
CA	NIOSH has identified numerous chemicals that it recommends to be treated as potential or confirmed human carcinogens.
(C)	The (ceiling) concentration that should not be exceed during any part of the working exposure.
Skin	Refers to the potential contribution to the overall exposure by the cutaneous (absorption) route, including mucous membranes and eye, either by airborne or more particularly by direct contact with the substance.
UEL	Upper Explosive Limit – the highest concentration of a material in air that produces an explosion in fire or ignites when it contacts an ignition source.
LEL	Lower Explosive Limit – the lowest concentration of the material in air that can be detonated by spark, shock, fire, etc.
INH	Inhalation
ABS	Skin absorption
ING	Ingestion
CON	Skin and/or eye contact

4.2 Physical Hazards

Field employees and subcontractors may be exposed to a number of physical hazards during this project. Physical hazards that may be encountered include the following:

- Heat and cold stress
- Lifting hazards
- Slips, trips and falls
- Working around heavy equipment
- Drilling hazards
- Noise
- Use of hand and power tools
- Buried hazards
- Electrical hazards
- Underground and overhead utilities
- Working over water
- Travel to and from site

4.2.1 Heat Stress

Local weather conditions may produce an environment that will require restricted work schedules in order to protect employees from heat stress. The Project Manager or the Field Lead Team Member will observe workers for any potential symptoms of heat stress. Adaptation of work schedules and training on recognition of heat stress conditions should help prevent heat-related illnesses from occurring. Heat stress controls will be stated at 70°F for personnel in protective clothing and at 90°F for personnel in regular work clothing. Heat stress prevention controls include:

- Allow workers to become acclimatized to heat (three to six days)
- Provide rest breaks in a shaded or air-conditioned break area
- Provide sun screen to prevent sun burn
- Provide drinking water and electrolyte-replenishing fluids
- Keep ice readily available to rapidly cool field team members

The following Heat Stress Index should be used as a guide to evaluate heat stress situations. If the Heat Stress exceeds 105 degrees Fahrenheit, contact the project manager prior to conducting work for detailed guidance.

Heat Stress Index									
Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	114	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77
NOTES: Add 10° F when protective clothing is being used; Add 10° F when in direct sunlight									

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HSI Temp	Category	Injury Threat
Above 130° F	Extreme Danger	No work unless emergency exists. Contact Cardno ATC RSC and Corporate Risk Management Department prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105° to 130° F	Danger	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90° to 105° F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80° to 90° F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Below 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

4.2.2 Cold Stress

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below 96.8° F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury the ambient temperature, and wind velocity. Reduced body temperature will very likely result in reduced mental alertness, reduction in rational decision making, and/or loss of consciousness with the threat of death.

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Use appropriate cold weather clothing when temperatures are at or below 40° F as exposed skin surfaces must be protected. These protective items can include facemask, hand wear, and foot wear. Workers handling evaporative solvents during cold stress conditions will take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

If extreme cold-related weather conditions occur, EAG field personnel and subcontractors will take the following precautions:

- Wear adequate insulated clothing when the air temperature drops below 40°F
- Reduce work periods in extreme conditions to allow adequate rest periods in a warm area
- Change clothes when work clothes become wet
- Avoid caffeine (which has diuretic and circulatory effects)

4.2.3 Lifting Hazards

Field personnel may be exposed to injury caused by lifting heavy objects and various pieces large or unwieldy pieces of equipment. All field team members will be trained in the proper methods for lifting heavy and/or large equipment and are cautioned against lifting objects that are too heavy or too big for one person. Proper lifting techniques include the following:

- Keep feet approximately shoulder width apart
- Bend at the knees
- Tighten abdominal muscles
- Lift with the legs
- Keep the load close to the body
- Keep the back upright
- Use the buddy system for larger or heavy pieces of equipment

All drums will be staged using an approved drum dolly or other appropriate equipment. Proper care will be taken in the use of this equipment. Healthy employees with no medical restrictions may lift and carry a maximum of 50 pounds using proper lifting and carrying techniques. This recommended weight limit may be reduced depending on physical and workplace factors.

4.2.4 Slips, Trips and Falls

The most common hazards that will be encountered during field activities will be slips, trips and falls. Field team members are trained to use common sense to avoid these hazards such as using work boots/safety shoes with nonskid soles. When working on slippery surfaces, tasks will be planned to decrease the risk of slipping via avoiding the slippery areas, if possible, or utilizing engineering controls. Engineering controls may involve the placement of supplemental material such as boards, gravel, or ice melt should be utilized to mitigate slippery conditions. Other engineering controls may involve the use of footgear traction control devices. Employees and subcontractors will avoid slippery surfaces, use engineering controls as appropriate, not hurry, and maintain good housekeeping.

4.2.5 Buried Hazards

Whenever the ground is penetrated, the potential for contacting buried hazards exists. During the planning/mobilization phase, prior to drilling or other excavation activities, EAG personnel and/or their contractors will establish the location of underground utility lines (gas, electrical, telephone, fiber optic cable, etc.) and/or substructures or other potential buried hazardous items. This may be conducted by review of historic utility and substructure maps, private utility locates, ground penetrating radar, or other technologies. If there is any evidence of utilities or subsurface objects/structures, drilling or excavation activities may be offset. If activities cannot be offset, measures will be taken to remove, disconnect, and/or protect the utilities and/or subsurface structures and/or objects. Every reasonable effort will be made to clear the area of intrusive work prior to fieldwork being started.

4.2.6 Electrical Hazards

It may be possible that overhead power lines will be in proximate locations during drilling or excavation activities. At least a 20 foot clearance must be maintained from overhead power lines. No equipment such as drill rigs or dump trucks can be moved while masts or buckets are in the upright position. Field personnel and subcontractors performing electrical work are required to be appropriately trained to work on the electrical systems in question prior to start of work. Authorization from project management personnel is required prior to any electrical work or work near overhead power lines. . When using extension cords, all field workers will ensure that they are in good working condition, are correctly rated for use, and do not contain abrasions such that bare wires could be exposed to the environment. Extension cords will not be used in wet areas without plugging the extension cord into a ground fault circuit interrupter (GFCI). GFCIs will detect a short circuit and cut power.

4.2.7 Heavy Equipment Operations

Heavy equipment must be operated in a safe manner and be properly maintained such that operators and ground personnel are protected.

Requirements for Operators

- Only qualified, trained, and authorized operators are allowed to operate equipment
- Seat belts will be used at all times in all equipment and trucks
- Operators will stop work whenever ground personnel or other equipment enter their work area; work will resume only when the area has been cleared
- No personnel may ride on equipment other than the Authorized Operator
- No personnel may be carried or lifted in the buckets or working “arms” of the equipment
- Spotters will be used when ground personnel are in the vicinity of heavy equipment work areas and/or when an operator is backing equipment near other structures or congested area

Requirements for Ground Personnel

- All ground personnel must wear orange protective vests in work areas with any operating heavy equipment
- Ground personnel will stay outside of the swing zone or work area of any operating equipment
- Ground personnel may only enter the swing or work area of any operating equipment when:
  -They have attracted the operators attention and made eye contact
  -The operator has idled the equipment down and grounded all extensions
  -The operator gives the ground personnel permission to approach
- Ground personnel shall never walk or position themselves between any fixed object and running equipment or between two running pieces of equipment

Equipment

- Maintain operations manuals at the site for each piece of equipment that is present and in use
- Ensure operators are familiar with the manual for the equipment and operate the equipment within the parameters of the manual
- Ensure all equipment is provided with roll-over protection systems
- Verify that seatbelts are present and functional in all equipment
- Prohibit the use of equipment that has cab glass which is broken or missing
- Ensure that backup alarms are functional on all trucks and equipment
- Require all extensions such as buckets, blades, forks, etc. to be grounded when not in use
- Require brakes to be set and wheels chocked (when applicable) when not in use

Daily inspections of equipment are required using a Daily Heavy Equipment Safety Checklist. Equipment deemed to be unsafe as a result of daily inspection will not be used until required repairs or maintenance occurs. During maintenance/repair, ensure that motors are turned off, all extensions are grounded or securely blocked, controls are in a neutral position, and the brakes are set.

4.2.8 Drilling and Excavation Safety

Prior to any intrusive work, as previously mentioned, the location of underground utilities, such as sewer, telephone, gas, water and electric lines must be determined and plainly staked. Necessary arrangements must be made with the utility company or owner for the protection, removal or relocation of the underground utilities. In such circumstances, excavation will be done in a manner that does not endanger the field personnel engaged in the work or the underground utility. Utilities left in place will be protected by barricading, shoring, suspension or other measures, as necessary.

