RESPONSE AND DEVELOPMENT WORK PLAN

AREA B: SUB-PARCEL B24-1
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

FIGURES

TABLES

TABLE OF CONTENTS
(CONT.)

APPENDICES

ELECTRONIC ATTACHMENTS

1.0 INTRODUCTION

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response and Development Work Plan (RADWP) for a portion of the Tradepoint Atlantic property that has been designated as Area B: Sub-Parcel B24-1 (the Site). Tradepoint Atlantic submitted a letter (dated April 21, 2021; **Appendix A**) requesting an expedited plan review to achieve construction deadlines for the proposed development on this Site. As shown on **Figure 1**, Sub-Parcel B24-1 consists of approximately 16.7 acres located within Parcel B8, Parcel B14, and Parcel B24 of the approximately 3,100-acre former steel plant property.

As shown on **Figure 2**, Sub-Parcel B24-1 is slated for development as a Stormwater Management Regional Pond. This will be a wet pond constructed with an impermeable liner. The water quality volume for the proposed wet pond will be approximately 5,500,000 cubic feet. This volume will provide treatment for approximately 1,123 acres of impervious area. The planned development activities will generally include demolition of the existing pond areas, grading, construction of the new retention basin, installation of a liner, piping, and landscaping. Outside of the main development area designated as Sub-Parcel B24-1, a temporary stockpile area (not intended for permanent use or occupancy) with a total area of 4.94 acres within the Limit of Disturbance (LOD) will be utilized to accommodate material storage during construction.

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 (MDE), 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 (USEPA), effective November 25, 2014.

An application to enter the full Tradepoint Atlantic property (3,100 acres) into the MDE Voluntary Cleanup Program (MDE-VCP) was submitted to the MDE on June 27, 2014. The property's current and anticipated future use is Tier 3 (Industrial) and plans for the property include demolition and redevelopment over the next several years. Sub-Parcel B24-1 is part of the acreage that remains subject to the requirements of the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from the USEPA on September 12, 2014.

In consultation with the MDE, 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 MDE and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (Code of Maryland Regulations (COMAR) 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on Sub-Parcel B24-1 and complement the statutory requirements of the VCP (Section 7-501 of the Environment Article). Upon submission of a RADWP and completion of any remedial activities for the sub-parcel, the MDE shall issue a No Further Action Letter (NFA) 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 MDE 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 RADWP are implemented and a NFA is issued by the MDE 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 RADWP, 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 RADWP.

This RADWP provides a Site description and history; summary of environmental conditions identified by the Phase I Environmental Site Assessment (ESA); summary of relevant findings and environmental conditions identified by the Parcel B8, Parcel B14, and Parcel B24 Phase II Investigations; a human health Screening Level Risk Assessment (SLRA) conducted for the identified conditions; and any necessary engineering and/or institutional controls to facilitate the planned development and address the impacts and potential human health exposures. These controls include work practices and applicable protocols that are submitted for approval to support the development and use of the Site. Engineering/institutional controls approved and installed for this RADWP shall be described in closure certification documentation submitted to the MDE demonstrating that exposure pathways on the Site are addressed in a manner that protects public health and the environment.

The remaining acreage of Parcel B8, Parcel B14, and Parcel B24 will be addressed in future work associated with completion of the obligations of the ACO and associated VCP requirements. This work will include assessments of risk and, if necessary, RADWPs to address unacceptable risks associated with future land use. As noted above, a temporary stockpile area consisting of 4.94 acres outside of the sub-parcel (located to the east) will be utilized to accommodate material storage during construction. The temporary work outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC, although the temporary use of this area is covered by this RADWP. Ground intrusive work will not be conducted in this stockpile area, and it will not be used for occupancy, so it has been excluded from the SLRA.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The Sub-Parcel B24-1 development project consists of approximately 16.7 acres comprising the northeast portion of Parcel B24, the western portion of Parcel B14, and a small southern portion of Parcel B8 (**Figure 1**). The proposed development on this sub-parcel will include a lined Stormwater Management Regional Pond (**Figure 2**). Outside of the main development area designated as Sub-Parcel B24-1, a temporary zone (not intended for permanent use or occupancy) with a total area of 4.94 acres within the construction LOD will be utilized to accommodate material storage during construction. The Site is not currently occupied. A smaller stormwater emergency detention basin currently exists on the Site (see Section 3.1) and will be removed during the proposed development. There is no groundwater use on-site or within the surrounding Tradepoint Atlantic property.

Ground surface elevations at the Site range from approximately 8 to 20 feet above mean sea level (amsl). Elevations are generally flat except for elevated berms surrounding the emergency detention basin (on Parcel B24) and the Humphrey Impoundment (on Parcel B14). According to Figure B-2 of the property Stormwater Pollution Prevention Plan (SWPPP) Revision 8 dated April 30, 2020, surface water runoff from the Site flows through National Pollutant Discharge Elimination System (NPDES) permitted Outfall 014 beyond the Humphrey Creek Wastewater Treatment Plant (HCWWTP), which discharges to the west into Bear Creek.

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.

There were three historic settling basins that were unlined and included concrete headwalls. Historic Settling Basin #1 was backfilled when HCWWTP was constructed (around 2002) and is under the HCWWTP. Historic Settling Basins #2 and 3 were taken out of service when the HCWWTP was put online (around 2003). The historic settling basins. Once out of service, the settling basins were hydraulically dredged using an Ellicott hydraulic dredge and the sediment was processed through the WWTP system

Parcel B24 contains the HCWWTP directly to the south of the proposed sub-parcel development area. The HCWWTP currently handles stormwater influent from the Tin Mill Canal (TMC), which historically received stormwater and wastewater from various steel production activities on the

Tradepoint Atlantic property. Since the cessation of steel operations, the HCWWTP continues to process stormwater collected in the TMC. The HCWWTP discharges treated effluent into the adjacent water body of Bear Creek to the west. The HCWWTP uses various treatment processes to treat the TMC influent, including but not limited to settling basins, thickeners, aerators, and chemical addition (lime, caustic, flocculation, and acid). Two thickener tanks located to the south of the HCWWTP building allow for sludge removal. An emergency detention basin is located to the north of the HCWWTP within the proposed sub-parcel development area. The 2.5-acre emergency detention basin was constructed in 2002 as a temporary storage system to be used in the event of any treatment upsets. The emergency detection pond was fully lined and part of the HCWWTP and associated NPDES permit. The emergency detention pond was used for temporary storage of water only and therefore minimal sediment has accumulated.

Parcel B14 contains the Humphrey Impoundment. Prior to 1970, Humphrey Creek existed as open water (the impoundment did not yet exist) and received wastewater from various steel processing areas including the Hot Strip Mill, Cold Sheet Mill, Tin Mill, and Rod & Wire Mill. Following completion of the TMC (ca. 1969), the Humphrey Impoundment is believed to have been used as a dewatering area for on-site sludges and slurry materials generated from the Basic Oxygen Furnace (BOF) and various on-site water treatment plants. Materials that were dewatered within the impoundment included: BOF slurry, Blast Furnace G, H, J, K, and L thickener sludges, HCWWTP sludge, Sinter Plant slurry, Open Hearth (No.4) slurry, waste oil pit sludge and non-recoverable waste oil residue, and pre-limer clarifier sludge. According to the Description of Current Conditions (DCC) Report prepared by Rust Environment and Infrastructure, dated January 1998 (included with Weaver Boos' 2014 Phase I ESA), all of the wastes that were placed inside the impoundment were determined to be non-hazardous.

More information on the historical activities conducted at the Site can be found in the agency-approved Parcel B24 Phase II Investigation Work Plan (Revision 1 dated December 27, 2019) and Parcel B14 Phase II Investigation Work Plan (Revision 0 dated August 3, 2017).

3.0 ENVIRONMENTAL SITE ASSESSMENT RESULTS

3.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT RESULTS

A Phase I ESA was completed by Weaver Boos Consultants for the entire Sparrows Point property on May 19, 2014. 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. The Phase I ESA 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. The Phase I ESA also relied upon findings identified during a previous visual site inspection (VSI) 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 DCC Report.

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 RECs were identified in Sub-Parcel B24-1:

Humphrey Impoundment Area (REC 2A, Finding 61, SWMU 190):
According to the Phase I ESA, this area was used to receive wastewater from various steel processing areas, as a sludge dewatering area, and for the storage of process slurry and other materials. These materials may have contained hazardous substances and/or petroleum products. The impoundment was closed in the 1960s due to the legislative precursors to the Clean Water Act, and was filled in the 1980s. The Humphrey Impoundment is included as a Special Study Area (SSA) under the Consent Decree. Based on this information, the potential exists for past releases which may have impacted the environment.

HCWWTP Settling Basins (REC 7A, Finding 165, also listed as SWMU 10):
According to the Phase I ESA, the settling basins associated with the HCWWTP are believed to contain significant quantities of sediment from the nearby TMC and HCWWTP sludge. Weaver Boos recognized the potential for a material release from these basins which could have negatively impacted the environment. The TMC sediments were investigated as described in the Sediment Characterization Report for the Tin Mill Canal (Revision 3 dated January 4, 2018). The TMC effluent historically discharged through three settling basins of relatively equal surface areas. The settling basins are no longer operational. Basin No. 2 has been partially backfilled, leaving approximately half of the original volume.

HCWWTP Aerators (REC 7B, Finding 167, also listed as SWMU 12):
According to the Phase I ESA, the HCWWTP aeration basins are believed to contain significant quantities of sediment from the nearby TMC and HCWWTP sludge. Weaver Boos recognized the potential for a material release from the aerators which could have negatively impacted the environment.

HCWWTP Emergency Detention Basin (REC 7C, Finding 173):
The approximately 2.5-acre emergency detention basin serves as a bypass system for the HCWWTP to be used in the event of any treatment upsets. The emergency detention basin was constructed in 2002. The basin includes a composite liner. Weaver Boos observed the emergency detention basin to contain what appeared to be several thousand cubic yards of sediment and sludge from the HCWWTP during their site visit. The sediment/sludge was presumed to contain petroleum products and/or hazardous substances. Weaver Boos recognized the potential for a material release from the basin which could have negatively impacted the environment.

Relevant SWMUs and AOCs were also identified as located on Figure 3-1 from the DCC Report. This figure generally shows the SWMUs, AOCs, and main facility areas within the property boundaries. Apart from the co-listed RECs above, there were no SWMUs or AOCs identified within the Sub-Parcel B24-1 boundary.

3.2 PHASE II INVESTIGATION RESULTS – SUB-PARCEL B24-1

Phase II Investigations specific to soil and groundwater conditions were performed for the property areas encompassing Sub-Parcel B24-1 in accordance with the requirements outlined in the ACO as further described in the following agency-approved Phase II Investigation Work Plans:

- Area B: Parcel B8 (Revision 0) dated September 25, 2015
- Area B: Parcel B14 (Revision 0) dated August 3, 2017
- Area B: Parcel B24 (Revision 1) dated December 27, 2019

All soil and groundwater samples were collected and analyzed in accordance with agency-approved protocols during the Phase II Investigations, the specific details of which can be reviewed in each agency-approved Work Plan. Each Phase II Investigation was developed to target specific features which represented a potential release of hazardous substances and/or petroleum products to the environment, including RECs, SWMUs, and AOCs, as applicable, as well as numerous other targets identified from former operations that would have the potential for environmental contamination. Samples were also collected at site-wide locations to ensure full coverage of each investigation area. The full analytical results and conclusions of each investigation have been presented to the agencies in the following Phase II Investigation Reports:

- Area B: Parcel B8 (Revision 1) dated March 16, 2018
- Area B: Parcel B14 (Revision 0) dated March 27, 2018
- Area B: Parcel B24 (Revision 0) dated September 25, 2020

This RADWP summarizes the relevant soil and groundwater findings from each investigation with respect to the proposed development of Sub-Parcel B24-1.

3.2.1 Phase II Soil Investigation Findings

Based on the scope of development for Sub-Parcel B24-1, 42 soil samples collected from 18 soil borings completed during the Parcel B14 and Parcel B24 Phase II Investigations were included for a representative evaluation of Sub-Parcel B24-1. The 18 boring locations are shown on **Figure 3**, and the samples obtained from these borings provided relevant analytical data for discussion of on-site conditions.

Soil samples collected during the Phase II Investigations were analyzed for the Target Compound List (TCL) semi-volatile organic compounds (SVOCs) and polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO), Oil & Grease, Target Analyte List (TAL) metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot below ground surface (bgs)) were analyzed for polychlorinated biphenyls (PCBs). Samples from any depth interval with a sustained photoionization detector (PID) reading above 10 ppm were also analyzed for TCL volatile organic compounds (VOCs). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (30% validated soil data for Parcel B24 and 50% validated soil data for Parcel B14) are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

The historic settling basins were also targeted as part of the Phase II. Historic Settling Basin #1 was backfilled when HCWWTP was constructed (around 2002) and is under the HCWWTP. Settling Basins #2 and 3 are approximately 10 to 12 feet bgs; soil borings were proposed to 20 feet bgs but that depth was not achieved due to refusal. Two soil borings (SB-025 and SB-026) were advanced in Settling Basin #2 to 15 and 16.5 feet bgs (terminated due to refusal). One soil boring (SB-037) was advanced just outside Settling Basin #3 (which was still full of water at sampling time) to a depth of 12 feet bgs (refusal on multiple attempts). The results from Settling Basin #2 are considered representative of all of the basins.

Soil sample results were screened against the Project Action Limits (PALs) established in the property-wide Quality Assurance Project Plan (QAPP) dated April 5, 2016, or based on other direct agency guidance. The PALs for relevant PAHs have been adjusted upward based on revised toxicity data published by the USEPA. **Table 1** and **Table 2** provide summaries of the detected organic compounds and inorganics in the soil samples collected from the 18 soil borings at the Site. **Figure S1** through **Figure S4** present the soil sample results that exceeded the PALs among these soil borings. PAL exceedances were limited to one SVOC (benzo[a]pyrene), two PCB mixtures (Aroclor 1260 and total PCBs), Oil & Grease, and four inorganics (arsenic, lead, manganese, and thallium).

Evidence of non-aqueous phase liquid (NAPL) was observed at two Phase II Investigation soil boring locations (B14-011-SB and B24-034-SB) along the western border of the Humphrey Impoundment. A temporary NAPL screening piezometer was installed at this location, and no NAPL was identified on the water table during subsequent gauging events. Contingency measures to address the presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

3.2.2 Phase II Groundwater Investigation Findings

Groundwater conditions were investigated in accordance with the Parcel B8, Parcel B14, and Parcel B24 Phase II Investigation Work Plans. During the groundwater investigations, samples were obtained from six temporary groundwater sample collection points (piezometers) and one shallow groundwater monitoring well (TM02-PZM009) within or proximate to Sub-Parcel B24-1. The seven groundwater points which provided relevant analytical data for the proposed development project are shown on **Figure 4**. This figure also shows that two additional NAPL screening piezometers were installed to investigate potential NAPL conditions within the Humphrey Impoundment. There is no direct exposure risk to groundwater for the future Composite Worker because the stormwater pond will be lined and there is no use of groundwater on the Tradepoint Atlantic property; however, groundwater may be encountered in the sub-parcel during some construction tasks. If groundwater is encountered, it will be managed to prevent exposures in accordance with the dewatering requirements outlined in Section 5.2.

The groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs and PAHs, TPH-DRO/GRO, Oil & Grease, TAL-dissolved metals, total/dissolved hexavalent chromium, and total, available, and/or amenable cyanide (depending on the specific Work Plan requirements). The groundwater sample collected from the permanent well TM02-PZM009 was also analyzed for total metals. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (30% validated groundwater data for Parcel B24 and 100% validated groundwater data for Parcel B8) are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

The Phase II Investigation groundwater results were screened against the PALs established in the property-wide QAPP dated April 5, 2016, or based on other direct agency guidance. Similar to the evaluation of soil data, the PALs for relevant PAHs have been adjusted upward based on revised toxicity data published by the USEPA. **Table 3** and **Table 4** provide summaries of the detected organic compounds and inorganics in the groundwater samples submitted for laboratory analysis. **Figure GW1** through **Figure GW4** present the groundwater results that exceeded the PALs among these samples. PAL exceedances consisted of one VOC (benzene), five SVOCs (1,1-biphenyl, 3&4-methylphenol, benz[a]anthracene, naphthalene, and nitrobenzene), TPH-DRO, Oil & Grease, and three total/dissolved metals (hexavalent chromium, thallium, and vanadium). For simplicity, the inorganic PAL exceedances shown on **Figure GW4** do not include duplicate

exceedances of total/dissolved metals. If both total and dissolved concentrations exceeded the PAL, the value for total metals is displayed.

Each groundwater collection point was also inspected for evidence of NAPL using an oil-water interface probe prior to sampling. None of the groundwater sample collection points relevant for the proposed development project showed evidence of NAPL during these checks. However, as shown on **Figure 4**, three of the five NAPL screening piezometers installed during the Parcel B14 Phase II Investigation to investigate NAPL conditions within the Humphrey Impoundment (B14-011-PZ, B14-037-PZ, and B14-041-PZ) accumulated NAPL. Contingency measures to address the presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

3.2.3 Locations of Potential Concern

Groundwater data were screened to determine whether any sample results exceeded the USEPA Vapor Intrusion (VI) TCR (carcinogen) or THQ (non-carcinogen) Screening Levels. None of the individual sample results exceeded the VI TCR or THQ criteria. When the aqueous results were summed by sample location, none of the cumulative VI cancer risks exceeded 1E-5, and none of the cumulative VI non-cancer Hazard Index (HI) values exceeded 1. There are no concerns related to potential VI risks/hazards at the Site. Additionally, no structures are proposed to be constructed for occupancy during this development project. The VI risk evaluation is summarized in **Table 5**.

Other locations of potential concern which are subject to special requirements could include elevated lead, PCBs, or TPH/Oil & Grease in soil. The soil data for Sub-Parcel B24-1 were evaluated to determine the presence of any such locations of potential concern including: lead concentrations above 10,000 mg/kg, PCB concentrations above 50 mg/kg, or TPH/Oil & Grease concentrations above 6,200 mg/kg. There were no soil concentrations of lead, PCBs, or TPH-DRO/GRO above the specified criteria. Oil & Grease was detected over the specified criteria at soil boring locations B14-011-SB, B14-034-SB, and B24-037-SB. These areas are identified as locations of potential concern.

Borings or piezometers with physical evidence of NAPL are also considered to be locations of potential concern with respect to proposed development. Visual observations of NAPL were observed at two soil boring locations (B14-011-SB and B24-034-SB). Additionally, NAPL accumulated in NAPL screening piezometers B14-011-PZ, B14-037-PZ, and B14-041-PZ, which had been installed to investigate NAPL conditions within the Humphrey Impoundment. NAPL was not identified in piezometers installed at soil boring locations B14-034-SB or B24-034-SB.

Figure 5 provides a summary of the soil borings and groundwater points that were identified by this screening evaluation as locations of potential concern at the Site. Overall, based on the depths of known impacts, NAPL is not expected to be encountered during development. However,

contingency measures to address the presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

3.3 HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

3.3.1 Analysis Process

A human health SLRA has been completed based on the analytical data obtained from the characterization of surface and subsurface soils. This includes the soil data obtained during the preceding Parcel B14 and Parcel B24 Phase II Investigations.

A Composite Worker baseline SLRA was evaluated as a conservative measure even though no long-term occupancy is proposed for the Stormwater Management Regional Pond following its construction. It should be noted that processed slag aggregate sourced from the Tradepoint Atlantic property is proposed to be placed on portions of the Site and will be used as the primary fill material for this project; therefore, regardless of the findings of the Composite Worker baseline SLRA, Sub-Parcel B24-1 will be subject to surface engineering controls (i.e., capping) unless separate approvals are received from the MDE following appropriate laboratory testing of the slag aggregate. The SLRA was conducted to further evaluate the existing soil conditions in support of the design of any additional necessary response measures.

The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): The SLRA was evaluated using a single site-wide EU with an area of 16.7 acres. The same EU and associated soil datasets were used for the evaluation of the Composite Worker and Construction Worker scenarios.

As shown on **Figure 2**, a temporary stockpile area consisting of 4.94 acres outside of the sub-parcel will be utilized to accommodate material storage during construction. Ground intrusive work will not be conducted in this stockpile area, and it will not be used for occupancy, so it has been excluded from the SLRA.

Identification of Constituents of Potential Concern (COPCs): For the project-specific SLRA, compounds that were present at concentrations at or above the USEPA RSLs set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. A COPC screening analysis is provided in **Table 6** to identify all compounds above the relevant screening levels.

All aroclor mixtures (e.g., Aroclor 1248, Aroclor 1260) are taken into account for the reported concentrations of total PCBs. The total PCBs concentrations are used to evaluate the carcinogenic risk associated with PCBs. Therefore, Aroclor 1260 was not separately evaluated in the SLRA.

Exposure Point Concentrations (EPCs): The COPC soil datasets for the site-wide EU were divided into surface (0 to 2 foot), subsurface (>2 foot), and pooled depths for estimation of potential EPCs. Thus, there are three soil datasets associated with the site-wide EU. A statistical analysis was performed for each COPC dataset using the ProUCL software (version 5.0) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the arithmetic mean for each depth was calculated for comparison to the Adult Lead Model (ALM)-based values (presented in **Table 7**).

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Worker and to site-specific Soil Screening Levels (SSLs) for the Construction Worker based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). Risk ratios were calculated with a cancer risk of 1E-6 and a non-cancer HQ of 1. The risk ratios for the carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk. The risk ratios for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer Hazard Index (HI).

For the Construction Worker, site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum allowable exposure frequency for the site-wide EU that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for the individual target organs. This analysis indicated that the allowable exposure frequency before additional worker protections or more detailed job safety evaluations might be needed is 60 days.

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

Assessment of Lead: For lead, the arithmetic mean concentrations for surface soils, subsurface soils, and pooled soils for the site-wide EU were compared to the applicable RSL (800 mg/kg) as an initial screening. If the mean concentrations for the EU were below the applicable RSL, the EU was identified as requiring no further action for lead. If a mean concentration exceeded the RSL, the mean values were compared to calculated ALM values (ALM Version dated 6/21/2009 updated with the 5/17/2017 OLEM Directive) with inputs of 1.8 for the geometric standard deviation and a blood baseline lead level of 0.6 ug/dL. The ALM calculation generates a soil lead concentration of 1,050 mg/kg, which is

the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 5 ug/dL. If the arithmetic mean concentrations for the EU were below 1,050 mg/kg, the EU was identified as requiring no further action for lead. The lead averages are presented for surface, subsurface, and pooled soils in **Table 7**. Neither surface, subsurface, nor pooled soils exceeded an average lead concentration of 800 mg/kg.

Assessment of TPH/Oil & Grease: EPCs were not calculated for TPH/Oil & Grease. Instead, the individual results were compared to the PAL set to a HQ of 1 (6,200 mg/kg). Five soil samples in Sub-Parcel B24-1 exceeded the Oil & Grease PAL: B14-011-SB-1 (16,200 J+ mg/kg), B14-034-SB-1 (32,000 J- mg/kg), B14-034-SB-5 (14,400 J- mg/kg), B24-037-SB-8 (14,900 mg/kg), and B24-037-SB-10 (19,200 mg/kg). Physical evidence of NAPL was also observed in the soils at B14-011-SB and B24-034-SB, and NAPL accumulated above the water table in screening piezometers B14-011-PZ, B14-037-PZ, and B14-041-PZ. The locations with confirmed or potential presence of NAPL (inclusive of the elevated Oil & Grease concentrations in soil) are plotted with respect to the development plan and utilities on **Figure 5**. Contingency measures to address the potential presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

Risk Characterization Approach: Generally, if the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1, and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of 1E-5, then a no further action determination will be recommended. If the baseline estimate of cumulative cancer risk exceeds 1E-5 but is less than or equal to 1E-4, then capping of the EU will be considered to be an acceptable remedy for the Composite Worker. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability. For the Construction Worker, cumulative cancer risks exceeding 1E-5 (but less than or equal to 1E-4) or HI values exceeding 1 will be mitigated via site-specific health and safety requirements.

It should be noted that processed slag aggregate sourced from the Tradepoint Atlantic property will be used as the primary fill material for this project; therefore, regardless of the findings of the Composite Worker baseline assessment, Sub-Parcel B24-1 will be subject to surface engineering controls (i.e., capping) unless separate approvals are received from the MDE following appropriate laboratory testing of the slag aggregate material. The goal of the SLRA is therefore to determine whether additional response actions beyond capping may be needed due to current conditions at the Site.

The USEPA's acceptable risk range is between 1E-6 and 1E-4. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of 1E-4, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of any non-carcinogen HI exceedances and bioavailability of the

COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy.

For lead, if the ALM results indicate that the mean concentrations would present a 5% to 10% probability of a blood concentration of 5 ug/dL for the EU, then capping of the EU would be an acceptable presumptive remedy. The mean soil lead concentrations corresponding to ALM probabilities of 5% and 10% are 1,050 mg/kg and 1,400 mg/kg, respectively. If the ALM indicates that the mean concentrations would present a >10% probability of a blood concentration of 5 ug/dL for the EU, further analysis of site conditions including toxicity reduction will be completed such that the probability would be reduced to less than 10% after toxicity reduction, but before capping.

3.3.2 Sub-Parcel B24-1 SLRA Results and Risk Characterization

Soil data were divided into three datasets (surface, subsurface, and pooled) for Sub-Parcel B24-1 to evaluate potential exposure scenarios. Due to the grading activities including cut and fill which will be implemented during development at the Site, each of these potential exposure scenarios is relevant for the SLRA.

EPCs were calculated for each soil dataset (i.e., surface, subsurface, and pooled soils) in the site-wide EU. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with computations presented and EPCs calculated for COPCs within each of the datasets. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated EPCs for the surface, subsurface, and pooled exposure scenarios are provided in **Table 8**.

As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. A lead evaluation spreadsheet, providing the computations to determine lead averages for each dataset, is also included as an electronic attachment. The screening criterion for lead was set at an arithmetic mean of 800 mg/kg based on the RSL, with a secondary limit of 1,050 mg/kg based on the May 2017 updated ALM developed by the USEPA (corresponding to a 5% probability of a blood lead level of 5 ug/dL). The average and maximum lead concentrations are presented for each dataset in **Table 7**, which indicates that neither surface, subsurface, nor pooled soils exceeded an average lead value of 800 mg/kg.

Composite Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker baseline scenario prior to the placement of slag aggregate at the Site are shown in **Table 9** (surface), **Table 10** (subsurface), and **Table 11** (pooled). The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	Site-Wide EU (16.7 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	6E-6
		Pooled Soil	none	7E-6

Based on the risk ratios for Sub-Parcel B24-1, capping is not necessary to be protective for the surface, subsurface, and pooled exposure scenarios. None of the cancer risk values exceeded 1E-5 and none of the non-carcinogenic HI values exceeded 1. However, slag aggregate will be used as the primary fill material and pavement subbase at the Site. Therefore, environmental capping will be required. As noted above, this evaluation has been conducted as a conservative measure because no long-term occupancy is proposed for the Stormwater Management Regional Pond following its construction. Institutional controls will be implemented to protect future Composite and Construction Workers against inadvertent contact with potentially impacted media.

Construction Worker Assessment:

Ground intrusive activities which could result in potential Construction Worker exposures are expected to be limited primarily to pond excavation and utility installation tasks performed by specific work crews. Construction Worker risks were evaluated for several different exposure scenarios to determine the maximum exposure frequency for the site-wide EU that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for any individual target organ. Risk ratios for the Construction Worker scenario using the selected duration (60 days) are shown in **Table 12** (surface), **Table 13** (subsurface), and **Table 14** (pooled). The variables entered for calculation of the site-specific Construction Worker SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheet used for computation of the site-specific Construction Worker SSLs is included in **Appendix B**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker	Site-Wide EU (16.7 acres) (60 exposure days)	Surface Soil	none	6E-7
		Subsurface Soil	none	3E-7
		Pooled Soil	none	4E-7

Using the selected exposure duration for the site-wide EU (60 days), the carcinogenic risks were all less than 1E-5, and none of the non-carcinogens caused a cumulative HI to exceed 1 for any target organ system. These findings are below the acceptable limits for no further action established by the agencies. This evaluation indicates that additional site-specific health and safety

requirements (beyond standard Level D protection) would be required only if the allowable exposure duration were to be exceeded for an individual worker.

Certain activities at the Site have the potential to exceed the allowable duration, and Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded Personal Protective Equipment (PPE) beyond standard Level D protection will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The Modified Level D PPE requirements which will be applied immediately and throughout this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE Standard Operational Procedure (SOP) provided as **Appendix C**.

Institutional controls will be required to be established for the protection of Construction Workers in the event of any future long-term construction projects which could include ground intrusive activities. The anticipated institutional controls, including notification requirements, health and safety requirements, and materials management requirements, are specified in Section 5.4.

3.3.3 Evaluation of RCRA Criteria

Results from the SLRA indicate that a site-wide remedy of capping with institutional controls will be acceptable to mitigate potential future Composite Worker risks resulting from on-site soil conditions. Site-specific health and safety controls will be implemented to mitigate Construction Worker risks within the sub-parcel. This includes using modified Level D PPE. The modified Level D PPE requirements will be implemented throughout the project duration in accordance with the PPE SOP provided as **Appendix C**. Institutional controls will also be required to be established for the protection of future Construction Workers in the event of any future long-term construction projects which could include ground intrusive activities.

The proposed VCP capping remedy with institutional controls was evaluated for consistency with the RCRA Threshold Criteria and Balancing Criteria. The Threshold Criteria assess the overall protection of human health and the environment, as well as achievement of media cleanup objectives and control of sources of releases at the Site. The Balancing Criteria assess long-term effectiveness and permanence; reduction of toxicity, mobility or volume; short-term effectiveness; implementability; cost effectiveness; and community and State acceptance.

Threshold Criteria:

Protect Human Health and the Environment: The assessment against this criterion evaluates how the remedy, as a whole, protects and maintains protection of human health and the environment. This criterion is satisfied when response actions are complete. The purpose of this remedy is to provide a protective barrier between human site users and

impacted materials, and to protect the environment by preventing surface water from contacting potentially impacted materials in place. The capping and institutional control remedy would eliminate risk to current and future industrial workers by preventing exposure to on-site media and areas of the Site where processed slag aggregate has been placed. Groundwater does not present a direct human health hazard since there is no groundwater use on the property. Implementation of the proposed use restrictions will address the residual risk and will also protect future workers by eliminating or controlling potential exposure pathways, thus, reducing potential intake and contact of COPCs by human receptors.

Achieve Media Cleanup Objective: The assessment against this criterion describes how the remedy meets the cleanup objective, which is risk reduction, appropriate for the expected current and reasonably anticipated future land use. The objective is to protect current/future Composite Workers and Construction Workers from potential exposures to constituents present in slag aggregate and on-site media at levels that may result in risks of adverse health effects. Given the controlled access and use restrictions, the proposed remedy will attain soil and groundwater objectives. The activity use restrictions will eliminate current and future unacceptable exposures to both soil and groundwater.

Control the Source of Releases: In its RCRA Corrective Action proposed remedies, USEPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the maximum extent practicable, further releases. Sampling results did not indicate localized, discernible source areas associated with the soil and groundwater conditions observed at the Site, with the possible exception of NAPL at soil boring B24-034-SB and piezometer B14-037-PZ (as described in Section 3.2.3). The control measures included in the proposed remedy, such as Materials Management Plan requirements and groundwater use restrictions, provide a mechanism to control and reduce potential further releases of COPCs. This is achieved by eliminating the potential for groundwater use and requiring proper planning for ground intrusive activities.

Balancing Criteria:

Long-Term Reliability and Effectiveness: The assessment against this criterion evaluates the long-term effectiveness of the remedy in maintaining protection of human health and the environment after the response objectives have been met. The primary focus of this criterion is the extent and effectiveness of the controls that may be required to manage the risk posed by slag aggregate, treatment residuals, and/or untreated wastes. The proposed capping remedies have been proven to be effective in the long-term at similar sites with

similar conditions. The capping remedy will permanently contain the slag aggregate and other potentially contaminated media in place.

Institutional controls will be implemented to protect future Composite and Construction Workers against inadvertent contact with potentially impacted media. The anticipated institutional controls are specified in Section 5.4. The proposed remedy will maintain protection of human health and the environment over time by controlling exposures to the hazardous constituents potentially remaining in slag aggregate or existing on-site media. The long-term effectiveness is high, as use restrictions are readily implementable and easily maintained. Given the historical, heavily industrial uses of the Site and the surrounding area, including the presence of landfills, land and groundwater use restrictions are expected to continue in the long term.

Reduction of Toxicity, Mobility, or Volume of Waste: The assessment against this criterion evaluates the anticipated performance of specific technologies that a remedial action alternative may employ. The capping remedy will prevent the spread of contaminants in wind-blown dust or stormwater and will prevent infiltration through the unsaturated zone from carrying contaminants to the groundwater. Thus, the mobility of contaminants will be reduced by the capping remedy.

Short-term Effectiveness: The assessment against this criterion examines how well the proposed remedy protects human health and the environment during the construction and implementation until response objectives have been met. This criterion also includes an estimate of the time required to achieve protection for either the entire site or individual elements associated with specific site areas or threats. The risks to the Construction Worker during remedy implementation are mitigated by executing the Modified Level D PPE requirements outlined in **Appendix C**. The short-term risk to site workers following these upgraded health and safety measures during implementation of the remedy will be low, leading to a high level of short-term effectiveness for protection of on-site workers and the environment. Short-term effectiveness in protecting on-site workers and the environment will be achieved through establishing appropriate management, construction, health and safety, and security procedures. Proper water management protocols will be implemented to prevent discharges offsite.

Implementability: The assessment against this criterion evaluates the technical and administrative feasibility, including the availability of trained and experienced personnel, materials, and equipment. Technical feasibility includes the ability to construct and operate the technology, the reliability of the technology, and the ability to effectively monitor the technology. Administrative feasibility includes the capability of obtaining permits, meeting permit requirements, and coordinating activities of governmental agencies. The

proposed capping remedy will use readily available, typically acceptable, and proven technologies.

Cost Effectiveness: The assessment against this criterion evaluates the capital costs, annual Operating and Maintenance (O&M) costs, and the net present value (NPV) of this remedy relative to alternatives. The capping remedy remedial costs would be incurred as part of the proposed site development, regardless of the findings of the SLRA or the placement of slag aggregate on the Site.

State Support / Agency Acceptance: MDE has been involved throughout the Site investigation process. The proposed use restrictions included in the proposed remedy are generally recognized as commonly employed measures for long-term stewardship. Ultimately State/MDE support will be evaluated based on comments received during the public comment period.

A capping remedy with institutional controls will satisfy the RCRA Threshold Criteria and Balancing Criteria and will do so in a manner that ensures reliable implementation and effectiveness. The remedy is cost-effective and consistent with the proposed development plan.

4.0 PROPOSED SITE DEVELOPMENT PLAN

Tradepoint Atlantic is proposing to construct a lined Stormwater Management Regional Pond on Sub-Parcel B24-1. The proposed development will include permanent improvements on approximately 16.74 acres of land within Parcel B8, Parcel B14, and Parcel B24. The proposed future use of Sub-Parcel B24-1 is Tier 3 – Industrial. The remainder of these parcels will be addressed in separate plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. The temporary stockpile area outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC. As shown on **Figure 6**, the Site will be fully capped by surface engineering controls.

Certain compounds are present in the soils located near the surface and in the subsurface at concentrations in excess of the PALs. Therefore, soil is considered a potential media of concern. Potential risks to future adult workers associated with impacts to soil and groundwater exceeding the PALs will be addressed through a remedy consisting of surface engineering controls (capping of the entire area) and institutional controls (deed restrictions). The development plan provides for a containment remedy and institutional controls that will mitigate any adult workers from contacting impacted soil at the Site. In addition, Tradepoint Atlantic has proposed the use of processed slag aggregate as the primary fill material at the Site. The placement of materials other than approved clean fill, including slag aggregate, requires the installation of surface engineering controls regardless of the existing soil conditions.

Construction Workers may contact impacted surface and/or subsurface soil during earth movement activities associated with construction activities. The findings of the Construction Worker SLRA using the selected exposure frequency for the site-wide EU (60 days) indicated the estimate of Construction Worker cancer risk was less than 1E-5 and no HI values above 1 were identified for any target organ system (the acceptable thresholds for no further action). This evaluation indicates that site-specific health and safety protocols or further action would be required only if this duration were exceeded.

Certain activities at the Site have the potential to exceed the allowable duration, and Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded PPE beyond standard Level D protection will be used in conjunction with the property-wide Health and Safety Plan (HASP) for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The Modified Level D PPE requirements which will be applied throughout this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

A restriction prohibiting the use of groundwater will be included as an institutional control in the NFA and COC issued by the MDE, and a deed restriction prohibiting the use of groundwater will

be filed. The groundwater use restriction will protect future Composite Workers from potential direct exposures. Proper water management is required to prevent unacceptable discharges or risks to Construction Workers during development. Work practices and health and safety plans governing groundwater encountered during excavation activities will provide protection for Construction Workers involved with development at the Site.

The development plan for the Site is shown on **Figure 2,** and the detailed development drawings (provided by Bohler Engineering) are included as **Appendix D**. The various types of surface engineering controls proposed to be installed on the Site are summarized on **Figure 6**. The process of constructing the Stormwater Management Regional Pond will involve the tasks listed below. Documentation of the outlined tasks and procedures will be provided in a Sub-Parcel B24-1 Development Completion Report.