The use of unsafe or defective equipment is not permitted. Equipment must be inspected regularly. If found to be defective, equipment must be immediately removed from use and either repaired or replaced prior to resuming work with that equipment. Field personnel will be familiar with the location of first-aid kits and fire extinguishers. Telephone numbers for emergency assistance must be prominently posted and kept current.

Good housekeeping conditions will be observed in and around the work areas. Suitable storage places will be provided for all materials and supplies. Pipe, drill rods, etc. must be securely stacked on solid, level sills. Work surfaces, platforms, stairways, walkways, scaffolding, and access ways will be kept free of obstructions. All debris will be collected and stored in piles or containers for removal and disposal.

The area of the site to undergo intrusive activity must be walked over with the drillers and/or heavy equipment operators to identify all work locations, as well as making sure all marked utilities are seen by those doing the intrusive work.

Drilling Specific Concerns:

In areas where utilities have been identified or may be suspected, pre-drilling clearance such hand-augering, hand excavation (with shovels or post-hole diggers), or air-knifing to a depth of at least 5' below ground surface (BGS) may be required. The Project Manager will provide guidance in those instances on what has been determined as an acceptable means of clearing drilling locations. It should be noted that if the soil lithology changes to gravel within those 5 feet, that may be an indication of a utility trench and extreme caution should be taken OR the drilling location should be offset 5 horizontal feet from the original location. Should 3 consecutive attempts be made without success to offset a particular drilling location, the field personnel should stop and contact the Project Manager for further instruction.

Special precaution must be taken when using a drill rig on a site within the vicinity of electrical power lines and other overhead utilities. Electricity can shock, burn and cause death. When overhead electrical power lines exist at or near a drilling site, all wires will be considered dangerous.

A check will be made for sagging power lines before a site is entered. Power lines will not be lifted to gain entrance. The appropriate utility company will be contacted and a request will be made that it lift or raise cut off power to the lines.

The area around the drill rig will be inspected before the drill rig mast (derrick) is raised at a site in the vicinity of power lines. The minimum distance from any point on the drill rig to the nearest power line will be determined when the mast is raised or is being raised. The mast will not be raised and the drill rig will not be operated if this distance is less than 20 feet, because hoist lines and overhead power lines can be moved toward each other by the wind.

Before the mast is raised, personnel will be cleared from the immediate area, with the exception of the operator and a helper, when necessary. A check will be made to ensure safe clearance from energized power lines or equipment (minimum 20-foot clearance). Unsecured equipment must be removed from the mast and cables, mud lines and catline ropes must be adequately secured to the mast before raising. After it is raised, the mast must be secured to the rig in an upright position with steel pins.

Excavation Specific Concerns:

For excavation work, entry into an excavated area or trench will only be allowed when:

- Shoring, sloping, and spoil pile placement is in conformance with 29 CFR 1926 Subpart P, and
- Personal protection and monitoring, as detailed in this HASP, has been implemented.

All excavation contractors are required to provide an OSHA trained and certified Competent Person. Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the Competent Person for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the Competent Person prior to the start of work and as needed throughout each shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. All inspections made by the Competent Person should be recorded in the field log book. No personnel shall perform work in a trench or excavation that contains accumulated water (any accumulated water will need to be either pumped out until the trench/excavation is dry, or the accumulated water is allowed to disperse naturally). Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock or the excavation is less than 5 feet in depth and examination by the Competent Person provides no indication of a potential cave-in. Protective systems consist of sloping or benching, use of trench boxes or other shielding mechanisms, or the use of a shoring system in accordance with the regulations.

When mobile equipment is operated adjacent to an excavation and the operators/drivers do not have a clear and direct view of the edge of the excavation, a warning system such as barricades, hand or mechanical signals, or spotters are required.

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard to personnel in the excavation. All temporary spoil piles shall be kept at least 2 feet away from the edge of the excavation. Spoil piles should be placed to channel rainwater or other run-off water away from the excavation.

All excavations deeper than 4 feet deep and which have the potential to have a hazardous atmosphere or oxygen deficient atmospheres (less than 19.5% oxygen) must be tested to ensure safe working conditions, prior to entry.

4.2.9 Use of Hand Tools and Portable Power Tools

Hand tools will be kept in good repair and used only for their designed purposes. Proper protective eyewear will be worn when using hand tools and portable power tools. Unguarded sharp-edged or pointed tools will not be carried in field personnel's pockets. The use of tools with mushroomed heads, split or defective handles, worn parts, or other defects will not be permitted. Inspect all tools prior to start-up or use to identify any defects. Tools that have become unsafe will be reconditioned before reissue or they will be discarded and replaced. Throwing or dropping of tools from one level to another will not be permitted; rather, containers and hand lines will be used for transporting tools from one level to another if working at heights.

Non-sparking tools will be used in atmospheres where sources of ignition may cause fire or explosion. Electric-powered shop and hand tools will be of the double-insulated, shockproof type, or they will be effectively grounded. Power tools will be operated only by designated personnel who are familiar and trained with their use. When not in use, tools will not be left on scaffolds, ladders or overhead working surfaces.

4.2.10 Noise

Exposure to high levels of noise may occur when working near drill rigs or other heavy equipment. Also, depending upon where the work is being performed, local equipment (e.g., airports, factory machines, etc.) may produce high levels of noise. A good indication of the need for hearing protection is when verbal communication is difficult at a distance of 2-3 feet. Personnel will be provided with ear plugs and/or earmuffs when exposed to noise levels in excess of the 8-hour Permissible Exposure Limit (PEL) of 90 decibels.

4.2.11 Work Zone Traffic Control

Personnel will exercise caution when working near areas of vehicular traffic. Work zones will be identified by the use of delineators (traffic cones, flags, vehicles, DOT approved devices, temporary or permanent fencing, and/or safety barrier tape). Personnel will wear reflective vests when working in these areas. Depending on frequency, proximity, and nature of traffic, a flag person may also be utilized.

4.2.12 Work Over Water

If personnel will be working near, above or immediately adjacent to or within 6 feet of water that is 3 feet or more deep or where water presents a drowning hazard (e.g., fast-moving stream, water body with a soft bottom), employees are required to a U.S. Coast Guard (USCG) approved personal flotation device (PFD). All PFDs must have reflective tape on them to facilitate visibility. Employees must inspect PFDs daily before use for defects. Do no use defective PFDs.

4.2.13 Vehicle Use

Personnel must use caution when driving to, from, and across the site, paying special attention to other site traffic, as well as weather and road conditions. Heavy equipment should be transported during non-rush hour traffic.

4.3 Biological Hazards

Site activities on this Site may expose workers to other hazards such as poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory protection equipment, and being capable of identifying poisonous plants, animals, and insects, can greatly reduce the chances of exposure. Thoroughly washing any exposed body parts, clothing, and equipment will also protect against infections. Avoiding contact with biological hazards is the best way to prevent potential adverse health effects. Recognition of potential hazards is essential. When avoidance is impractical or impossible, PPE, personal hygiene, good general health and awareness must be used to prevent adverse effects. If working in wooded/grassy areas, use appropriate insect repellants (containing DEET and/or Permethrin) and apply them per the manufacturers' directions. The following is a list of biological hazards that may be encountered while performing field activities at the project site and surrounding areas:

BIOLOGICAL HAZARD and LOCATION	CONTROL MEASURES
Snakes typically are found in underbrush and tall grassy areas.	If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the snake: note color, size, patterns and markings.
Poison ivy, poison oak and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.	Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.
Exposure to **bloodborne pathogens** may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material or when coming into contact with landfill waste or waste streams containing such infectious material.	Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) area required. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.
Bees, spiders and other stinging insects may be encountered almost anywhere and may present a serious hazard particularly to people who are allergic.	Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past and inform the Project Manager and/or the buddy. If a stinger is present, remove it carefully with tweezers. Watch for allergic reaction; seek medical attention if a reaction develops.
Ticks typically are in wooded areas, bushes, tall grass and brush. Ticks are black, black and red or brown and can be up to one-quarter inch in size.	Avoid tick areas. Wear tightly woven, light-colored clothing with pants tucked into boots or socks. Spray outside of clothing with insect repellent containing permethrin. Check yourself for ticks often. If bitten, carefully remove tick with tweezers. Report the bit to the Project Manager. Look for symptoms of Lyme

	disease that include a rash that looks like a bulls eye and chills, fever, headache, fatigue, stiff neck or bone pain. If symptoms appear, seek medical attention.

5.0 PERSONAL PROTECTIVE EQUIPMENT

PPE ensembles are used to protect employees and subcontractors from potential contamination hazards while conducting project field activities. Level D is expected to be used for most activities at the site. The following subsections describe the PPE requirements for the field activities.

5.1 Level D Protection

When the atmosphere contains no known hazards and work functions preclude splashes, immersions or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals, Level D protection may be used. Level D does not provide respiratory protection and only provides minimal dermal protection. The Level D ensemble consists of the following:

- Work clothes that may consist of a short or long-sleeved cotton shirt and cotton pants, cotton overalls, or disposal overalls such as Tyvek™
- Steel-toe/steel-shank work boots
- Safety glasses with side shields
- Hearing protection, as necessary
- Hand protection, as appropriate
- Hard hat when working around overhead equipment such as a drilling rig
- Reflective vests when working around heavy equipment or near roadways
- Body harness and life vests when working on or within 6 feet of bulkheads, at heights, or in 3 feet or more of standing water (such as in Tin Mill Canal)

5.2 Modified Level D Protection

This is the level of protection that may be needed for material handling, sampling operations, and operation of remediation equipment when splash hazards are present. Modified Level D protection consists of the following:

- Disposable overalls such as polyethylene-coated Tyvek™
- Latex, vinyl, or nitrite inner gloves when handling liquids/fluids
- Nitrile outer gloves (taped to outer suit)
- Chemical-protective over-boots (taped to outer suit)
- Steel-toe/steel-shank, high-ankle work boots
- Hard hat with face shield
- Safety glasses with side shields or goggles
- Hearing protection, as necessary

5.3 Level C Protection

Level C protection will be used when site action levels are exceeded and respiratory protection is required. The Level C ensemble consists of Modified Level D with the following modifications:

- Half or full-face air-purifying respirator (APR) equipped with appropriate cartridges/filters
- Chemical resistant clothing such as poly-coated Tyvek™
- Inner and outer nitrile gloves
- Chemical-resistant safety boots or boot covers to go over safety boots

Upgrading or downgrading the level of protection used by EAG employees and subcontractors is a decision made by EAG based on the air monitoring protocols presented in Section 7.0 for respiratory protection, the potential for inhalation exposure to toxic chemicals, and the need for dermal protection during the activity.

5.4 First Aid, Emergency and Safety Equipment

The following first aid, emergency and safety equipment will be maintained onsite at the work area:

- A portable eye wash
- Appropriate ABC-type fire extinguishers (minimum of 10 pounds; remediation systems to house individual 20 pound extinguishers) carried in every vehicle used during field operations
- Industrial first-aid kit (one 16-unit that complies with American National Standards Institute (ANSI) Z308A for every 25 persons or less)
- Bloodborne pathogen precaution kit with CPR mouth shield
- Instant cold packs
- Soap or waterless hand cleaner and towels
- American Red Cross First Aid and CPR Instruction Manuals

6.0 PERSONNEL TRAINING AND STANDARD SAFETY PROCEDURES

Employees must have received, at the time of project assignment, a minimum of 40 hours of initial OSHA health and safety training for hazardous waste site operations. Personnel who have not met the requirements for the initial training will not be allowed in the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ) of any active work area. A copy of each subcontractor site worker's 40-hour training certificate must be sent to the Project Manager for review prior to the start of the site work.

The 8-hour refresher training course must be taken at a minimum of once per year. At the time of the job assignment, all site workers must have received 8 hours of refresher training within the past year. This course is required of all field personnel to maintain their qualifications for hazardous waste site work. A copy of each subcontractor site worker's most recent 8-hour refresher training certificate must be sent to the Project Manager for review prior to the start of the site work.

A site-specific safety orientation will be conducted by EAG for all EAG employees and subcontractors engaged in fieldwork.

6.1 Onsite Safety, Health and Emergency Response Training

The OSHA 1910.120 standard requires that site safety and health training be provided by a trained, experienced supervisor. “Trained” is defined to mean an individual that has satisfactorily completed the OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course and 8-hour site supervisor training. Training will be offered at the time of the initial task assignment and/or whenever new chemicals are introduced into the workplace. Training will include all applicable regulatory requirements, location of the program, inventory and MSDSs, chemicals used and their hazards (chemical, physical, and health), how to detect the presence or release of chemicals, safe work practices and methods employees can take to protect themselves from hazards, how to read MSDSs and site or project specific information on hazard warnings and labels in use at that location. All training will be documented and training certificates will be kept in the employee’s permanent training file. All applicable training will also require annual refreshers.

EAG qualified personnel must also provide safety meetings.

6.2 Standard Safety Procedures

This section describes the standard safety procedures that EAG requires all onsite personnel to follow during site activities.

6.2.1 General Safety Work Practices

All onsite employees and subcontractors will observe the following general safety work practices:

- Health and safety tailgate briefings will occur to introduce new activities, any new safety issues, and emergency egress routes for work areas; any significant change (added personnel, change in scope, or change in field conditions) will trigger a second (or more) tailgate meeting to address whatever change occurred
- No food, drink, or tobacco products will be allowed in the Exclusion and Contamination Reduction Zones
- Loose clothing, hair, and/or jewelry will not be permitted around moving or rotating equipment
- The “buddy system” will be implemented as necessary whereby a pair of co-workers watches out for each other while in proximity of potential physical work hazards
- Good housekeeping of all work areas will be maintained on an ongoing basis

6.2.2 Hand Safety

This standard is intended to protect employees from activities that may expose them to injury. This standard provides information on recognizing those conditions that require personal protective equipment (PPE) or specific work practices to reduce the risk of hand injury.

Appropriate gloves must be worn when persons work with materials or equipment that presents the potential for hand injury due to sharp edges, corrosives, flammable and irritating materials, extreme temperatures, splinters, etc.

<u>Guidelines for Working With and Around Equipment (Hand Tools, Portable Powered Equipment)</u>:

- Employees should be trained in the use of all tools.
- Keep hand and power tools in good repair and use them only for the task for which they were designed.

- Inspect tools before use and remove damaged or defective tools from service.
- Operate tools in accordance with manufacturer's instructions.
- Do not remove or bypass a guarding device for any reason.
- Keep surfaces and handles clean and free of excess oil to prevent slipping.
- Wear proper PPE, including gloves, as necessary.
- Do not carry sharp tools in pockets.
- Clean tools and return to the toolbox or storage area upon completion of a job.
- Before applying pressure, ensure that wrenches have a good bite.
- Brace yourself by placing your body in the proper position so you will not fall if the tool slips.
- Make sure hands and fingers have sufficient clearance in the event the tool slips.
- Always pull on a wrench, never push.
- When working with tools overhead, place tools in a holding receptacle when not in use.
- Do not throw tools from place to place or from person to person, or drop tools from heights.
- Inspect all tools prior to start-up or use to identify any defects.
- Powered hand tools should not be capable of being locked in the ON position.
- Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.
- Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.
- Do not use cheater pipes.
- Make provisions to prevent machines from restarting through proper lockout/tagout.

<u>Guidelines for using Cutting Tools:</u>

- Always use the specific tool for the task. Tubing cutters, snips, self- retracting knives, concealed blade cutters, and related tools are task specific and minimize the risk of hand injury. For more information about cutting tools, see Supplemental Information A.
- Fixed open-blade knives (FOBK) are prohibited from use. Examples of fixed open-blade knives include pocket knives, multitools, hunting knives, and standard utility knives.
- When utilizing cutting tools, personnel will observe the following precautions to the fullest extent possible:
- Use the correct tool and correct size tool for the job.
- Cut in a direction away from yourself and not toward other workers in the area.
- Maintain the noncutting hand and arm toward the body and out of the direction of the cutting tool if it were to slip out of the material being cut.
- Ensure that the tool is sharp and clean; dirty and dull tools typically cause poor cuts and more hazard than a sharp, clean cutting tool.
- Store these tools correctly with covers in place or blades retracted, as provided by the manufacturer.
- On tasks where cutting may be very frequent or last all day (e.g., liner samples), consider Kevlar® gloves in the PPE evaluation for the project.
- Do not remove guards on paper cutters.