4.1 RESPONSE PHASE – GROUNDWATER NETWORK ABANDONMENT

Abandonment of several groundwater monitoring wells and piezometers located within Parcel B14 will be required as part of the proposed development work. The locations of these wells and piezometers are shown on **Figure 7**. All abandonments will be completed in accordance with COMAR 26.04.04.34 through 36. Piezometers located on Parcel B24 and Parcel B8 have already been properly abandoned.

The abandonment of any permitted groundwater wells will be reported to the Water Management Administration as per COMAR 26.04.04, and records of all groundwater well and piezometer abandonments (including abandonment forms, if available) will be included in the Development Completion Report. It is understood that the agencies may require the installation of additional permanent monitoring wells in the future following site development.

Figure 7 also shows that several monitoring wells are located in Parcel B14 adjacent to the TMC and in proximity to the temporary stockpile area. As indicated, these wells will not be abandoned under this development plan. To ensure that the locations are not damaged or destroyed, these wells should be protected using sonotubes, flagging, and/or barriers as needed.

4.2 DEVELOPMENT PHASE

4.2.1 Erosion and Sediment Control Installation

Installation of erosion and sediment controls will be completed in accordance with the requirements of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control prior to any construction at the Site. Any soils which are disturbed during the installation of erosion and sediment controls will be placed on-site below the cap.

4.2.2 Grading and Site Preparation

As indicated on the development plans in **Appendix D**, grading activities including both cut and fill will occur within the Sub-Parcel B24-1 boundary. 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. Borrow materials will be obtained from MDE-approved sources and will be documented prior to transport to the Site. Fill sources shall be free of organic material, frozen material, or other deleterious material.

In the case that there is excess material (not anticipated), the spoils will be stockpiled at a suitable location in accordance with the Materials Management Plan (MMP) for the Sparrows Point Facility (Jenkins Environmental, Inc., August 17, 2021). This work will be coordinated with MDE accordingly. No excess material will leave the 3,100-acre property without prior approval from MDE.

The historic settling basins were unlined and included concrete headwalls; the headwalls are structurally sound and will remain in place. Historic Settling Basin #1 was backfilled when the WWTP was constructed (around 2002) and is under the WWTP. Historic Settling Basins #2 and 3 were taken out of service when the HCWWTP was constructed and put online in 2003. Once out of service, the settling basins were hydraulically dredged using an Ellicott hydraulic dredge and the sediment was processed through the HCWWTP system.

4.2.3 Installation of Structures and Underground Utilities

The Stormwater Management Regional Pond and associated utilities will be installed as shown on the development plans in **Appendix D**. The development plans include a storm sewer utility south of the main limit of disturbance. This utility connection will be covered by a future Limited Scope Project Plan and is not covered in this RADWP. Excavated soils may be placed on-site below the cap based on field observations by the Environmental Professional (EP). All utility trenches will be backfilled with bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils). Additional protocols for soil monitoring during the installation of utilities at the Site are provided in Section 5.1.2. Any water removed will be managed as detailed in Section 5.2.

4.2.4 Landscaping

A portion of the Site that is not capped with an impermeable liner will be covered with landscaping caps as indicated on **Figure 6**. The required minimum thicknesses of all site-wide landscaping sections which will serve as surface engineering controls are shown in the minimum capping section details provided in **Appendix E**. All landscaped areas will require a minimum of 24 inches of VCP clean fill, with a geotextile marker fabric between the VCP clean fill and the existing underlying material.

4.2.5 Paving

A portion of the Site will be paved as indicated on **Figure 6**. The paved areas will receive a layer of subbase material which will consist of compacted aggregate base, which may include processed slag aggregate sourced from the Tradepoint Atlantic property. The placement of processed slag aggregate or materials other than MDE-approved clean fill will necessitate that the Site will be subject to surface engineering controls (i.e., capping).

The required minimum thicknesses of all site-wide pavement sections which will serve as surface engineering controls are shown in the minimum capping section details provided in **Appendix E**. According to the development plans, all paved areas at the Site will be installed with a minimum of 4 inches of compacted aggregate base and a minimum of 4 inches of overlying pavement surface (asphalt), which meet these required minimum thicknesses.

4.2.6 Stormwater Management

The purpose of the development project is to construct a lined Stormwater Management Regional Pond on the Site as indicated on **Figure 6**. According to the development plans, provided as **Appendix D**, the pond will be installed with an impermeable PVC liner, or an equivalent alternative approved by the MDE, on all sides and bottom. Perforated PVC dewatering pipes will also be installed to facilitate pond drainage for maintenance purposes. The pond section will meet the minimum capping requirements as specified in **Appendix E**.

Tradepoint Atlantic is working with the MDE Industrial & General Permits Division to renew the property-wide NPDES permit. The stormwater management systems for each parcel are reviewed and approved by Baltimore County for each individual development project.

5.0 DEVELOPMENT IMPLEMENTATION PROTOCOLS

5.1 DEVELOPMENT PHASE

This plan presents protocols for the handling of soils and fill materials in association with the development of Sub-Parcel B24-1. 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.

Several exceedances of the PALs were identified in soil samples across the Site. The PALs are set based on USEPA's RSLs for industrial soils, or other direct guidance from the MDE. Because PAL exceedances 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 for material remaining on-site during the development phase. There were no locations within the proposed development boundary with soil exceedances of the special management criteria for PCBs (50 mg/kg), lead (10,000 mg/kg), or TPH (6,200 mg/kg). However, as described in Section 3.2.3, Oil & Grease PAL exceedances were observed in three soil borings (B14-011-SB, B14-034-SB and B24-037-SB). Additionally, NAPL was identified in two soil borings (B14-011-SB and B24-034-SB) and three NAPL screening piezometer (B14-011-PZ, B14-037-PZ, and B14-041-PZ). These are identified as locations of potential concern on **Figure 5**.

Following completion of the SLRA, the findings of the Construction Worker evaluation using the selected exposure frequency for the site-wide EU (60 days) indicated the estimates of Construction Worker cancer risk were less than 1E-5 and no HI values exceeded 1 for any target organ system (the acceptable thresholds for no further action). Certain activities at the Site have the potential to exceed the allowable duration; however, Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded PPE beyond standard Level D protection will be used in conjunction with the HASP for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

Based on the characterization of surface and subsurface soils and the associated SLRA findings, surface engineering controls are an acceptable remedy to be protective of potential Composite Workers who could potentially contact impacted materials at the Site. The proposed capping sections will meet the required minimum thicknesses for surface engineering controls, which are provided in **Appendix E**.

5.1.1 Erosion/Sediment Control

Erosion and sediment controls will be installed prior to commencing work in accordance with the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The erosion and sediment controls will be approved by the MDE. In addition, the following measures will be taken to prevent contaminated soil from exiting the Site:

- Stabilized construction entrance will be placed at site entrance.
- A dry street sweeper will be used as necessary on adjacent roads, and the swept dust will be collected and properly managed.

Accumulated sediment removed from silt fence, and sediment traps if applicable, shall be periodically removed and returned to the Site.

5.1.2 Soil Excavation and Utility Trenching

A pre-excavation meeting shall be held to address proper operating procedures for working on-site and monitoring excavations and utility trenching in potentially contaminated material. This meeting shall include the construction manager and the EP providing oversight on the project. During the meeting, the construction manager and the EP shall review the proposed excavation/trenching locations and any associated utility invert elevations. The construction manager will be responsible for conveying all relevant information regarding excavation/grading and/or utility work to the workers who will be involved with these activities. The HASP and PPE SOP for the project shall also be reviewed and discussed.

The Utility Excavation NAPL Contingency Plan (discussed below) must also be reviewed during the pre-excavation meeting. There were four locations identified from prior investigations with confirmed or potential presence of NAPL. Oil & Grease PAL exceedances were observed in three soil borings (B14-011-SB, B14-034-SB, and B24-037-SB). NAPL was identified in two soil borings (B14-011-SB and B24-034-SB) and three NAPL screening piezometer (B14-011-PZ, B14-037-PZ, B14-041-PZ). These locations are plotted with respect to the development plan and utilities on **Figure 5**. Soil screening will be especially important during any excavation of existing soil in these areas.

Proposed development will include cuts of approximately 10,590 cubic yards of material, mainly from the removal of the berms from the existing emergency pond. The intent is to re-use this material in the construction of the new facility, assuming that it is structurally suitable and acceptable to the MDE. Additionally, to build the berm, approximately 58,260 cubic yards of slag material from the slag reclamation process will be transferred and placed in lifts. The fill will be placed utilizing staged construction techniques and specifications in order to achieve an overall berm height of 23 feet amsl for the new berm and to meet the Dam Safety Division criteria. The elevation in the interior of the pond will be held approximately 4 feet amsl until the final phase of construction when this area will be graded, and the underdrain and the liner installed. The top of

the berm will be at 25 feet amsl, and the basin floor will be at 2 feet amsl, for a maximum berm height of 23 feet above the basin floor. The berm is proposed to be constructed from slag material with a 30-mil PVC impermeable liner. Utility trench depths will be minimized to the extent possible and will fall within a range of 2 to 6 feet below grade. **Figure 9** shows the location of Parcel B24 cross sections (**Figure 10** – **Figure 12**).

The EP will provide oversight of soil excavation/trenching activities as described in Section 5.6. Particular care and dedicated oversight will be employed when excavation occurs in the aera of B24-034-SB and B14-037-PZ, where indications of NAPL have been identified. This phase of the basin work will take place when berm installation and settlement is complete, approximately 18 months after work commences. Soil excavation/trenching will occur during various phases of construction. In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the Site, with the possible exception of the potentially NAPL-impacted materials described above (if encountered). The EP will monitor the soil excavation activities for signs of significantly contaminated material which may not be suitable for reuse (as described below). The EP will also be responsible for monitoring organic vapor concentrations in the worker breathing zone within utility trenches and excavations to determine whether any increased level of health and safety protection is required.

To the extent practical, all excavation activities should be conducted in a manner to minimize double or extra handling of materials. Stockpiles will be kept 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. Soil designated for replacement on-site which does not otherwise exhibit evidence of contamination (as determined by the EP) may be managed in large stockpiles (no size restriction) as long as they remain within the erosion and sediment controls.

All utility trenches will be backfilled with bedding and backfill materials approved by the MDE. A general utility cross section is provided as **Appendix F**. Additional preventative measures will be required if evidence of petroleum contamination is encountered, to prevent the discharge to, or migration of, petroleum product along a utility conduit. Contingency measures have been developed to ensure that utilities will be constructed in a manner that will prevent the migration of any encountered NAPL, and that excavated materials will be properly managed. The Utility Excavation NAPL Contingency Plan (**Appendix G**) provides protocols to be followed if NAPL is encountered during the construction activities. Preventative measures to inhibit the spread of petroleum product will be conducted in accordance with this plan.

The EP will monitor all soil excavation and utility trenching activities for signs of potential contamination. In particular, soils will be monitored with a hand-held photoionization detector (PID) for potential VOCs and will also be visually inspected for the presence of staining, petroleum

waste materials, or other indications of significant contamination. 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.

Excavated material exhibiting evidence of significant contamination (including NAPL) shall be placed in stockpiles (not to exceed 500 cubic yards) on polyethylene sheeting and covered with polyethylene sheeting to minimize potential exposures and erosion when not in use. Materials stockpiled due to evidence of contamination will be sampled in accordance with reuse and/or waste disposal requirements. If not suitable for reuse, the material will be disposed of onsite at Greys Landfill or at an appropriate offsite permitted disposal facility. Plans for analysis of segregated soils for any use other than disposal must be submitted to the MDE for approval. The quantities of all materials that require disposal, if any, will be recorded and identified in the Development Completion Report.

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 indications of potential contamination shall be sampled and analyzed to determine how the materials should be managed. If excavated and stockpiled, such materials should be covered with a polyethylene tarp or equivalent to minimize potential exposures and erosion. All stockpiled soil may be considered for use as fill at this Site or on other areas of the property depending on the analytical results. A summary of sampling results, including a description of the material, estimated volume, and sampling parameters will be submitted to the MDE for approval to determine the suitability of the material for reuse. If the MDE determines that the materials are unsuitable for reuse, the materials will be sampled to determine if they require regulated disposal.

Soil material may be taken to an appropriate non-hazardous landfill (including Greys Landfill) for proper disposal if the concentrations of excavated sampled materials indicate that the materials are not hazardous, but still are not suitable for reuse. Soil material that is determined to be a hazardous waste shall be shipped off-site in accordance with applicable regulations to an appropriate and permitted RCRA disposal facility. The quantities of all materials that require disposal, if any, will be recorded and identified in the Development Completion Report.

5.1.4 Fill

Materials approved by the MDE for industrial use will be used as structural fill. The Site will be capped by surface engineering controls. Soil excavated on the sub-parcel has been determined to be suitable for re-use at the Site below the surface engineering controls, unless such materials are determined by the EP/MDE to be unsuitable for use as outlined in Section 5.1.2 and Section 5.1.3.

Historic Settling Basin #1 was backfilled when the WWTP was constructed. Historic Settling Basins #2 and 3 will be backfilled with VCP clean fill material. Any soft material generated during the backfill operations will be removed from the basins and stockpiled on site. The material will be tested for reuse and the results will be submitted to the MDE. If not acceptable for reuse, the material will be landfilled at Greys Landfill.

All utility trenches will be backfilled with bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils). Any utility backfill which will extend into the cap (i.e., top 2 feet of backfill in landscaped areas) must meet the VCP clean fill requirements, and a geotextile marker fabric will be placed between the VCP clean fill and any underlying material. A general utility detail drawing is provided as **Appendix F**. Material imported to the Site will be screened according to MDE guidance for suitability.

5.1.5 Dust Control

General construction operations, including soil excavation and transport, and trenching for utilities will be performed at the Site. These activities are anticipated to be performed in areas of soil impacted with COPCs. Best management practices should be undertaken at the Sparrows Point property as a whole to prevent the generation of dust which could impact other areas of the property outside of the immediate work zone. To limit worker exposure to contaminants borne on dust and windblown particulates, dust monitoring will be performed in the immediate work zone and at the upwind and downwind perimeter of the Site, and dust control measures will be implemented if warranted based on the monitoring results. The action level proposed for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) during the development activities at the 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.

The EP will be responsible for the dust monitoring program. Air monitoring will be performed using Met One Instruments, Inc. E-Sampler dust monitors or equivalent real-time air monitoring devices. The EP will set-up dust monitoring equipment at the outset of ground intrusive work or other dust-generating activities, and continuous dust monitoring will be performed during this work. In addition to work area monitoring, a dust monitor will be placed at selected perimeter locations that will correspond to the upwind and downwind boundaries based on the prevailing wind direction predicted for that day. The prevailing wind direction will be assessed during the day, and the positions of the perimeter monitors will be adjusted if there is a substantial shift in the prevailing wind direction.

Once all dust-generating activities are complete (which may occur at a later stage of the project once ground intrusive work has been completed or after the Site has been capped), the dust monitoring program may be discontinued. If additional dust-generating activities commence, additional dust monitoring activities will be performed.

If sustained dust concentrations exceed the action level (3.0 mg/m³) at any of the monitoring locations as a result of conditions occurring at the Site, operations will be stopped temporarily until dust suppression can be implemented. Operations may be resumed once monitoring indicates that dust concentrations are below the action level. The background dust concentration will be utilized to evaluate whether Site activities are the source of the action level exceedance. The background dust concentration will be based on measurements over a minimum of a 1-hour period at the upwind Site boundary. The upwind data will be used to calculate a time weighted average background dust concentration. As noted above, the locations of the perimeter dust monitors may be adjusted periodically if there is a substantial shift in the prevailing wind direction.

As applicable, air monitoring will be conducted during development implementation activities 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 at the upwind and downwind Site boundaries to ensure contaminants are not migrating off-site. The concentration measured at the downwind perimeter shall not exceed the action level of 3.0 mg/m³, unless caused by background dust from upwind of the Site. If exceedances of the action level are identified downwind for more than five minutes, the background dust concentration shall be evaluated to determine whether the action level exceedances are attributable to Site conditions. If on-site activities are the source of the exceedances, dust control measures and additional monitoring will be implemented. The dust suppression measures may include wetting or misting using a hose connected to a water supply or a water truck stationed at the Site.

Dust control measures will be implemented as described above to address dust generated as a result of construction activities conducted at the Site. However, based on the nature of the area and/or ongoing 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 area. A pre-construction meeting will be held to discuss the potential of windblown particulates from other activities impacting the air monitoring required for this RADWP. Site contact information will be provided to address the possibility of upwind dust impacts. If sustained dust is observed above the action level (3.0 mg/m³) and it is believed to originate from off-site (i.e., upwind) sources, this will immediately be reported to TPA and the MDE-VCP team, as well as the MDE Air and Radiation Administration (ARA).

5.2 WATER MANAGEMENT

This plan presents the protocols for handling any groundwater or surface water that needs to be removed to facilitate construction of the proposed Sub-Parcel B24-1 development.

5.2.1 Groundwater PAL Exceedances

Groundwater samples were collected during the preceding Phase II Investigations from six temporary groundwater sample collection points (piezometers) and one permanent monitoring well within and surrounding the Site. Aqueous PAL exceedances in groundwater in the vicinity of the Site included both inorganic and organic compounds. The aqueous PAL exceedances obtained during the preceding Phase II Investigations are summarized on **Figure GW1** through **Figure GW4**.

While the concentrations of PAL exceedances are not deemed to be a significant human health hazard for potential future workers since there is no on-site groundwater use which could lead to direct exposures, proper water management is required during construction to prevent unacceptable discharges or risks to Construction Workers.

5.2.2 Dewatering

Dewatering may be necessary during pond construction or the installation of underground utilities and within excavations/trenches. **Figure 8** displays the groundwater elevations underlying the Site for the shallow aquifer zone, based on prior investigation data. Any dewatering shall be done in accordance with all local, state, and federal regulations. Water that collects in excavations/trenches due to intrusion of groundwater, stormwater, and/or dust control waters will be transported to the HCWWTP. The water will be treated and discharged in accordance with NPDES Permit No. 90-DP-0064A; I. Special Conditions; A.4; Effluent Limitations and Monitoring Requirements.

It is the intent to take any water removed from the site and put it in the TMC by pumping or truck where it will be treated at the HCWWTP. Prior to removal, the dewatering fluids will be evaluated and then tested (if required) pursuant to the HCWWTP Constituent Threshold Limits for Dewatering Activities related to Remediation, Development, and Capping Protocol. If the groundwater does not meet the constituent threshold limits specified in the protocol, the groundwater will be pre-treated. The HCWWTP discharges to Bear Creek. Any water discharged to the TMC will be pumped through a filter bag or equivalent to remove suspended solids prior to discharge.

Note that additional analyses could be required if warranted based on field observations by the EP. The EP will inspect any water that collects in the excavations/trenches. If the water exhibits indications of significant contamination (sheen, odor, discoloration, presence of product), the water may be sampled and analyzed for some or all of the analyses listed below. In such case, the analyses run will be dependent on the suspected source of contamination and local site conditions.

The results of the analyses will be reviewed by the HCWWTP operator to determine if any wastewater treatment system adjustments are necessary. If the results of the analyses are above the threshold levels listed below, the water will be further evaluated to confirm acceptable

treatment at the HCWWTP, or will be evaluated to design an appropriate pre-treatment option. Alternatively, the water may be disposed of at an appropriate off-site facility.

Analysis	Threshold Levels
• Total metals by USEPA Method 6020A	1,000 ppm
• PCBs by USEPA Method 8082	>Non-Detect
• SVOCs by USEPA Method 8270C	1 ppm
• VOCs by USEPA Method 8260B	1 ppm
• Oil & Grease by USEPA Method 1664	200 ppm
• TPH-DRO by USEPA Method 8015B	200 ppm
• TPH-GRO by USEPA Method 8015B	200 ppm

Documentation of any water testing, as well as the selected disposal option, will be reported to the MDE in the Development Completion Report. Any permits or permit modifications related to dewatering will be provided to the agencies as addenda to this RADWP.

5.3 HEALTH AND SAFETY

A property-wide HASP has been developed and is provided with this RADWP (as an electronic attachment) to present the minimum requirements for worker health and safety protection for all development projects. All contractors working on the Site must prepare their own HASP that provides a level of protection at least as protective as that provided by the property-wide HASP. Alternately, on-site contractors may elect to adopt the HASP provided.

General health and safety controls (level D protection) are adequate to mitigate potential risk to Construction Workers for a duration of up to 60 days. Certain activities at the Site have the potential to exceed the allowable duration. Modified Level D PPE will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. Health and safety controls outlined in the HASP and PPE SOP will mitigate any potential risk to Construction Workers from contacting impacted soil and groundwater during development. The modified Level D PPE requirements planned for this development project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**. The EP will be responsible for monitoring organic vapor concentrations in the worker breathing zone within utility trenches and excavations to determine whether any increased level of safety protection (including engineering controls and/or PPE) is required.

Prior to commencing work, the contractor must conduct an on-site safety meeting for all personnel. All personnel must be made aware of the HASP and the PPE SOP. Detailed safety information shall be provided to personnel who may be exposed to COPCs. Workers will be responsible for following established safety procedures to prevent contact with potentially contaminated material.

5.4 INSTITUTIONAL CONTROLS (FUTURE LAND USE CONTROLS)

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

- A restriction prohibiting the use of groundwater for any purpose at the Site and a requirement to characterize, containerize, and properly dispose of groundwater in the event of deep excavations encountering groundwater.
- Notice to the MDE at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy (i.e., through the pond liner or marker fabric in landscaped areas).
- Notice to the USEPA at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy, only if the proposed duration of ground intrusive activity would exceed the allowable exposure duration determined in the SLRA and the contractor will not use the modified Level D PPE specified in the approved SOP.
- Requirement for a HASP in the event of any future excavations at the Site.
- Complete appropriate characterization and disposal of any material excavated/pumped at the Site in accordance with applicable local, state, and federal requirements.
- Implementation of inspection procedures and maintenance of the containment remedies.

The owner/operator will file the above deed restrictions as defined by the MDE-VCP in the NFA and COC.

5.5 POST REMEDIATION REQUIREMENTS

Post remediation requirements will include compliance with the conditions specified in the NFA, COC, and the deed restrictions recorded for the Site. Deed restrictions will be recorded within 30 days after receipt of the final NFA. In addition, the MDE and USEPA will be provided with a written notice of any future excavations (as applicable) in accordance with the requirements given in Section 5.4. Written notice of planned excavation activities will include the proposed date(s) for the excavation, location of the excavation, health and safety protocols (as required), clean fill source (as required), and proposed characterization and disposal requirements. Written notice may consist of email correspondence and/or hard copy correspondence.

Additional requirements will include inspection procedures and maintenance of the containment remedies to minimize degradation which could lead to future exposures. An Operations and Maintenance Plan (O&M Plan) will be submitted for MDE approval. This O&M Plan will include long-term inspection and maintenance requirements for the capped areas of the Site. The responsible party will perform cap inspections, perform maintenance of the cap, and retain inspection records, as required by the O&M Plan.

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 RADWP.

The EP will monitor all soil excavation and utility trenching activities for signs of contamination that may indicate materials that are not suitable for reuse. In particular, soils will be monitored with a hand-held PID for potential VOCs, and will also be visually inspected for staining, petroleum waste materials, or other indications of significant contamination. 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 (as described in Section 5.1.2; Soil Excavation and Utility Trenching). The EP will also perform routine periodic breathing zone monitoring and PPE spot checks during ground intrusive activities. The EP will also inspect any water that collects in the excavations/trenches on an as-needed basis to coordinate appropriate sampling prior to disposal (as described in Section 5.2.2; Dewatering).

Daily inspections, as necessary, will be performed during general site grading and cap construction activities to verify that appropriate fill materials are being used (as described in Section 5.1.4; Fill), dust monitoring and control measures are being implemented as appropriate (as described in Section 5.1.5; Dust Control), the requirements of the HASP and the PPE SOP are being enforced as applicable (as described in Section 5.3; Health and Safety), and surface engineering controls are being installed with the appropriate thicknesses (shown on the RADWP attachments). Oversight by an EP will not be required during construction activities which do not have a significant environmental component, such as above-grade construction.

Records will be developed by the EP to document:

- Compliance with soil screening requirements
- Proper water management, including documentation of any testing and water disposal
- Observations of construction activities during site grading and cap construction
- Proper cap thickness and construction

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. TPA submitted a Joint Permit Application (JPA) for the retention basin to MDE and USACE. The MDE Dam Safety Program has also reviewed the project. Any permits or permit modifications from State or local authorities will be provided as addenda to this RADWP.

A grading permit is required if the proposed grading disturbs over 5,000 square feet of surface area or over 100 cubic yards of earth. A grading permit is required for any grading activities in any watercourse, floodplain, wetland area, buffers (stream and within 100 feet of tidal water), habitat protection areas or forest buffer areas (includes forest conservation areas). Erosion and Sediment Control Plans will be submitted to, and approved by, the MDE prior to initiation of land disturbance for development. TPA is also working with multiple county departments, including the Baltimore County Department of Environmental Protection and Sustainability, the Baltimore County Department of Environmental Impact Review, the Baltimore County Department of Parks and Recreation, the Baltimore County Department of Permits, Approvals, and Inspections, to obtain reviews and approvals of grading plans and permits, stormwater management plans and permits, critical area approvals, and Forest Conservation Approval.

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.

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

3. Modified Level D PPE will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project are outlined in the PPE SOP provided as **Appendix C**. If it is not possible to implement the PPE SOP as provided, the agencies will be notified and a RADWP Addendum will be submitted to detail any appropriate mitigative measures.

7.0 IMPLEMENTATION SCHEDULE

Progress reports will be submitted to the MDE on a quarterly basis. Each quarterly progress report will include, at a minimum, a discussion of the following information regarding tasks completed during the specified quarter:

- Development Progress
- Dust Monitoring
- Water Management
- Soil Management (imported materials, screening, stockpiling)
- Soil Sampling and Disposal
- Notable Occurrences (if applicable)
- Additional Associated Work (if applicable)

The proposed implementation schedule is shown below:

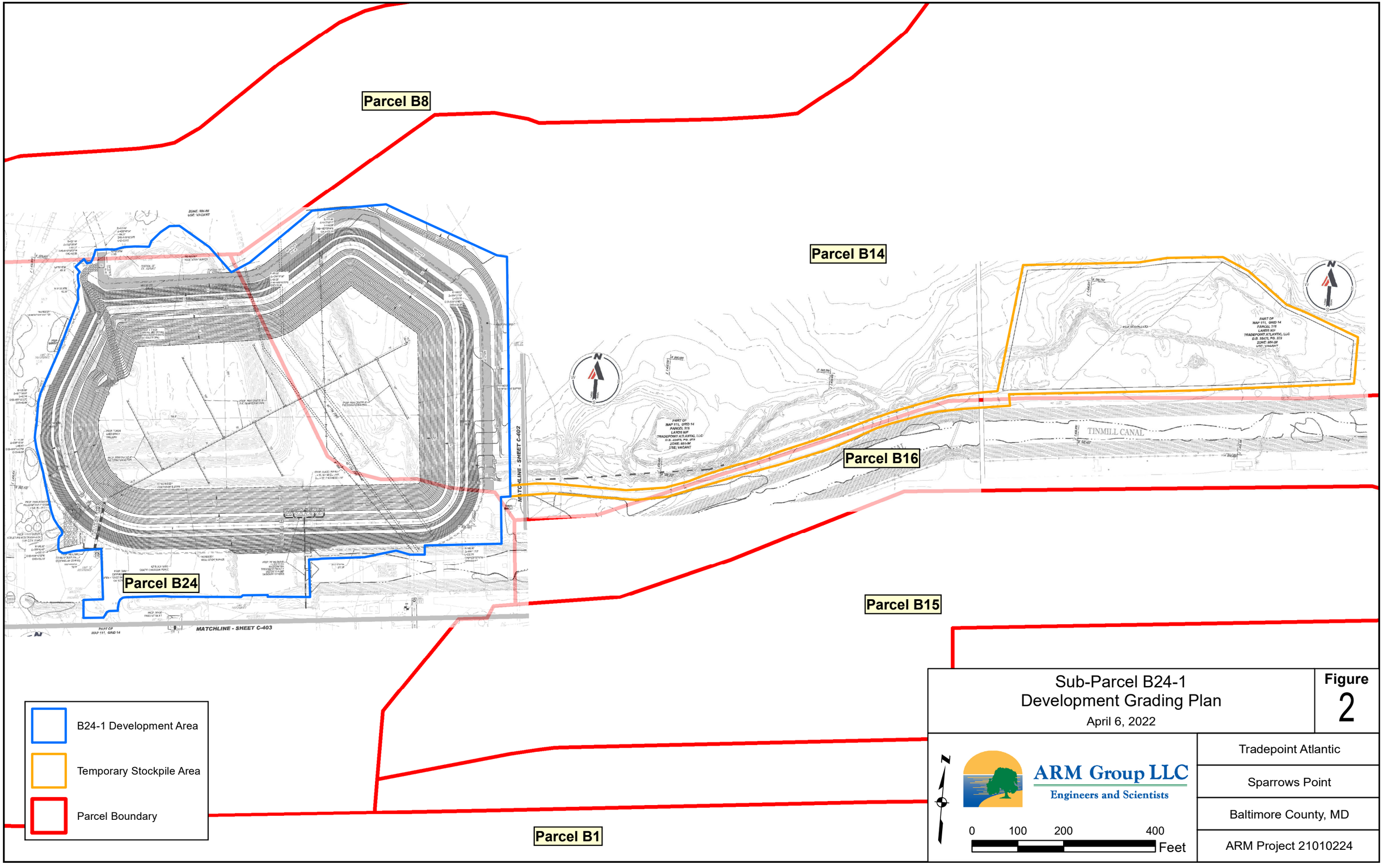
Task	**Proposed Completion Date**
Anticipated RADWP Approval	May 2022
Response:	
Groundwater Network Abandonments	November 2022
Development:	
Installation of Erosion and Sediment Controls	June 2022
Site Preparation	June 2022
Site Grading	June 2022
Berm Phased Placement and Settlement	
Phase 1	August 2022
Phase 2	June 2023
Phase 3	January 2024
Utility Installations	August 2023
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	May 2024

Request for NFA from the MDE	May 2024

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

FIGURES


B24-1 Development Area
Site Boundary
Parcel Boundaries
Private Property
Parcel A9
Parcel A13
Parcel A5
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A4
Parcel A10
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B21
Parcel B22
B24-1
Parcel B16
Parcel B15
Parcel B24
Parcel B23
Parcel B7
Parcel B25
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Source: Esri, IGN, and the
Tradepoint Atlantic
Area A and Area B Parcels
April 7, 2022
Figure
1
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 210101
Area B: Project 210102



Sub-Parcel B24-1
Development Grading Plan
April 6, 2022

Figure
2

ARM Group LLC
Engineers and Scientists

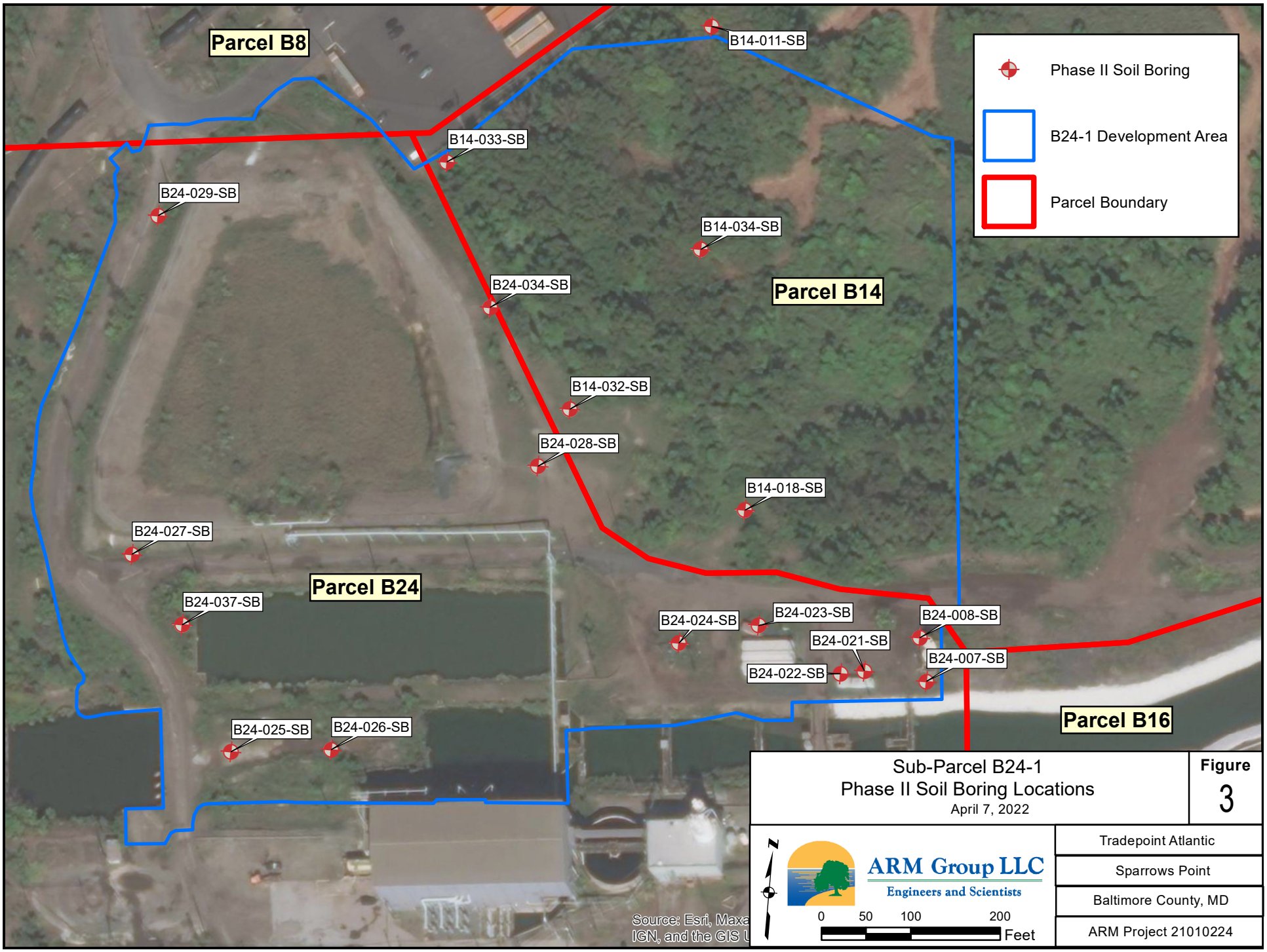
0 100 200 400
Feet

Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 21010224

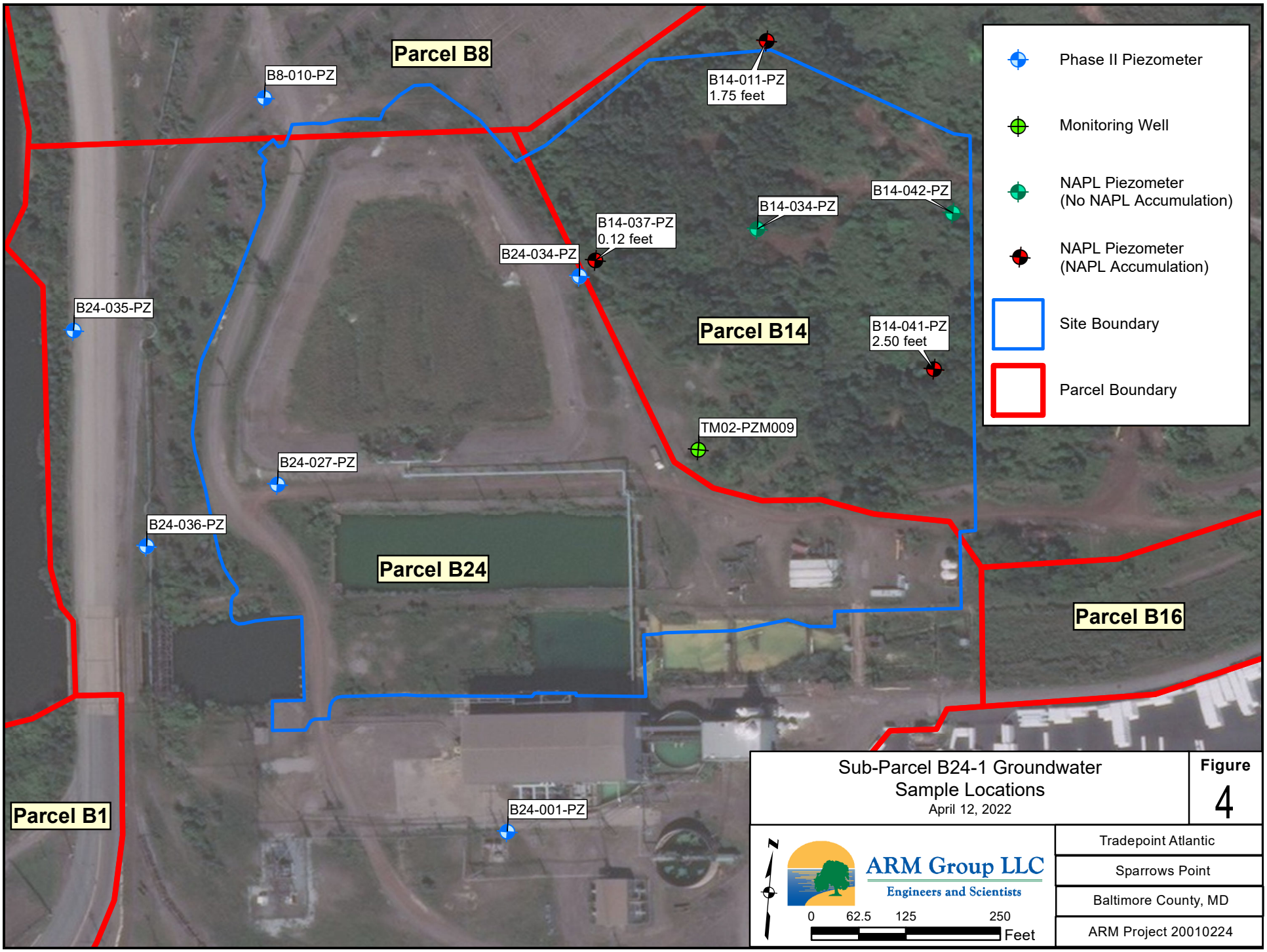


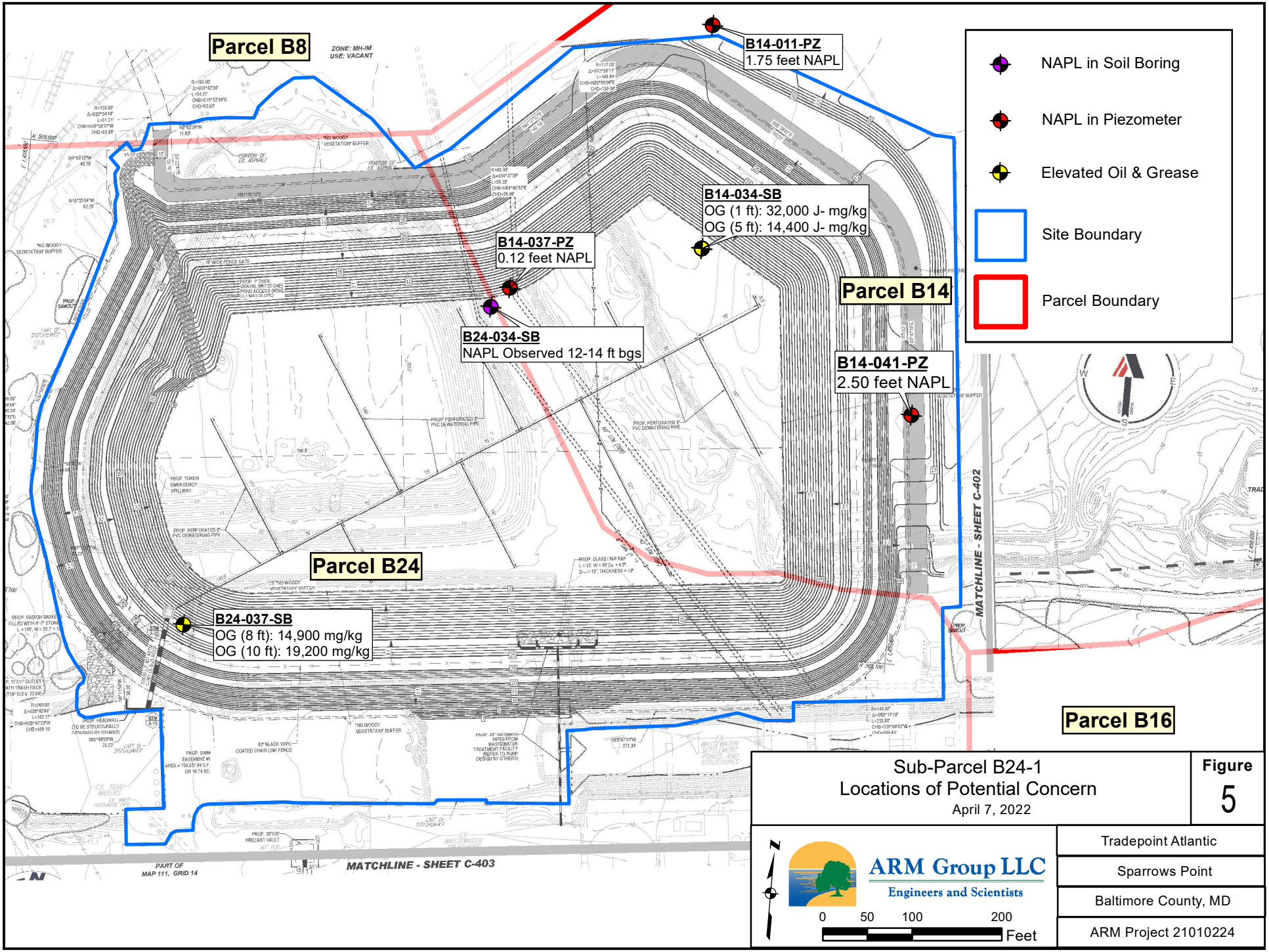
Sub-Parcel B24-1
Phase II Soil Boring Locations
April 7, 2022