6.2.3 Respiratory Protection

Based on air monitoring, an upgrade to Level C protection may be indicated. Half or full-face APRs will be utilized for protection against organic vapors and particulates. All employees required to wear respirators will be need to be medically cleared, in writing to do so by a qualified Occupational Physician.

All respirator users must be trained before they are assigned a respirator, annually thereafter, whenever a new hazard or job is introduces and whenever employees fail to demonstrate proper use or knowledge. Training will include, at a minimum:

- Why the respirator is necessary and what conditions can make the respirator ineffective.
- What limitation and capabilities of the respirators area.
- How to inspect, put on and remove and check the seals of the respirator.
- What respirator maintenance and storage procedures are.
- How to recognize medicals signs and symptoms that may limit or prevent effective use of the respirator.
- The engineering and administrative controls being used and the need for respirators.
- The hazards and consequences of improper respirator use.
- How to recognize and handle emergency situations.

Training will be documented and training certificated will be kept in the employee's permanent training file.

6.2.4 Personal Hygiene Practices

The field team must pay strict attention to sanitation and personal hygiene requirements to avoid personal contamination. The following instructions will be discussed and must be followed:

- During field activities, never put anything in the mouth, including fingers
- All employees must wash their hands, forearms, face, and neck before eating drinking, smoking or using the restroom
- Smoking is prohibited except in designated areas outside the work zone
- At the end of the day, all employees will shower upon returning home or to their hotel

6.2.5 Electrical Safety

All extension cords used onsite must be heavy-duty variety and must be properly grounded. All temporary circuitry must incorporate the use of GFCI devices. Refer to electrical safety in Section 4.2.6, Electrical Hazards.

6.2.6 Fire Safety

All flammable liquids will be used only for their intended purpose and stored and handled only in approved containers. Portable containers must be the approved red safety containers equipped with flame arresters and self-closing lids. All transfers of flammable liquids must be made with the containers grounded or bonded. Also, gasoline containers will be clearly labeled and storage areas (if applicable) will be posted with "No Smoking" signs. Fire extinguishers will be stalled in all areas that contain flammable liquids.

6.2.7 Illumination

All work is planned for daylight hours. No special requirements are anticipated. However, should any work take place outdoors after daylight hours, suitable lighting will be required. In addition, suitable lighting is to be provided in each remediation system building or enclosure.

6.2.8 Sanitation

Potable water and toilet facilities will be provided in compliance with the OSHA 1926.51 standard. Any container used to distribute drinking water shall be clearly marked and not used for any other purpose. Single drinking cups will be supplied, both a sanitary container for the unused cups and a receptacle for disposed of the used cups will also be provided. Port-a-johns will be provided since there are no sanitary sewers on the job site.

7.0 EXPOSURE MONITORING PLAN

This section describes air and personnel monitoring protocols, sampling methods, and instrumentation to be used, as well as the methods and frequency of sampling instrument calibration and action levels for potential work site hazards. When engaged in air monitoring, EAG personnel and subcontractors must use the forms to record air monitoring data and air monitoring instrument calibration records. All monitoring records/forms are to be maintained in the project file by the EAG Project Manager.

7.1 Air Monitoring

The surveillance program is established to detect changes in the ambient air at the work site and to ensure the continuing safety of the work zones and adequacy of the level of worker protection. During field activities, the designated field team member will monitor the work site for combustible gas concentrations and organic vapors. Calibration of all monitoring equipment will be performed in accordance with the manufacturers' procedures by trained EAG employees and subcontractors. The Project Manager, Project Field Team Leader or representative will be notified immediately of any contaminant levels that could trigger an upgrade in PPE or cause a suspension of site activities.

- One or more of the following direct-reading instruments may be used to aid in this determination. Photoionization Detectors (PID) and Flame Ionization Detectors (FID) will measure non-specific organic gases and vapors. Combustible Gas Indicators (CGI) will detect explosive atmospheres. Oxygen (O2) meters will detect fluctuations in oxygen concentrations. These instruments should be calibrated or bump tested daily and whenever the readings may be erratic. All readings should be recorded in the field log books.

Air monitoring results obtained from the breathing zone during field activities will be recorded in field log books. All such records will also include the location, date/time, weather conditions, person monitored, background concentration, and identification of specific contaminant whenever possible. Air monitoring information will be utilized to evaluate personnel exposure and assess the appropriateness of PPE for Site conditions.

7.1.1 Combustible Gas and Oxygen Deficiency/Excess Monitoring

Explosive gas concentrations are not expected to exceed 10% of the lower explosive level (LEL). Should the need be indicated for monitoring, action guidance for the CGI/O2 meter responses is contained in **Table 7-1**.

Table 7-1

CGI/Oxygen Meter Action Levels	
Meter Response	**Action**
CGI response 0%-10% LEL	Continue normal operations
CGI initial response >10% and <20% LEL	Eliminate all sources of ignition from the work area; temporarily retreat from work area for 15-30 minutes and then monitor area again
CGI response after 15-30 minute retreat >10% and <20% LEL	Retreat from work area; notify Project Manager
CGI response >20%	Discontinue operations; retreat from work area
Oxygen level <19.5%	Retreat from work area; notify Project Manager
Oxygen level >23.5%	Retreat from work area; notify Project Manager

7.1.2 Organic Vapor Concentrations

Real-time monitoring for organic vapor concentrations in the breathing zone and down hole will be conducted during field operations (installation of groundwater monitoring and groundwater sampling by EAG and EAG subcontractor personnel) with a PID equipped with a 10.2- or 11.7-electron volt (eV) probe. The PID will be taken into the field and operated during site activities where contaminated soil and/or groundwater may be present. Air monitoring will be conducted during well installation and when a well is opened for groundwater measurements. Measurements will be made at the well head and personnel breathing zones where activities are being performed. The instrument will be calibrated using ultra-high purity air and isobutylene vapor of known concentration before and after use each day. Air calibration measurements will be documented in writing and kept in the project file. Action guidance for PID responses is contained in **Table 7-2**.

Table 7-2

Action Levels for General Site Work	
Meter Response in Breathing Zone (minimum of 3 minutes)	**Action Required**
<5ppm above background	Use Level D PPE
>5ppm above background	Level C PPE, including half or full-face APR with organic vapor cartridges/P100 filters
>50ppm above background	Stop work
Action Levels for Handling NAPL	
Meter Response in Breathing Zone (minimum of 3 minutes)	**Action Required**
<1ppm above background	Use Modified Level D PPE
>1ppm to <10ppm	Level C PPE, including half or full-face APR with organic vapor cartridges
>10ppm above background	Immediately withdraw; monitoring will continue until action levels will allow safe re-entry

If air concentrations of organic vapors are greater than 5 ppm above background in the breathing zone for a 3-minute period, personnel will stop work, retreat from site, and allow time (at least 15 minutes) for vapors to dissipate. If monitoring indicates that concentrations still exceed 5 ppm, workers will upgrade to Level C PPE. If monitoring indicates that concentrations exceed 50 ppm, work will be stopped until site conditions can be re-evaluated.

These action levels are based on the assumption that the major component of free product being recovered will be benzene or naphthalene.

Work involving NAPL recovery from monitoring wells will be conducted in Level C PPE. This level may be downgraded based on air monitoring data and actual field conditions. Downgrading of PPE must be approved by the PM and HSE staff. If ventilation is conducted, additional air monitoring will be performed to the resumption of work to determine the level of PPE required.

7.2 Physical Conditions Monitoring

Site workers will be monitored by the Project Manager for signs of weather-related symptoms from exposure to excessive heat or cold.

Whenever the air temperature exceeds 70°F for personnel wearing chemical protective clothing or 90°F for personnel wearing regular work clothes, the Project Manager will assess conditions that may cause heat stress in site workers.

8.0 MEDICAL SURVEILLANCE

This section discusses the medical surveillance program, how the results are reviewed by a physician and how participation is documented.

8.1 Medical Surveillance Program

All personnel who will be performing any task where potential exposure to hazardous material exists will undergo medical surveillance as outlined in OSHA 29 CFR 1910.120(f). All personnel performing tasks in the Exclusion Zone or Contamination Reduction Zone will be required to have passed the EAG medical surveillance examination (or equivalent), performed by a licensed Occupational Physician. The Project Manager will verify that all EAG and subcontractor personnel meet applicable OSHA medical surveillance requirements.