Figure 3

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224


Parcel B8
B8-010-PZ
B14-011-PZ
1.75 feet
B14-042-PZ
B14-034-PZ
B14-037-PZ
0.12 feet
B24-034-PZ
B24-035-PZ
Parcel B14
B14-041-PZ
2.50 feet
TM02-PZM009
B24-027-PZ
B24-036-PZ
Parcel B24
Parcel B16
Parcel B1
B24-001-PZ
Phase II Piezometer
Monitoring Well
NAPL Piezometer
(No NAPL Accumulation)
NAPL Piezometer
(NAPL Accumulation)
Site Boundary
Parcel Boundary
Sub-Parcel B24-1 Groundwater
Sample Locations
April 12, 2022
Figure
4
ARM Group LLC
Engineers and Scientists
0
62.5
125
250
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010224

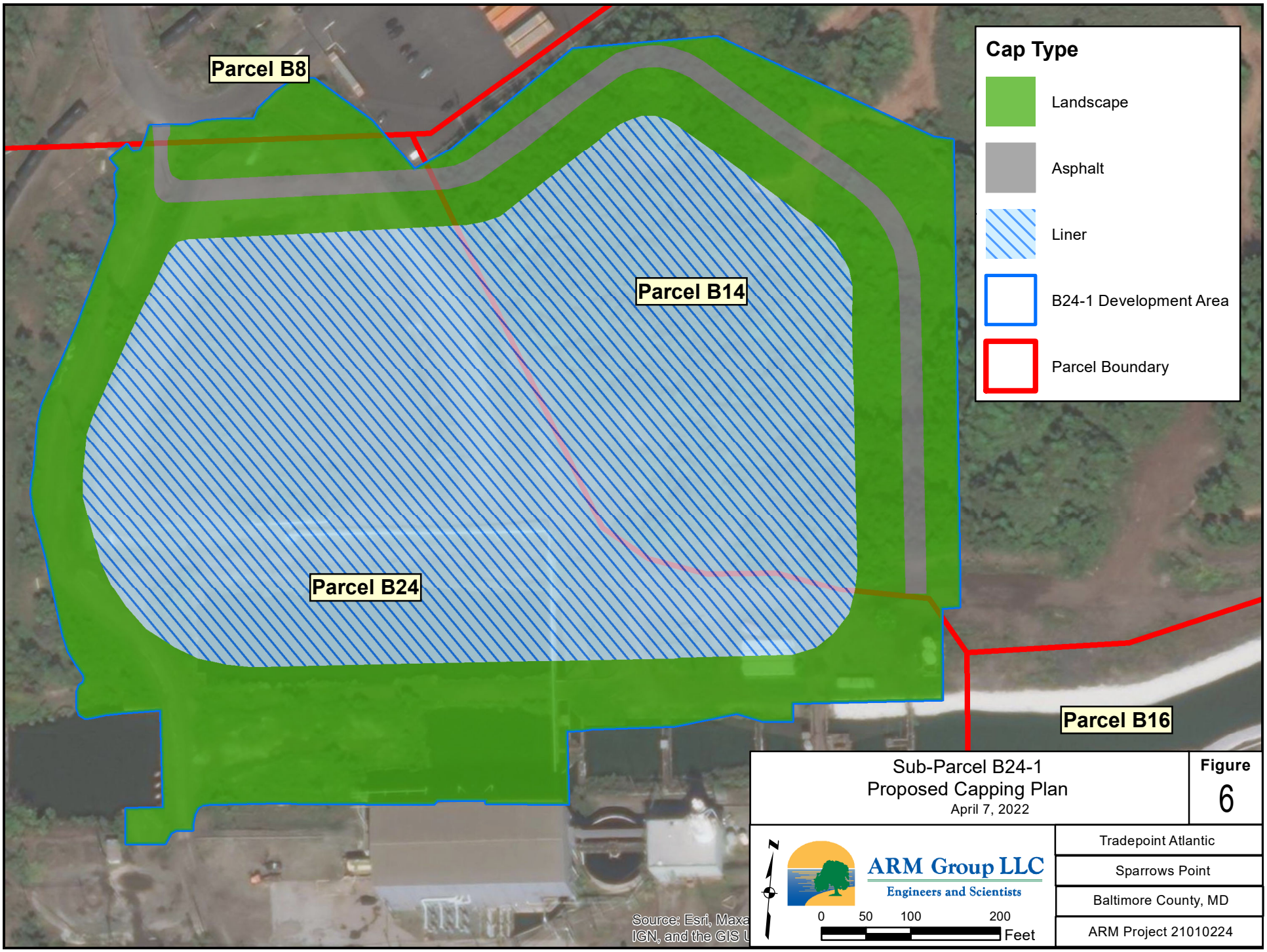


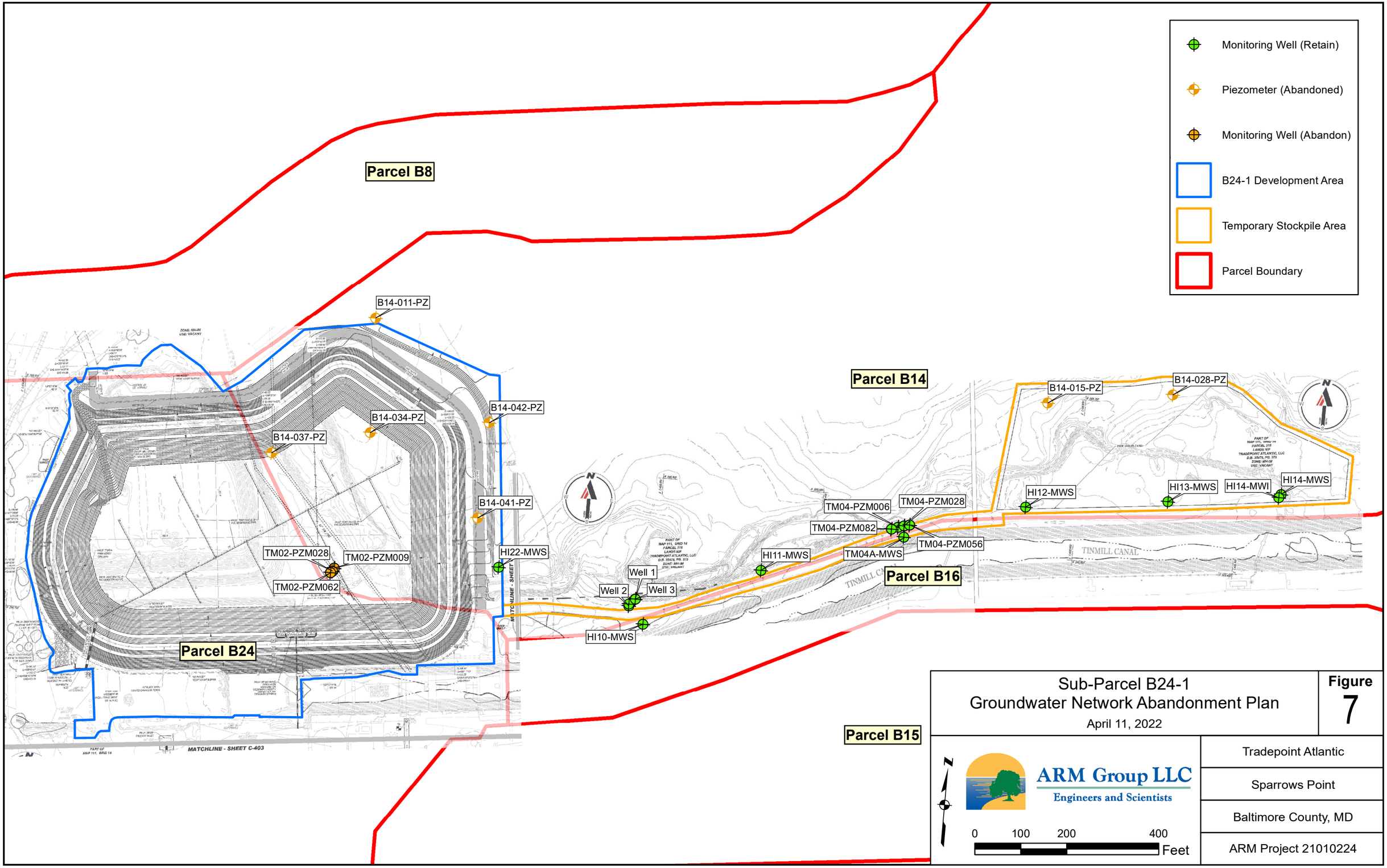
Sub-Parcel B24-1
Locations of Potential Concern
April 7, 2022

Figure 5

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224


Parcel B8
Parcel B14
Parcel B24
Parcel B16
Cap Type
Landscape
Asphalt
Liner
B24-1 Development Area
Parcel Boundary
Source: Esri, Maxa
IGN, and the GIS U
Sub-Parcel B24-1
Proposed Capping Plan
April 7, 2022
Figure
6
ARM Group LLC
Engineers and Scientists
0 50 100 200
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224

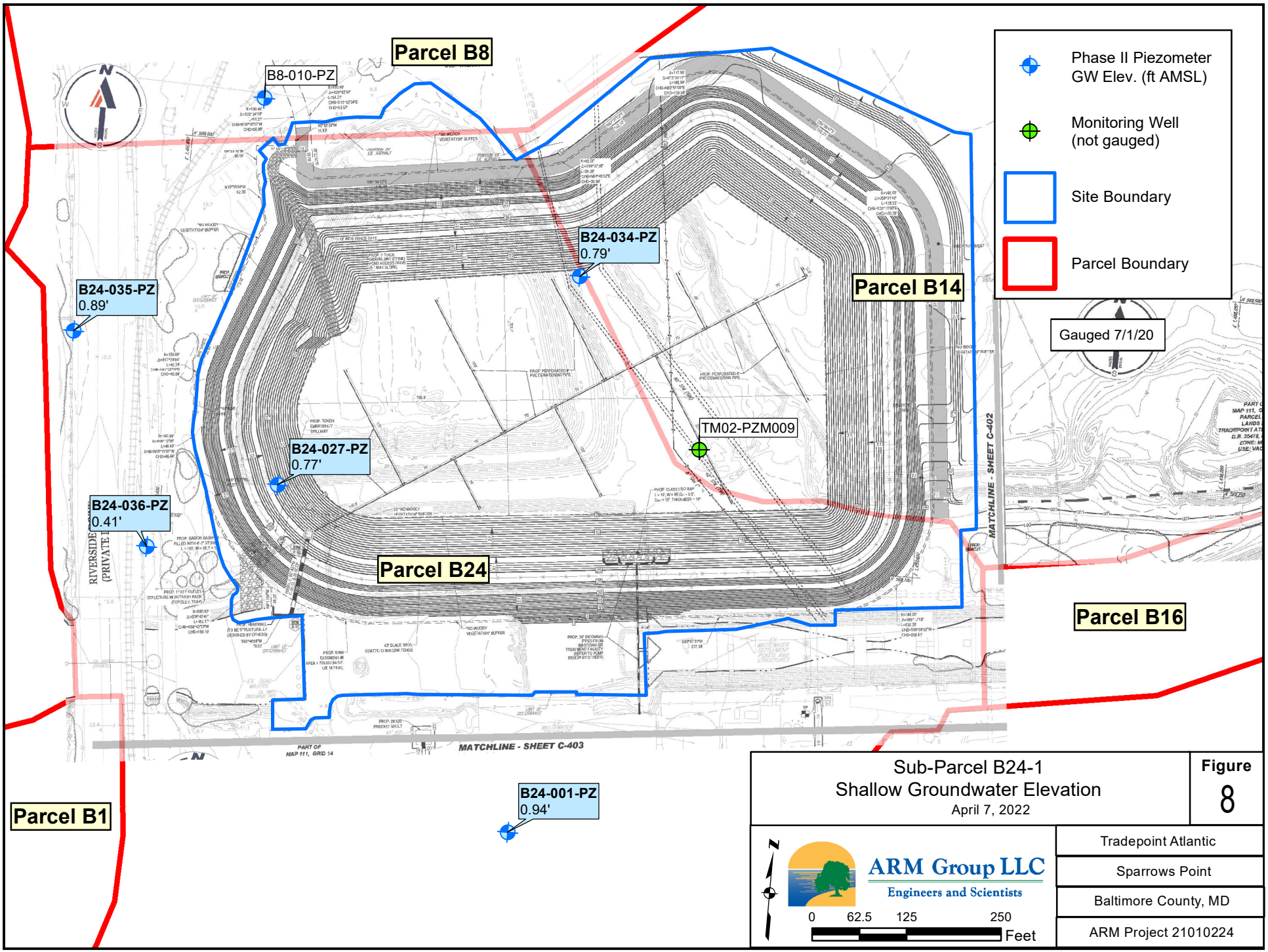


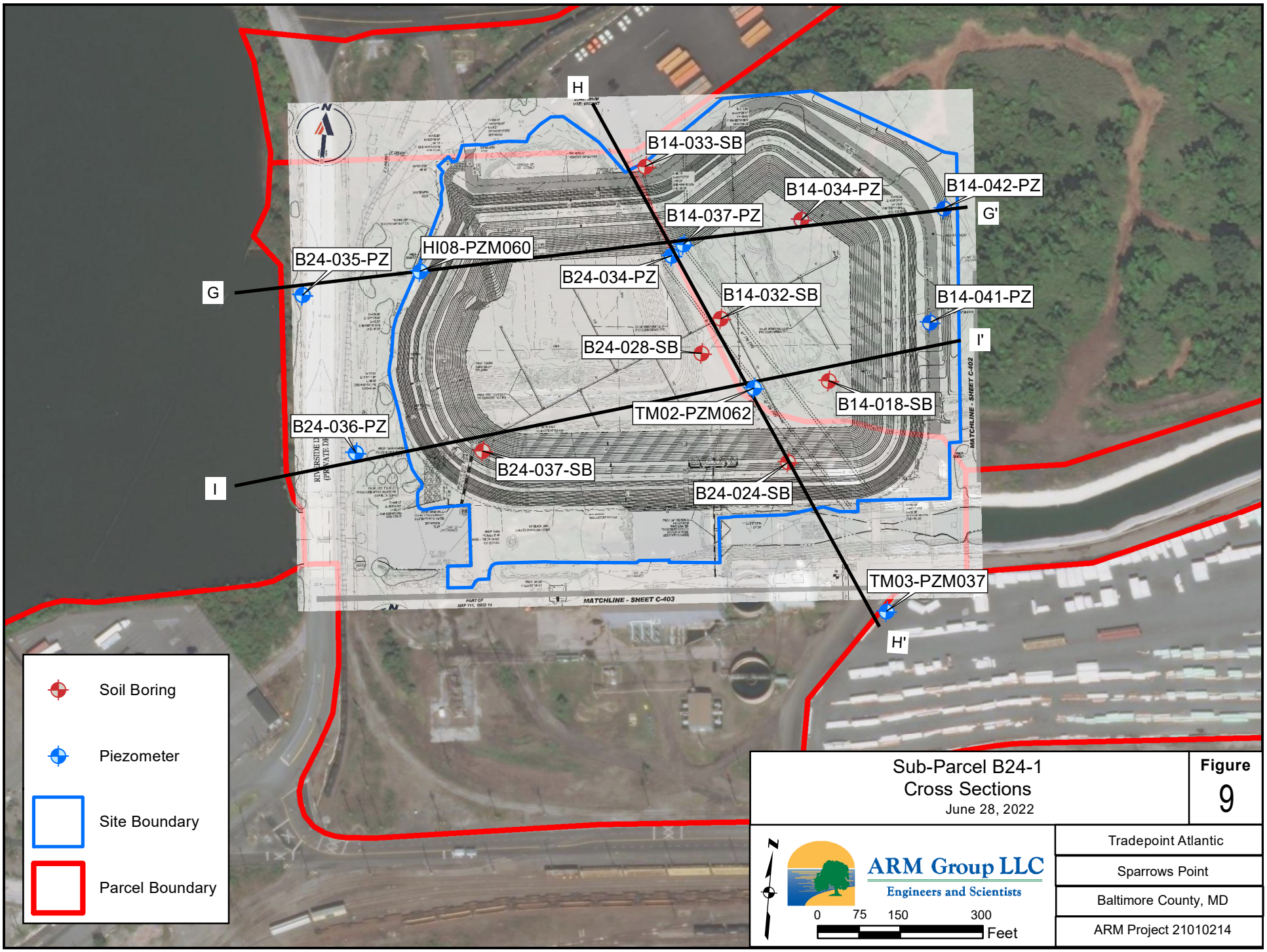
Sub-Parcel B24-1
Groundwater Network Abandonment Plan
April 11, 2022

Figure 7

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224


Parcel B8
B8-010-PZ
B24-034-PZ
0.79'
B24-035-PZ
0.89'
Parcel B14
Gauged 7/1/20
TM02-PZM009
B24-027-PZ
0.77'
B24-036-PZ
0.41'
Parcel B24
Parcel B16
Parcel B1
B24-001-PZ
0.94'
MATCHLINE - SHEET C-402
MATCHLINE - SHEET C-403
RIVERSIDE (PRIVATE)
Phase II Piezometer GW Elev. (ft AMSL)
Monitoring Well (not gauged)
Site Boundary
Parcel Boundary
Sub-Parcel B24-1
Shallow Groundwater Elevation
April 7, 2022
Figure
8
ARM Group LLC
Engineers and Scientists
0 62.5 125 250
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224


H
B14-033-SB
B14-034-PZ
B14-042-PZ
G'
B14-037-PZ
HI08-PZM060
B24-035-PZ
G
B24-034-PZ
B14-032-SB
B14-041-PZ
I'
B24-028-SB
B14-018-SB
TM02-PZM062
B24-036-PZ
I
B24-037-SB
B24-024-SB
TM03-PZM037
H'
MATCHLINE - SHEET C-403
MATCHLINE - SHEET C-402
Soil Boring
Piezometer
Site Boundary
Parcel Boundary
Sub-Parcel B24-1
Cross Sections
June 28, 2022
Figure
9
ARM Group LLC
Engineers and Scientists
0 75 150 300
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010214

G (west)

G' (east)

B24-035-SB/PZ

HI08-PZM

B24-034-SB/PZ

B14-037-SB/PZ

B14-034-SB

B14-042-SB/PZ

Proposed Final Grade

Approximate Original Creek Bottom Elevation

Elevation (feet)

DISTANCE (feet)

Tradepoint Atlantic
Sparrows Point, MD
ARM Project 21010214

Figure 10

Geologic Cross section

Section G-G'

ARM Group LLC
Engineers and Scientists

LEGEND

- Fill - Slag Gravel
- Fill - Sand
- Fill - Silt/Clay
- Sand
- Silt/Clay
- NAPL Sheen in Soil
- Shallow Well Groundwater Elevation
- NAPL in Well

10-05-2021 P:\EnviroAnalytics Group\20010224 EAG Parcel B24\Cross Sections\A-A' .cro

H (northwest)

H' (southeast)

B14-033-SB

B14-037-SB/PZ

B14-032-SB
B24-028-SB

TM02-PZM

B24-024-SB

TM03-PZM

Proposed Final Grade

Approximate Original Creek Bottom Elevation

Elevation (feet)

40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

0
100
200
300
400
500
600
700
800
900
1000
1100

DISTANCE (feet)

Tradepoint Atlantic
Sparrows Point, MD
ARM Project 21010214

ARM Group LLC
Engineers and Scientists

Figure 11

Geologic Cross section

Section H-H'

LEGEND

- Fill - Slag Gravel
- Fill - Sand
- Fill - Silt/Clay
- Sand
- Silt/Clay
- NAPL Sheen in Soil
- Shallow Well Groundwater Elevation
- Intermediate Well Groundwater Elevation
- NAPL in Well

10-01-2021 P:\EnviroAnalytics Group\20010224 EAG Parcel B24\Cross Sections\B-B'.cro

I (west)

I' (east)

B24-036-SB/PZ

B24-037-SB

TM02-PZM

B14-018-SB

B14-041-SB/PZ

Proposed Final Grade

Approximate Original Creek Bottom Elevation

Elevation (feet)

40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400

DISTANCE (feet)

Tradepoint Atlantic
Sparrows Point, MD
ARM Project 21010214

ARM Group LLC
Engineers and Scientists

Figure 12

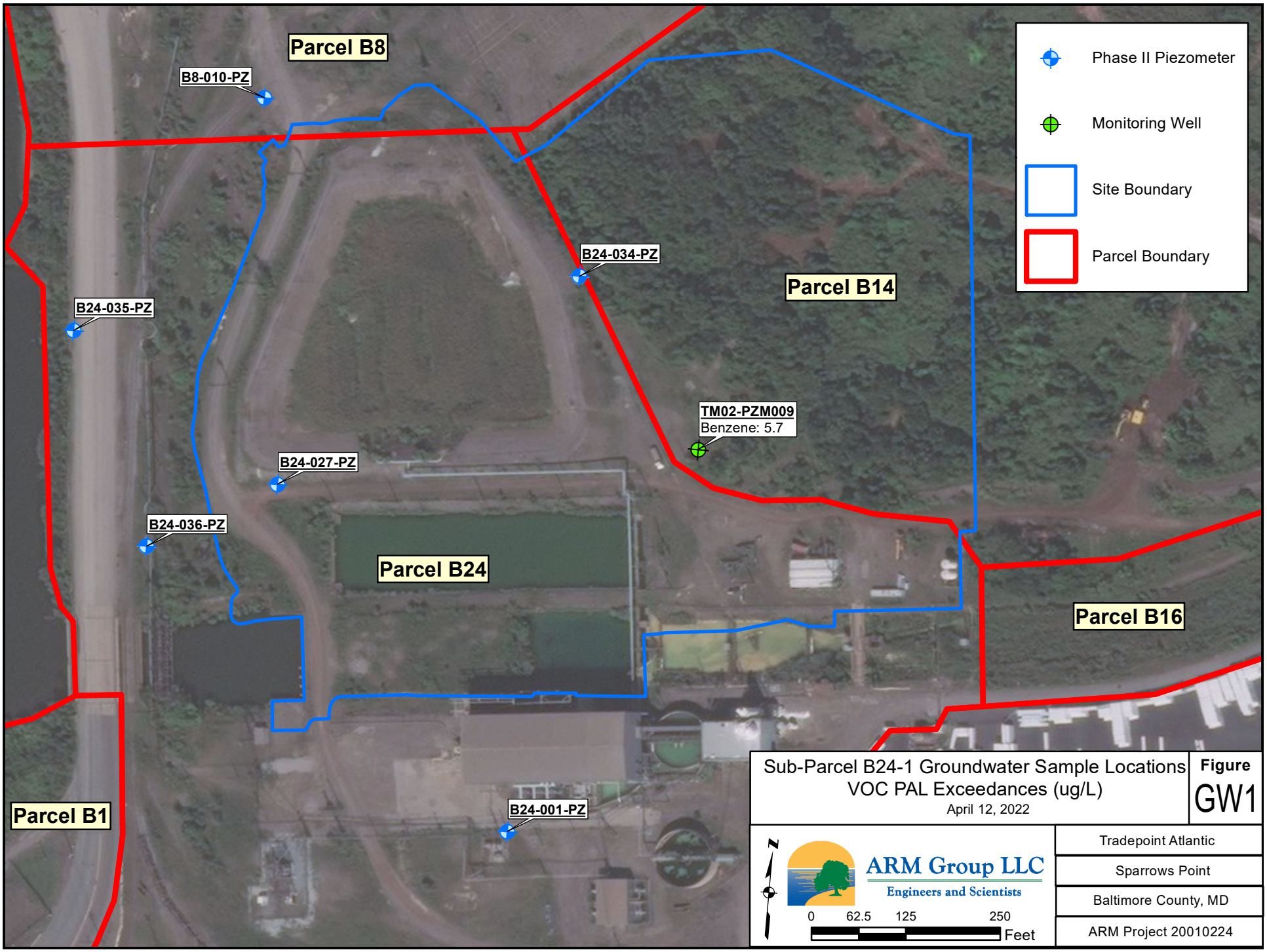
Geologic Cross section

Section I-I'

LEGEND

- Fill - Slag Gravel
- Fill - Sand
- Fill - Silt/Clay
- Sand
- Silt/Clay
- NAPL Sheen in Soil
- Shallow Well Groundwater Elevation
- Intermediate Well Groundwater Elevation
- NAPL in Well

09-30-2021 P:\EnviroAnalytics Group\20010224 EAG Parcel B24\Cross Sections\C-C'.cro



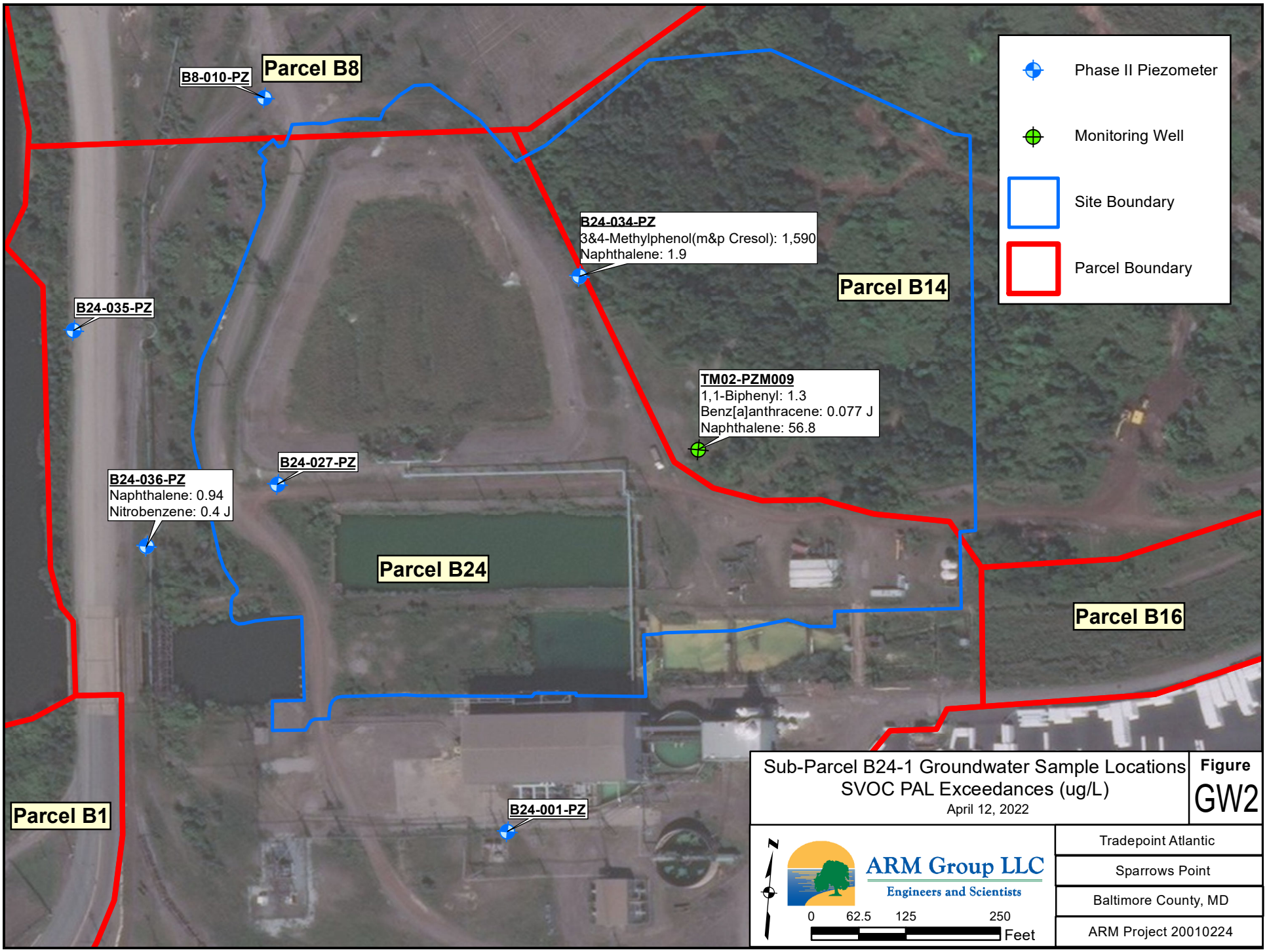
Sub-Parcel B24-1 Groundwater Sample Locations
VOC PAL Exceedances (ug/L)
April 12, 2022

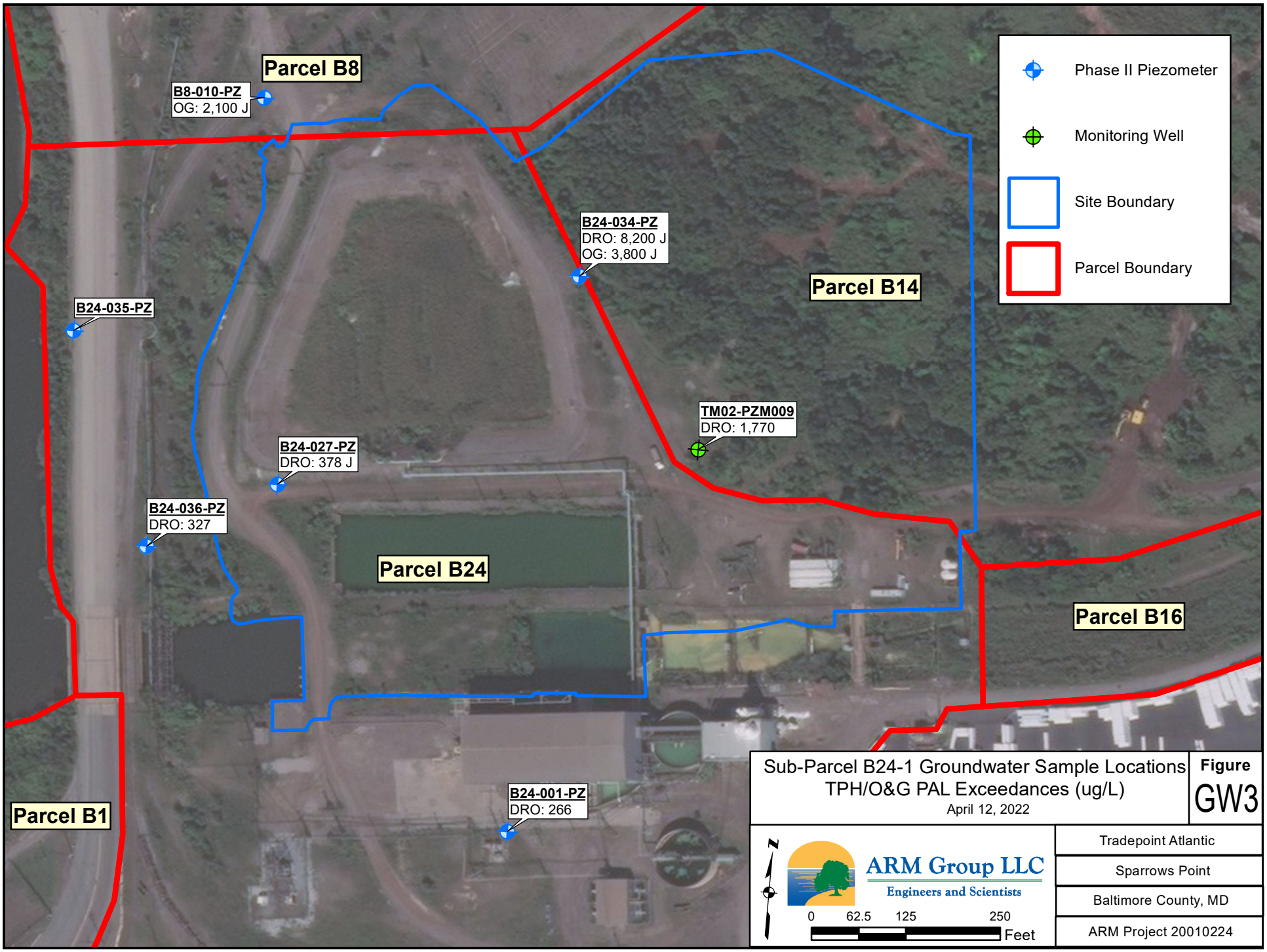
Figure
GW1

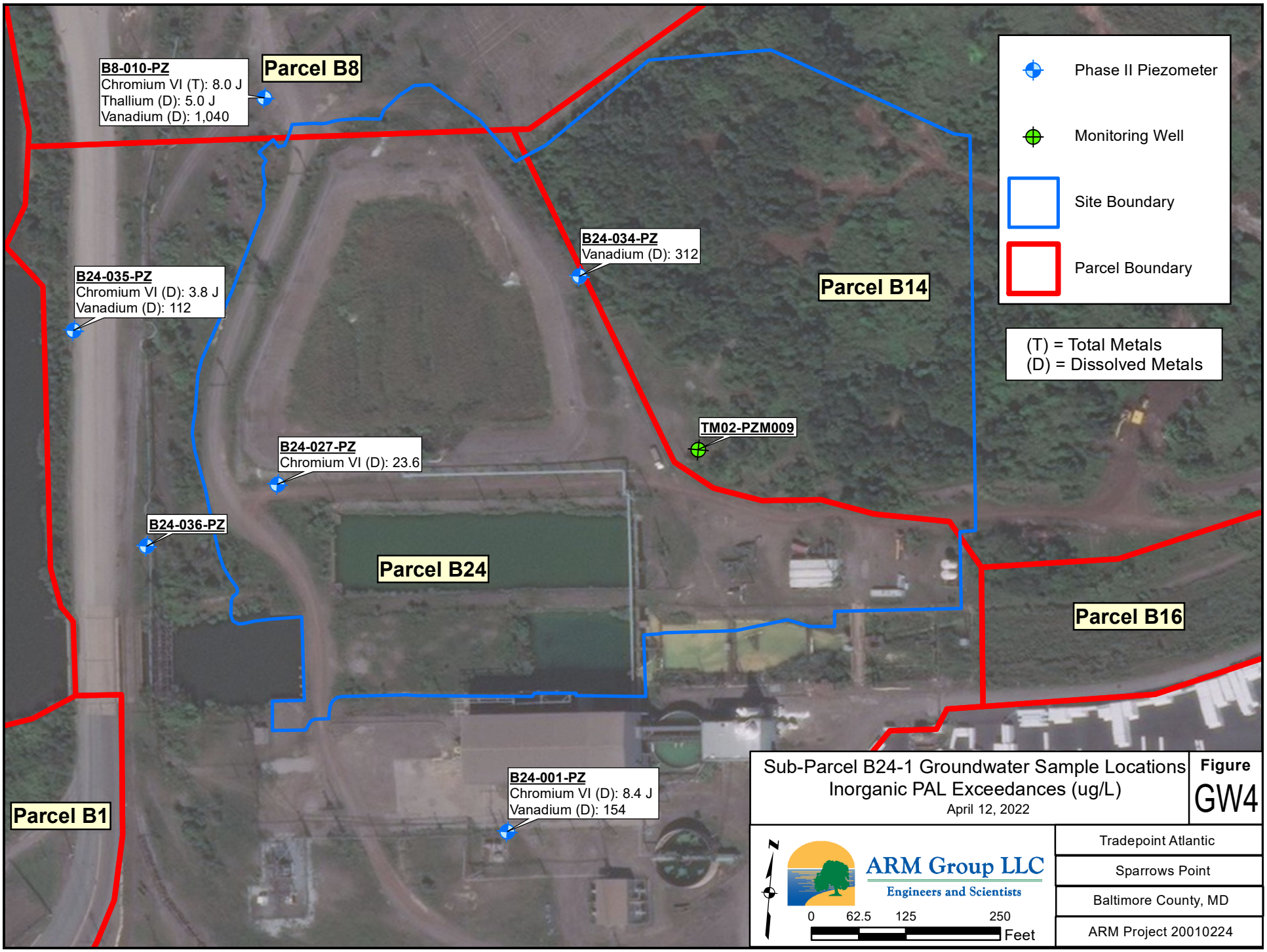
ARM Group LLC
Engineers and Scientists

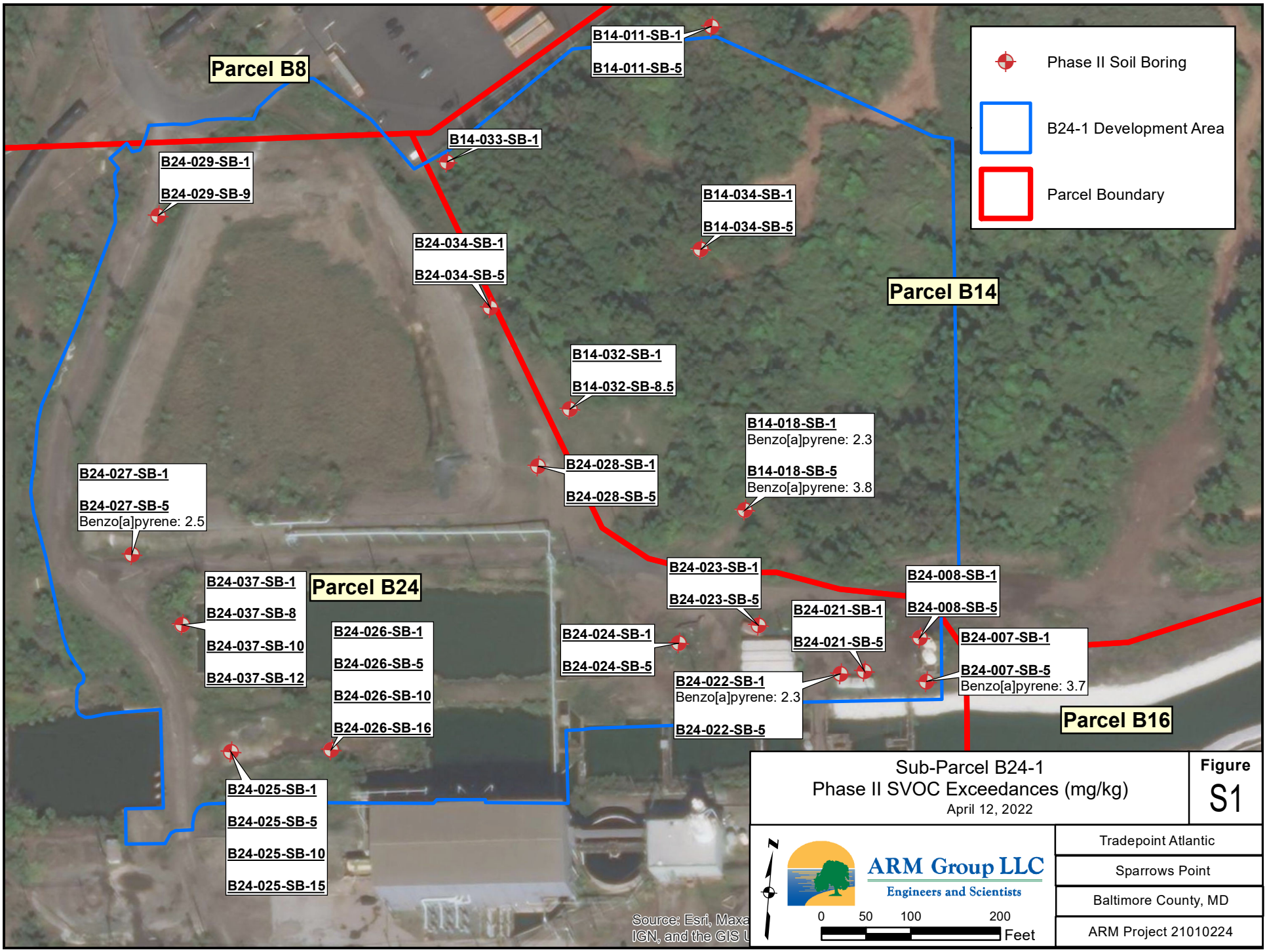
0 62.5 125 250
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010224


Parcel B8
B8-010-PZ
B24-034-PZ
3&4-Methylphenol(m&p Cresol): 1,590
Naphthalene: 1.9
Parcel B14
B24-035-PZ
TM02-PZM009
1,1-Biphenyl: 1.3
Benz[a]anthracene: 0.077 J
Naphthalene: 56.8
B24-027-PZ
B24-036-PZ
Naphthalene: 0.94
Nitrobenzene: 0.4 J
Parcel B24
Parcel B16
Parcel B1
B24-001-PZ
Phase II Piezometer
Monitoring Well
Site Boundary
Parcel Boundary
Sub-Parcel B24-1 Groundwater Sample Locations
SVOC PAL Exceedances (ug/L)
April 12, 2022
Figure
GW2
ARM Group LLC
Engineers and Scientists
0 62.5 125 250
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010224


Parcel B8
B8-010-PZ
OG: 2,100 J
B24-034-PZ
DRO: 8,200 J
OG: 3,800 J
Parcel B14
B24-035-PZ
TM02-PZM009
DRO: 1,770
B24-027-PZ
DRO: 378 J
B24-036-PZ
DRO: 327
Parcel B24
Parcel B16
Parcel B1
B24-001-PZ
DRO: 266
Phase II Piezometer
Monitoring Well
Site Boundary
Parcel Boundary
Sub-Parcel B24-1 Groundwater Sample Locations
TPH/O&G PAL Exceedances (ug/L)
April 12, 2022
Figure
GW3
ARM Group LLC
Engineers and Scientists
0 62.5 125 250
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010224


B8-010-PZ
Chromium VI (T): 8.0 J
Thallium (D): 5.0 J
Vanadium (D): 1,040
Parcel B8
B24-034-PZ
Vanadium (D): 312
Parcel B14
B24-035-PZ
Chromium VI (D): 3.8 J
Vanadium (D): 112
TM02-PZM009
B24-027-PZ
Chromium VI (D): 23.6
B24-036-PZ
Parcel B24
Parcel B16
Parcel B1
B24-001-PZ
Chromium VI (D): 8.4 J
Vanadium (D): 154
Phase II Piezometer
Monitoring Well
Site Boundary
Parcel Boundary
(T) = Total Metals
(D) = Dissolved Metals
Sub-Parcel B24-1 Groundwater Sample Locations
Inorganic PAL Exceedances (ug/L)
April 12, 2022
Figure
GW4
ARM Group LLC
Engineers and Scientists
0 62.5 125 250
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010224

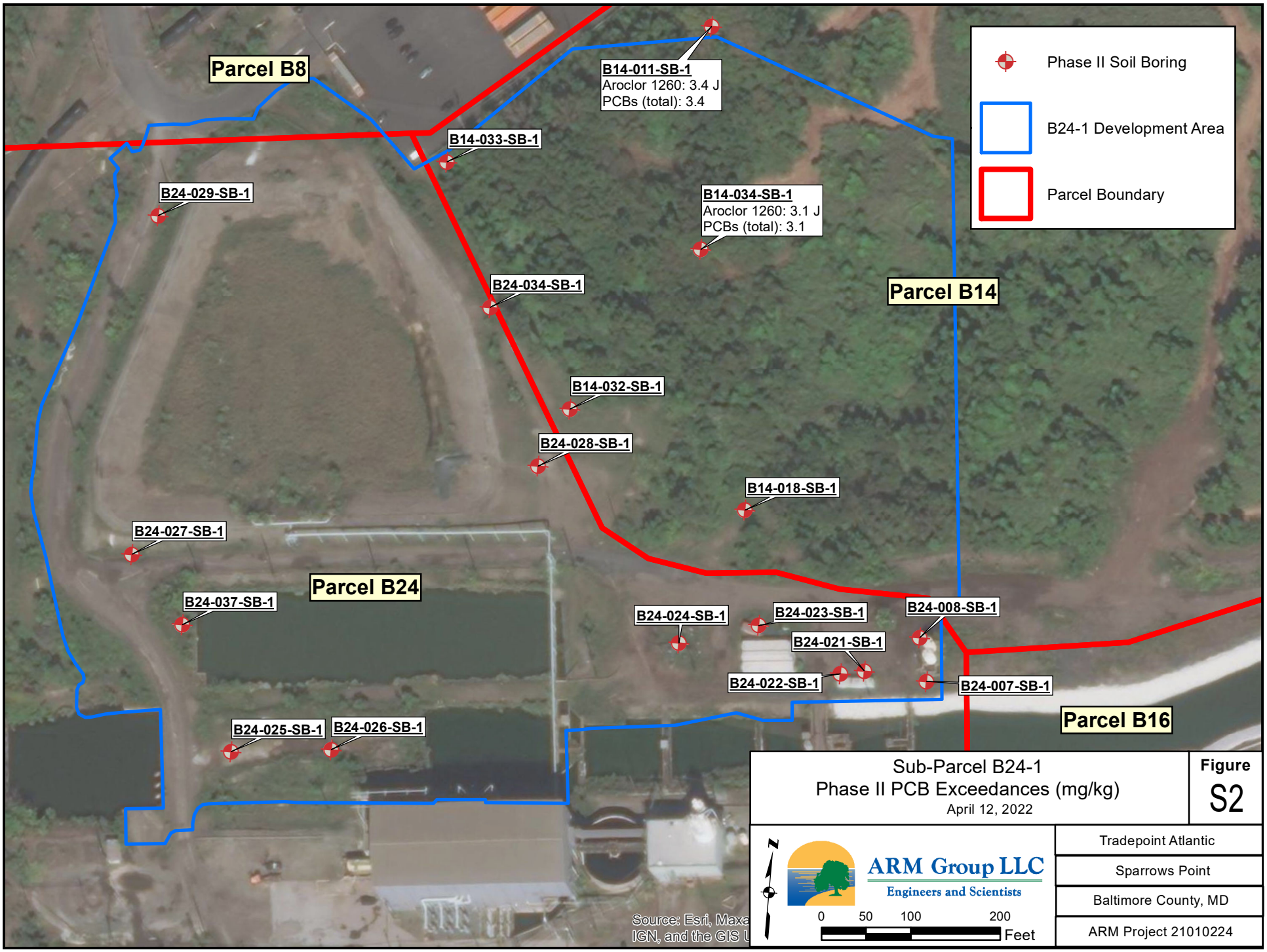


Sub-Parcel B24-1
Phase II SVOC Exceedances (mg/kg)
April 12, 2022

Figure
S1

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224

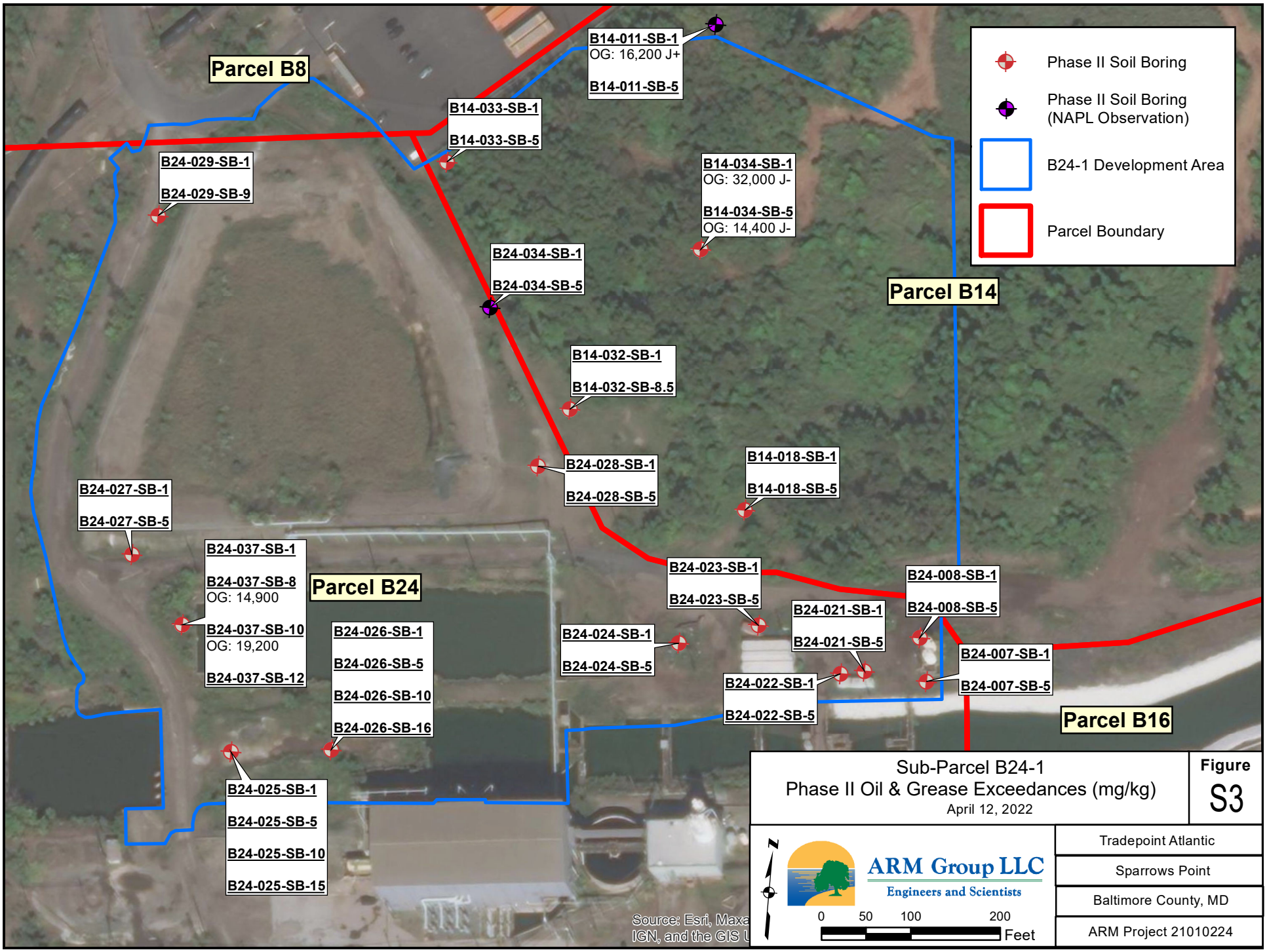


Sub-Parcel B24-1
Phase II PCB Exceedances (mg/kg)
April 12, 2022

Figure
S2

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224

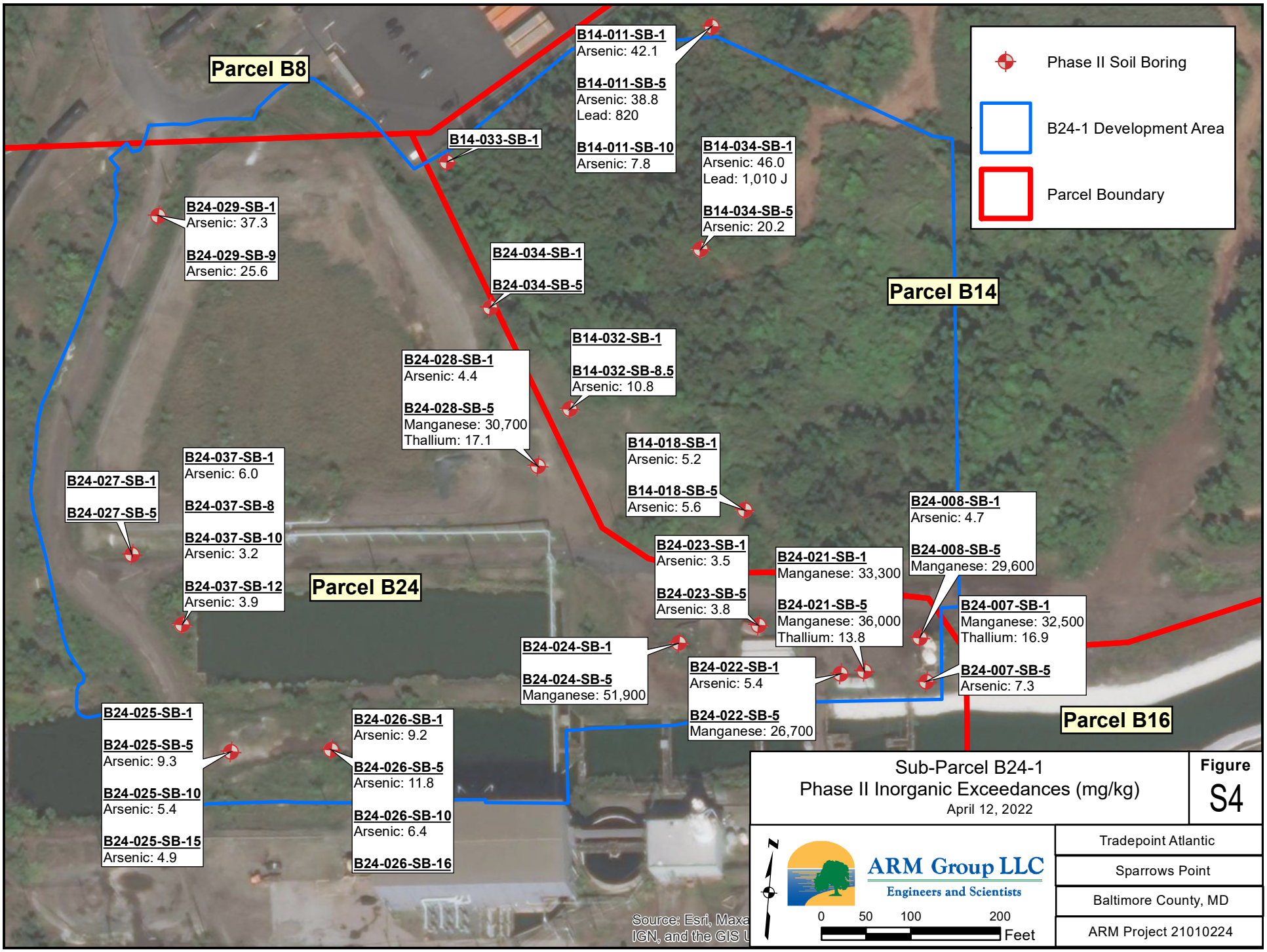


Sub-Parcel B24-1
Phase II Oil & Grease Exceedances (mg/kg)
April 12, 2022

Figure
S3

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224


Parcel B8
Parcel B14
Parcel B24
Parcel B16
B14-011-SB-1
Arsenic: 42.1
B14-011-SB-5
Arsenic: 38.8
Lead: 820
B14-011-SB-10
Arsenic: 7.8
B14-033-SB-1
B14-034-SB-1
Arsenic: 46.0
Lead: 1,010 J
B14-034-SB-5
Arsenic: 20.2
B24-029-SB-1
Arsenic: 37.3
B24-029-SB-9
Arsenic: 25.6
B24-034-SB-1
B24-034-SB-5
B14-032-SB-1
B14-032-SB-8.5
Arsenic: 10.8
B24-028-SB-1
Arsenic: 4.4
B24-028-SB-5
Manganese: 30,700
Thallium: 17.1
B14-018-SB-1
Arsenic: 5.2
B14-018-SB-5
Arsenic: 5.6
B24-027-SB-1
B24-027-SB-5
B24-037-SB-1
Arsenic: 6.0
B24-037-SB-8
B24-037-SB-10
Arsenic: 3.2
B24-037-SB-12
Arsenic: 3.9
B24-023-SB-1
Arsenic: 3.5
B24-023-SB-5
Arsenic: 3.8
B24-021-SB-1
Manganese: 33,300
B24-021-SB-5
Manganese: 36,000
Thallium: 13.8
B24-008-SB-1
Arsenic: 4.7
B24-008-SB-5
Manganese: 29,600
B24-007-SB-1
Manganese: 32,500
Thallium: 16.9
B24-007-SB-5
Arsenic: 7.3
B24-024-SB-1
B24-024-SB-5
Manganese: 51,900
B24-022-SB-1
Arsenic: 5.4
B24-022-SB-5
Manganese: 26,700
B24-025-SB-1
B24-025-SB-5
Arsenic: 9.3
B24-025-SB-10
Arsenic: 5.4
B24-025-SB-15
Arsenic: 4.9
B24-026-SB-1
Arsenic: 9.2
B24-026-SB-5
Arsenic: 11.8
B24-026-SB-10
Arsenic: 6.4
B24-026-SB-16
Phase II Soil Boring
B24-1 Development Area
Parcel Boundary
Source: Esri, Maxa
IGN, and the GIS U
Sub-Parcel B24-1
Phase II Inorganic Exceedances (mg/kg)
April 12, 2022
Figure
S4
ARM Group LLC
Engineers and Scientists
0 50 100 200
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21010224

TABLES

Table 1 - Sub-Parcel B24-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B14-011-SB-1 9/7/2017	B14-011-SB-5 9/7/2017	B14-018-SB-1 9/14/2017	B14-018-SB-5 9/14/2017	B14-032-SB-1 9/6/2017	B14-032-SB-8.5 9/6/2017	B14-033-SB-1* 9/15/2017	B14-034-SB-1 9/6/2017	B14-034-SB-5 9/6/2017	B24-007-SB-1* 4/21/2020	B24-007-SB-5* 4/21/2020	B24-008-SB-1 4/20/2020	B24-008-SB-5 4/20/2020	B24-021-SB-1* 4/21/2020
Volatile Organic Compounds																
2-Butanone (MEK)	mg/kg	190,000	N/A	N/A	N/A	N/A	N/A	0.012 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	0.012 UJ	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	mg/kg	5.1	N/A	N/A	N/A	N/A	N/A	0.006 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbon disulfide	mg/kg	3,500	N/A	N/A	N/A	N/A	N/A	0.006 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyclohexane	mg/kg	27,000	N/A	N/A	N/A	N/A	N/A	0.012 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	0.006 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	mg/kg	47,000	N/A	N/A	N/A	N/A	N/A	0.006 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^																
1,1-Biphenyl	mg/kg	200	1 U	0.097 U	1.5 U	1.5 U	**0.075**	0.098 U	0.36 U	2.5 U	0.11 U	**0.11**	**0.26**	**0.38 J**	**0.63 J**	0.71 U
1,2,4,5-Tetrachlorobenzene	mg/kg	350	1 U	0.097 U	1.5 U	1.5 U	**0.029 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,3,4,6-Tetrachlorophenol	mg/kg	25,000	1 U	0.097 U	1.5 U	1.5 U	**0.037 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,4,5-Trichlorophenol	mg/kg	82,000	2.6 U	0.24 U	3.6 U	3.7 U	**0.034 J**	0.25 U	0.89 U	6.2 U	0.26 U	0.18 U	0.18 U	1.8 U	1.8 U	1.8 U
2,4,6-Trichlorophenol	mg/kg	210	1 U	0.097 U	1.5 U	1.5 U	**0.031 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,4-Dichlorophenol	mg/kg	2,500	1 U	0.097 U	1.5 U	1.5 U	**0.029 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,4-Dimethylphenol	mg/kg	16,000	1 U	**0.06 J**	1.5 U	1.5 U	**0.028 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,4-Dinitrophenol	mg/kg	1,600	2.6 UJ	0.24 UJ	3.6 U	3.7 U	**0.049 J**	0.25 R	0.89 U	6.2 R	0.26 R	0.18 U	0.18 U	1.8 U	1.8 U	1.8 U
2,4-Dinitrotoluene	mg/kg	7.4	1 U	0.097 U	1.5 U	1.5 U	**0.037 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2,6-Dinitrotoluene	mg/kg	1.5	1 U	0.097 U	1.5 U	1.5 U	**0.034 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2-Chloronaphthalene	mg/kg	60,000	1 U	0.097 U	1.5 U	1.5 U	**0.028 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2-Chlorophenol	mg/kg	5,800	1 U	0.097 U	1.5 U	1.5 U	**0.026 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2-Methylnaphthalene	mg/kg	3,000	**0.063 J**	**0.0026 J**	**0.075**	**0.23**	**0.088**	**0.0082 J**	**0.016 J**	**0.12 J**	**0.013 J**	**0.075**	**0.2**	**0.066**	**0.1**	**0.096**
2-Methylphenol	mg/kg	41,000	1 U	0.097 U	1.5 U	1.5 U	**0.03 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
2-Nitroaniline	mg/kg	8,000	2.6 U	0.24 U	3.6 U	3.7 U	**0.033 J**	0.25 U	0.89 U	6.2 U	0.26 U	0.18 U	0.18 U	1.8 U	1.8 U	1.8 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	2 U	**0.031 J**	2.9 U	3 U	**0.03 J**	0.2 U	0.71 U	5 U	0.21 U	0.14 U	0.14 U	1.4 U	1.4 U	1.4 U
3,3'-Dichlorobenzidine	mg/kg	5.1	1 UJ	0.097 UJ	1.5 U	1.5 UJ	0.073 U	0.098 U	0.36 U	2.5 U	0.11 UJ	0.071 U	0.072 U	0.72 UJ	0.72 UJ	0.71 U
Acenaphthene	mg/kg	45,000	0.1 U	0.0097 U	**0.24**	**0.2**	**0.08**	**0.0022 J**	0.073 U	0.25 U	0.11 U	**0.065**	**0.33**	**0.041**	**0.063**	**0.11**
Acenaphthylene	mg/kg	45,000	**0.15**	**0.003 J**	**0.083**	**0.53**	**0.075**	**0.024**	**0.013 J**	**0.27**	**0.0098 J**	**0.14**	**0.44**	**0.038**	**0.068**	**0.19**
Acetophenone	mg/kg	120,000	1 U	0.097 U	1.5 U	1.5 U	**0.031 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	**0.019 J**	0.72 U	0.72 U	0.71 U
Anthracene	mg/kg	230,000	**0.13**	**0.0057 J**	**0.21**	**1.4**	**0.16**	**0.023**	**0.013 J**	**0.21 J**	**0.04 J**	**0.28**	**1.3**	**0.05**	**0.08**	**0.18**
Benz[a]anthracene	mg/kg	21	**0.055 J**	0.0097 U	**1.3**	**3.7**	**0.58**	**0.1**	**0.089**	**0.12 J**	**0.04 J**	**1.4**	**4.5**	**0.23**	**0.35**	**1.5**
Benzaldehyde	mg/kg	120,000	1 R	0.097 R	1.5 R	1.5 R	**0.028 J**	0.098 R	0.36 U	2.5 R	**0.1 J**	0.071 U	**0.018 J**	0.72 U	0.72 U	0.71 U
Benzo[a]pyrene	mg/kg	2.1	**0.065 J**	0.0097 U	**2.3**	**3.8**	**0.73**	**0.11**	**0.097**	**0.088 J**	**0.018 J**	**1.4**	**3.7**	**0.3**	**0.51**	**1.2**
Benzo[b]fluoranthene	mg/kg	21	**0.11**	0.0097 U	**3.8**	**8.9**	**0.87**	**0.18**	**0.18**	**0.11 J**	**0.052 J**	**2**	**5.4**	**0.38**	**0.65**	**1.6**
Benzo[g,h,i]perylene	mg/kg		**0.086 J**	**0.0063 J**	**1.6**	**2.9**	**0.54**	**0.066**	**0.054 J**	**0.27**	**0.039 J**	**0.96**	**2.4**	**0.22**	**0.45**	**0.92**
Benzo[k]fluoranthene	mg/kg	210	**0.095 J**	0.0097 U	**3**	**6.9**	**0.32**	**0.16**	**0.14**	**0.093 J**	**0.046 J**	**0.48**	**1.5**	**0.11**	**0.18**	**0.44**
bis(2-chloroethoxy)methane	mg/kg	2,500	1 U	0.097 U	1.5 U	1.5 U	**0.027 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
bis(2-Chloroethyl)ether	mg/kg	1	1 U	0.097 U	1.5 U	1.5 U	**0.022 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
bis(2-Chloroisopropyl)ether	mg/kg	22	1 U	0.097 U	1.5 U	1.5 U	**0.024 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	1 UJ	0.097 UJ	1.5 U	1.5 UJ	**0.041 J**	0.098 U	0.36 U	2.5 U	**0.14 J**	**0.035 J**	**0.034 J**	0.72 U	0.72 U	0.71 U
Caprolactam	mg/kg	400,000	2.6 U	0.24 U	3.6 U	3.7 U	**0.039 J**	0.25 U	0.89 U	6.2 U	0.26 U	0.18 U	**0.031 J**	1.8 U	1.8 U	1.8 U
Carbazole	mg/kg		1 U	0.097 U	1.5 U	**0.7 J**	**0.088**	0.098 U	0.36 U	2.5 U	0.11 U	**0.08**	**0.34**	0.72 U	0.72 U	0.71 U
Chrysene	mg/kg	2,100	**0.058 J**	0.0097 U	**1.3**	**3.9**	**0.51**	**0.1**	**0.085**	**0.053 J**	**0.021 J**	**1.2**	**3.6**	**0.2**	**0.3**	**0.91**
Dibenz[a,h]anthracene	mg/kg	2.1	0.1 U	0.0097 U	**0.42**	**0.82**	**0.16**	**0.023**	**0.017 J**	0.25 U	0.11 U	**0.26**	**0.54**	**0.066**	**0.13**	**0.24**
Diethylphthalate	mg/kg	660,000	1 U	0.097 U	1.5 U	1.5 U	**0.041 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	**0.019 J**	0.72 U	0.72 U	0.71 U
Di-n-butylphthalate	mg/kg	82,000	1 U	0.097 U	1.5 U	1.5 U	**0.043 J**	0.098 U	0.36 U	2.5 U	0.11 U	**0.079**	0.078 B	0.72 U	0.72 U	0.71 U
Di-n-ocytlphthalate	mg/kg	8,200	1 UJ	0.097 UJ	1.5 U	1.5 UJ	**0.085 J**	0.098 U	0.36 U	2.5 UJ	0.11 UJ	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Fluoranthene	mg/kg	30,000	**0.062 J**	**0.0025 J**	**1.6**	**7.1**	**0.86**	**0.12**	**0.13**	**0.081 J**	**0.022 J**	**1.6**	**6.5**	**0.33**	**0.42**	**1.1**
Fluorene	mg/kg	30,000	**0.016 J**	0.0097 U	**0.058 J**	**0.17**	**0.046 J**	**0.0038 J**	0.073 U	0.25 U	0.11 U	**0.043**	**0.28**	**0.015**	**0.024**	**0.03**
Hexachlorobenzene	mg/kg	0.96	1 U	0.097 U	1.5 U	1.5 U	**0.041 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Hexachlorobutadiene	mg/kg	5.3	1 U	0.097 U	1.5 U	1.5 U	**0.028 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Hexachlorocyclopentadiene	mg/kg	7.5	1 UJ	0.097 UJ	1.5 U	1.5 U	**0.019 J**	0.098 U	0.36 U	2.5 UJ	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Hexachloroethane	mg/kg	8	1 U	0.097 U	1.5 U	1.5 U	**0.026 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.033 J**	0.0097 U	**1.5**	**2.7**	**0.49**	**0.064**	**0.05 J**	**0.061 J**	0.11 U	**1.1**	**2.8**	**0.26**	**0.51**	**1**
Isophorone	mg/kg	2,400	1 U	0.097 U	1.5 U	1.5 U	**0.027 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Naphthalene	mg/kg	8.6	**0.075 J**	**0.0073 J**	**0.28**	**1.2**	**0.26**	**0.054**	0.073 U	**0.15 J**	0.11 U	**0.21**	**0.56**	**0.38**	**0.62**	**0.29**
Nitrobenzene	mg/kg	22	1 U	0.097 U	1.5 U	1.5 U	**0.026 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
N-Nitroso-di-n-propylamine	mg/kg	0.33	1 U	0.097 U	1.5 U	1.5 U	**0.027 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
N-Nitrosodiphenylamine	mg/kg	470	1 U	0.097 U	1.5 U	1.5 U	**0.029 J**	0.098 U	0.36 U	2.5 U	0.11 U	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Pentachlorophenol	mg/kg	4	2.6 UJ	0.24 UJ	3.6 U	3.7 U	**0.038 J**	0.25 U	0.89 U	6.2 UJ	0.26 U	0.18 U	0.18 U	1.8 U	1.8 U	1.8 U
Phenanthrene	mg/kg		**0.088 J**	**0.0039 J**	**0.66**	**4.4**	**0.59**	**0.045**	**0.051 J**	**0.15 J**	**0.025 J**	**0.64**	**4.4**	**0.18**	**0.25**	**0.6**
Phenol	mg/kg	250,000	1 U	**0.11**	1.5 U	1.5 U	**0.029 J**	0.098 U	0.36 U	2.5 U	**0.1 J**	0.071 U	0.072 U	0.72 U	0.72 U	0.71 U
Pyrene	mg/kg	23,000	**0.087 J**	**0.0026 J**	**1.7**	**9.6**	**0.69**	**0.085**	**0.11**	**0.1 J**	**0.025 J**	**1.4**	**6.2**	**0.32**	**0.39**	**0.93**
Polychlorinated Biphenyls (PCBs)																
Aroclor 1242	mg/kg	0.97	0.26 U	N/A	0.019 U	N/A	0.018 U	N/A	0.018 U	0.31 U	N/A	**0.053 J**	N/A	0.018 U	N/A	0.17 U
Aroclor 1248	mg/kg	0.94	0.26 U	N/A	0.019 U	N/A	0.018 U	N/A	0.018 U	0.31 U	N/A	0.089 U	N/A	0.018 U	N/A	0.17 U
Aroclor 1254	mg/kg	0.97	0.26 U	N/A	0.019 UJ	N/A	**0.06 J**	N/A	0.018 U	0.31 U	N/A	0.089 U	N/A	**0.067 J**	N/A	**0.12 J**
Aroclor 1260	mg/kg	0.99	**3.4 J**	N/A	**0.096 J**	N/A	0.018 U	N/A	**0.014 J**	**3.1 J**	N/A	**0.078 J**	N/A	**0.07 J**	N/A	**0.094 J**
PCBs (total)	mg/kg	0.97	**3.4**	N/A	**0.096 J**	N/A	**0.06 J**	N/A	0.16 U	**3.1**	N/A	0.8 U	N/A	**0.14 J**	N/A	1.6 U
Total Petroleum Hydrocarbons																
Diesel Range Organics	mg/kg	6,200	**942 J**	**857 J**	**154 J**	**299 J**	**47.8 J**	**44.6 J**	**22.1**	**678 J**	**1,220 J**	**77.1**	**434**	**119 J**	**228**	**137**
Gasoline Range Organics	mg/kg	6,200	21.2 UJ	15.5 UJ	11.3 U	11.4 U	**9.7**	6.8 B	3.3 B	31.6 U	19.9 U	13 U	10.7 U	11.8 UJ	9.8 UJ	10.1 U
Oil and Grease	mg/kg	6,200	**16,200 J+**	**3,750 J+**	**903 J-**	**3,500 J-**	**262 J-**	**238 J-**	**2,350**	**32,000 J-**	**14,400 J-**	**263**	**1,120**	**845 J-**	**844 J-**	**933**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data

^PAH compounds were analyzed via SIM
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.