Applicable field employees will undergo an annual comprehensive medical examination, including a comprehensive health history, blood chemistry with complete blood count and differential, urinalysis, medical history, required chest x-rays, audiogram, pulmonary function testing, testing for heavy metals (as needed), and a physician's interpretation of each employee's medical surveillance examination, including the ability of the employee to wear a respirator. A comprehensive medical examination will be performed if an employee develops signs or symptoms indicating possible overexposure to hazardous substances and/or heat or cold stress.

8.2 Physician Review

All medical surveillance and examination results are reviewed by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine. EAG employee participation in the medical surveillance program is a part of their permanent medical record maintained in the employee's home office. A copy of the current medical clearance signed by the occupational health physician for all EAG employees must be maintained at the home office.

9.0 SITE CONTROL MEASURES AND DECONTAMINATION

To provide for the protection of public health and safety and minimize the possibility of transferring hazardous substances from the site, contamination control procedures are required. These procedures consist of site control measures (which entail the delineation of work zones, communications, and site security) and decontamination procedures (which are necessary for both personnel and equipment). Contaminants that may be uncovered during sampling operations must not be transferred outside the work zone unless properly containerized, and must be removed from clothing, personnel, and equipment prior to relocation from that zone. This section discusses site control measures and decontamination procedures to be used during the collection of samples, the installation of soil borings and/or groundwater monitoring/remediation wells, excavations, and other intrusive work where contact with impacted soils and groundwater could occur by EAG and/or EAG subcontractor personnel.

9.1 Site Control Measures

Site control can be achieved by effectively delineating the work zone, providing appropriate communication, and establishing site security.

9.1.1 Work Zone Delineation

To minimize the transfer of hazardous substances from the site and to ensure proper protection of employees and subcontractors, work zones will be established by the Field Project Team Leader. Applicable site work and the associated requirement for work zones will be determined by the Project Manager. The work area will be divided into an Exclusion Zone (EZ), a Contamination Reduction Zone (CRZ), and a Support Zone (SZ). A typical work zone delineation setup is shown as **Figure 9-1**, below.

Exclusion Zone (EZ)

Contamination does or could exist in this zone. Only properly authorized and trained individuals (refer to Section 6.0) wearing appropriate PPE will be allowed to enter and work in this zone. All people entering the EZ must wear, at a minimum, Level D protection. An entry and exit point for personnel and equipment will be established at the periphery of the EZ (between the EZ and the CRZ) to regulate the flow of personnel and equipment.

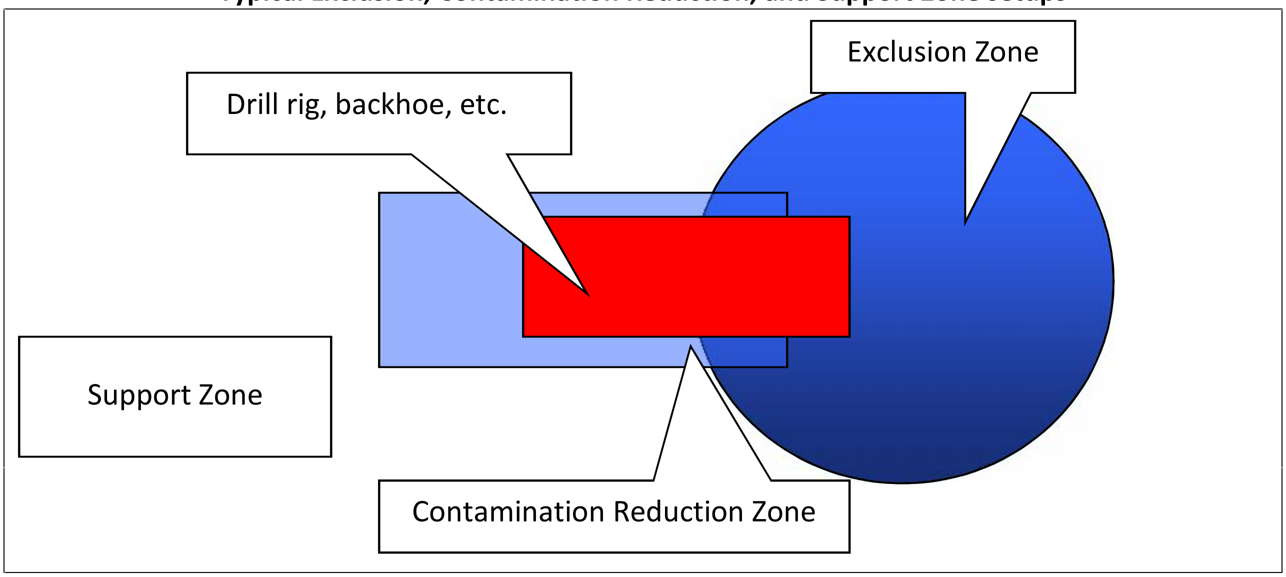
Contamination Reduction Zone (CRZ)

Between the EZ and the SZ will be the CRZ, which will provide a transition between the potentially contaminated EZ and the clean SZ. The CRZ (located upwind of the EZ, if possible) will be a corridor leading from the EZ and will serve as a buffer to further reduce the probability of the SZ becoming contaminated. Exit from the EZ will only be allowed through this CRZ. The CRZ will provide additional assurance that the physical transfer of contaminating substances on people, equipment, and/or in the air will be limited through a combination of decontamination and zone restrictions. Within this zone, employees and subcontractors may perform personal decontamination (e.g., face and hand washing), and certain PPE and small equipment decontamination. Buckets or wash basins for boot washing and equipment decontamination will be stationed on a sheet of plastic (a minimum of 8 feet by 8 feet), the boundaries of which will constitute the CRZ.

Support Zone (SZ)

The Support Zone will be considered a non-contaminated area. The location of support facilities in the SZ will be upwind of the EZ (where possible) and readily accessible to the nearest road. The field office/support facilities, equipment vehicles, a first aid station and a visitors/personnel entry and exit log for the work site will be located in this zone. Potentially contaminated personal clothing, equipment and samples are not permitted in this zone unless properly containerized.

Figure 9-1
Typical Exclusion, Contamination Reduction, and Support Zone setups



9.1.2 Communications

A loud and clear form of communication should be made available for Site personnel entering the work zones. Site communication may be in the form of hand signals, voice, or other communication devices. All forms of communication should be understood by all workers on the Site prior to starting work. Offsite communications may be conducted with mobile phones or walkie-talkies only if the atmosphere has been deemed non-explosive, and the person using the mobile device is in the SZ while placing the call, or inside the cab of a stationary vehicle.

9.1.3 Site Security

The Sparrows Point facility is not open to the public, and there is a strictly monitored main entrance with a security guard on duty at all times who only allows authorized personnel onto the Site. This limited access to the facility should eliminate the need for many requirements for specific site security except those needed to maintain work zone integrity, such as visible barriers around open excavations or EZs and CRZs. No site visitors will be allowed to travel unescorted by EAG or subcontractor personnel around the facility.

Once site visitors arrive at their intended work zone, they must check in with the Field Team Lead. If visitors are authorized to enter the CRZ and/or the EZ, they must have completed OSHA 1910.120 medical surveillance and training requirements (refer to Section 8.0 and Section 6.0). Visitors must wear appropriate PPE before they will be allowed to enter the CRZ and/or the EZ. They must also be taken through this HASP during a brief tail-gate meeting and sign the Acknowledgement page in the back prior to engaging in any activities inside the CRZ or the EZ. All site visitors must follow the same site control measures and decontamination procedures as EAG personnel and subcontractors. The Project Manager must also be informed of each visitor's name, purpose for their visit, time of entry (and exit), location of tasks they wish to perform, whether they completed their intended task(s), and any other relevant information pertaining to their visit.

9.2 Decontamination Procedures

Decontamination of employees, subcontractors, and equipment leaving the EZ will be performed to minimize human exposure to hazardous substances and to minimize the spread of contamination to surrounding areas. The purpose of the CRZ is to provide a location to perform limited personnel decontamination and certain PPE and small equipment decontamination.