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 or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte ir
NJ: This analyte has been "tentatively" identified. The numeric value represents its approximate concentration.

Table 1 - Sub-Parcel B24-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B24-021-SB-5*	B24-022-SB-1*	B24-022-SB-5*	B24-023-SB-1*	B24-023-SB-5*	B24-024-SB-1*	B24-024-SB-5*	B24-025-SB-1*	B24-025-SB-5*	B24-025-SB-10*	B24-025-SB-15*	B24-026-SB-1*	B24-026-SB-5*	B24-026-SB-10*
			4/21/2020	4/21/2020	4/21/2020	4/21/2020	4/21/2020	4/21/2020	4/21/2020	4/14/2020	4/14/2020	4/14/2020	4/15/2020	4/14/2020	4/14/2020	4/14/2020
Volatile Organic Compounds																
2-Butanone (MEK)	mg/kg	190,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	mg/kg	5.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbon disulfide	mg/kg	3,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cyclohexane	mg/kg	27,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	mg/kg	47,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^																
1,1-Biphenyl	mg/kg	200	**0.14**	**0.076**	**0.13**	**0.027 J**	**0.11**	**0.022 J**	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
1,2,4,5-Tetrachlorobenzene	mg/kg	350	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,3,4,6-Tetrachlorophenol	mg/kg	25,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,4,5-Trichlorophenol	mg/kg	82,000	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.18 U	0.18 U	1.9 U	0.18 U	0.19 U	0.19 U	0.18 U	0.2 U	0.2 U
2,4,6-Trichlorophenol	mg/kg	210	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,4-Dichlorophenol	mg/kg	2,500	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,4-Dimethylphenol	mg/kg	16,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,4-Dinitrophenol	mg/kg	1,600	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.18 U	0.18 U	1.9 U	0.18 U	0.19 U	0.19 U	0.18 U	0.2 U	0.2 U
2,4-Dinitrotoluene	mg/kg	7.4	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2,6-Dinitrotoluene	mg/kg	1.5	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2-Chloronaphthalene	mg/kg	60,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2-Chlorophenol	mg/kg	5,800	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2-Methylnaphthalene	mg/kg	3,000	**0.1**	**0.098**	**0.088**	**0.23**	**0.22**	**0.059**	**0.033**	**0.029**	**0.013**	**0.006 J**	0.077 U	**0.062**	**0.028**	**0.014**
2-Methylphenol	mg/kg	41,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
2-Nitroaniline	mg/kg	8,000	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.18 U	0.18 U	1.9 U	0.18 U	0.19 U	0.19 U	0.18 U	0.2 U	0.2 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14 U	0.14 U	0.14 U	0.14 U	0.15 U	0.14 U	0.14 U	1.5 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.16 U
3,3'-Dichlorobenzidine	mg/kg	5.1	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Acenaphthene	mg/kg	45,000	**0.049**	**0.09**	**0.075**	**0.025**	**0.026**	**0.049**	**0.0048 J**	**0.012**	**0.0025 J**	**0.0018 J**	**0.0069 J**	**0.012**	**0.0066 J**	**0.0048 J**
Acenaphthylene	mg/kg	45,000	**0.12**	**0.15**	**0.061**	**0.045**	**0.09**	**0.066**	**0.012**	**0.18**	**0.017**	**0.012**	**0.0076 J**	**0.063**	**0.082**	**0.045**
Acetophenone	mg/kg	120,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Anthracene	mg/kg	230,000	**0.1**	**0.28**	**0.098**	**0.029**	**0.077**	**0.093**	**0.026**	**0.24**	**0.054**	**0.013**	**0.025 J**	**0.098**	**0.14**	**0.073**
Benz[a]anthracene	mg/kg	21	**0.42**	**2.4**	**0.5**	**0.21**	**0.38**	**0.33**	**0.13**	**1.7**	**0.088**	**0.087**	**0.074 J**	**0.39**	**0.95**	**0.33**
Benzaldehyde	mg/kg	120,000	0.071 U	0.072 U	**0.016 J**	0.069 U	**0.017 J**	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Benzo[a]pyrene	mg/kg	2.1	**0.56**	**2.3**	**0.86**	**0.35**	**0.47**	**0.44**	**0.11**	**1.6**	**0.087**	**0.084**	**0.057 J**	**0.39**	**0.79**	**0.28**
Benzo[b]fluoranthene	mg/kg	21	**0.64**	**3.6**	**1**	**0.44**	**0.68**	**0.52**	**0.18**	**2.4**	**0.16**	**0.15**	**0.14**	**0.66**	**1.5**	**0.51**
Benzo[g,h,i]perylene	mg/kg		**0.39**	**1.7**	**0.83**	**0.26**	**0.4**	**0.41**	**0.067**	**0.77**	**0.067**	**0.05**	**0.044 J**	**0.21**	**0.43**	**0.13**
Benzo[k]fluoranthene	mg/kg	210	**0.22**	**0.99**	**0.34**	**0.11**	**0.2**	**0.2**	**0.057**	**1**	**0.061**	**0.052**	**0.11**	**0.25**	**0.53**	**0.17**
bis(2-chloroethoxy)methane	mg/kg	2,500	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
bis(2-Chloroethyl)ether	mg/kg	1	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
bis(2-Chloroisopropyl)ether	mg/kg	22	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.025 J**	**0.031 J**	**0.022 J**	**0.13**	**0.037 J**	**0.022 J**	**0.021 J**	0.74 U	**0.1**	**0.07 J**	0.076 U	**0.063 J**	**0.04 J**	**0.047 J**
Caprolactam	mg/kg	400,000	0.18 U	**0.023 J**	**0.023 J**	**0.032 J**	**0.03 J**	0.18 U	**0.023 J**	1.9 U	**0.029 J**	**0.028 J**	0.19 U	0.18 U	0.2 U	0.2 U
Carbazole	mg/kg		**0.058 J**	**0.14**	**0.062 J**	**0.022 J**	**0.044 J**	0.072 U	**0.02 J**	0.74 U	**0.021 J**	0.077 U	**0.035 J**	**0.15**	**0.12**	**0.044 J**
Chrysene	mg/kg	2,100	**0.4**	**2**	**0.47**	**0.2**	**0.42**	**0.34**	**0.13**	**1.8**	**0.11**	**0.1**	**0.078**	**0.39**	**0.96**	**0.35**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.12**	**0.47**	**0.21**	**0.076**	**0.12**	**0.11**	**0.023**	**0.36**	**0.024**	**0.02**	0.077 U	**0.087**	**0.2**	**0.06**
Diethylphthalate	mg/kg	660,000	0.071 U	0.072 U	0.072 U	**0.021 J**	**0.016 J**	0.072 U	0.07 U	0.74 U	**0.02 J**	**0.016 J**	0.076 U	0.073 U	0.079 U	0.079 U
Di-n-butylphthalate	mg/kg	82,000	0.062 B	0.066 B	0.057 B	0.065 B	0.058 B	0.041 B	0.065 B	0.74 U	**0.093**	**0.071 J**	**0.049 J**	**0.06 J**	**0.047 J**	**0.048 J**
Di-n-ocytlphthalate	mg/kg	8,200	0.071 U	0.072 U	0.072 U	0.069 U	**0.093**	0.072 U	**0.026 J**	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Fluoranthene	mg/kg	30,000	**0.46**	**2.4**	**0.63**	**0.21**	**0.46**	**0.52**	**0.21**	**1.9**	**0.12**	**0.14**	**0.13**	**0.62**	**1.4**	**0.49**
Fluorene	mg/kg	30,000	**0.027**	**0.046**	**0.027**	**0.015**	**0.02**	**0.021**	**0.0039 J**	**0.017**	**0.0049 J**	**0.0016 J**	**0.0099 J**	**0.026**	**0.0095**	**0.0099**
Hexachlorobenzene	mg/kg	0.96	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Hexachlorobutadiene	mg/kg	5.3	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Hexachlorocyclopentadiene	mg/kg	7.5	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Hexachloroethane	mg/kg	8	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.49**	**2**	**0.84**	**0.31**	**0.46**	**0.44**	**0.082**	**0.86**	**0.065**	**0.05**	**0.041 J**	**0.22**	**0.48**	**0.15**
Isophorone	mg/kg	2,400	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Naphthalene	mg/kg	8.6	**0.47**	**0.36**	**0.29**	**0.54**	**0.71**	**0.23**	**0.057**	**0.02**	**0.014**	**0.0089**	0.077 U	**0.058**	**0.051**	**0.02**
Nitrobenzene	mg/kg	22	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
N-Nitroso-di-n-propylamine	mg/kg	0.33	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
N-Nitrosodiphenylamine	mg/kg	470	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Pentachlorophenol	mg/kg	4	0.18 U	0.18 U	0.18 U	0.17 U	0.19 U	0.18 U	0.18 U	1.9 U	0.18 U	0.19 U	0.19 U	0.18 U	0.2 U	0.2 U
Phenanthrene	mg/kg		**0.3**	**0.85**	**0.37**	**0.11**	**0.23**	**0.32**	**0.085**	**0.66**	**0.059**	**0.049**	**0.091**	**0.38**	**0.67**	**0.23**
Phenol	mg/kg	250,000	0.071 U	0.072 U	0.072 U	0.069 U	0.075 U	0.072 U	0.07 U	0.74 U	0.073 U	0.077 U	0.076 U	0.073 U	0.079 U	0.079 U
Pyrene	mg/kg	23,000	**0.5**	**3**	**0.54**	**0.21**	**0.64**	**0.5**	**0.19**	**2.1**	**0.11**	**0.11**	**0.11**	**0.49**	**1.1**	**0.37**
Polychlorinated Biphenyls (PCBs)																
Aroclor 1242	mg/kg	0.97	N/A	0.091 U	N/A	0.088 U	N/A	0.09 U	N/A	0.018 U	N/A	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1248	mg/kg	0.94	N/A	**0.064 J**	N/A	**0.058 J**	N/A	0.09 U	N/A	0.018 U	N/A	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	N/A	**0.2**	N/A	**0.075 J**	N/A	0.09 U	N/A	0.018 U	N/A	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1260	mg/kg	0.99	N/A	**0.13**	N/A	**0.062 J**	N/A	0.09 U	N/A	0.018 U	N/A	N/A	N/A	0.018 U	N/A	N/A
PCBs (total)	mg/kg	0.97	N/A	**0.39 J**	N/A	0.79 U	N/A	0.81 U	N/A	0.16 U	N/A	N/A	N/A	0.16 U	N/A	N/A
Total Petroleum Hydrocarbons																
Diesel Range Organics	mg/kg	6,200	**101**	**234**	**138**	**75.1**	**302**	**38.3**	**101**	**112**	**34.2**	**78**	**67.4**	**61.7**	**75.2**	**31.4**
Gasoline Range Organics	mg/kg	6,200	7.9 U	10.7 U	11.7 U	11.1 U	11.6 U	10.9 U	**11.1 J**	10.8 U	11.5 U	9.3 U	9.7 U	12.4 U	10.7 U	9.7 U
Oil and Grease	mg/kg	6,200	**171**	**387**	**161**	**245**	**1,110**	**195**	**260**	**361**	**124**	**283**	**637**	**156**	**158**	**105 J**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data

^PAH compounds were analyzed via SIM
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.

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 or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in
NJ: This analyte has been "tentatively" identified. The numeric value represents its approximate concentration.

Table 1 - Sub-Parcel B24-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B24-026-SB-16* 4/14/2020	B24-027-SB-1* 4/16/2020	B24-027-SB-5* 4/16/2020	B24-028-SB-1* 4/21/2020	B24-028-SB-5* 4/21/2020	B24-029-SB-1 (&G Rerun) 4/20/20	B24-029-SB-1 4/20/2020	B24-029-SB-9 4/20/2020	B24-034-SB-1* 4/21/2020	B24-034-SB-5* 4/21/2020	B24-037-SB-1* 4/16/2020	B24-037-SB-8* 4/16/2020	B24-037-SB-10* 4/16/2020	B24-037-SB-12* 4/16/2020
Volatile Organic Compounds																
2-Butanone (MEK)	mg/kg	190,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.011 U	N/A	N/A	N/A	**0.02**	N/A	N/A
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0069 B	N/A	N/A	N/A	**0.012 J**	N/A	N/A
Benzene	mg/kg	5.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0057 U	N/A	N/A	N/A	**0.0024 J**	N/A	N/A
Carbon disulfide	mg/kg	3,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0057 U	N/A	N/A	N/A	**0.0039 J**	N/A	N/A
Cyclohexane	mg/kg	27,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.011 U	N/A	N/A	N/A	**0.013**	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0057 U	N/A	N/A	N/A	**0.0019 J**	N/A	N/A
Toluene	mg/kg	47,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0057 U	N/A	N/A	N/A	**0.0032 J**	N/A	N/A
Semi-Volatile Organic Compounds^																
1,1-Biphenyl	mg/kg	200	0.072 U	0.7 U	**2.1**	**0.21**	**0.047 J**	N/A	0.75 U	0.72 U	0.75 U	**0.051 J**	0.72 U	0.73 U	0.71 U	0.73 U
1,2,4,5-Tetrachlorobenzene	mg/kg	350	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,3,4,6-Tetrachlorophenol	mg/kg	25,000	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,4,5-Trichlorophenol	mg/kg	82,000	0.18 U	1.8 U	1.8 U	0.18 U	0.18 U	N/A	1.9 U	1.8 U	1.9 U	0.18 U	1.8 U	1.8 U	1.8 U	1.8 U
2,4,6-Trichlorophenol	mg/kg	210	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,4-Dichlorophenol	mg/kg	2,500	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,4-Dimethylphenol	mg/kg	16,000	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,4-Dinitrophenol	mg/kg	1,600	0.18 U	1.8 U	1.8 U	0.18 U	0.18 U	N/A	1.9 U	1.8 U	1.9 U	0.18 U	1.8 U	1.8 U	1.8 U	1.8 U
2,4-Dinitrotoluene	mg/kg	7.4	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2,6-Dinitrotoluene	mg/kg	1.5	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2-Chloronaphthalene	mg/kg	60,000	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2-Chlorophenol	mg/kg	5,800	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2-Methylnaphthalene	mg/kg	3,000	0.0073 U	**0.041 J**	**0.14**	**0.15**	**0.28**	N/A	**0.031**	**0.14**	**0.18**	**0.1**	**0.097**	**0.024 J**	0.07 U	**0.044 J**
2-Methylphenol	mg/kg	41,000	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
2-Nitroaniline	mg/kg	8,000	0.18 U	1.8 U	1.8 U	0.18 U	0.18 U	N/A	1.9 U	1.8 U	1.9 U	0.18 U	1.8 U	1.8 U	1.8 U	1.8 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14 U	1.4 U	1.4 U	0.15 U	0.15 U	N/A	1.5 U	1.4 U	1.5 U	0.14 U	1.4 U	1.5 U	1.4 U	1.5 U
3,3'-Dichlorobenzidine	mg/kg	5.1	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 UJ	0.72 UJ	0.75 U	**0.016 J**	0.72 U	0.73 U	**0.18 J**	0.73 U
Acenaphthene	mg/kg	45,000	**0.00093 J**	**0.057 J**	**0.23**	**0.1**	**0.13**	N/A	**0.12**	**0.024**	**0.066**	**0.082**	**0.014 J**	**0.018 J**	**0.023 J**	**0.057 J**
Acenaphthylene	mg/kg	45,000	**0.0029 J**	**0.06 J**	**0.035 J**	**0.14**	**0.11**	N/A	**0.051**	**0.033**	**0.059**	**0.13**	**0.083**	**0.028 J**	**0.026 J**	**0.033 J**
Acetophenone	mg/kg	120,000	0.072 U	0.7 U	0.71 U	0.073 U	**0.02 J**	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Anthracene	mg/kg	230,000	**0.0052 J**	**0.12**	**0.23**	**0.14**	**0.33**	N/A	**0.26**	**0.077**	**0.084**	**0.53**	**0.094**	**0.11**	**0.035 J**	**0.19**
Benz[a]anthracene	mg/kg	21	**0.019**	**0.44**	**1.3**	**0.69**	**1.2**	N/A	**1.5**	**0.16**	**0.52**	**0.66**	**0.38**	**0.41**	**0.13**	**0.32**
Benzaldehyde	mg/kg	120,000	0.072 U	0.7 U	0.71 U	0.073 U	**0.018 J**	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Benzo[a]pyrene	mg/kg	2.1	**0.016**	**0.72**	**2.5**	**0.82**	**1.1**	N/A	**1.4**	**0.17**	**0.68**	**0.9**	**0.44**	**0.42**	**0.15**	**0.26**
Benzo[b]fluoranthene	mg/kg	21	**0.032**	**1.4**	**3.9**	**1.1**	**1.4**	N/A	**2.1**	**0.26**	**0.88**	**1.2**	**0.97**	**1**	**0.59**	**0.49**
Benzo[g,h,i]perylene	mg/kg		**0.0081**	**0.2**	**1.5**	**0.6**	**0.79**	N/A	**1**	**0.1**	**0.46**	**0.59**	**0.2**	**0.1**	**0.063 J**	**0.14**
Benzo[k]fluoranthene	mg/kg	210	**0.0089**	**1.1**	**3**	**0.33**	**0.51**	N/A	**0.51**	**0.061**	**0.29**	**0.39**	**0.75**	**0.77**	**0.46**	**0.38**
bis(2-chloroethoxy)methane	mg/kg	2,500	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
bis(2-Chloroethyl)ether	mg/kg	1	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
bis(2-Chloroisopropyl)ether	mg/kg	22	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.077**	0.7 U	0.71 U	**0.028 J**	**0.028 J**	N/A	0.75 U	0.72 U	0.75 U	**0.032 J**	0.72 U	0.73 U	0.71 U	0.73 U
Caprolactam	mg/kg	400,000	**0.035 J**	1.8 U	1.8 U	0.18 U	**0.028 J**	N/A	1.9 U	1.8 U	1.9 U	**0.027 J**	1.8 U	1.8 U	1.8 U	1.8 U
Carbazole	mg/kg		0.072 U	0.7 U	0.71 U	**0.072 J**	**0.065 J**	N/A	0.75 U	0.72 U	0.75 U	**0.11**	0.72 U	0.73 U	0.71 U	0.73 U
Chrysene	mg/kg	2,100	**0.021**	**0.42**	**1.2**	**0.62**	**0.92**	N/A	**1.3**	**0.17**	**0.5**	**0.79**	**0.41**	**0.44**	**0.31**	**0.37**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.0036 J**	**0.086**	**0.46**	**0.18**	**0.21**	N/A	**0.3**	**0.034**	**0.13**	**0.18**	**0.088**	**0.049 J**	**0.029 J**	**0.045 J**
Diethylphthalate	mg/kg	660,000	**0.02 J**	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Di-n-butylphthalate	mg/kg	82,000	**0.078**	0.7 U	0.71 U	0.072 B	0.058 B	N/A	0.75 U	0.72 U	0.75 U	**0.09**	0.72 U	0.73 U	0.71 U	0.73 U
Di-n-ocytlphthalate	mg/kg	8,200	0.072 U	0.7 U	0.71 U	0.073 U	**0.027 J**	N/A	0.75 U	0.72 U	0.75 U	**0.073**	0.72 U	0.73 U	0.71 U	0.73 U
Fluoranthene	mg/kg	30,000	**0.029**	**0.62**	**1.5**	**0.72**	**1.9**	N/A	**2.4**	**0.25**	**0.68**	**1.2**	**0.48**	**0.78**	**0.21**	**0.93**
Fluorene	mg/kg	30,000	**0.00095 J**	**0.047 J**	**0.051 J**	**0.038**	**0.027 J**	N/A	**0.093**	**0.035**	**0.024**	**0.051**	**0.015 J**	**0.036 J**	**0.02 J**	**0.075**
Hexachlorobenzene	mg/kg	0.96	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Hexachlorobutadiene	mg/kg	5.3	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Hexachlorocyclopentadiene	mg/kg	7.5	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Hexachloroethane	mg/kg	8	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0093**	**0.23**	**1.5**	**0.72**	**0.91**	N/A	**0.84**	**0.12**	**0.51**	**0.84**	**0.21**	**0.1**	**0.05 J**	**0.14**
Isophorone	mg/kg	2,400	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Naphthalene	mg/kg	8.6	**0.0032 J**	**0.094**	**0.78**	**0.55**	**0.85**	N/A	**0.048**	**0.75**	**0.69**	**0.36**	**0.073**	**0.026 J**	**0.018 J**	**0.075**
Nitrobenzene	mg/kg	22	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
N-Nitroso-di-n-propylamine	mg/kg	0.33	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
N-Nitrosodiphenylamine	mg/kg	470	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Pentachlorophenol	mg/kg	4	0.18 U	1.8 U	1.8 U	0.18 U	0.18 U	N/A	1.9 U	1.8 U	1.9 U	0.18 U	1.8 U	1.8 U	1.8 U	1.8 U
Phenanthrene	mg/kg		**0.018**	**0.37**	**0.79**	**0.43**	**1.5**	N/A	**1**	**0.27**	**0.35**	**0.53**	**0.14**	**0.42**	**0.12**	**0.6**
Phenol	mg/kg	250,000	0.072 U	0.7 U	0.71 U	0.073 U	0.073 U	N/A	0.75 U	0.72 U	0.75 U	0.072 U	0.72 U	0.73 U	0.71 U	0.73 U
Pyrene	mg/kg	23,000	**0.023**	**0.55**	**1.6**	**0.87**	**1.5**	N/A	**1.9**	**0.21**	**0.62**	**0.94**	**0.5**	**0.59**	**0.22**	**1.1**
Polychlorinated Biphenyls (PCBs)																
Aroclor 1242	mg/kg	0.97	N/A	0.018 U	N/A	0.091 U	N/A	N/A	0.019 U	N/A	0.093 U	N/A	0.018 U	N/A	N/A	N/A
Aroclor 1248	mg/kg	0.94	N/A	**0.093**	N/A	**0.052 J**	N/A	N/A	0.019 U	N/A	**0.071 J**	N/A	0.018 U	N/A	N/A	N/A
Aroclor 1254	mg/kg	0.97	N/A	0.018 U	N/A	**0.067 J**	N/A	N/A	0.019 U	N/A	**0.087 J**	N/A	0.018 U	N/A	N/A	N/A
Aroclor 1260	mg/kg	0.99	N/A	**0.073**	N/A	**0.072 J**	N/A	N/A	**0.048 NJ**	N/A	**0.053 J**	N/A	**0.068**	N/A	N/A	N/A
PCBs (total)	mg/kg	0.97	N/A	**0.17**	N/A	0.82 U	N/A	N/A	**0.048 NJ**	N/A	0.84 U	N/A	**0.068 J**	N/A	N/A	N/A
Total Petroleum Hydrocarbons																
Diesel Range Organics	mg/kg	6,200	**45.5**	**157**	**199**	**128**	**198**	N/A	**144**	**238**	**89.7**	**466**	**124**	**1,230**	**491**	**252**
Gasoline Range Organics	mg/kg	6,200	11.2 U	11 U	11.8 U	13.5 U	11.8 U	N/A	13.2 UJ	9.6 UJ	12.4 U	11.3 U	14.6 U	**23.7**	9.2 U	9.6 U
Oil and Grease	mg/kg	6,200	**98.6 J**	**731**	**676**	**416**	**487**	**249 J-**	**39.8 J**	**496 J-**	**306**	**1,280**	**1,900**	**14,900**	**19,200**	**2,860**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data

^PAH compounds were analyzed via SIM
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.

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 or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in
NJ: This analyte has been "tentatively" identified. The numeric value represents its approximate concentration.

Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B14-011-SB-1	B14-011-SB-5	B14-011-SB-10*	B14-018-SB-1	B14-018-SB-5	B14-032-SB-1	B14-032-SB-8.5
			9/7/2017	9/7/2017	9/7/2017	9/14/2017	9/14/2017	9/6/2017	9/6/2017
Metals									
Aluminum	mg/kg	1,100,000	**3,460**	**4,920**	N/A	**10,500**	**8,760**	**13,200**	**21,800**
Antimony	mg/kg	470	3.5 UJ	3.5 UJ	N/A	2.6 UJ	2.7 UJ	2.6 UJ	3.5 UJ
Arsenic	mg/kg	3	**42.1**	**38.8**	**7.8**	**5.2**	**5.6**	**2.4**	**10.8**
Barium	mg/kg	220,000	**208 J**	**186 J**	N/A	**176 J**	**193 J**	**135 J**	**58.3 J**
Beryllium	mg/kg	2,300	1.2 U	**0.29 J**	N/A	0.52 B	0.36 B	**1.2**	**1.2**
Cadmium	mg/kg	980	**62.6 J**	**62.5 J**	N/A	**1.1 J**	**1.7**	**1.3**	1.7 U
Chromium	mg/kg	120,000	**3,760**	**4,230**	N/A	**622 J**	**751**	**915**	**50.9**
Chromium VI	mg/kg	6.3	**2 J-**	1 B	N/A	0.6 B	0.51 B	0.71 B	0.8 B
Cobalt	mg/kg	350	**22.4**	**17**	N/A	**9.1**	**10.9**	**10.3**	**11.5**
Copper	mg/kg	47,000	**591**	**453**	N/A	**79.7**	**104**	**57.3 J**	**22.7 J**
Iron	mg/kg	820,000	**375,000**	**292,000**	N/A	**124,000**	**164,000**	**128,000**	**37,800**
Lead	mg/kg	800	**401**	**820**	**16.4**	**148 J**	**273**	**88.7 J**	**27 J**
Manganese	mg/kg	26,000	**3,100**	**5,510**	N/A	**16,000**	**14,100**	**24,800**	**485**
Mercury	mg/kg	350	**0.96 J+**	**0.04 J+**	N/A	**0.083 J**	**0.17**	**0.059 J**	**0.071 J**
Nickel	mg/kg	22,000	**382 J**	**203 J**	N/A	**41.9**	**174 J**	**38.7**	**26.8**
Selenium	mg/kg	5,800	4.6 U	4.6 U	N/A	3.5 U	3.6 U	3.5 U	4.7 U
Silver	mg/kg	5,800	**6.4 J**	**13.4 J**	N/A	**43.4 J**	**29.7 J**	**63.2 J**	**2.9 J**
Thallium	mg/kg	12	11.6 U	11.6 U	N/A	8.8 U	8.9 U	8.8 U	11.6 U
Vanadium	mg/kg	5,800	**30.7**	**193**	N/A	**1,650 J**	**1,430**	**2,070**	**73.6**
Zinc	mg/kg	350,000	**12,300**	**18,100**	N/A	**300**	**490**	**276**	**149**
Other									
Cyanide	mg/kg	150	**7.8 J+**	**1 J+**	N/A	**0.81 J-**	**1.2 J-**	**1.6**	1.2 U

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

Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B14-033-SB-1* 9/15/2017	B14-034-SB-1 9/6/2017	B14-034-SB-5 9/6/2017	B24-007-SB-1* 4/21/2020	B24-007-SB-5* 4/21/2020	B24-008-SB-1 4/20/2020	B24-008-SB-5 4/20/2020
Metals									
Aluminum	mg/kg	1,100,000	**23,200**	**4,580**	**11,800**	**6,890**	**10,600**	**8,210**	**10,400**
Antimony	mg/kg	470	2.5 U	4.4 UJ	3.6 UJ	2.9 U	3 U	3 UJ	3 UJ
Arsenic	mg/kg	3	**1.7 J**	**46**	**20.2**	2.4 U	**7.3**	**4.7**	**2.5 J**
Barium	mg/kg	220,000	**143**	**381 J**	**90.2 J**	**186**	**158**	**122**	**274**
Beryllium	mg/kg	2,300	**2.3**	1.5 U	**3.2**	**0.69 J**	**0.96 J**	**0.79 J**	**1.3**
Cadmium	mg/kg	980	**0.85 J**	**109**	**45.8**	**1.5**	**7.3**	**1.5**	**1.3 J**
Chromium	mg/kg	120,000	**115**	**6,240**	**7,270**	**1,260**	**964**	**1,070**	**1,160**
Chromium VI	mg/kg	6.3	0.64 B	1.7 B	1.1 B	**0.6 J**	1.1 U	1.1 R	0.55 B
Cobalt	mg/kg	350	**15**	**25.9**	**35**	**6.3**	**13**	**13.3**	**9.6**
Copper	mg/kg	47,000	**21.1**	**841 J**	**386 J**	**2,050**	**169**	**104**	**80.7**
Iron	mg/kg	820,000	**30,900**	**318,000**	**233,000**	**136,000**	**165,000**	**167,000**	**199,000**
Lead	mg/kg	800	**45**	**1,010 J**	**627 J**	**115**	**750**	**164**	**122**
Manganese	mg/kg	26,000	**1,230**	**2,970**	**1,580**	**32,500**	**21,800**	**22,400**	**29,600**
Mercury	mg/kg	350	**0.026 J**	**1.1**	**0.83**	**0.083 J**	**0.18**	**0.2**	**0.14**
Nickel	mg/kg	22,000	**92.5**	**339**	**180**	**33.5**	**46.1**	**45.8**	**32.6**
Selenium	mg/kg	5,800	3.3 U	**3.6 J**	4.8 U	3.8 U	4.1 U	3.9 U	4 U
Silver	mg/kg	5,800	**9.8**	**12.9 J**	**8.2 J**	2.9 U	3 U	3 U	3 U
Thallium	mg/kg	12	8.3 U	14.7 U	12 U	**16.9**	**6 J**	**6.2 J**	**8.2 J**
Vanadium	mg/kg	5,800	**47.8**	**67.4**	**46.4**	**3,760**	**1,650**	**2,160 J**	**2,760 J**
Zinc	mg/kg	350,000	**236**	**21,400**	**10,400**	**293**	**1,100**	**467 J**	**328 J**
Other									
Cyanide	mg/kg	150	**0.27 J**	**12.9**	**11.3**	**1.1**	**1.7**	**2.7 J-**	**1.3 J-**

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Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B24-021-SB-1* 4/21/2020	B24-021-SB-5* 4/21/2020	B24-022-SB-1* 4/21/2020	B24-022-SB-5* 4/21/2020	B24-023-SB-1* 4/21/2020	B24-023-SB-5* 4/21/2020	B24-024-SB-1* 4/21/2020
Metals									
Aluminum	mg/kg	1,100,000	**7,370**	**7,240**	**12,300**	**8,140**	**10,400**	**6,630**	**21,700**
Antimony	mg/kg	470	2.9 U	2.9 U	3 U	3 U	3 U	3.1 U	3 U
Arsenic	mg/kg	3	**2.6**	2.4 U	**5.4**	2.5 U	**3.5**	**3.8**	2.5 U
Barium	mg/kg	220,000	**66**	**100**	**176**	**98.1**	**111**	**77.8**	**256**
Beryllium	mg/kg	2,300	**0.67 J**	**0.69 J**	**1.2**	**0.81 J**	**0.89 J**	**0.44 J**	**2.5**
Cadmium	mg/kg	980	**0.73 J**	**0.78 J**	**6.3**	**0.99 J**	**1.8**	**1.4 J**	**1.1 J**
Chromium	mg/kg	120,000	**532**	**1,270**	**1,120**	**1,020**	**916**	**503**	**839**
Chromium VI	mg/kg	6.3	**1.1 J**	**1.4**	1.1 U	**0.57 J**	**0.55 J**	**0.65 J**	**0.67 J**
Cobalt	mg/kg	350	**5.5**	**12.1**	**8.6**	**6.2**	**14.4**	**10.5**	**8.6**
Copper	mg/kg	47,000	**47.6**	**74.2**	**110**	**121**	**67**	**151**	**2,180**
Iron	mg/kg	820,000	**143,000**	**182,000**	**166,000**	**195,000**	**134,000**	**111,000**	**129,000**
Lead	mg/kg	800	**66.2**	**81**	**428**	**94.4**	**204**	**201**	**172**
Manganese	mg/kg	26,000	**33,300**	**36,000**	**18,500**	**26,700**	**20,100**	**11,900**	**16,400**
Mercury	mg/kg	350	**0.11**	**0.085 J**	**0.25**	**0.049 J**	**0.15**	**0.11 J**	**0.049 J**
Nickel	mg/kg	22,000	**17.4**	**26.8**	**36.1**	**19.4**	**41.6**	**34.7**	**39.1**
Selenium	mg/kg	5,800	3.9 U	3.9 U	4 U	4 U	3.9 U	4.1 U	4 U
Silver	mg/kg	5,800	2.9 U	2.9 U	3 U	3 U	3 U	3.1 U	3 U
Thallium	mg/kg	12	9.7 U	**13.8**	**7.9 J**	**10.6**	**7.6 J**	**4.6 J**	**3.5 J**
Vanadium	mg/kg	5,800	**1,530**	**3,270**	**1,880**	**2,760**	**2,220**	**1,240**	**1,500**
Zinc	mg/kg	350,000	**188**	**286**	**943**	**383**	**621**	**945**	**257**
Other									
Cyanide	mg/kg	150	**0.37 J**	0.98 U	**2.4**	**3**	**2.3**	**1.4**	**1.1 J**

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Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B24-024-SB-5* 4/21/2020	B24-025-SB-1* 4/14/2020	B24-025-SB-5* 4/14/2020	B24-025-SB-10* 4/14/2020	B24-025-SB-15* 4/15/2020	B24-026-SB-1* 4/14/2020	B24-026-SB-5* 4/14/2020
Metals									
Aluminum	mg/kg	1,100,000	**9,430**	**8,190**	**7,730**	**7,950**	**14,800**	**13,900**	**12,400**
Antimony	mg/kg	470	2.9 U	3.2 U	3 U	3.2 U	3.5 U	3.2 U	3.3 U
Arsenic	mg/kg	3	2.4 U	2.6 U	**9.3**	**5.4**	**4.9**	**9.2**	**11.8**
Barium	mg/kg	220,000	**162**	**79.2**	**151**	**106**	**305**	**191**	**145**
Beryllium	mg/kg	2,300	**0.68 J**	**0.56 J**	**0.38 J**	**0.46 J**	**1.1 J**	**1.4**	**0.68 J**
Cadmium	mg/kg	980	**2.2**	**1.3 J**	**2.6**	**3.4**	**4.6**	**1.7**	**8.1**
Chromium	mg/kg	120,000	**1,100**	**518**	**416**	**386**	**264**	**188**	**146**
Chromium VI	mg/kg	6.3	**0.95 J**	**0.66 J**	**0.73 J**	**0.84 J**	**0.81 J**	1.1 U	1.2 U
Cobalt	mg/kg	350	**9.4**	**4.4 J**	**6.3**	**7.6**	**4.6 J**	**19.3**	**14.3**
Copper	mg/kg	47,000	**91.9**	**43.6**	**69.6**	**70.6**	**57.5**	**126**	**143**
Iron	mg/kg	820,000	**131,000**	**108,000**	**128,000**	**127,000**	**72,700**	**60,300**	**54,700**
Lead	mg/kg	800	**150**	**158**	**489**	**305**	**293**	**176**	**750**
Manganese	mg/kg	26,000	**51,900**	**10,800**	**8,410**	**9,000**	**8,190**	**14,100**	**2,970**
Mercury	mg/kg	350	**0.029 J**	**0.034 J**	**0.14**	**0.14**	**0.053 J**	**0.18**	**0.1 J**
Nickel	mg/kg	22,000	**33.9**	**26.4**	**33.6**	**39.6**	**22**	**47.1**	**53.8**
Selenium	mg/kg	5,800	3.9 U	4.2 U	4 U	4.3 U	4.6 U	4.3 U	4.4 U
Silver	mg/kg	5,800	2.9 U	3.2 U	3 U	3.2 U	3.5 U	3.2 U	3.3 U
Thallium	mg/kg	12	9.7 U	10.6 U	10.1 U	10.6 U	11.6 U	10.7 U	11.1 U
Vanadium	mg/kg	5,800	**2,600**	**570**	**394**	**380**	**290**	**173**	**273**
Zinc	mg/kg	350,000	**348**	**372**	**1,010**	**649**	**554**	**552**	**1,760**
Other									
Cyanide	mg/kg	150	**0.81 J**	**0.63 J**	**0.73 J**	**1.2**	**1.1**	**1.5**	**1.5**