9.2.1 Personnel Decontamination

Persons leaving the EZ must pass through the CRZ and follow decontamination procedures before entering the SZ. Hand tools and other sampling equipment used in the EZ and reusable PPE (boots, safety glasses, etc.) will be appropriately cleaned prior to removal from the site each day. The step-by-step sequence for personnel decontamination is as follows:

- Remove boot covers (if used) at the boot washing station and place them in the disposal container provided
- Wash outer gloves and chemical resistant boots (if used) at the boot washing station
- Remove wrist tape (if used) and outer gloves and place them in the disposal container provided
- Remove ankle tape (if used) and disposable coveralls (if used) and place them in the disposal container provided
- Remove respirators (if used) and place each in designated locations in the CRZ
- Remove inner gloves and discard in the disposal container provided
- Wash hands and face and proceed to the SZ

Respirators must be fully decontaminated after each use by the personnel who previously wore them. All project employees and subcontractors are required to take a thorough soap and water shower in their home or motel room at the end of each workday. If monitoring or a general exposure assessment indicates that an employee has become contaminated, the employee or subcontractor will notify the EAG Project Manager and the Field Team Lead as soon as the contaminated state has been discovered.

9.2.2 Equipment Decontamination

All equipment leaving the EZ must be decontaminated either within the CRZ or at the central decontamination area. Small equipment, such as hand tools, will be thoroughly decontaminated within the CRZ before being placed in the SZ. The field tools may be scrubbed visually clean using a detergent solution (Alconox/Liquinox) with water and a stiff, long-bristled scrub brush. Following the solution scrubbing, the tools may be rinsed with distilled water or isopropyl alcohol. Any vehicle working in an EZ will be decontaminated before leaving the site. The vehicle will be cleaned by sweeping excess soil and debris off the wheels. A high-pressure sprayer will then be used to wash the wheels, if necessary.

Each piece of equipment will be inspected after cleaning for any soil remaining on the tires or elsewhere. All vehicles will be cleaned to the satisfaction of the Field Team Lead or a designated assistant prior to entering the SZ or leaving the site. Employees or subcontractors performing decontamination shall wear the appropriate level of PPE (refer to Section 5.0).

9.2.3 Waste Management

The Project Manager and the Field Team Leads will be responsible for overseeing the containerization and disposal of any field derived wastes. Contaminated or suspected contaminated field derived wastes shall be disposed of in accordance with all local, state, and/or federal regulations. Field derived wastes include decontamination rinse waters and other related decontamination generated wastes.

Soils and groundwater expected to be encountered during any sampling or intrusive work not to be contaminated, based on existing data, may be discharged to the ground surface in the immediate vicinity of the monitoring well. However, any known or suspected to be contaminated soil (in small quantities) or groundwater will be containerized for future removal, likely in 55-gallon drums or other approved storage vessels. Depending on the suspected contaminants, the recovered groundwater may be sent through one of the onsite groundwater treatment units. However, the treatment unit must be designed to address the contaminants of concern in the groundwater being treated. Otherwise, the liquid must be staged onsite for eventual offsite disposal at an approved facility.

Impacted soil, if in drums, will be staged in an area designated by the Project Manager or Field Team Lead for eventual disposal. For large excavations, where excavated soil is stockpiled, it may be necessary to place soils on plastic and cover with plastic to prevent any potential leachable runoff. The Project Manager and/or Field Team Lead will provide the proper guidance necessary for handling bulk soil piles.

Any NAPL recovered via remediation systems or manual recovery efforts will be properly containerized and either disposed of offsite as a recyclable material, if possible, or as a hazardous waste. The receiving facility must be an approved facility.

10.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

The objective of emergency response and contingency procedures is to ensure that effective actions are implemented in a timely manner to minimize or control the effects of adverse events (e.g., potential chemical exposures, personal injuries, fires/explosions, and spills/releases). The following subsections describe the basic emergency responses required should an emergency take place during field investigation or remedial effort activities.

10.1 Emergency Phone Numbers

Emergency telephone numbers are listed in **Table 10-1**.

Table 10-1
Emergency Telephone Numbers and Agencies

Agency	Telephone Number
Security (Sparrows Point facility)	(410) 388-7761
Ambulance	911
Fire	911
Occupational Health Clinic	(410) 633-3600
Hospital	(410) 550-0100 (general) (410) 550-0350 (emergency)
National Response Center	(800) 424-8802
Poison Control Center - Maryland	(800) 222-1222
EAG Main Contact	
VP Remediation, Russ Becker	(314) 686-5611
Project Manager, James Calenda	(314) 620-3056

10.2 Injury/Illness Treatment

In the event of illness or injury, the following steps will be taken:

- Evaluate the extent of injuries or seriousness of illness.
- When employees require urgent medical attention, call for emergency assistance. First aid should be administered while awaiting an ambulance or paramedics. All emergency medical treatment, other than first aid, will be administered by the local paramedics. **Table 10-1** lists site emergency telephone numbers. In all cases, critical injuries must be immediately referred for professional medical attention.
- For a non-critical injury/illness, first aid will be administered by onsite personnel. Anyone sustaining a non-critical injury/illness who continues to work will be monitored by the Field Team Lead for any signs of worsening condition, if it is deemed that the person can return to work by the Team Lead and Project Manager. Injured personnel who later suffer any worsening change in status are to immediately notify the Team Lead or the Project Manager.

10.3 Occupational Health Clinic and Hospital Information

Occupational Health Clinic

The Concentra Medical Center, located at 1833 Portal Street, Baltimore, MD, is the closest occupational health clinic, just over 6 miles away. A map to the clinic in included as **Figure 10-1**. The clinic should be used for non-emergency injuries and illnesses.

Directions:
From Sparrow's Point Road, turn left onto Wharf Road;
Turn left onto MD-158 W/Bethlehem Blvd. (0.4 mile);
Turn right onto MD-157 N/Peninsula Expy. (2.7 miles);
Turn slight left onto Merritt Ave. (0.1 mile);
Merritt Ave. becomes Sollers Point Rd. (0.3 mile);
Turn left to stay on Sollers Point Rd (0.6 mile);
Turn left onto Williams Ave. (0.2 mile);
Turn right onto Dundalk Ave. (<0.1 miles);
Turn left onto Chandlery St. (0.1 mile);
Turn left onto Portal St.

Figure 10-1: Health Clinic (Non-Emergency) Map

Hospital

The Johns Hopkins Bayview Hospital is the closest emergency facility, just over 9 miles away. The hospital is located at 4940 Eastern Avenue in Baltimore, MD. **Figure 10-2** is a map to this hospital. Maps are also included in **Attachment E**.

Directions:

From the Sparrows Point Industrial Complex, go north on Route 151 for approximately one mile.

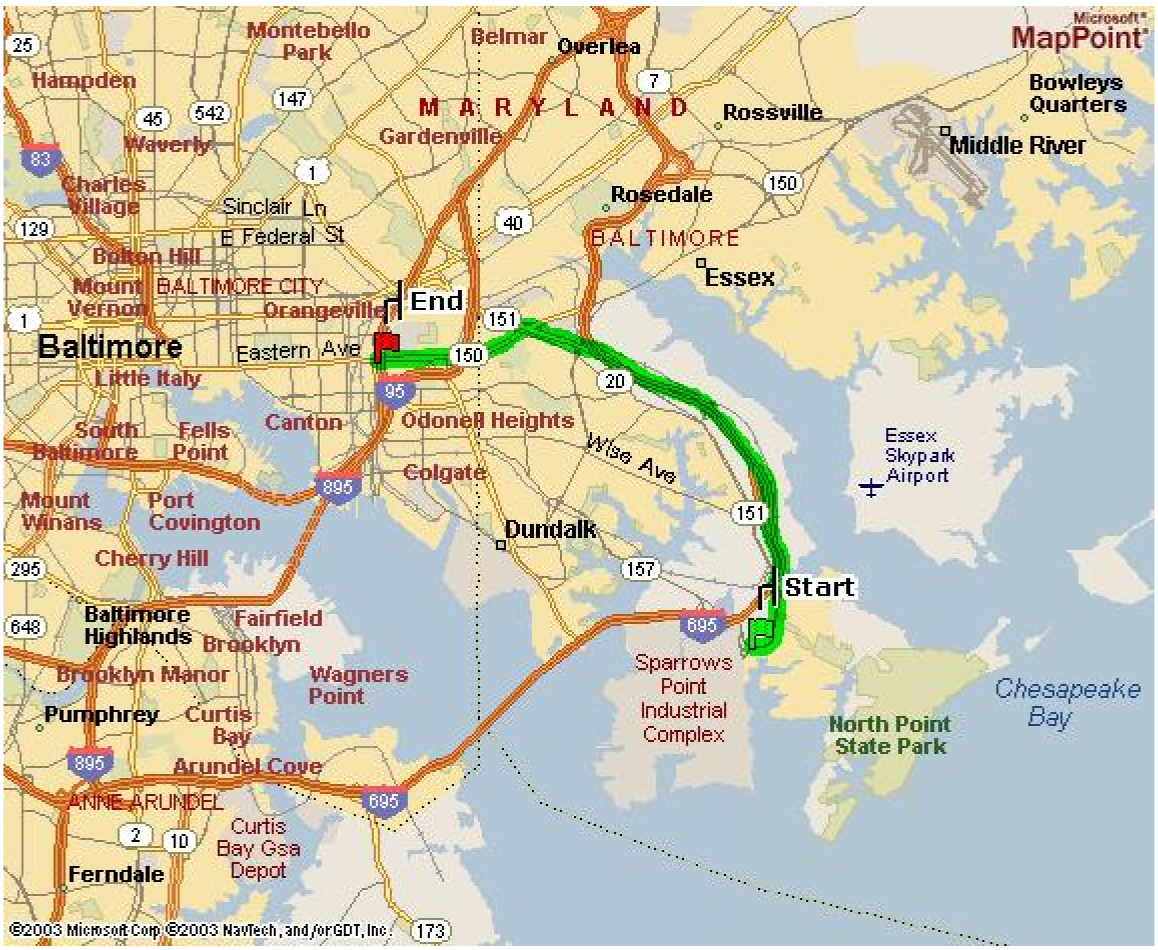
Take ramp (right) onto I-695 towards I-695/Essex.