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Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B24-026-SB-10* 4/14/2020	B24-026-SB-16* 4/14/2020	B24-027-SB-1* 4/16/2020	B24-027-SB-5* 4/16/2020	B24-028-SB-1* 4/21/2020	B24-028-SB-5* 4/21/2020	B24-029-SB-1 4/20/2020
Metals									
Aluminum	mg/kg	1,100,000	**14,200**	**18,500**	**10,800**	**7,960**	**9,010**	**6,580**	**12,800**
Antimony	mg/kg	470	3.5 U	3.3 U	3 U	3 U	3 U	3 U	3 UJ
Arsenic	mg/kg	3	**6.4**	2.8 U	2.5 U	2.5 U	**4.4**	2.5 U	**37.3**
Barium	mg/kg	220,000	**75**	**200**	**161**	**128**	**118**	**142**	**209**
Beryllium	mg/kg	2,300	**0.61 J**	**2.6**	**0.85 J**	**0.36 J**	**0.72 J**	**0.71 J**	**1.8**
Cadmium	mg/kg	980	**4.8**	**2**	**1.3 J**	**1.1 J**	**4.4**	**0.54 J**	1.5 U
Chromium	mg/kg	120,000	**90.6**	**409**	**646**	**1,080**	**987**	**1,560**	**34.3**
Chromium VI	mg/kg	6.3	**0.64 J**	**0.62 J**	1.1 U	**0.81 J**	1.1 U	**0.94 J**	1.1 R
Cobalt	mg/kg	350	**8**	**9.2**	**9.1**	**9.6**	**10.8**	**4.3 J**	**10.5**
Copper	mg/kg	47,000	**44.5**	**33**	**56.2**	**59**	**83.9**	**42.5**	**45.7**
Iron	mg/kg	820,000	**57,700**	**54,700**	**118,000**	**183,000**	**145,000**	**166,000**	**29,000**
Lead	mg/kg	800	**230**	**98.3**	**84.3**	**86.7**	**240**	**37.6**	**31.5**
Manganese	mg/kg	26,000	**1,810**	**3,370**	**16,800**	**25,700**	**18,600**	**30,700**	**651**
Mercury	mg/kg	350	**0.081 J**	0.11 U	**0.081 J**	**0.054 J**	**0.09 J**	**0.13**	**0.012 J**
Nickel	mg/kg	22,000	**26.4**	**36.1**	**24.7**	**26.4**	**52**	**13.3**	**22.1**
Selenium	mg/kg	5,800	4.7 U	4.4 U	4 U	3.9 U	4 U	4 U	4 U
Silver	mg/kg	5,800	3.5 U	3.3 U	3 U	3 U	3 U	3 U	3 U
Thallium	mg/kg	12	11.7 U	11.1 U	9.9 U	9.9 U	**9.6 J**	**17.1**	10.1 U
Vanadium	mg/kg	5,800	**82.4**	**144**	**1,430**	**2,480**	**2,280**	**4,250**	**75.4 J**
Zinc	mg/kg	350,000	**753**	**521**	**366**	**253**	**774**	**112**	**140 J**
Other									
Cyanide	mg/kg	150	**0.61 J**	**0.54 J**	**1.8**	**1.1**	**1.8**	**0.67 J**	**0.5 J-**

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Table 2 - Sub-Parcel B24-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B24-029-SB-9	B24-034-SB-1*	B24-034-SB-5*	B24-037-SB-1*	B24-037-SB-8*	B24-037-SB-10*	B24-037-SB-12*
			4/20/2020	4/21/2020	4/21/2020	4/16/2020	4/16/2020	4/16/2020	4/16/2020
Metals									
Aluminum	mg/kg	1,100,000	**7,220**	**9,190**	**8,810**	**18,300**	**15,300**	**18,800**	**13,700**
Antimony	mg/kg	470	**4.1 J**	3.2 U	2.9 U	3 U	3.1 U	3 U	3 U
Arsenic	mg/kg	3	**25.6**	2.6 U	2.4 U	**6**	2.6 U	**3.2**	**3.9**
Barium	mg/kg	220,000	**161**	**100**	**128**	**179**	**140**	**176**	**190**
Beryllium	mg/kg	2,300	**0.57 J**	**1 J**	**0.99**	**1.6**	**1.4**	**2.4**	**1.5**
Cadmium	mg/kg	980	**2.7**	**2**	**1.6**	**1.7**	**0.66 J**	**0.45 J**	**2.2**
Chromium	mg/kg	120,000	**192**	**957**	**961**	**321**	**248**	**27.7**	**749**
Chromium VI	mg/kg	6.3	1.1 R	1.1 U	**0.55 J**	**0.66 J**	**0.56 J**	1.1 U	**0.57 J**
Cobalt	mg/kg	350	**31**	**16.6**	**9.4**	**10.3**	**5.6**	**3.1 J**	**10**
Copper	mg/kg	47,000	**519**	**79.2**	**76.7**	**75.1**	**32.3**	**14.8**	**75.6**
Iron	mg/kg	820,000	**250,000**	**149,000**	**145,000**	**78,400**	**94,400**	**21,000**	**106,000**
Lead	mg/kg	800	**259**	**105**	**143**	**118**	**51.2**	**31.6**	**87.2**
Manganese	mg/kg	26,000	**3,780**	**20,400**	**18,200**	**21,300**	**6,680**	**1,090**	**23,000**
Mercury	mg/kg	350	**0.097 J**	**0.092 J**	**0.096 J**	**0.26**	**0.026 J**	**0.021 J**	**0.18**
Nickel	mg/kg	22,000	**94.5**	**61.2**	**42.4**	**28.3**	**29.7**	**12.5**	**33.5**
Selenium	mg/kg	5,800	4 U	4.2 U	3.9 U	4 U	4.1 U	4 U	4 U
Silver	mg/kg	5,800	3 U	3.2 U	2.9 U	3 U	3.1 U	3 U	3 U
Thallium	mg/kg	12	10 U	10.5 U	**3.8 J**	10.1 U	10.2 U	10.1 U	9.9 U
Vanadium	mg/kg	5,800	**440 J**	**1,280**	**1,480**	**278**	**375**	**47.6**	**1,100**
Zinc	mg/kg	350,000	**628 J**	**521**	**351**	**452**	**432**	**46.3**	**536**
Other									
Cyanide	mg/kg	150	**0.84 J-**	**2.2**	**2**	**4.9**	**0.59 J**	**3.5**	**1.4**

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Table 3 - Sub-Parcel B24-1
Summary of Organics Detected in Groundwater

Parameter	Units	PAL	B24-001-PZ*	B24-027-PZ	B24-034-PZ	B24-035-PZ	B24-036-PZ*	B8-010-PZ	TM02-PZM009*
			5/1/2020	4/29/2020	4/29/2020	4/29/2020	5/1/2020	10/30/2015	9/17/2020
Volatile Organic Compounds									
2-Butanone (MEK)	µg/L	5,600	10 U	10 U	**5.1 J**	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	38	10 U	10 U	**1.4 J**	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (MIBK)	µg/L	1,200	10 U	10 U	**3.3 J**	10 U	10 U	10 U	10 U
Acetone	µg/L	14,000	10 U	10 U	**15.3**	10 U	10 U	10 U	**7.8 J**
Benzene	µg/L	5	1 U	1 U	1 U	1 U	1 U	1 U	**5.7**
Carbon disulfide	µg/L	810	1 U	1 U	1 U	1 U	**0.5 J**	1 U	1 U
Methyl Acetate	µg/L	20,000	5 U	5 U	**1.1 J**	5 U	5 U	5 R	5 U
Toluene	µg/L	1,000	1 U	1 U	**118**	1 U	**0.46 J**	1 U	**3.1**
Xylenes	µg/L	10,000	3 U	3 U	3 U	3 U	3 U	3 U	**6.4**
Semi-Volatile Organic Compounds^									
1,1-Biphenyl	µg/L	0.83	0.97 U	0.99 U	1 U	1 U	0.99 U	1 U	**1.3**
2,3,4,6-Tetrachlorophenol	µg/L	240	0.97 U	0.99 U	**0.31 J**	1 U	0.99 U	1 U	0.98 U
2,4-Dimethylphenol	µg/L	360	**0.4 J**	0.99 U	**304**	1 U	0.99 U	1 U	**34.7**
2-Chloronaphthalene	µg/L	750	0.97 U	0.99 U	**5.4**	1 U	0.99 U	1 U	**4**
2-Methylnaphthalene	µg/L	36	0.097 U	0.099 U	**0.37 J**	0.099 U	**0.1**	0.1 U	**4.6**
2-Methylphenol	µg/L	930	0.97 U	0.99 U	1 U	1 U	0.99 U	1 U	**1.5**
3&4-Methylphenol(m&p Cresol)	µg/L	930	1.9 U	2 U	**1,590**	2 U	2 U	2.1 U	**14.9**
Acenaphthene	µg/L	530	**0.17**	**0.047 J**	1 U	0.099 U	**0.4**	0.1 U	**2.2**
Acenaphthylene	µg/L	530	0.097 U	**0.039 J**	1 U	0.099 U	0.099 U	0.1 U	**0.85**
Acetophenone	µg/L	1,900	0.97 U	0.99 U	1 U	1 U	0.99 U	1 U	**0.81 J**
Anthracene	µg/L	1,800	**0.082 J**	**0.055 J**	1 U	0.099 U	**0.038 J**	**0.027 J**	**0.6**
Benz[a]anthracene	µg/L	0.03	0.097 U	0.099 U	1 U	0.099 U	0.099 U	**0.016 J**	**0.077 J**
Benzo[a]pyrene	µg/L	0.2	**0.033 J**	0.099 U	1 U	**0.02 J**	0.099 U	0.1 U	**0.012 J**
Benzo[b]fluoranthene	µg/L	0.25	**0.061 J**	0.099 U	1 U	**0.038 J**	0.099 U	0.1 U	0.098 U
Benzo[k]fluoranthene	µg/L	2.5	**0.054 J**	0.099 U	1 U	**0.03 J**	0.099 U	0.1 U	0.098 U
bis(2-Ethylhexyl)phthalate	µg/L	6	0.97 U	0.99 U	**0.99 J**	1 U	0.99 U	**0.23 J**	0.98 U
Carbazole	µg/L		0.97 U	0.99 U	**0.31 J**	1 U	0.99 U	1 U	**4.5**
Chrysene	µg/L	25	**0.043 J**	0.099 U	1 U	0.099 U	0.099 U	0.1 U	**0.074 J**
Di-n-butylphthalate	µg/L	900	0.97 U	0.99 U	**1.5**	0.45 B	**0.38 J**	1 U	0.98 U
Fluoranthene	µg/L	800	**0.21**	**0.13**	1 U	0.099 U	**0.12**	**0.015 J**	**1.2**
Fluorene	µg/L	290	**0.098**	**0.039 J**	1 U	0.099 U	**0.23**	0.1 U	**2.4**
Naphthalene	µg/L	0.12	**0.038 J**	0.099 U	**1.9**	0.099 U	**0.94**	0.061 B	**56.8**
Nitrobenzene	µg/L	0.14	0.97 U	0.99 U	20.4 U	1 U	**0.4 J**	1 U	9.8 U
Phenanthrene	µg/L		**0.13**	0.099 U	1 U	0.099 U	**0.43**	**0.023 J**	**4**
Phenol	µg/L	5,800	0.97 U	0.99 U	**163**	1 U	0.99 U	1 U	0.98 U
Pyrene	µg/L	120	**0.29**	**0.13**	1 U	0.099 U	**0.073 J**	**0.017 J**	**0.81**
TPH/Oil & Grease									
Diesel Range Organics	µg/L	47	**266**	**378 J**	**8,200 J**	99.5 UJ	**327**	N/A	**1,770**
Oil & Grease	µg/L	47	4,750 U	4,750 U	**3,800 J**	4,750 U	4,750 U	**2,100 J**	4,750 U

Detections in bold
Values in red indicate exceedances of the Project Action Limit (PAL)
*Indicates non-validated data
^PAH compounds were analyzed via SIM
N/A: This parameter was not analyzed for this sample.

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
B: The analyte was not detected substantially above the level of the associated method blank or field blank.
J: The positive result reported for this analyte is a quantitative estimate.
R: The result for this analyte is unreliable. Additional data is needed ot confirm or disprove the presence of this compound/analyte in the sample.

Table 4 - Sub-Parcel B24-1
Summary of Inorganics Detected in Groundwater

Parameter	Units	PAL	B24-001-PZ* 5/1/2020	B24-027-PZ 4/29/2020	B24-034-PZ 4/29/2020	B24-035-PZ 4/29/2020	B24-036-PZ* 5/1/2020	B8-010-PZ 10/30/2015	TM02-PZM009* 9/17/2020
Total Metals									
Aluminum	µg/L	20,000	N/A	N/A	N/A	N/A	N/A	N/A	**89.2**
Barium	µg/L	2,000	N/A	N/A	N/A	N/A	N/A	N/A	**64.2**
Chromium	µg/L	100	N/A	N/A	N/A	N/A	N/A	N/A	**1 J**
Chromium VI	µg/L	0.035	N/A	N/A	N/A	N/A	N/A	**8 J**	10 U
Copper	µg/L	1,300	N/A	N/A	N/A	N/A	N/A	N/A	**2.7 J**
Nickel	µg/L	390	N/A	N/A	N/A	N/A	N/A	N/A	**2.6 J**
Vanadium	µg/L	86	N/A	N/A	N/A	N/A	N/A	N/A	**61.3**
Dissolved Metals									
Aluminum, Dissolved	µg/L	20,000	**298**	**131**	**164**	**34.5 J**	**160**	25.4 B	**59.4**
Arsenic, Dissolved	µg/L	10	5 U	5 U	**6.9**	5 U	5 U	**5.8**	5 U
Barium, Dissolved	µg/L	2,000	**60.1**	**129**	**32.2**	**46.4**	**82.2**	**18.9**	**61.7**
Cadmium, Dissolved	µg/L	5	3 U	3 U	3 U	**0.91 J**	3 U	3 U	3 U
Chromium VI, Dissolved	µg/L	0.035	**8.4 J**	**23.6**	10 U	**3.8 J**	100 U	N/A	10 U
Chromium, Dissolved	µg/L	100	**14.2**	**30.4**	**30.8**	**5**	0.91 B	**6.9**	**0.99 J**
Cobalt, Dissolved	µg/L	6	5 U	5 U	**1.4 J**	10 U	5 U	5 U	5 U
Copper, Dissolved	µg/L	1,300	5 U	5 U	5 U	5 U	5 U	**1.5 J**	5 U
Iron, Dissolved	µg/L	14,000	70 U	70 U	**65.2 J**	70 U	70 U	**87.2**	70 U
Manganese, Dissolved	µg/L	430	**1.3 J**	5 U	**2.7 J**	5 U	5 U	**59**	5 U
Nickel, Dissolved	µg/L	390	10 U	10 U	**7.5 J**	10 U	10 U	10 U	**2.5 J**
Thallium, Dissolved	µg/L	2	10 U	10 U	10 U	20 U	10 U	**5 J**	10 U
Vanadium, Dissolved	µg/L	86	**154**	**27.4**	**312**	**112**	**3.8 J**	**1,040**	**57.6**
Zinc, Dissolved	µg/L	6,000	10 U	10 U	**3.6 J**	10 U	10 U	4.7 B	10 U
Other									
Available Cyanide	µg/L	200	5 U	**2 J**	**9**	**4 J**	5 U	N/A	N/A
Amenable Cyanide	µg/L	200	N/A	N/A	N/A	N/A	N/A	N/A	**16**
Total Cyanide	µg/L	200	**5 J**	**4.9 J**	**24**	**7.3 J**	10 U	10 U	**26 / 16.2**

Detections in bold
Values in red indicate exceedances of the Project Action Limit (PAL)
*Indicates non-validated data
N/A: This parameter was not analyzed for this sample.
Total Cyanide was run by both Pace and Alpha Laboratories

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
B: The analyte was not detected substantially above the level of the associated method blank or field blank.
J: The positive result reported for this analyte is a quantitative estimate.

Table 5 - Sub-Parcel B24-1
Cumulative Vapor Intrusion Criteria Comparison

				B24-001-PZ 5/1/2020		B24-027-PZ 4/29/2020		B24-034-PZ 4/29/2020		B24-035-PZ 4/29/2020	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk											
1,4-Dioxane	SVOC		130,000	0.097 U	0	0.099 U	0	0.1 U	0	0.099 U	0
Naphthalene	SVOC		200	0.038 J	1.9E-09	0.099 U	0	1.9	9.5E-08	0.099 U	0
Nitrobenzene	SVOC		3,100	0.97 U	0	0.99 U	0	20.4 U	0	1 U	0
Benzene	VOC		69	1 U	0	1 U	0	1 U	0	1 U	0
Ethylbenzene	VOC		150	1 U	0	1 U	0	1 U	0	1 U	0
Cumulative Vapor Intrusion Risk =					2E-09		0		1E-07		0
Non-Cancer Hazard											
Cumulative Vapor Intrusion Non-Cancer Hazard =					0		0		0		0

				B24-036-PZ 5/1/2020		B8-010-PZ 10/30/2015		TM02-PZM009 9/17/2020	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk									
1,4-Dioxane	SVOC		130,000	0.099 U	0	0.1 U	0	0.098 U	0
Naphthalene	SVOC		200	0.94	4.7E-08	0.061 B	0	56.8	2.8E-06
Nitrobenzene	SVOC		3,100	0.4 J	1.3E-09	1 U	0	9.8 U	0
Benzene	VOC		69	1 U	0	1 U	0	5.7	8.3E-07
Ethylbenzene	VOC		150	1 U	0	1 U	0	1U	0
Cumulative Vapor Intrusion Risk =					5E-08		0		4E-06
Non-Cancer Hazard									
Cumulative Vapor Intrusion Non-Cancer Hazard =					0		0		0

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

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive value reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method or field blank.

Table 6 - Sub-Parcel B24-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	B24-027-SB-5	2.1		0.022	0.29	41	36.59	410	20	no
1,2,4,5-Tetrachlorobenzene	95-94-3	B14-032-SB-1	0.029	J	0.029	0.03	41	2.44		35	no
2,3,4,6-Tetrachlorophenol	58-90-2	B14-032-SB-1	0.037	J	0.037	0.04	41	2.44		2,500	no
2,4,5-Trichlorophenol	95-95-4	B14-032-SB-1	0.034	J	0.034	0.03	41	2.44		8,200	no
2,4,6-Trichlorophenol	88-06-2	B14-032-SB-1	0.031	J	0.031	0.03	41	2.44	210	82	no
2,4-Dichlorophenol	120-83-2	B14-032-SB-1	0.029	J	0.029	0.03	41	2.44		250	no
2,4-Dimethylphenol	105-67-9	B14-011-SB-5	0.06	J	0.028	0.04	41	4.88		1,600	no
2,4-Dinitrophenol	51-28-5	B14-032-SB-1	0.049	J	0.049	0.05	38	2.63		160	no
2,4-Dinitrotoluene	121-14-2	B14-032-SB-1	0.037	J	0.037	0.04	41	2.44	7.4	160	no
2,6-Dinitrotoluene	606-20-2	B14-032-SB-1	0.034	J	0.034	0.03	41	2.44	1.5	25	no
2-Butanone (MEK)	78-93-3	B24-037-SB-8	0.02		0.02	0.02	3	33.33		19,000	no
2-Chloronaphthalene	91-58-7	B14-032-SB-1	0.028	J	0.028	0.03	41	2.44		6,000	no
2-Chlorophenol	95-57-8	B14-032-SB-1	0.026	J	0.026	0.03	41	2.44		580	no
2-Methylnaphthalene	91-57-6	B24-028-SB-5	0.28		0.0026	0.09	41	92.68		300	no
2-Methylphenol	95-48-7	B14-032-SB-1	0.03	J	0.03	0.03	41	2.44		4,100	no
2-Nitroaniline	88-74-4	B14-032-SB-1	0.033	J	0.033	0.03	41	2.44		800	no
3,3'-Dichlorobenzidine	91-94-1	B24-037-SB-10	0.18	J	0.016	0.10	41	4.88	5.1		no
Acenaphthene	83-32-9	B24-007-SB-5	0.33		0.00093	0.07	41	87.80		4,500	no
Acenaphthylene	208-96-8	B14-018-SB-5	0.53		0.0029	0.09	41	100.00			no
Acetone	67-64-1	B24-037-SB-8	0.012	J	0.012	0.01	3	33.33		67,000	no
Acetophenone	98-86-2	B14-032-SB-1	0.031	J	0.019	0.02	41	7.32		12,000	no
Aluminum	7429-90-5	B14-033-SB-1	23,200		3,460	11,163	41	100.00		110,000	no
Anthracene	120-12-7	B14-018-SB-5	1.4		0.0052	0.21	42	100.00		23,000	no
Antimony	7440-36-0	B24-029-SB-9	4.1	J	4.1	4.10	41	2.44		47	no
Aroclor 1242	53469-21-9	B24-007-SB-1	0.053	J	0.053	0.05	18	5.56	1		no
Aroclor 1248	12672-29-6	B24-027-SB-1	0.093		0.052	0.07	18	27.78	0.95		no
Aroclor 1254	11097-69-1	B24-022-SB-1	0.2		0.06	0.10	18	38.89	1	1.5	no
Aroclor 1260	11096-82-5	B14-011-SB-1	3.4	J	0.014	0.53	18	77.78	0.99		YES (C)
Arsenic	7440-38-2	B14-034-SB-1	46		1.7	11.6	42	69.05	3	48	YES (C)
Barium	7440-39-3	B14-034-SB-1	381	J	58.3	157	41	100.00		22,000	no
Benz[a]anthracene	56-55-3	B24-007-SB-5	4.5		0.019	0.87	46	97.83	21		no
Benzaldehyde	100-52-7	B14-034-SB-5	0.1	J	0.016	0.03	35	17.14	820	12,000	no
Benzene	71-43-2	B24-037-SB-8	0.0024	J	0.0024	0.002	3	33.33	5.1	42	no
Benzo[a]pyrene	50-32-8	B14-018-SB-5	3.8		0.016	0.91	49	97.96	2.1	22	YES (C)

Table 6 - Sub-Parcel B24-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Benzo[b]fluoranthene	205-99-2	B14-018-SB-5	8.9		0.032	1.40	50	98.00	21		no
Benzo[g,h,i]perylene	191-24-2	B14-018-SB-5	2.9		0.0063	0.60	46	100.00			no
Benzo[k]fluoranthene	207-08-9	B14-018-SB-5	6.9		0.0089	0.68	43	97.67	210		no
Beryllium	7440-41-7	B14-034-SB-5	3.2		0.29	1.12	41	90.24	6,900	230	no
bis(2-chloroethoxy)methane	111-91-1	B14-032-SB-1	0.027	J	0.027	0.03	41	2.44		250	no
bis(2-Chloroethyl)ether	111-44-4	B14-032-SB-1	0.022	J	0.022	0.02	41	2.44	1		no
bis(2-Chloroisopropyl)ether	108-60-1	B14-032-SB-1	0.024	J	0.024	0.02	41	2.44		4,700	no
bis(2-Ethylhexyl)phthalate	117-81-7	B14-034-SB-5	0.14	J	0.021	0.05	41	48.78	160	1,600	no
Cadmium	7440-43-9	B14-034-SB-1	109		0.45	9.20	41	95.12	9,300	98	YES (NC)
Caprolactam	105-60-2	B14-032-SB-1	0.039	J	0.023	0.03	41	29.27		40,000	no
Carbazole	86-74-8	B14-018-SB-5	0.7	J	0.02	0.12	41	43.90			no
Carbon disulfide	75-15-0	B24-037-SB-8	0.0039	J	0.0039	0.004	3	33.33		350	no
Chromium	7440-47-3	B14-034-SB-5	7,270		27.7	1,119	41	100.00		180,000	no
Chromium VI	18540-29-9	B14-011-SB-1	2	J-	0.55	0.80	38	55.26	6.3	350	no
Chrysene	218-01-9	B14-018-SB-5	3.9		0.021	0.78	47	97.87	2,100		no
Cobalt	7440-48-4	B14-034-SB-5	35		3.1	11.7	41	100.00	1,900	35	YES (NC)
Copper	7440-50-8	B24-024-SB-1	2180		14.8	233	41	100.00		4,700	no
Cyanide	57-12-5	B14-034-SB-1	12.9		0.27	2.16	41	95.12		120	no
Cyclohexane	110-82-7	B24-037-SB-8	0.013		0.013	0.01	3	33.33		2,700	no
Dibenz[a,h]anthracene	53-70-3	B14-018-SB-5	0.82		0.0036	0.18	41	87.80	2.1		no
Diethylphthalate	84-66-2	B14-032-SB-1	0.041	J	0.016	0.02	41	17.07		66,000	no
Di-n-butylphthalate	84-74-2	B24-025-SB-5	0.093		0.043	0.07	41	24.39		8,200	no
Di-n-ocytlphthalate	117-84-0	B24-023-SB-5	0.093		0.026	0.06	41	12.20		820	no
Ethylbenzene	100-41-4	B24-037-SB-8	0.0019	J	0.0019	0.00	3	33.33	25	2,000	no
Fluoranthene	206-44-0	B14-018-SB-5	7.1		0.0025	1.18	48	100.00		3,000	no
Fluorene	86-73-7	B24-007-SB-5	0.28		0.00095	0.04	41	90.24		3,000	no
Hexachlorobenzene	118-74-1	B14-032-SB-1	0.041	J	0.041	0.04	41	2.44	0.96	93	no
Hexachlorobutadiene	87-68-3	B14-032-SB-1	0.028	J	0.028	0.03	41	2.44	5.3	120	no
Hexachlorocyclopentadiene	77-47-4	B14-032-SB-1	0.019	J	0.019	0.02	41	2.44		0.75	no
Hexachloroethane	67-72-1	B14-032-SB-1	0.026	J	0.026	0.03	41	2.44	8	46	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B24-007-SB-5	2.8		0.0093	0.71	48	95.83	21		no
Iron	7439-89-6	B14-011-SB-1	375,000		21,000	139,234	41	100.00		82,000	YES (NC)
Isophorone	78-59-1	B14-032-SB-1	0.027	J	0.027	0.03	41	2.44	2,400	16,000	no

Table 6 - Sub-Parcel B24-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Lead^	7439-92-1	B14-034-SB-1	1,010	J	16.4	233	42	100.00		800	YES (NC)
Manganese	7439-96-5	B24-024-SB-5	51,900		485	15,523	41	100.00		2,600	YES (NC)
Mercury	7439-97-6	B14-034-SB-1	1.1		0.012	0.17	41	97.56		35	no
Naphthalene	91-20-3	B14-018-SB-5	1.2		0.0032	0.32	43	93.02	8.6	59	no
Nickel	7440-02-0	B14-011-SB-1	382	J	12.5	63.7	41	100.00	64,000	2,200	no
Nitrobenzene	98-95-3	B14-032-SB-1	0.026	J	0.026	0.03	41	2.44	22	130	no
N-Nitroso-di-n-propylamine	621-64-7	B14-032-SB-1	0.027	J	0	0.03	41	2.44	0.33		no
N-Nitrosodiphenylamine	86-30-6	B14-032-SB-1	0.029	J	0.029	0.03	41	2.44	470		no
PCBs (total)*	1336-36-3	B14-011-SB-1	3.4		0.048	0.83	18	50.00	0.94		YES (C)
Pentachlorophenol	87-86-5	B14-032-SB-1	0.038	J	0.038	0.04	41	2.44	4	280	no
Phenanthrene	85-01-8	B24-007-SB-5	4.4		0.0039	0.65	43	100.00			no
Phenol	108-95-2	B14-011-SB-5	0.11		0.029	0.08	41	7.32		25,000	no
Pyrene	129-00-0	B14-018-SB-5	9.6		0.0026	1.20	48	100.00		2,300	no
Selenium	7782-49-2	B14-034-SB-1	3.6	J	3.6	3.60	41	2.44		580	no
Silver	7440-22-4	B14-032-SB-1	63.2	J	2.9	21.1	41	21.95		580	no
Thallium	7440-28-0	B24-028-SB-5	17.1		3.5	8.91	41	31.71		1.2	YES (NC)
Toluene	108-88-3	B24-037-SB-8	0.0032	J	0.0032	0.003	3	33.33		4,700	no
Vanadium	7440-62-2	B24-028-SB-5	4,250		30.7	1,238	41	100.00		580	YES (NC)
Zinc	7440-66-6	B14-034-SB-1	21,400		46.3	1,966	41	100.00		35,000	no

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

COPC = Constituent of Potential Concern
TR = Target Risk
HQ = Hazard Quotient
C = Compound was identified as a cancer COPC
NC = Compound was identified as a non-cancer COPC

*PCBs (total) include the sum of all detected aroclor mixtures, including those without RSLs (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.
^Lead is assessed separately through the ALM and IEUBK models.

Table 7 - Sub-Parcel B24-1
Assessment of Lead

Exposure Unit	Surface/Sub-Surface	Maximum Concentration (mg/kg)	Arithmetic Mean (mg/kg)
Site-Wide EU1 (16.7 ac.)	Surface	1,010	209
	Sub-Surface	820	251
	Pooled	1,010	233

Table 8 - Sub-Parcel B24-1
Soil Exposure Point Concentrations

	Site-Wide EU1 (16.7 ac.)					
	EPCs - Surface Soils		**EPCs - Sub-Surface Soils**		**EPCs - Pooled Soils**	
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	95% KM (Chebyshev) UCL	25.4	95% GROS Adjusted Gamma UCL	15.3	KM H-UCL	11.3
Cadmium	95% KM (Chebyshev) UCL	40.3	95% KM (Chebyshev) UCL	20.8	95% KM (Chebyshev) UCL	23.6
Cobalt	95% Student's-t UCL	14.6	95% Adjusted Gamma UCL	14.2	95% Adjusted Gamma UCL	13.5
Iron	95% Adjusted Gamma UCL	187,974	95% Student's-t UCL	163,224	95% Adjusted Gamma UCL	164,135
Manganese	95% Student's-t UCL	20,292	95% Adjusted Gamma UCL	22,847	95% Student's-t UCL	18,662
Thallium	95% KM (t) UCL	9.14	95% KM (t) UCL	8.60	95% KM (t) UCL	8.34
Vanadium	95% Student's-t UCL	1,709	95% Adjusted Gamma UCL	1,975	95% Chebyshev (Mean, Sd) UCL	2,020
Total PCBs	99% KM (Chebyshev) UCL	2.94	NA	NA	99% KM (Chebyshev) UCL	2.94
Benzo[a]pyrene	95% Student's-t UCL	1.09	Gamma Adjusted KM-UCL	1.42	Gamma Adjusted KM-UCL	1.10

NA = No Detections

Table 9 - Sub-Parcel B24-1
Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (16.7 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	25.4	3.00	480	8.5E-06	0.05
Cadmium	**Urinary**	40.3	9,300	980	4.3E-09	0.04
Cobalt	**Thyroid**	14.6	1,900	350	7.7E-09	0.04
Iron	**Gastrointestinal**	187,974		820,000		0.2
Manganese	**Nervous**	20,292		26,000		0.8
Thallium	**Dermal**	9.14		12.0		0.8
Vanadium	**Dermal**	1,709		5,800		0.3
PCBs (Total)		2.94	0.94		3.1E-06	
Benzo(a)pyrene	**Developmental**	1.09	2.10	220	5.2E-07	0.005
					1E-05	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	1
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

Table 10 - Sub-Parcel B24-1
Subsurface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (16.7 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	15.3	3.00	480	5.1E-06	0.03
Cadmium	**Urinary**	20.8	9,300	980	2.2E-09	0.02
Cobalt	**Thyroid**	14.2	1,900	350	7.5E-09	0.04
Iron	**Gastrointestinal**	163,224		820,000		0.2
Manganese	**Nervous**	22,847		26,000		0.9
Thallium	**Dermal**	8.60		12.0		0.7
Vanadium	**Dermal**	1,975		5,800		0.3
PCBs (Total)		NA	0.94			
Benzo(a)pyrene	**Developmental**	1.42	2.10	220	6.7E-07	0.006
					6E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index
NA = No Detections

Total HI	Cardiovascular	0
	Dermal	1
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

Table 11 - Sub-Parcel B24-1
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide EU1 (16.7 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	11.3	3.00	480	3.8E-06	0.02
Cadmium	**Urinary**	23.6	9,300	980	2.5E-09	0.02
Cobalt	**Thyroid**	13.5	1,900	350	7.1E-09	0.04
Iron	**Gastrointestinal**	164,135		820,000		0.2
Manganese	**Nervous**	18,662		26,000		0.7
Thallium	**Dermal**	8.34		12.0		0.7
Vanadium	**Dermal**	2,020		5,800		0.3
PCBs (Total)		2.94	0.94		3.1E-06	
Benzo(a)pyrene	**Developmental**	1.098	2.10	220	5.2E-07	0.005
					7E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	1
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

Table 12 - Sub-Parcel B24-1
Surface Soils
Construction Worker Risk Ratios

60 Day		Site-Wide EU1 (16.7 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	**Cardiovascular; Dermal**	25.4	63.0	399.8	4.0E-07	0.06
Cadmium	**Urinary**	40.3	69,524	635	5.8E-10	0.06
Cobalt	**Thyroid**	14.6	13,905	3,835	1.0E-09	0.004
Iron	**Gastrointestinal**	187,974		1,002,256		0.2
Manganese	**Nervous**	20,292		16,493		1.23
Thallium	**Dermal**	9.14		57.3		0.2
Vanadium	**Dermal**	1,709		6,594		0.3
PCBs (Total)		2.94	17.5		1.7E-07	
Benzo(a)pyrene	**Developmental**	1.09	70.6	22.5	1.5E-08	0.05
					6E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

Table 13 - Sub-Parcel B24-1
Subsurface Soils
Construction Worker Risk Ratios

60 Day		Site-Wide EU1 (16.7 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	15.3	63.0	399.8	2.4E-07	0.04
Cadmium	Urinary	20.8	69,524	635	3.0E-10	0.03
Cobalt	Thyroid	14.2	13,905	3,835	1.0E-09	0.004
Iron	Gastrointestinal	163,224		1,002,256		0.2
Manganese	Nervous	22,847		16,493		1.4
Thallium	Dermal	8.60		57.3		0.2
Vanadium	Dermal	1,975		6,594		0.3
PCBs (Total)		NA	17.5			
Benzo(a)pyrene	Developmental	1.42	70.6	22.5	2.0E-08	0.06
					3E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index
NA = No Detections

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

Table 14 - Sub-Parcel B24-1
Pooled Soils
Construction Worker Risk Ratios

60 Day		Site-Wide EU1 (16.7 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	11.3	63.0	399.8	1.8E-07	0.03
Cadmium	Urinary	23.6	69,524	635	3.4E-10	0.04
Cobalt	Thyroid	13.5	13,905	3,835	9.7E-10	0.004
Iron	Gastrointestinal	164,135		1,002,256		0.2
Manganese	Nervous	18,662		16,493		1.13
Thallium	Dermal	8.34		57.3		0.1
Vanadium	Dermal	2,020		6,594		0.3
PCBs (Total)		2.94	17.5		1.7E-07	
Benzo(a)pyrene	Developmental	1.098	70.6	22.5	1.6E-08	0.05
					4E-07	↓

SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness
EPC: Exposure Point Concentration
HQ: Hazard Quotient
HI: Hazard Index

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0
	Urinary	0

APPENDIX A

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

April 21, 2021

Maryland Department of Environment
1800 Washington Boulevard
Baltimore MD, 21230
Attention: Ms. Barbara Brown

Subject: **Request to Enter Temporary CHS Review**
Tradepoint Atlantic Parcel B24-1; Stormwater Management Pond

Dear 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).

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 Sub-Parcel B24-1 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

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

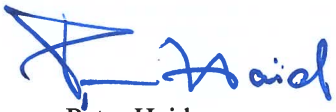
Alternatively, Tradepoint Atlantic, or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this work plan are implemented and a No Further 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,



Peter Haid

Vice President Environmental
TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
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T 443.649.5055 C 732.841.7935
phaid@tradepointatlantic.com

APPENDIX B

Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B24-1

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm2)	AF	0.3
Skin surface exposed (cm2)	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm3)	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B24-1

Area of site (ac)	Ac	16.7
Overall duration of construction (wk/yr)	EW	12
Exposure frequency (day/yr)	EF	**60**
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	**11**
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	**14.6**
Overall duration of construction (hr)	tc	**2,016**
Overall duration of traffic (s)	Tt	**1,728,000**
Surface area (m2)	AR	**67,583**
Length (m)	LR	**260**
Distance traveled (km)	ΣVKT	**156**
Particulate emission factor (m3/kg)	PEFsc	**97,959,347**
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	**7.76**
Total time of construction (s)	Tcv	**1,728,000**

Input
Calculation

Chemical	RfD & RfC Sources	^Ingestion SF (mg/kg-day)$^{-1}$	^Inhalation Unit Risk (ug/m^3)$^{-1}$	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m^3)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m^3/kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				63.1	29,103	63.0	405.9	26,816	399.8
Cadmium	A/I	-	1.80E-03	5.00E-04	1.00E-05	0.025	1.25E-05	0.001	1			-	7.50E+01					69,524	69523.9	658.4	17,878	635.0
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	**0.01**	1			-	4.50E+01					13,905	13,905	4,295	35,755	3,835
Iron	P	-	-	7.00E-01	-	1	7.00E-01	**0.01**	1			-	2.50E+01							1,002,256		1,002,256
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	**0.01**	1			-	6.50E+01							20,225	89,388	16,493
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	**0.01**	1			-	7.10E+01							57		57
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	**0.01**	1			-	1.00E+03							6,847	178,776	6,594
PCB Total	I	2.00E+00	5.71E-04	-	-	1		0.14	1	2.40E-02	6.30E-06	1.70E-02	4.68E+02	7.80E+04	4.66E-08	1.51E+4	36.3	34	17.49			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	6.69E+5	74.3	1,415	70.6	318.3	24	22.54

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls
^chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at https://www.epa.gov/iris
C: chemical specific parameters found in Cal EPA at https://www.dtsc.ca.gov/AssessingRisk
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at https://hhpprtv.ornl.gov/quickview/pprtv.php

APPENDIX C

Sparrows Point Development - PPE Standard Operational Procedure, Revision 3

Planning, Tracking/Supervision, Enforcement, and Documentation

Planning

- Response and Development Work Plan (RDWP) for each individual redevelopment sub-parcel identifies and documents site conditions.
- RDWP is reviewed and approved by regulators.
- Contractor HASP to address site-specific conditions and PPE requirements:
    - Contractor H&S professional to sign-off on PPE requirements for site workers;
    - Job Safety Analysis (JSA) to be performed for ground intrusive work.
- Project Environmental Professional (EP) assigned to each construction project – monitors project during environmentally sensitive project phases and is available to construction contractor on an as needed basis. EP responsibilities include the following:
    - Dust monitoring
    - Routine ground intrusive breathing space air monitoring
    - Soil tracking
    - Water handling oversight
    - Ground intrusive work observation
    - Notification for unexpected conditions
- Pre-construction meeting identifies EP roles and responsibilities and reviews site conditions.
- Contractor to perform job-site HazCom. HazCom to be addressed in Contractor HASP and include:
    - PPE requirements,
    - Exposure time limits,
    - Identification of chemicals of concern and potential effects of over-exposure (adverse reactions),
    - Methods and routes of potential exposure.
- All personnel that will be performing ground intrusive work within impacted soils shall sign-off on HazCom.
- If, based on a thorough review of Site conditions, it is expected that construction workers will have the potential to encounter materials considered hazardous waste under RCRA or DOT regulations, HAZWOPER-trained personnel will be utilized.

Tracking/Supervision

- Contractor to record any day that there is ground intrusive work and confirm that proper PPE is being worn.
- EP will note ground intrusive work on daily work sheets and perform at least one spot check per day.
- EP will log on daily work sheets PPE compliance for all intrusive work areas at least once per day.

- EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically.

Work Zones Delineation

- Exclusion Zone – The Exclusion Zones will include the areas proposed for excavation or with active trenches, excavations, or ground intrusive work, at a minimum. Personnel working within the exclusion zone will be required to wear Modified Level D PPE as described in this SOP. EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically. The Exclusion Zones will be identified each work day.
- Contamination Reduction Zone – This work zone is located outside of the exclusion zone, but inside of the limits of development (LOD). The Contamination Reduction Zone will be located adjacent to the Exclusion Zone, and all personal decontamination including removal of all disposable PPE/removal of soil from boots will be completed in the Contamination Reduction Zone.

Documentation

- Contractor HASP and HazCom.
- Contractor ground intrusive tracking record.
- HASP and HazCom sign-in sheets.
- EP pre-con memos.
- EP daily work sheets.
- Records documenting intrusive work and proper PPE use to be provided in completion report.

Enforcement

- Non-compliance of PPE requirements will result in disciplinary action up to and including prohibition from working on Sparrows Point.

Unknown and/or Unexpected Conditions

If unknown and/or unexpected conditions are encountered during the project that the EP determines to have a reasonable potential to significantly impact construction worker health and safety, the following will be initiated:

1. Job stoppage,
2. TPA and MDE notification,
3. Re-assessment of conditions.

Work will not continue until EP has cleared the area. If hazardous waste is identified, a HAZWOPER contractor will be brought in to address. The approved contingency plan will be implemented, where appropriate.

Modified Level D PPE

Modified Level D PPE will include, at a minimum, overalls such as polyethylene-coated Tyvek or clean washable cloth overalls, latex (or similar) disposable gloves (when working in wet/chemical surroundings) or work gloves, steel-toe/steel-shank high ankle work boots with taped chemical-protective over-boots (as necessary), dust mask, hard hat, safety glasses with

side shields, and hearing protection (as necessary). If chemical-protective over-boots create increased slip/trip/fall hazardous, then standard leather or rubber work boots could be used, but visible soils from the sides and bottoms of the boots must be removed upon exiting the Exclusion Zone.

APPENDIX D

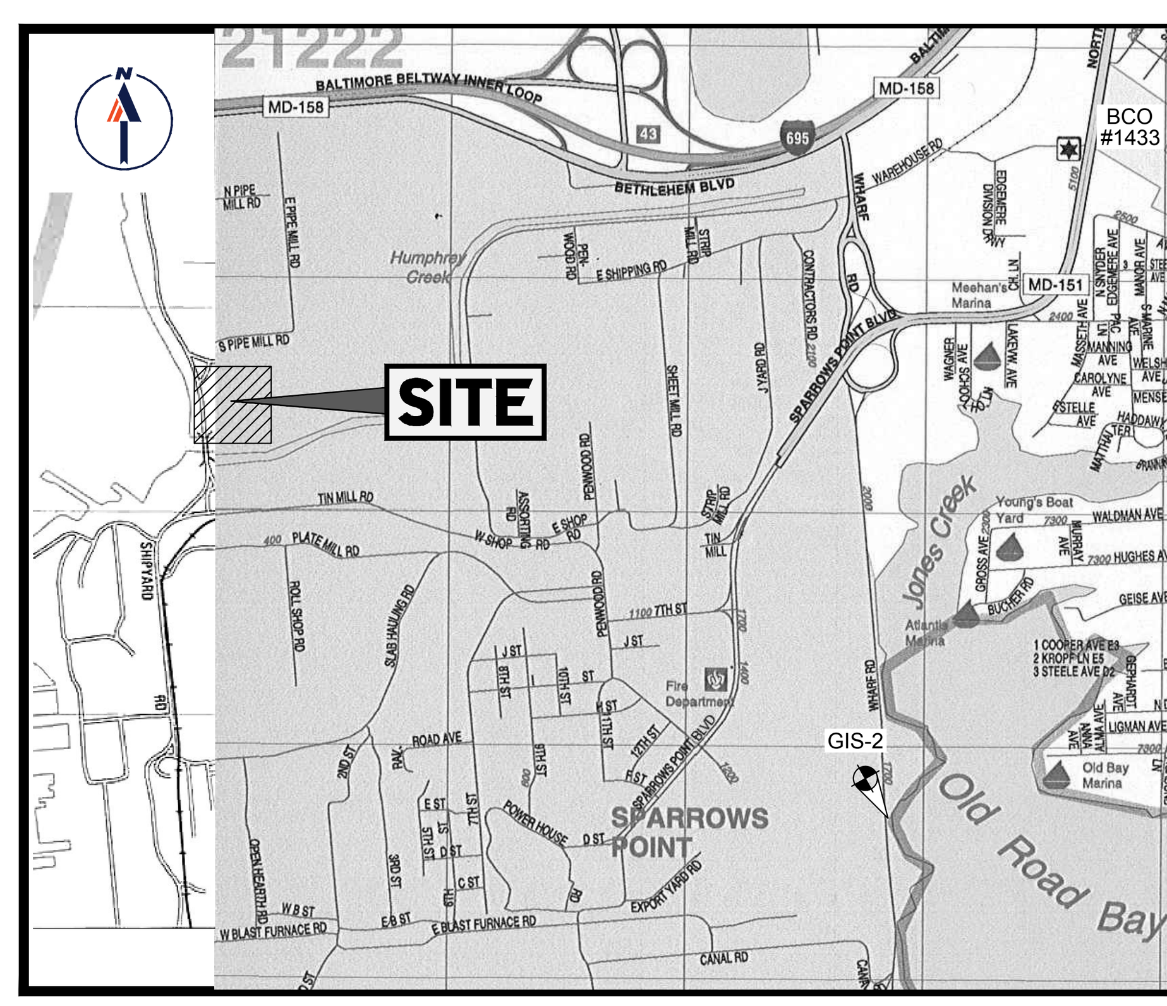
TIN MILL CANAL STORMWATER MANAGEMENT REGIONAL POND

FOR

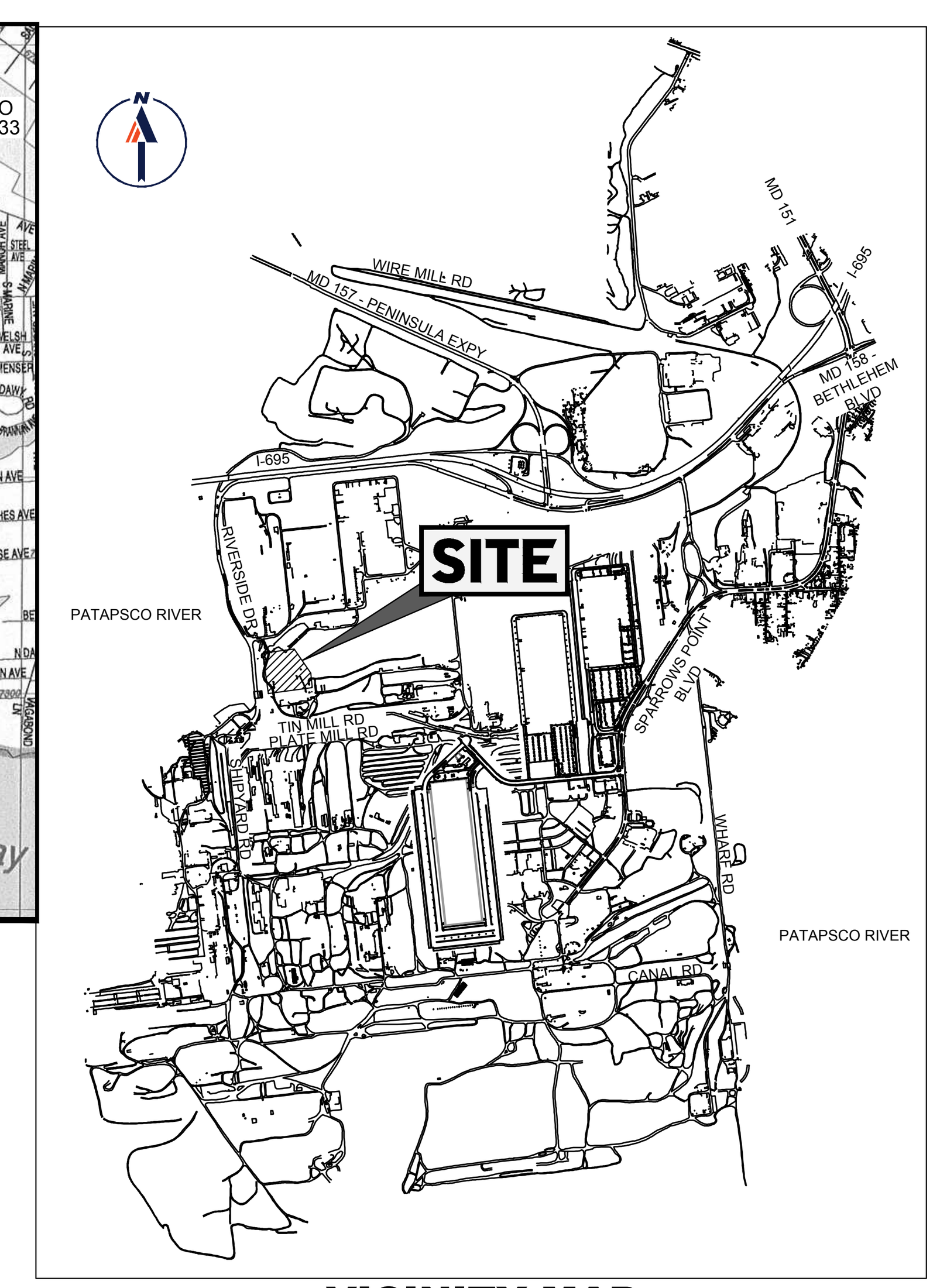
TRADEPOINT ATLANTIC

CONSTRUCTION DOCUMENTS

LOCATION OF SITE
SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14, PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY



LOCATION MAP
COPYRIGHT ADC THE MAP PEOPLE
PERMIT USE NO. 20602153-5
SCALE: 1"=2000'



VICINITY MAP
SCALE: 1"=3000'

OWNER / DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: JOHN M. MARTIN III, P.E.
PHONE: 301-651-3565

PREPARED BY

BOHLER

CONTACT: MICHAEL J. GESELL, P.E.

GENERAL NOTE:
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF THE WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.

STANDARD DRAWING LEGEND

FOR ENTIRE PLAN SET

EXISTING	DESCRIPTION	PROPOSED
	LIMIT OF WORK	LOW
	LIMIT OF DISTURBANCE	LOD
EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
	ONSITE PROPERTY LINE / R.O.W. LINE	
	NEIGHBORING PROPERTY LINE / INTERIOR PARCEL LINE	
	EASEMENT LINE	
	SETBACK LINE	
	CONCRETE CURB & GUTTER	CURB AND GUTTER; SPILL / TRANSITION; DEPRESSED CURB AND GUTTER
	UTILITY POLE WITH LIGHT	
	POLE LIGHT	
	TRAFFIC LIGHT	
	UTILITY POLE	
	TYPICAL LIGHT	
	ACORN LIGHT	
	TYPICAL SIGN	
	PARKING COUNTS	
170 / 169	CONTOUR LINE	190 / 187
TC 516.4 OR 516.4	SPOT ELEVATIONS	TC 516.00; TC 516.00 BC 515.55; MATCH EX 518.02 ±
SAN #	SANITARY LABEL	SAN #
#	STORM LABEL	#
SL	SANITARY SEWER LATERAL	SL
W	UNDERGROUND WATER LINE	W
E	UNDERGROUND ELECTRIC LINE	E
G	UNDERGROUND GAS LINE	G
OH	OVERHEAD WIRE	OH
T	UNDERGROUND TELEPHONE LINE	T
C	UNDERGROUND CABLE LINE	C
	STORM SEWER	
S	SANITARY SEWER MAIN	S
	HYDRANT	
S	SANITARY MANHOLE	S
D	STORM MANHOLE	D
WM	WATER METER	
WV	WATER VALVE	
	GAS VALVE	
	GAS METER	
	TYPICAL END SECTION	
	HEADWALL OR ENDWALL	
	GRATE INLET	
	CURB INLET	
	CLEAN OUT	
E	ELECTRIC MANHOLE	E
T	TELEPHONE MANHOLE	T
EB	ELECTRIC BOX	EB
EP	ELECTRIC PEDESTAL	EP
	MONITORING WELL	
	TEST PIT	
	BENCHMARK	
	BORING	

STANDARD ABBREVIATIONS

FOR ENTIRE PLAN SET

AC	ACRES
ADA	AMERICANS WITH DISABILITY ACT
ARCH	ARCHITECTURAL
BC	BOTTOM OF CURB
BF	BASEMENT FLOOR
BK	BLOCK
BL	BASELINE
BLDG	BUILDING
BM	BUILDING BENCHMARK
BRL	BUILDING RESTRICTION LINE
CF	CUBIC FEET
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONN	CONNECTION
CONC	CONCRETE
CPP	CORRUGATED PLASTIC PIPE
CY	CUBIC YARDS
DEC	DECORATIVE
DEP	DEPRESSED
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC
ELEC	ELECTRIC
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
ES	EDGE OF SHOULDER
EW	END WALL
EX	EXISTING
FES	FLARED END SECTION
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FG	FINISHED GRADE
G	GRADE
GF	GARAGE FLOOR (AT DOOR)
GH	GRADE HIGHER SIDE OF WALL
GL	GRADE LOWER SIDE OF WALL
GRT	GRATE
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HP	HIGH POINT
HOR	HORIZONTAL
HW	HEADWALL
INT	INTERSECTION
INV	INVERT
LF	LINEAR FOOT
LOC	LIMITS OF CLEARING
LOD	LIMITS OF DISTURBANCE
LOS	LINE OF SIGHT
LP	LOW POINT
L/S	LANDSCAPE
MAX	MAXIMUM
MIN	MINIMUM
MH	MANHOLE
MJ	MECHANICAL JOINT
OC	ON CENTER
PA	POINT OF ANALYSIS
PC	POINT CURVATURE
PCCR	POINT OF COMPOUND CURVATURE, CURB RETURN
PI	POINT OF INTERSECTION
POG	POINT OF GRADE
PROP	PROPOSED
PT	POINT OF TANGENCY
PTCR	POINT OF TANGENCY, CURB RETURN
PVC	POLYVINYL CHLORIDE PIPE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RET WALL	RETAINING WALL
R/W	RIGHT OF WAY
S	SLOPE
SAN	SANITARY SEWER
SF	SQUARE FEET
STA	STATION
STM	STORM
S/W	SIDEWALK
TBR	TO BE REMOVED
TBRL	TO BE RELOCATED
TC	TOP OF CURB
TELE	TELEPHONE
TPF	TREE PROTECTION FENCE
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UP	UTILITY POLE
W	WIDE
W/L	WATER LINE
W/M	WATER METER
±	PLUS OR MINUS
°	DEGREE
Ø	DIAMETER
#	NUMBER

REFERENCES

- EXISTING CONDITIONS
  CAD FILES PROVIDED BY TRADEPOINT ATLANTIC ENTITLED: "BASE - UTILITIES", "BASE - TOPO", "BASE - PLANOMETRICS"
  RECEIVED: 5/27/16

UTILITY CONTACTS

- WATER AND SEWER
  BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS
  111 WEST CHESAPEAKE AVENUE
  TOWSON, MD 21204
  CONTACT: D'ANDREA WALKER
  PHONE: (410) 887-3306
- GAS AND ELECTRIC:
  BGE
  1068 N. FRONT ST. ROOM 401
  BALTIMORE, MD 21202
  PHONE: (410) 850-4620
- CABLE:
  COMCAST BUSINESS SERVICES
  5001 METRO DRIVE
  BALTIMORE, MD 21215
  PHONE: (800) 391-3000
- TELEPHONE
  VERIZON
  99 SHAWAN ROAD
  COCKEYSVILLE, MD 21030
  PHONE: (410) 393-5793
- STORM DRAIN:
  BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS
  111 WEST CHESAPEAKE AVENUE
  TOWSON, MD 21204
  CONTACT: D'ANDREA WALKER
  PHONE: (410) 887-3306

GOVERNING AGENCIES

- BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS
  111 WEST CHESAPEAKE AVENUE
  TOWSON, MD 21204
  CONTACT: D'ANDREA WALKER
  PHONE: (410) 887-3306
- MARYLAND DEPARTMENT OF THE ENVIRONMENT
  1800 WASHINGTON BOULEVARD
  BALTIMORE, MD 21230
  CONTACT: DANIEL LAIRD, P.E.
  PHONE: (410) 537-4311
- BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY
  111 WEST CHESAPEAKE AVENUE, ROOM 319
  TOWSON, MD 21204
  CONTACT: KRITTY UDHIN, P.E.
  PHONE: (410) 887-4488
- BALTIMORE COUNTY DEPARTMENT OF DEVELOPMENT MANAGEMENT
  111 WEST CHESAPEAKE AVENUE
  TOWSON, MD 21204
  CONTACT: LLOYD MOXLEY
  PHONE: (410) 887-3321

SHEET INDEX

SHEET TITLE	SHEET NUMBER
COVER SHEET	C-101 (E&S 1 OF 8
GENERAL NOTES	C-102
EXISTING CONDITIONS AND DEMOLITION PLAN	C-201 - C-202
FINAL GRADING PLAN	C-401 - C-403
PHASE I EROSION AND SEDIMENT CONTROL PLAN	C-601 (E&S 2 OF 8)
PHASE I EROSION AND SEDIMENT CONTROL PLAN	C-602 (E&S 3 OF 8)
PHASE II EROSION AND SEDIMENT CONTROL PLAN	C-603 (E&S 4 OF 8)
PHASE II EROSION AND SEDIMENT CONTROL PLAN	C-604 (E&S 5 OF 8)
EROSION AND SEDIMENT CONTROL STOCKPILE	C-605 (E&S 6 OF 8)
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	C-606 (E&S 7 OF 8)
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	C-607 (E&S 8 OF 8)
STORMWATER MANAGEMENT PLAN	C-701 - C-703
STORMWATER MANAGEMENT NOTES AND DETAILS	C-704 - C-707

OWNER'S/DEVELOPER'S CERTIFICATION:

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 CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE 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

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 THE 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 CONSULTANT — DATE

MICHAEL J. GESELL, PE
PRINT NAME — MD LICENSE NUMBER

MDE PROJECT #: xx-SF-xxxx

E&S 1 OF 8

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105
BY — DATE
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: MD16206639
DRAWN BY: CPH
CHECKED BY: MJG
DATE: 3/5/2021
CAD I.D.: CNDS - 0

PROJECT:
WASTEWATER TREATMENT PLANT REPLACEMENT PLAN
FOR
TRADEPOINT ATLANTIC
SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER

SHEET TITLE:
COVER SHEET

SHEET NUMBER:
C-101

REVISION 2 - 04/05/2022

GENERAL NOTES

(Rev. 1/2020)

1. THESE PLANS ARE SOLELY BASED ON INFORMATION THE OWNER AND OTHERS PROVIDED TO BOHLER ENGINEERING, VA, LLC. (HEREIN "BOHLER") PRIOR TO THE DATE ON WHICH ENGINEER PREPARED THESE PLANS. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND IMMEDIATELY NOTIFY BOHLER , IN WRITING, IF ANY ACTUAL SITE CONDITIONS DIFFER FROM THOSE SHOWN ON THESE PLANS, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.
2. THE CONTRACTOR MUST STRICTLY COMPLY WITH THESE NOTES AND ALL SPECIFICATIONS/REPORTS CONTAINED HEREIN. THE CONTRACTOR MUST ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS, THESE NOTES, AND THE REQUIREMENTS ARTICULATED IN THE NOTES CONTAINED IN ALL THE OTHER DRAWINGS THAT COMPRISE THE PLAN SET OF DRAWINGS. ADDITIONAL NOTES AND SPECIFIC PLAN NOTES MAY BE FOUND ON THE INDIVIDUAL PLANS. THESE GENERAL NOTES APPLY TO THIS ENTIRE DOCUMENT PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE, PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION.
3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST CONFIRM WITH THE ENGINEER OF RECORD THAT THE LATEST EDITION OF THE DOCUMENTS AND/OR REPORTS REFERENCED WITHIN THE PLAN REFERENCES ARE BEING USED FOR CONSTRUCTION. THIS IS THE CONTRACTOR'S SOLE AND COMPLETE RESPONSIBILITY.
4. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION IS TO BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE CONDITIONS OF APPROVAL TO ALL PLANS AND OTHER DOCUMENTS REVIEWED AND APPROVED BY THE PERMITTING AUTHORITIES AND HAS ALSO CONFIRMED THAT ALL NECESSARY AND REQUIRED PERMITS HAVE BEEN OBTAINED. THE CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.
5. THE CONTRACTOR MUST ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS/REPORTS AND CONDITIONS OF APPROVAL, AND ALL APPLICABLE REQUIREMENTS, RULES, REGULATIONS, STATUTORY REQUIREMENTS, CODES, LAWS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT, AND ALL PROVISIONS IN AND CONDITIONS OF THE CONSTRUCTION CONTRACT WITH THE OWNER/DEVELOPER INCLUDING ALL EXHIBITS, ATTACHMENTS AND ADDENDA TO SAME.
6. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST COORDINATE THE BUILDING LAYOUT BY CAREFULLY REVIEWING THE MOST CURRENT ARCHITECTURAL, CIVIL AND STRUCTURAL CONSTRUCTION DOCUMENTS (INCLUDING, BUT NOT LIMITED TO, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLANS, WHERE APPLICABLE). THE CONTRACTOR MUST IMMEDIATELY NOTIFY OWNER, ARCHITECT AND ENGINEER OF RECORD, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST BETWEEN THESE PLANS AND ANY OTHER PLANS THAT COMPRISE THE CONSTRUCTION DOCUMENTS.
7. CONTRACTOR MUST REFER TO AND ENSURE COMPLIANCE WITH THE APPROVED ARCHITECTURAL/BUILDING PLANS OF RECORD FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.
8. THE CONTRACTOR MUST FIELD VERIFY ALL DIMENSIONS AND MEASUREMENTS SHOWN ON THESE PLANS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR MUST IMMEDIATELY NOTIFY ENGINEER OF RECORD, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR WORK WHICH HAS TO BE RE-DONE OR REPAIRED DUE TO DIMENSIONS, MEASUREMENTS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO BOTH (A) THE CONTRACTOR GIVING ENGINEER OF RECORD WRITTEN NOTIFICATION OF SAME AND (B) ENGINEER OF RECORD, THEREAFTER, PROVIDING THE CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH ADDITIONAL WORK.
9. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND MEASUREMENTS INCLUDED ON DESIGN DOCUMENTS HEREIN AND MUST NOT SCALE OFF THE DRAWINGS DUE TO POTENTIAL PRINTING INACCURACIES. ALL DIMENSIONS AND MEASUREMENTS ARE TO BE CHECKED AND CONFIRMED BY THE GENERAL CONTRACTOR PRIOR TO PREPARATION OF SHOP DRAWINGS, FABRICATION/ORDERING OF PARTS AND MATERIALS AND COMMENCEMENT OF SITE WORK. SITE PLAN DRAWINGS ARE NOT INTENDED AS SURVEY DOCUMENTS. DIMENSIONS SUPERSEDE GRAPHICAL REPRESENTATIONS. THE CONTRACTOR MUST MAKE CONTRACTOR'S OWN MEASUREMENTS FOR LAYOUT OF IMPROVEMENTS.
10. THE OWNER AND CONTRACTOR MUST BE FAMILIAR WITH, AND RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
11. WHEN INCLUDED AS ONE OF THE REFERENCED DOCUMENTS, THE GEOTECHNICAL REPORT, SPECIFICATIONS AND RECOMMENDATIONS SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE STRINGENT REQUIREMENTS AND/OR RECOMMENDATIONS CONTAINED IN: (A) THE PLANS; AND (B) THE GEOTECHNICAL REPORT AND RECOMMENDATIONS, MUST TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORT AND PLANS AND SPECIFICATIONS, PRIOR TO PROCEEDING WITH ANY FURTHER WORK. IF A GEOTECHNICAL REPORT WAS NOT CREATED, THEN THE CONTRACTOR MUST FOLLOW AND COMPLY WITH ALL OF THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE SPECIFICATIONS WHICH HAVE JURISDICTION OVER THIS PROJECT.
12. ENGINEER OF RECORD IS NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, HAS NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.
13. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN AND WHERE SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES. ALL OF THIS WORK IS TO BE PERFORMED AT CONTRACTOR'S SOLE COST AND EXPENSE.
14. THE CONTRACTOR MUST EXERCISE EXTREME CAUTION WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER FOR AN INITIAL PHASE OF THE PROJECT OR AS PART OF THE FINAL CONDITION. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE WHICH ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.
15. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION AND CONSTRUCTION WASTES, UNSUITABLE EXCAVATED MATERIAL, EXCESS SOIL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER THE CONTRACTOR.
16. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MAINTAIN RECORDS TO DEMONSTRATE PROPER AND FULLY COMPLIANT DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.
17. THE CONTRACTOR MUST REPAIR, AT CONTRACTOR'S SOLE COST, ALL DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR AND MUST REPLACE ALL SIGNAL INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT TO OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS, RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE CONTRACTOR MUST, PROMPTLY, DOCUMENT ALL EXISTING DAMAGE AND NOTIFY, IN WRITING, THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
18. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR AND HAVE NO CONTRACTUAL, LEGAL OR OTHER RESPONSIBILITIES FOR JOB SITE SAFETY JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME. THE ENGINEER OF RECORD AND BOHLER HAVE NOT BEEN RETAINED TO PERFORM OR TO BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF ENGINEER OF RECORD'S AND BOHLER SERVICES AS RELATED TO THE PROJECT. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES OR ANY JOB SITE CONDITIONS, AT ANY TIME.
19. THE CONTRACTOR MUST IMMEDIATELY IDENTIFY IN WRITING, TO THE ENGINEER OF RECORD AND BOHLER , ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF THE CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER WRITTEN NOTIFICATION AS DESCRIBED ABOVE, IT WILL BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, THE CONTRACTOR MUST INDEMNIFY, DEFEND AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER FOR ANY AND ALL DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM OR ARE IN ANY WAY RELATED TO SAME INCLUDING, BUT NOT LIMITED TO, ANY THIRD PARTY AND FIRST PARTY CLAIMS.
20. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM THE CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS, AND CURRENT CODES, RULES, STATUTES AND THE LIKE. IF THE CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH APPROVED PLANS, RULES, STATUTES, CODES AND THE LIKE, THE CONTRACTOR AND/OR OWNER AGREE TO AND MUST JOINTLY, INDEPENDENTLY, SEPARATELY, AND SEVERALLY INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER HARMLESS FOR AND FROM ALL INJURIES, CLAIMS AND DAMAGES THAT ENGINEER AND BOHLER SUFFER AND ANY AND ALL COSTS THAT ENGINEER AND BOHLER INCUR AS RELATED TO SAME.
21. ALL CONTRACTORS MUST CARRY AT LEAST THE MINIMUM AMOUNT OF THE SPECIFIED AND COMMERCIALLY REASONABLE STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND COMMERCIAL GENERAL LIABILITY INSURANCE (CGL) INCLUDING ALSO ALL UMBRELLA COVERAGES. ALL CONTRACTORS MUST HAVE THEIR CGL POLICIES ENDORSED TO NAME BOHLER , AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSUREDS AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE THE (DEFEND, IF APPLICABLE) AND HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED AND AGREED TO BY THE CONTRACTOR HEREIN. ALL CONTRACTORS MUST FURNISH BOHLER WITH CERTIFICATIONS OF INSURANCE OR CERTIFICATES OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE COVERAGES PRIOR TO COMMENCING ANY WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION AND FOR TWO YEARS AFTER THE COMPLETION OF CONSTRUCTION AND AFTER ALL PERMITS ARE ISSUED, WHICHEVER DATE IS LATER. IN ADDITION, ALL CONTRACTORS AGREE THAT THEY WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS FROM AND AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, TORT DAMAGES, STATUTORY CLAIMS, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTOR(S), ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT. THE CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.
22. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONFLICTS IN SCOPE AND REVISIONS THAT RESULT FROM SAME. THE CONTRACTOR IS FULLY AND SOLELY RESPONSIBLE FOR DETERMINING THE MEANS AND METHODS FOR COMPLETION OF THE WORK, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
23. NEITHER THE PROFESSIONAL ACTIVITIES OF: BOHLER , NOR THE PRESENCE OF BOHLER AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE (HEREIN "BOHLER PARTIES"), RELIEVES OR WILL RELIEVE THE CONTRACTOR OF AND FROM ITS OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ALL HEALTH AND SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT AND/OR PROPERTY. BOHLER AND ITS EMPLOYEES, PERSONNEL, AGENTS, SUBCONTRACTORS AND SUBCONSULTANTS HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER (OR ANY RESPONSIBILITY FOR) ANY CONSTRUCTION, THE CONTRACTOR OR ITS EMPLOYEES RELATING TO THEIR WORK AND ANY AND ALL HEALTH AND SAFETY PROGRAMS OR PROCEDURES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. THE CONTRACTOR MUST INDEMNIFY, DEFEND, PROTECT AND HOLD HARMLESS BOHLER FOR AND FROM ANY LIABILITY TO BOHLER RESULTING FROM THE CONTRACTOR'S WORK, SERVICES AND/OR VIOLATIONS OF THIS NOTE, THESE NOTES OR ANY NOTES IN THE PLAN SET AND, FURTHER, THE CONTRACTOR MUST NAME BOHLER AS AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE.
24. WHEN IT IS CLEARLY AND SPECIFICALLY WITHIN BOHLER'S SCOPE OF SERVICES CONTRACT WITH THE OWNER/DEVELOPER, BOHLER WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF EVALUATING CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME. BOHLER WILL PERFORM ITS SHOP DRAWING REVIEW WITH REASONABLE PROMPTNESS, AS CONDITIONS PERMIT. ANY DOCUMENT, DOCUMENTING BOHLER'S REVIEW OF A SPECIFIC ITEM OR LIMITED SCOPE, MUST NOT INDICATE THAT BOHLER HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR MUST, IN WRITING, PROMPTLY AND IMMEDIATELY BRING ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS TO BOHLER'S ATTENTION. BOHLER IS NOT REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.
25. IF THE CONTRACTOR DEVIATES FROM THESE PLANS AND/OR SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER OF RECORD AND/OR BOHLER FOR ALL DEVIATIONS WITHIN ENGINEER'S SCOPE, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK PERFORMED WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, MUST DEFEND, INDEMNIFY, PROTECT, AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER PARTIES TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, JUDGMENTS, CLAIMS, INJURIES, PENALTIES AND THE LIKE RELATED TO SAME.
26. THE CONTRACTOR IS RESPONSIBLE FOR A MAINTAINING AND PROTECTING THE TRAFFIC CONTROL PLAN AND ELEMENTS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS, FOR ALL WORK THAT AFFECTS PUBLIC TRAVEL EITHER IN THE RIGHT OF WAY OR ON SITE. THE COST FOR THIS ITEM MUST BE INCLUDED IN THE CONTRACTOR'S PRICE AND IS THE CONTRACTOR'S SOLE RESPONSIBILITY.
27. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN; AND, FURTHER, THE ENGINEER OF RECORD AND/OR BOHLER ARE NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, OWNER AGREES TO INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER PARTIES, HARMLESS FOR ALL INJURIES, DAMAGES AND COSTS THAT ENGINEER OF RECORD AND/OR BOHLER INCUR AS A RESULT OF SAID FAILURE OR FAILURE TO PRESERVE.
28. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION ACTIVITIES AND MATERIALS COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL RULES AND REGULATIONS, LAWS, ORDINANCES, AND CODES, AND ALL APPLICABLE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 ET SEQ.) AS AMENDED, AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.
29. THE CONTRACTOR MUST STRICTLY COMPLY WITH THE LATEST AND CURRENT OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION OVER EXCAVATION AND TRENCHING PROCEDURES. ENGINEER OF RECORD AND BOHLER HAS NO RESPONSIBILITY FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES AND WORK.
30. THE CONTRACTOR AND THE OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF THE CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY, INDEPENDENTLY, SEPARATELY, COLLECTIVELY, AND SEVERALLY INDEMNIFY, DEFEND, PROTECT AND HOLD ENGINEER OF RECORD AND/OR BOHLER PARTIES HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.
31. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIREMENTS OR LOCAL GOVERNING AGENCY FOR SITES WHERE ONE (1) ACRE OR MORE IS DISTURBED BY CONSTRUCTION ACTIVITIES (UNLESS THE LOCAL JURISDICTION REQUIRES A DIFFERENT THRESHOLD). THE CONTRACTOR MUST ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF ALL SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE AND FURTHER, THE CONTRACTOR IS SOLELY AND COMPLETELY RESPONSIBLE FOR FAILING TO DO SO.
32. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED DOCUMENTS PREPARED BY THE SIGNATORY PROFESSIONAL ENGINEER OF RECORD, THE USE OF THE WORDS 'CERTIFY' OR 'CERTIFICATION' CONSTITUTE(S) AN EXPRESSION ONLY OF PROFESSIONAL OPINION REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE ENGINEER OF RECORD'S KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON AND ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE OF ANY NATURE OR TYPE, EITHER EXPRESSED OR IMPLIED, UNDER ANY CIRCUMSTANCES.

SITE LAYOUT NOTES

(Rev. 1/2020)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. PRIOR TO THE COMMENCEMENT OF GENERAL CONSTRUCTION, THE CONTRACTOR MUST INSTALL SOIL EROSION CONTROL AND ANY STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MEASURES NECESSARY, AS INDICATED ON THE APPROVED SOIL EROSION AND SEDIMENT CONTROL PLAN AND IN ACCORDANCE WITH APPLICABLE AND/OR APPROPRIATE AGENCIES' GUIDELINES TO PREVENT SEDIMENT AND/OR LOOSE DEBRIS FROM WASHING ONTO ADJACENT PROPERTIES OR THE RIGHT OF WAY.
3. ALL DIRECTIONAL/TRAFFIC SIGNING AND PAVEMENT STRIPING MUST CONFORM TO THE LATEST STANDARDS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ANY APPLICABLE STATE OR LOCALLY APPROVED SUPPLEMENTS, GUIDELINES, RULES, REGULATIONS, STANDARDS AND THE LIKE.
4. THE LOCATIONS OF PROPOSED UTILITY POLES AND TRAFFIC SIGNS SHOWN ON THE PLANS ARE SCHEMATIC AND PRELIMINARY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR FIELD-VERIFYING THEIR LOCATION. THE CONTRACTOR MUST COORDINATE THE RELOCATION OF TRAFFIC SIGNS WITH THE ENTITY WITH JURISDICTION OVER THE PROJECT.
5. ALL DIMENSIONS SHOWN ARE TO BOTTOM FACE OF CURB, EDGE OF PAVEMENT, OR EDGE OF BUILDING, EXCEPT WHEN DIMENSION IS TO A PROPERTY LINE, STAKE OUT OF LOCATIONS OF INLETS, LIGHT POLES, ETC. MUST BE PERFORMED IN STRICT ACCORDANCE WITH THE DETAILS, UNLESS NOTED CLEARLY OTHERWISE.