At exit 40, take ramp (right) onto Route 151/North Point Boulevard North/MD 150;

Take ramp (right) onto Route 150 (Eastern Avenue).

Continue on Eastern Avenue to hospital on right.

Figure 10-2: Hospital Map



Prior to the start of field activities, the Project Field Team Leader will call to verify the telephone numbers and directions for the clinic and hospital, and then distribute location maps and the emergency telephone list to workers and vehicles.

10.4 Accident and Emergency Medical Response

All field team members will be aware of the location of a first aid kit kept onsite. All vehicles used to transport injured persons to an offsite medical facility will be provided with directions and a map to the medical facility.

If treatment beyond first aid is required, emergency response personnel will be contacted for assistance and transport. Before beginning site activities, the Project Field Team Leader will ensure that each field team member knows where the nearest emergency medical facilities are and how to get there. The closest hospital will be used in cases of life-threatening emergencies at the direction of the Project Field Team Leader. The telephone numbers of the local emergency services will be available in the SZ, and the Project Field Team Leader will brief the field team on the procedures for calling for help in an emergency.

Site personnel will inform the Project Manager of any medications, allergies, or other medical information that may be applicable for their medical treatment. The Project Manager will supply this information to emergency response personnel, and will accompany the victim to the hospital, if possible.

10.4.1 Chemical Exposure

In case of accidental overexposure to a hazardous material (groundwater, soil, and/or off-gas materials), guidelines shown in **Table 10-2** will be used.

Table 10-2
Chemical Exposure Guidelines

Type of Overexposure	First Aid Guidelines
Skin Contact	Skin: Wash/rinse the affected area thoroughly with copious amounts of soap and water.
	Eyes: Eyes should be rinsed for at least 15 minutes following chemical contamination.
	Contact emergency response personnel if required, or transport victim to the hospital.
Inhalation	Move the victim to fresh air.
	Contact emergency response personnel if required, or transport victim to the hospital.
Ingestion	Contact Poison Control Center.
	Contact emergency response personnel, or transport victim to the hospital.

10.4.2 Decontamination During a Medical Emergency

For minor medical problems or injuries, regular decontamination procedures will be followed. If emergency, life-saving first aid and/or medical treatment are required, regular decontamination procedures may need to be abbreviated or omitted:

- Do not attempt to wash or rinse an unresponsive victim unless the victim has been contaminated with an extremely toxic or corrosive chemical that may cause injury or loss of life to emergency response personnel.
- Outer garments can be removed if it does not cause a delay, interfere with treatment, or aggravate the problem.

- PPE can be cut away and respiratory protective equipment must always be removed.
- If contaminated clothing cannot be safely removed, then the victim should be wrapped in a blanket or plastic sheeting to prevent contamination to the inside of the ambulance and/or emergency response personnel.

The Project Manager or Field Team Lead will advise the medical staff as to the type of contamination possibly involved.

10.4.3 Small or Incipient Fire

A small fire is defined as a fire that can be extinguished with an available 20 pound type ABC fire extinguisher. An incipient fire is a fire that is small because it has just started. In the event of a small or incipient fire, the following minimum actions will be taken:

- Evacuate nearby personnel from the area, if possible, to an upwind location or to an area not affected by smoke or hazardous decomposition products if an upwind location is not feasible.
- Attempt to extinguish fire using portable fire extinguisher or by smothering.
- Contact emergency response personnel, as needed, for any injuries or exposures to hazardous decomposition products, or if fire cannot be put out.
- After the fire has been extinguished, or emergency response personnel have been contacted, notify the following project personnel:
  The Project Manager

10.4.4 Large Fire or Explosion

An explosion, large fire or a small fire which cannot be extinguished is beyond the first line capabilities of EAG personnel. Professional emergency response personnel would be needed to provide emergency assistance for these types of incidents. In the event of a large fire, explosion or a small fire that cannot be extinguished, the following minimum actions will be taken:

- Evacuate all personnel from the site, if possible, to an upwind location, or to an area not affected by smoke or hazardous decomposition products if an upwind location is not feasible
- Perform a quick role call to account for all site personnel
- Contact the fire department
- Contact emergency response personnel, as needed, for any injuries or exposures to hazardous decomposition products
- After emergency response personnel have been contacted, notify the following project personnel:
  The Project Manager

10.4.5 Adverse Weather Conditions

In the event of adverse weather conditions, the Project Manager will determine if work can continue without sacrificing the health and safety of site personnel. Threatening weather conditions will be monitored by the Project Manager and possibly the Team Lead via radio, television, internet, and/ or calls to the National Weather Service. Some of the conditions to be considered include:

- Potential for heat or cold stress
- Limited visibility

- Electrical storms
- Treacherous weather-related working conditions (i.e., heavy rainfall, icy conditions causing slippery footing hazards, etc.).

10.4.6 First Aid for Heat Stress/Cold Stress

First aid treatment for **heat cramps** includes shade, rest and fluid replacement. If available, the individual should drink electrolyte replacement fluids (e.g., Gatorade, Squincher or 10-K). The individual should recover within half an hour.

First aid treatment for **heat exhaustion** includes cooling the victim, elevating the feet and fluid replacement. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Heat stroke is a medical emergency, requiring the immediate cooling of the victim and transport to the hospital for medical treatment immediately.

First aid treatment for **frost nip** and **frostbite** includes covering the affected area with warmth and retreating to a warm area. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Frozen tissue is a medical emergency and the victim must receive medical attention immediately. Contact emergency response personnel immediately or transport the victim to the hospital.

First aid treatment of **mild hypothermia** includes using heat to raise the individual's body temperature. Heat may be applied to the victim in the form of heat packs, hot water bottles and blankets. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Severe hypothermia is a medical emergency and the victim must be transported to the hospital immediately. First aid treatment for severe hypothermia includes handling the victim very gently; rough handling may set off of an irregular heartbeat. ***DO NOT*** attempt to re-warm the severely hypothermic victim; re-warming may cause the development of an irregular heartbeat.

10.4.7 Snake Bites

If bitten, lower the extremity below the heart to reduce the poison's dissemination through the body. Remain calm, try to keep the heart rate reduced and seek medical attention immediately. Do not cut the wound or attempt to suck out the venom. Note any physical features (e.g., shape of head and color or pattern on body) of the snake.

10.4.8 Animal Bites

All bites should be treated as contaminated soft tissue injuries. Bites should be washed immediately with large amounts of soap and water. If soap is not available, flush the wound with water. The severity and onset of any infection is dependent upon the number of organisms (viruses or bacteria) introduced into the wound. Washing saliva out of the wound immediately will reduce the number of bacteria or viruses that can enter the tissue. Medical attention must be sought if rabies is suspected or the individual has not had a recent tetanus booster.