GRADING NOTES

(Rev.1/2020)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. SITE GRADING MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AS REFERENCED IN THIS PLAN SET. IF NO GEOTECHNICAL REPORT HAS BEEN REFERENCED, THE CONTRACTOR MUST HAVE A GEOTECHNICAL ENGINEER PROVIDE WRITTEN SPECIFICATIONS AND RECOMMENDATIONS PRIOR TO THE CONTRACTOR COMMENCING THE GRADING WORK. THE CONTRACTOR MUST FOLLOW THE REQUIREMENTS OF ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS, WHICH HAVE JURISDICTION OVER THIS PROJECT.
3. THE CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY AND/OR REQUIRED PERMITS AND APPROVALS FOR ALL OFF-SITE MATERIAL SOURCES AND DISPOSAL FACILITIES. THE CONTRACTOR MUST SUPPLY A COPY OF APPROVALS TO THE ENGINEER OF RECORD AND THE OWNER PRIOR TO THE CONTRACTOR COMMENCING ANY WORK.
4. THE CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFYING EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCING ANY CONSTRUCTION. SHOULD DISCREPANCIES BETWEEN THE PLANS AND INFORMATION OBTAINED THROUGH FIELD VERIFICATIONS BE IDENTIFIED OR EXIST, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING.
5. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ALL UNSUITABLE MATERIALS WITH SUITABLE MATERIALS AS SPECIFIED IN THE GEOTECHNICAL REPORT. THE CONTRACTOR MUST COMPACT ALL EXCAVATED OR FILLED AREAS IN STRICT ACCORDANCE WITH THE GEOTECHNICAL REPORT'S GUIDANCE. MOISTURE CONTENT AT TIME OF PLACEMENT MUST BE SUBMITTED IN A COMPACTION REPORT PREPARED BY A QUALIFIED GEOTECHNICAL ENGINEER, REGISTERED WITH THE STATE WHERE THE WORK IS PERFORMED. THIS REPORT MUST VERIFY THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES WHICH ARE IN EFFECT AND WHICH ARE APPLICABLE TO THE PROJECT. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT MUST BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE BY OWNER/DEVELOPER, OR OWNER/DEVELOPER'S REPRESENTATIVE, SUBBASE MUST BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL, COMPACTED AS THE GEOTECHNICAL REPORT DIRECTS. EARTHWORK ACTIVITIES INCLUDING, BUT NOT LIMITED TO, EXCAVATION, BACKFILL, AND COMPACTING MUST COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. EARTHWORK ACTIVITIES MUST COMPLY WITH THE STANDARD STATE DOT SPECIFICATIONS FOR ROADWAY CONSTRUCTION (LATEST EDITION) AND ANY AMENDMENTS OR REVISIONS THERETO.
6. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT MUST BE ADJUSTED, AS NECESSARY, TO MATCH PROPOSED FINISHED GRADES WITH NO TRIPPING OR SAFETY HAZARD IN ACCORDANCE WITH ALL APPLICABLE STANDARDS, REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
7. IN THE EVENT OF A DISCREPANCY(IES) AND/OR A CONFLICT(S) BETWEEN PLANS, OR RELATIVE TO OTHER PLANS, THE GRADING PLAN TAKES PRECEDENCE AND CONTROLS. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY DISCREPANCY(IES) AND/OR CONFLICT(S).
8. THE CONTRACTOR IS RESPONSIBLE TO IMPORT FILL OR EXPORT EXCESS MATERIAL AS NECESSARY TO CONFORM TO THE PROPOSED GRADING, AND TO BACKFILL EXCAVATIONS FOR THE INSTALLATION OF UNDERGROUND IMPROVEMENTS.

ACCESSIBILITY DESIGN GUIDELINES

(Rev. 1/2020)

1. ALL ACCESSIBLE (A.K.A. ADA) COMPONENTS AND ACCESSIBLE ROUTES MUST BE CONSTRUCTED TO MEET, AT A MINIMUM, THE MORE STRINGENT OF: (A) THE REQUIREMENTS OF THE "AMERICANS WITH DISABILITIES ACT" (ADA) CODE (42 U.S.C. § 12101 ET SEQ. AND 42 U.S.C. § 4151 ET SEQ.); AND (B) ANY APPLICABLE LOCAL AND STATE GUIDELINES, AND ANY AND ALL AMENDMENTS TO BOTH, WHICH ARE IN EFFECT WHEN THESE PLANS WERE COMPLETED.
2. THE CONTRACTOR MUST REVIEW ALL DOCUMENTS REFERENCED IN THESE NOTES FOR ACCURACY, COMPLIANCE AND CONSISTENCY WITH INDUSTRY GUIDELINES.
3. THE CONTRACTOR MUST EXERCISE APPROPRIATE CARE AND PRECISION IN CONSTRUCTION OF ACCESSIBLE (ADA) COMPONENTS AND ACCESSIBLE ROUTES FOR THE SITE. FINISHED SURFACES ALONG THE ACCESSIBLE ROUTE OF TRAVEL FROM PARKING SPACES, PUBLIC TRANSPORTATION, PEDESTRIAN ACCESS, AND INTER-BUILDING ACCESS, TO POINTS OF ACCESSIBLE BUILDING ENTRANCE/EXIT, MUST COMPLY WITH THE ACCESSIBLE GUIDELINES AND REQUIREMENTS WHICH INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
   A. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SLOPES MUST NOT EXCEED 1:50 (2.0%) IN ANY DIRECTION.
   B. PATH OF TRAVEL ALONG ACCESSIBLE ROUTE MUST PROVIDE A 36-INCHES MINIMUM WIDTH (48-INCHES PREFERRED), OR AS SPECIFIED BY THE GOVERNING AGENCY. UNOBSTRUCTED WIDTH OF TRAVEL (CAR OVERHANGS AND/OR HANDRAILS) MUST NOT REDUCE THIS MINIMUM WIDTH. THE SLOPE MUST NOT EXCEED 1:20 (5.0%) IN THE DIRECTION OF TRAVEL AND MUST NOT EXCEED 1:50 (2.0%) IN CROSS SLOPE. WHERE ACCESSIBLE PATH OF TRAVEL IS GREATER THAN 1:20 (5.0%), AN ACCESSIBLE RAMP MUST BE PROVIDED. ALONG THE ACCESSIBLE PATH OF TRAVEL, OPENINGS MUST NOT EXCEED 1/2-INCH IN WIDTH. VERTICAL CHANGES OF UP TO 1/2-INCH ARE PERMITTED ONLY IF THEY INCLUDES A 1/4-INCH BEVEL AT A SLOPE NOT STEEPER THAN 1:2. NO VERTICAL CHANGES OVER 1/4-INCH ARE PERMITTED.
   C. ACCESSIBLE RAMPS MUST NOT EXCEED A SLOPE OF 1:12 (8.3%) AND A RISE OF 30-INCHES. LEVEL LANDINGS MUST BE PROVIDED AT EACH END OF ACCESSIBLE RAMPS. LANDING MUST PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES, AND MUST NOT EXCEED 1:50 (2.0%) SLOPE IN ANY DIRECTION. RAMPS THAT CHANGE DIRECTION BETWEEN RUNS AT LANDINGS MUST HAVE A CLEAR LANDING OF A MINIMUM OF 60-INCHES BY 60-INCHES. HAND RAILS ON BOTH SIDES OF THE RAMP MUST BE PROVIDED ON AN ACCESSIBLE RAMP WITH A RISE GREATER THAN 6-INCHES.
   D. ACCESSIBLE CURB RAMPS MUST NOT EXCEED A SLOPE OF 1:12 (8.3%). WHERE FLARED SIDES ARE PROVIDED, THEY MUST NOT EXCEED 1:10 (10%) SLOPE. LEVEL LANDING MUST BE PROVIDED AT RAMPS TOP AT A MINIMUM OF 36-INCHES LONG (48-INCHES PREFERRED). IN ALTERATIONS, WHEN THERE IS NO LANDING AT THE TOP, FLARE SIDES SLOPES MUST NOT EXCEED A SLOPE OF 1:12 (8.3%).
   E. DOORWAY LANDINGS AREAS MUST BE PROVIDED ON THE EXTERIOR SIDE OF ANY DOOR LEADING TO AN ACCESSIBLE PATH OF TRAVEL. THIS LANDING MUST BE SLOPED AWAY FROM THE DOOR NO MORE THAN 1:50 (2.0%) FOR POSITIVE DRAINAGE. THIS LANDING AREA MUST BE NO FEWER THAN 60-INCHES (5 FEET) LONG, EXCEPT WHERE OTHERWISE CLEARLY PERMITTED BY ACCESSIBLE STANDARDS FOR ALTERNATIVE DOORWAY OPENING CONDITIONS. (SEE ICC/ANSI A117.1-2009 AND OTHER REFERENCES INCORPORATED BY CODE).
   F. WHEN THE PROPOSED CONSTRUCTION INVOLVES RECONSTRUCTION, MODIFICATION, REVISION OR EXTENSION OF OR TO ACCESSIBLE COMPONENTS FROM EXISTING DOORWAYS OR SURFACES, THE CONTRACTOR MUST VERIFY ALL EXISTING ELEVATIONS SHOWN ON THE PLAN. NOTE THAT TABLE 405.2 OF THE DEPARTMENT OF JUSTICE'S ADA STANDARDS FOR ACCESSIBLE DESIGN ALLOWS FOR STEEPER RAMP SLOPES, IN RARE CIRCUMSTANCES. THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, OF ANY DISCREPANCIES AND/OR FIELD CONDITIONS THAT DIFFER IN ANY WAY OR IN ANY RESPECT FROM WHAT IS SHOWN ON THE PLANS BEFORE COMMENCING ANY WORK. CONSTRUCTED IMPROVEMENTS MUST FALL WITHIN THE MAXIMUM AND MINIMUM LIMITATIONS IMPOSED BY THE BARRIER FREE REGULATIONS AND THE ACCESSIBLE GUIDELINES.
   G. THE CONTRACTOR MUST VERIFY ALL OF THE SLOPES OF THE CONTRACTOR'S FORMS PRIOR TO POURING CONCRETE. IF ANY NON-CONFORMANCE EXISTS OR IS OBSERVED OR DISCOVERED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, PRIOR TO POURING CONCRETE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL COSTS TO REMOVE, REPAIR AND/OR REPLACE NON-CONFORMING CONCRETE AND/OR PAVEMENT SURFACES.
4. IT IS STRONGLY RECOMMENDED THAT THE CONTRACTOR REVIEW THE INTENDED CONSTRUCTION TO ENSURE SAME IS CONSISTENT WITH THE LOCAL BUILDING CODE PRIOR TO COMMENCING CONSTRUCTION.

DEMOLITION NOTES

(Rev. 1/2020)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. THE CONTRACTOR MUST CONDUCT DEMOLITION/REMOVALS ACTIVITIES IN SUCH A MANNER AS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND ALL OTHER ADJACENT FACILITIES. THE CONTRACTOR MUST OBTAIN ALL APPLICABLE PERMITS FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY(IES) PRIOR TO THE COMMENCEMENT OF ANY ROAD OPENING OR DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.
3. WHEN DEMOLITION-RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY, THE CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED SAFE PRACTICES IN CONFORMANCE WITH THE CURRENT FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS.
4. THE DEMOLITION (AND/OR REMOVALS) PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION AND TO IDENTIFY ONLY CONDITIONS REGARDING ITEMS TO BE DEMOLISHED, REMOVED, AND/OR TO REMAIN.
   A. THE CONTRACTOR MUST ALSO REVIEW ALL CONSTRUCTION DOCUMENTS AND INCLUDE WITHIN THE DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
   B. THIS PLAN IS NOT INTENDED TO AND DOES NOT PROVIDE DIRECTION REGARDING THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE EMPLOYED TO ACCOMPLISH THE WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST BE IN STRICT ACCORDANCE AND CONFORMANCE WITH ALL STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE FOR THE CONTRACTOR AND THE PUBLIC.
5. THE CONTRACTOR MUST PROVIDE ALL "METHODS AND MEANS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES, AND ANY OTHER IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR, AT THE CONTRACTOR'S SOLE COST, MUST REPAIR ALL DAMAGE TO ALL ITEMS AND FEATURES THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIRS MUST INCLUDE THE RESTORATION OF ALL ITEMS AND FEATURES REPAIRED TO THEIR PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR MUST PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.
6. ENGINEER OF RECORD AND/OR BOHLER ARE NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. THE CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, COMPLYING WITH ALL OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY AND SAFETY TO ALL PROPERTY ON THE SITE OR ADJACENT OR NEAR TO THE SAME.
7. THE CONTRACTOR IS RESPONSIBLE FOR JOB SITE SAFETY, WHICH MUST INCLUDE, BUT IS NOT LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING, OTHER APPROPRIATE AND/OR NECESSARY SAFETY FEATURES AND ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR MUST SAFEGUARD THE SITE AS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF ALL UNAUTHORIZED PERSONS AT ANY TIME, TO OR NEAR THE DEMOLITION AREA.
8. PRIOR TO THE COMMENCEMENT OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY, THE CONTRACTOR MUST, IN WRITING, RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS AND/OR SPECIFICATIONS, ALL CONCERNS OR QUESTIONS REGARDING THE APPLICABLE SAFETY STANDARDS, AND/OR THE SAFETY OF THE CONTRACTOR AND/OR THIRD PARTIES IN PERFORMING THE WORK ON THIS PROJECT. ANY SUCH CONCERNS MUST BE CONVEYED TO THE ENGINEER OF RECORD AND/OR BOHLER , IN WRITING AND MUST ADDRESS ALL ISSUES AND ITEMS RESPONDED TO, BY THE ENGINEER OF RECORD AND/OR BY BOHLER , IN WRITING. ALL DEMOLITION ACTIVITIES MUST BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, RULES, REQUIREMENTS, STATUTES, ORDINANCES AND CODES.
9. THE CONTRACTOR MUST BECOME FAMILIAR WITH THE APPLICABLE UTILITY SERVICE PROVIDER REQUIREMENTS AND IS RESPONSIBLE FOR ALL COORDINATION REGARDING UTILITY DEMOLITION AND/OR DISCONNECTION AS IDENTIFIED OR REQUIRED FOR THE PROJECT. THE CONTRACTOR MUST PROVIDE THE OWNER WITH WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED, REMOVED AND/OR ABANDONED IN ACCORDANCE WITH THE JURISDICTION AND UTILITY COMPANY REQUIREMENTS AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
10. PRIOR TO COMMENCING ANY DEMOLITION, THE CONTRACTOR MUST:
    A. OBTAIN ALL REQUIRED PERMITS AND MAINTAIN THE SAME ON SITE FOR REVIEW BY THE ENGINEER AND ALL PUBLIC AGENCIES WITH JURISDICTION THROUGHOUT THE DURATION OF THE PROJECT, SITE WORK, AND DEMOLITION WORK.
    B. NOTIFY, AT A MINIMUM, THE MUNICIPAL ENGINEER, DESIGN ENGINEER, AND LOCAL SOIL CONSERVATION JURISDICTION, AT LEAST 72 BUSINESS HOURS PRIOR TO THE COMMENCEMENT OF WORK.
    C. INSTALL THE REQUIRED SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO SITE DISTURBANCE, AND MAINTAIN SAID CONTROLS UNTIL SITE IS STABILIZED
    D. IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR MUST CALL THE STATE ONE-CALL DAMAGE PROTECTION SYSTEM FOR UTILITY MARK OUT, IN ADVANCE OF ANY EXCAVATION.
    E. LOCATE AND PROTECT ALL UTILITIES AND SERVICES, INCLUDING BUT NOT LIMITED TO GAS, WATER, ELECTRIC, SANITARY AND STORM SEWER, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN AND ADJACENT TO THE LIMITS OF PROJECT ACTIVITIES. THE CONTRACTOR MUST USE AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL UNDERGROUND UTILITIES.
    F. PROTECT AND MAINTAIN IN OPERATION, ALL ACTIVE UTILITIES AND SYSTEMS THAT ARE NOT BEING REMOVED DURING ANY DEMOLITION ACTIVITIES.
    G. ARRANGE FOR AND COORDINATE WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) FOR THE TEMPORARY OR PERMANENT TERMINATION OF SERVICE REQUIRED BY THE PROJECT PLANS AND SPECIFICATIONS REGARDING THE METHODS AND MEANS TO CONSTRUCT SAME. THESE ARE NOT THE ENGINEER OF RECORD'S RESPONSIBILITY. IN THE EVENT OF ABANDONMENT, THE CONTRACTOR MUST PROVIDE THE UTILITY ENGINEER AND OWNER WITH IMMEDIATE WRITTEN NOTIFICATION THAT THE EXISTING UTILITIES AND SERVICES HAVE BEEN TERMINATED AND ABANDONED IN ACCORDANCE WITH JURISDICTIONAL AND UTILITY COMPANY REQUIREMENTS.
    H. ARRANGE FOR AND COORDINATE WITH THE APPLICABLE UTILITY SERVICE PROVIDER(S) REGARDING WORKING "OFF-PEAK" HOURS OR ON WEEKENDS AS NECESSARY OR AS REQUIRED TO MINIMIZE THE IMPACT ON, OF AND TO THE AFFECTED PARTIES. WORK REQUIRED TO BE PERFORMED "OFF-PEAK" IS TO BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
    I. IN THE EVENT THE CONTRACTOR DISCOVERS ANY HAZARDOUS MATERIAL, THE REMOVAL OF WHICH IS NOT ADDRESSED IN THE PROJECT PLANS AND SPECIFICATIONS, OR THE CONTRACT WITH THE OWNER/DEVELOPER, THE CONTRACTOR MUST IMMEDIATELY CEASE ALL WORK IN THE AREA OF DISCOVERY, AND IMMEDIATELY NOTIFY, IN WRITING AND VERBALLY, THE OWNER AND ENGINEER OF RECORD AND BOHLER , THE DISCOVERY OF SUCH MATERIALS TO PURSUE PROPER AND COMPLIANT REMOVAL OF SAME.
11. THE CONTRACTOR MUST ENSURE THAT ANY EXISTING ASBESTOS-CONTAINING MATERIALS ENCOUNTERED ARE PROPERLY REMOVED FROM THE SUBJECT PREMISES AND ARE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS, PRIOR TO THE COMMENCEMENT OF DEMOLITION ON SITE AND MUST PERFORM ALL AGENCY NOTIFICATIONS AS REQUIRED, AT THE CONTRACTOR'S SOLE EXPENSE.
12. THE CONTRACTOR MUST NOT PERFORM ANY EARTH MOVEMENT ACTIVITIES, DEMOLITION OR REMOVAL OF FOUNDATION WALLS, FOOTINGS, OR OTHER MATERIALS WITHIN THE LIMITS OF DISTURBANCE, UNLESS SAME IS IN STRICT ACCORDANCE AND CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, OR PURSUANT TO THE WRITTEN DIRECTION OF THE OWNER'S STRUCTURAL OR GEOTECHNICAL ENGINEER.
13. DEMOLITION ACTIVITIES AND EQUIPMENT MUST NOT USE OR INCLUDE AREAS OUTSIDE THE DEFINED PROJECT LIMIT LINE, WITHOUT SPECIFIC WRITTEN PERMISSION AND AUTHORITY OF AND FROM THE OWNER AND ALL GOVERNMENTAL AGENCIES WITH JURISDICTION.
14. THE CONTRACTOR MUST BACKFILL ALL EXCAVATION RESULTING FROM, OR INCIDENTAL TO, DEMOLITION ACTIVITIES. BACKFILL MUST BE ACCOMPLISHED WITH APPROVED BACKFILL MATERIALS AND MUST BE SUFFICIENTLY COMPACTED TO SUPPORT ALL NEW IMPROVEMENTS AND MUST BE PERFORMED IN COMPLIANCE WITH THE RECOMMENDATIONS AND GUIDANCE ARTICULATED IN THE GEOTECHNICAL REPORT. BACKFILLING MUST OCCUR IMMEDIATELY AFTER DEMOLITION ACTIVITIES AND MUST BE PERFORMED SO AS TO PREVENT WATER ENTERING THE EXCAVATION. FINISHED SURFACES MUST BE GRADED TO PROMOTE POSITIVE DRAINAGE. THE CONTRACTOR IS RESPONSIBLE FOR COMPACTION TESTING AND MUST SUBMIT SUCH REPORTS AND RESULTS TO THE ENGINEER OF RECORD AND THE OWNER.
15. EXPLOSIVES MUST NOT BE USED WITHOUT PRIOR WRITTEN CONSENT FROM BOTH THE OWNER AND ALL APPLICABLE, NECESSARY AND REQUIRED GOVERNMENTAL AUTHORITIES. PRIOR TO COMMENCING ANY EXPLOSIVE PROGRAM AND/OR ANY DEMOLITION ACTIVITIES, THE CONTRACTOR MUST ENSURE AND OVERSEE THE INSTALLATION OF ALL OF THE REQUIRED PERMIT AND EXPLOSIVE CONTROL MEASURES THAT THE FEDERAL, STATE, AND LOCAL GOVERNMENTS REQUIRE. THE CONTRACTOR IS ALSO RESPONSIBLE TO CONDUCT AND PERFORM ALL INSPECTION AND SEISMIC VIBRATION TESTING THAT IS REQUIRED TO MONITOR THE EFFECTS ON ALL LOCAL STRUCTURES AND THE LIKE.
16. IN ACCORDANCE WITH FEDERAL, STATE, AND/OR LOCAL STANDARDS, THE CONTRACTOR MUST USE DUST CONTROL MEASURES TO LIMIT AIRBORNE DUST AND DIRT RISING AND SCATTERING IN THE AIR. AFTER THE DEMOLITION IS COMPLETE, THE CONTRACTOR MUST CLEAN ALL ADJACENT STRUCTURES AND IMPROVEMENTS TO REMOVE ALL DUST AND DEBRIS WHICH THE DEMOLITION OPERATIONS CAUSE. THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL ADJACENT AREAS TO THEIR "PRE-DEMOLITION" CONDITION AT CONTRACTOR'S SOLE COST.
17. PAVEMENT MUST BE SAW CUT IN STRAIGHT LINES, AND EXCEPT FOR EDGE OF BUTT JOINTS, MUST EXTEND TO THE FULL DEPTH OF THE EXISTING PAVEMENT. ALL DEBRIS FROM REMOVAL OPERATIONS MUST BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPILING OF DEBRIS OUTSIDE OF APPROVED AREAS WILL NOT BE PERMITTED, INCLUDING BUT NOT LIMITED TO, THE PUBLIC RIGHT-OF-WAY.
18. THE CONTRACTOR MUST MAINTAIN A RECORD SET OF PLANS WHICH INDICATES THE LOCATION OF EXISTING UTILITIES THAT ARE CAPPED, ABANDONED IN PLACE, OR RELOCATED DUE TO DEMOLITION ACTIVITIES. THIS RECORD DOCUMENT MUST BE PREPARED IN A NEAT AND WORKMAN-LIKE MANNER AND TURNED OVER TO THE OWNER/DEVELOPER UPON COMPLETION OF THE WORK, ALL OF WHICH IS AT THE CONTRACTOR'S SOLE COST.
19. THE CONTRACTOR MUST EMPTY, CLEAN AND REMOVE FROM THE SITE ALL UNDERGROUND STORAGE TANKS, IF ENCOUNTERED, IN ACCORDANCE WITH FEDERAL, STATE, COUNTY AND LOCAL REQUIREMENTS, PRIOR TO CONTINUING CONSTRUCTION IN THE AREA AROUND THE TANK WHICH EMPTYING, CLEANING AND REMOVAL ARE AT THE CONTRACTOR'S SOLE COST.

LIGHTING NOTES

(Rev. 1/2020)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. THE LIGHTING CONTRACTOR MUST COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE PLANS, INCLUDING BUT NOT LIMITED TO GENERAL NOTES, GRADING AND UTILITY NOTES, SITE SAFETY, AND ALL AGENCY AND GOVERNMENTAL REGULATIONS.
3. THE LIGHTING PLAN DEPICTS PROPOSED, SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURER. ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
4. THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT GROUND LEVEL UNLESS OTHERWISE NOTED. ILLUMINATION LEVELS ARE SHOWN IN FOOT-CANDLES (FC).
5. THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT IS NOT LIMITED TO, VISUAL OBSERVATION, CLEANING OF LENSES, AND RE-LAMPING ACCORDING TO MANUFACTURER RECOMMENDATIONS. FAILURE TO FOLLOW THE ABOVE STEPS COULD RESULT IN IMPROPER LIGHT DISTRIBUTION AND FAILURE TO COMPLY WITH THE APPROVED DESIGN. UPON COMPLETION AND OWNER'S ACCEPTANCE OF THE WORK, THE ABOVE RESPONSIBILITIES BECOMES SOLELY THE OWNER'S.
6. THE LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES. POWER SYSTEM, CONDUITS, WIRING AND OTHER ELECTRICAL COMPONENTS ARE SOLELY THE ARCHITECT'S, MECHANICAL ENGINEER'S AND/OR LIGHTING CONTRACTOR'S RESPONSIBILITY, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THE LIGHTING CONTRACTOR MUST COORDINATE WITH THE PROJECT ARCHITECT AND/OR ELECTRICAL ENGINEER REGARDING ANY AND ALL POWER SOURCES AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES.
7. THE CONTRACTOR MUST BRING IMMEDIATELY, IN WRITING, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURE(S) TO THE ENGINEER OF RECORD'S ATTENTION, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT SHIELDING AND OR ROTATED OPTICS ARE INSTALLED AS INDICATED ON THE PLAN IN ORDER TO ACHIEVE THE LIGHTING LEVELS THE REVIEWING AGENCY APPROVED.

SOIL EROSION & SEDIMENT CONTROL PLAN NOTES

(Rev. 1/2019)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. OMITTED.
3. OMITTED.
4. OMITTED.
5. OMITTED.
6. OMITTED.
7. OMITTED.
8. OMITTED.
9. OMITTED.
10. OMITTED.
11. OMITTED.
12. THIS PLAN REPRESENTS THE MINIMUM LEVEL OF IMPLEMENTATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES, MEASURES AND STRUCTURES. ADDITIONAL FACILITIES, MEASURES AND STRUCTURES MUST BE INSTALLED WHERE NECESSARY TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS AND/OR TO PREVENT ANY, INCLUDING THE INCIDENTAL DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.
13. THE CONTRACTOR MUST PROTECT ALL EXISTING TREES AND SHRUBS. THE CONTRACTOR MUST REFER TO THE LANDSCAPE AND/OR DEMOLITION PLAN(S) FOR TREE PROTECTION, FENCE LOCATIONS AND DETAILS.
14. THE CONTRACTOR MUST REFER TO GRADING PLANS FOR ADDITIONAL INFORMATION.
15. THE CONTRACTOR MUST CLEAN EXISTING AND PROPOSED DRAINAGE STRUCTURES AND INTERCONNECTING PIPES ON OR OFF-SITE AS THE JURISDICTIONAL AGENCY REQUIRES, BOTH AT THE TIME OF SITE STABILIZATION AND AT END OF PROJECT.
16. SOIL EROSION CONTROL MEASURES MUST BE ADJUSTED OR RELOCATED BY THE CONTRACTOR AS IDENTIFIED DURING SITE OBSERVATION IN ORDER TO MAINTAIN THE COMPLETE EFFECTIVENESS OF ALL CONTROL MEASURES.
17. OMITTED.
18. EROSION CONTROL MEASURES MUST CONFORM TO THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL UNLESS OTHERWISE NOTED, OR AS UNLESS OTHERWISE CLEARLY AND SPECIFICALLY DIRECTED BY ENGINEER. INSTALLATION OF EROSION CONTROL, CLEARING, AND SITE WORK MUST BE PERFORMED EXACTLY AS INDICATED IN THE EROSION CONTROL CONSTRUCTION NOTES.
19. REFER TO THE APPROVED EROSION AND SEDIMENT CONTROL PLANS FOR THE DISTURBED LAND AREA OF THIS SITE.
20. REFER TO THE APPROVED EROSION AND SEDIMENT CONTROL PLANS FOR THE EROSION CONTROL MEASURES PROPOSED FOR THIS SITE.
21. INSTALLATION OF EROSION CONTROL DEVICES MUST BE IN ACCORDANCE WITH ALL OF THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED DETAILS AS SHOWN ON THE APPROVED EROSION AND SEDIMENT CONTROL PLANS.
22. CONTRACTOR MUST INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EVERY RAIN EVENT. CONTRACTOR MUST IMMEDIATELY CLEAR AND REMOVE ANY SILT AS RECOMMENDED BY THE APPROVED DETAILS ON THE APPROVED EROSION AND SEDIMENT CONTROL PLANS OR AS OUTLINED IN THE SPECIFICATIONS LISTED IN NOTE #18.
23. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, CONTRACTOR MUST COMPLETE PERMANENT OR TEMPORARY STABILIZATION 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 (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING. WHEN AREAS ARE DISTURBED AFTER THE GROWING SEASON, CONTRACTOR MUST STABILIZE SAME WITH GEOTEXTILE FABRIC AND MAINTAIN SAME IN STRICT ACCORDANCE WITH BEST MANAGEMENT PRACTICES.
24. CONTRACTOR MUST INSTALL ADDITIONAL EROSION CONTROL MEASURES IF REQUIRED BY THE ENGINEER OR THE LOCAL EROSION AND SEDIMENT CONTROL INSPECTOR, TO PREVENT THE INCIDENTAL AND ANY DISCHARGE OF SILT-LADEN RUNOFF FROM EXITING THE SITE.
25. THE CONTRACTOR MUST BE RESPONSIBLE FOR ALL INSPECTING AND MAINTAINING ALL EROSION CONTROL MEASURES ON THE SITE UNTIL PERMANENT PAVING AND TURF/LANDSCAPING IS ESTABLISHED AND UPON APPROVAL OF THE LOCAL EROSION AND SEDIMENT CONTROL INSPECTOR. THE COSTS OF INSTALLING AND MAINTAINING THE EROSION CONTROL MEASURES MUST BE INCLUDED IN THE BID PRICE FOR THE SITE WORK AND THE CONTRACTOR IS RESPONSIBLE FOR ALL SUCH COSTS.
26. CONTRACTOR MUST CONTINUE TO MAINTAIN ALL EROSION CONTROL MEASURES UNTIL THE COMPLETION OF CONSTRUCTION AND THE ESTABLISHMENT OF VEGETATION AND UPON THE APPROVAL OF THE LOCAL EROSION AND SEDIMENT CONTROL INSPECTOR.
27. CONTRACTOR MUST REMOVE EROSION CONTROL MEASURES, SILT AND DEBRIS AFTER ESTABLISHING PERMANENT VEGETATION COVER OR OTHER SPECIFIED METHOD OF STABILIZATION AND UPON THE APPROVAL OF THE LOCAL EROSION AND SEDIMENT CONTROL INSPECTOR.
28. WITHOUT WRITTEN APPROVAL OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) OR LOCAL SOIL CONSERVATION DISTRICT (SCD), UNSTABILIZED AREAS OF DISTURBANCE THROUGHOUT THE SITE MUST NOT BE MORE THAN AS APPROVED BY MDE OR THE LOCAL SCD AT ANY TIME. ADDITIONAL INSPECTION REQUIREMENTS AS STIPULATED BY THE JURISDICTIONAL AGENCY MUST BE ADOPTED AS REQUIRED FOR DISTURBANCE MORE THAN AS APPROVED BY MDE OR THE LOCAL SCD.

DRAINAGE AND UTILITY NOTES

(Rev.1/2020)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. LOCATIONS OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE, AND THE CONTRACTOR MUST INDEPENDENTLY VERIFY AND CONFIRM THOSE LOCATIONS AND SERVICES WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCING ANY CONSTRUCTION OR EXCAVATION. THE CONTRACTOR MUST INDEPENDENTLY VERIFY AND CONFIRM ALL SANITARY CONNECTION POINTS AND ALL OTHER UTILITY SERVICE CONNECTION POINTS IN THE FIELD, PRIOR TO COMMENCING ANY CONSTRUCTION. THE CONTRACTOR MUST REPORT ALL DISCREPANCIES, ERRORS AND OMISSIONS IN WRITING, TO THE ENGINEER OF RECORD.
3. THE CONTRACTOR MUST VERTICALLY AND HORIZONTALLY LOCATE ALL UTILITIES AND SERVICES INCLUDING, BUT NOT LIMITED TO, GAS, WATER, ELECTRIC, SANITARY AND STORM, TELEPHONE, CABLE, FIBER OPTIC CABLE, ETC. WITHIN THE LIMITS OF DISTURBANCE OR WORK SPACE, WHICHEVER IS GREATER. THE CONTRACTOR MUST USE, REFER TO, AND COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE UTILITY NOTIFICATION SYSTEM TO LOCATE ALL OF THE UNDERGROUND UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL DAMAGE TO ANY EXISTING UTILITIES WHICH OCCUR DURING CONSTRUCTION, AT NO COST TO THE OWNER AND AT CONTRACTOR'S SOLE COST AND EXPENSE. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH DAMAGE TO ANY EXISTING UTILITIES WHICH OCCURS DURING CONSTRUCTION.
4. THE CONTRACTOR MUST FIELD VERIFY THE PROPOSED INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES BY USING A TEST PIT TO CONFIRM EXACT DEPTH, PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. STORMWATER ROOF DRAIN LOCATIONS ARE BASED ON ARCHITECTURAL PLANS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF SAME BASED UPON FINAL ARCHITECTURAL PLANS.
6. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING SITE PLAN DOCUMENTS AND ARCHITECTURAL PLANS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, GREASE TRAP REQUIREMENTS AND DETAILS, DOOR ACCESS, AND EXTERIOR GRADING. THE ARCHITECT WILL DETERMINE THE UTILITY SERVICE SIZES. THE CONTRACTOR MUST COORDINATE INSTALLATION OF UTILITY SERVICES WITH THE INDIVIDUAL COMPANIES, TO AVOID CONFLICTS AND TO ENSURE THAT PROPER DEPTHS ARE ACHIEVED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT INSTALLATION OF ALL IMPROVEMENTS COMPLIES WITH ALL UTILITY REQUIREMENTS OF THE APPLICABLE JURISDICTION AND REGULATORY AGENCIES AND ALL OTHER APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES AND, FURTHER, IS RESPONSIBLE FOR COORDINATING THE UTILITY TIE-INS/CONNECTIONS PRIOR TO CONNECTING TO THE EXISTING UTILITY/SERVICE. WHERE A CONFLICT(S) EXISTS BETWEEN THESE DOCUMENTS AND THE ARCHITECTURAL PLANS, OR WHERE ARCHITECTURAL PLAN UTILITY CONNECTION POINTS DIFFER, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER OF RECORD, IN WRITING, AND PRIOR TO CONSTRUCTION, MUST RESOLVE SAME.
7. ALL FILL, COMPACTION, AND BACKFILL MATERIALS REQUIRED FOR UTILITY INSTALLATION MUST BE EXACTLY AS PER THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT AND THE CONTRACTOR MUST COORDINATE SAME WITH THE APPLICABLE UTILITY COMPANY SPECIFICATIONS. WHEN THE PROJECT DOES NOT HAVE GEOTECHNICAL RECOMMENDATIONS, FILL AND COMPACTION MUST, AT A MINIMUM, COMPLY WITH THE STATE DOT REQUIREMENTS AND SPECIFICATIONS AND CONSULTANT HAS NO LIABILITY OR RESPONSIBILITY FOR OR AS RELATED TO FILL, COMPACTION AND BACKFILL.
8. DURING THE INSTALLATION OF SANITARY, STORM, AND ALL UTILITIES, THE CONTRACTOR MUST MAINTAIN A CONTEMPORANEOUS AND THOROUGH RECORD OF CONSTRUCTION TO IDENTIFY THE AS-INSTALLED LOCATIONS OF ALL UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR MUST CAREFULLY NOTE ANY INSTALLATIONS THAT DEVIATE, IN ANY RESPECT, FROM THE INFORMATION CONTAINED IN THESE PLANS. THIS RECORD MUST BE KEPT ON A CLEAN COPY OF THE SITE PLAN, WHICH THE CONTRACTOR MUST PROMPTLY PROVIDE TO THE OWNER IMMEDIATELY UPON THE COMPLETION OF WORK.
9. THE CONTRACTOR MUST ENSURE THAT ALL UTILITY TRENCHES LOCATED IN EXISTING PAVED ROADWAYS INCLUDING SANITARY, WATER AND STORM SYSTEMS, ARE REPAIRED IN ACCORDANCE WITH REFERENCED MUNICIPAL, COUNTY AND OR STATE DOT DETAILS AS APPLICABLE. THE CONTRACTOR MUST COORDINATE INSPECTION AND APPROVAL OF COMPLETED WORK WITH THE AGENCY WITH JURISDICTION OVER SAME.
10. FINAL LOCATIONS OF PROPOSED UTILITY POLES, AND/ OR POLES TO BE RELOCATED ARE AT THE SOLE DISCRETION OF THE RESPECTIVE UTILITY COMPANY, REGARDLESS OF WHAT THIS PLAN DEPICTS.
11. WATER SERVICE MATERIALS, BURIAL DEPTH, AND COVER REQUIREMENTS MUST BE SPECIFIED BY THE LOCAL UTILITY COMPANY. THE CONTRACTOR MUST CONTACT THE APPLICABLE MUNICIPALITY TO CONFIRM THE PROPER WATER METER AND VAULT, PRIOR TO COMMENCING CONSTRUCTION.

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

TM BOHLER//
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

Know what's below. Call before you dig.
ALWAYS CALL 811
It's fast. It's free. It's the law.

NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	CNDS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER//
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
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MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

C-102

REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - CNDS - 0----->LAYOUT: C-102 GENERAL NOTES
DD

SITE SPECIFIC DEMOLITION NOTES

1. ADDITIONAL EXISTING UTILITIES OR EXISTING FEATURES LOCATED WITHIN THE LIMIT OF DISTURBANCE NOT IDENTIFIED AS "TO BE REMOVED" OR "TO BE RELOCATED" MAY REQUIRE REMOVAL OR RELOCATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR TRADEPOINT DEVELOPMENT.
2. EXISTING UTILITIES NOTED AS "TO REMAIN" WITHIN THE LIMIT OF DISTURBANCE MUST BE MAINTAINED TO PROVIDE SERVICE FOR THE PROPOSED DEVELOPMENT.
3. THE LOCATION OF ALL UTILITIES SHOWN ARE APPROXIMATE BASED ON BETHLEHEM STEEL RECORD DRAWINGS (BS#), BALTIMORE COUNTY RECORD DRAWINGS (DWG #), AND THE AERIAL SURVEY CAD FILES NOTED ON THE COVER SHEET. THE CONTRACTOR IS ADVISED EXCAVATION MAY BE NECESSARY.
4. CONTRACTOR IS TO COORDINATE WITH TRADEPOINT DEVELOPMENT AND BGE FOR ANY UTILITY POLE RELOCATIONS THAT ARE REQUIRED TO CONSTRUCT THE IMPROVEMENTS SHOWN IN THIS PLAN SET.
5. SUBGRADE SITE FEATURES ARE SHOWN BASED UPON INFORMATION PROVIDED BY MCM MANAGEMENT CORPORATION