10.4.9 Insect Bites and Stings

Emergency care for insect bites and stings depends on the individual’s reaction. To treat a sting that results in a minor reaction, remove the stinger by gently scraping it off the skin. Do not try to grasp the sac or stinger, because this forces the remaining venom into the skin. Once the stinger has been removed, clean the wound and surrounding area. Apply cold packs to slow the absorption of the venom and reduce pain and swelling. The treatment for a severe reaction to insect stings includes the following:

- Confirm with the victim whether they are highly allergic to the insect that stung them
    - If victim has gone into anaphylactic shock, retrieve their epi pen or other auto-injector and administer per the directions as hastily as possible
- Assuming the victim remains conscious, ask them to refrain from moving around, and to lie down
- Immobilize the injured area immediately
- If an extremity is involved, remove any rings or watch
- Keep the affected part low, below the level of the heart
- Apply cold compresses to the affected area
- If possible, try to identify the type of insect that inflicted the sting
- Transport the victim to a medical facility immediately, continuing supportive measures en route.

All employees and subcontractors must report severe reactions to insect stings prior to the beginning of work to both the Project Manager and Field Team Lead.

10.4.10 Poisonous Plants

Decontamination: Wash the skin immediately after contact with the plant. Proper washing may not be practical in the middle of the woods, but a product such as Technu or a small wash-up kit with prepackaged, alcohol-based cleansing tissues can be effective. Employees and subcontractors should not forget to wash contaminated clothing and clean up contaminated equipment prior to re-use.

Treatment: Options are as follows:

- Home treatment: Calamine lotion and an oatmeal bath (one cup to a tub full of water) can help relieve itching. To prevent secondary skin infection, scratching is not helpful and the fingernails should be cut to avoid damage to the skin. Over-the-counter hydrocortisone cream can decrease inflammation and itching; however, the label should be read and the cream used according to directions.
- When to see the doctor: Severe cases may require further treatment. A physician should be seen if the rash appears infected, is on the face or other sensitive body areas, or is too extensive to be easily treated at home.

10.4.11 Ticks

To remove an attached tick:

- Use fine-tipped tweezers or a “tick tool” to grasp the tick at the surface of the skin
- If tweezers are not available, use a tissue to protect the fingers (exposure to the tick's body fluid may lead to transmission of disease)
- With a steady motion, pull the tick straight out

Disinfect the bite site and the tweezers. Wash your hands thoroughly with soap and water. Save the tick if you can by placing it in a Ziploc bag in the freezer; this may help with diagnosis in the future.

If flu-like symptoms such as fatigue, headache, neck-stiffness or jaw discomfort begin following a tick bite, seek medical attention.

APPENDICES

EnviroAnalytics
Group

Environmental Engineers

ATTACHMENT A

COMPLIANCE AGREEMENT

EAG HEALTH AND SAFETY PLAN

ACKNOWLEDGEMENT FORM

I, _________________________________, have read (or had read to me), EAG's health and safety plan.
(Print Name)
I understand my responsibilities as they are defined in this plan and will abide by these rules and procedures, as well as any regulations or otherwise governing safety. When in doubt concerning safe job performance, I will speak to my immediate supervisor and/or Project Manager.

I understand EAG reserves the right to change or amend the HASP at any time.

I understand any violation to the plan policies or procedures will be cause for disciplinary action up to and including termination.

____ _____________________________
Employee Signature Date

____ _____________________________
EAG Supervisor/Project Manager Signature Date

ATTACHMENT B

Material Safety Data Sheets (MSDSs)

APPENDIX I

CONTAINMENT REMEDY OPERATIONS AND MAINTENANCE PLAN
PARCEL B4-1, FORMER SPARROWS POINT STEEL MILL

Containment Remedy Operations and Maintenance Overview

In accordance with the Response Action Plan (RAP) for the property identified as Parcel B4-1 located in the central portion of the Sparrows Point Peninsula in Sparrows Point, Maryland (the Site), post remediation care requirements include compliance with the conditions placed on the No Further Action Letter, Certificate of Completion, and deed restrictions recorded for the Site. In addition, maintenance will be performed on the capped areas to control degradation and exposure to the underlying soil. Inspections of the capped areas will be conducted semi-annually. The responsible party will perform cap inspections, maintenance of the cap, and retain cap inspection records. Maintenance records will include the date of the inspection, name of the inspector, any noted issues, and subsequent resolution of the issues. Maintenance records will be maintained in a designated area at the Site for Maryland Department of the Environment (MDE) inspection and review, if requested.

The containment remedy (capping) will be constructed as described in the MDE-approved RAP. The following sections provide details of the Operations and Maintenance Plan (O&M Plan) procedures to be followed at the Site to assess when maintenance of the capped areas is necessary.

Designated Pavement Area Inspections

The asphalt-paved areas will consist of a 11 or 13-inch thick combination of road base and asphalt.
The designated paved areas, as identified in the RAP, will be maintained to ensure the integrity of the cap.

Pavement area inspections will be conducted on a semi-annual basis to ensure that the capped areas are maintained as needed. During the inspection, the capped surfaces will be inspected to check for the following potential conditions:

- Differential settlement and significant surface-water ponding;
- Erosion or cracking of the cap materials; and
- Obstruction or blocking of drainage facilities.

When inspections indicate that cap repair is necessary, repairs will be completed as soon as practically possible in compliance with any recorded deed restrictions. The work will be documented on a form similar to the attached example Pavement Inspection Form. The inspection documentation will include the results of each inspection, recommended maintenance actions, and the actual maintenance/repair implemented. The responsible party will maintain inspection forms and any resulting repair records.

Pavement Inspection Protocol

A pavement management system (pavement condition index) will be implemented in the designated areas of the Site. The purpose of this system is to plan and prioritize future pavement maintenance needs. The system is based on a numerical rating of pavement distresses as published by the United States Army Corps of Engineers. The following chart will be used to provide an index of the pavement condition.

PAVEMENT CONDITION INDEX (PCI)		
PCI	**Characterization**	**Description**
1	New crack-free surface	Black in color, smooth texture
2	Oxidation has started	Short hairline cracks start to develop; dark gray color.
3	Oxidation in advanced state	Hairline cracks are longer and wider; gray in color
4	Oxidation complete	Cracked area 0.25 inch wide and crack lines have found base faults
5	Moisture penetrating through 0.25 inch cracks; loose material, stone and sand, evident	Texture of surface becoming rough; Preventative maintenance
6	Cracks widen and join	Cracks and shrinkage evident at curb and gutter lines
7	Potholes develop in low spots	Gatoring areas begin to break up; overall texture very rough.
8	Potholes developing	Pavement breaking up
9	Heaving due to excessive moisture in base	Distorts entire surface

PAVEMENT CONDITION INDEX (PCI)		
PCI	**Characterization**	**Description**
10	General breakup of surface	General breakup of surface

An inspection indicating a PCI of 4 or greater for designated areas of the Site will require maintenance. The intent is that repairs should be completed before the pavement degrades beyond a PCI of 4. MDE will be notified in a timely manner of any repairs that are the result of a PCI of 4 or greater. The notification will include documentation of the conditions being repaired and the location of the repair.

PAVEMENT INSPECTION FORM	Parcel B4-1, Former Sparrows Point Steel Mill

Date:	Time:
Weather Conditions:	
General Pavement Conditions:	

	PCI	Characterization	Description
1		New crack-free surface	Black in color, smooth texture
2		Oxidation has started	Short hairline cracks start to develop; dark gray color
3		Oxidation in advanced state	Hairline cracks are longer and wider; gray in color
RESPONSE REQUIRED	4	Oxidation complete	Crack area 0.25 inch wide and crack lines have found base faults
	5	Moisture penetrating through 0.25-inch cracks; loose material, stone and sand,evident	Texture of surface becoming rough; preventative maintenance
	6	Cracks widen and join	Cracks and shrinkage evident at curb and gutter lines
	7	Potholes develop in low spots	Gatoring areas begin to break up; overall texture very rough
	8	Potholes developing	Pavement breaking up
	9	Heaving due to excessive moisture in base	Distorts entire surface
	10	General breakup of surface	General breakup of surface

PAVEMENT INSPECTION FORM	Parcel B4-1, Former Sparrows Point Steel Mill
CURB CONDITION	☐ Exists ☐ Sound ☐ Cracked ☐ Root Intrusion ☐ Deteriorated Comments:____
SIDEWALK CONDITION	Comments:____
RESPONSE REQUIRED	
WORK COMPLETED	
PHOTOGRAPHS / FIGURES ATTACHED	
RESPONSE CONTRACTOR	Work Completed By: ________________________________ Date: Signature: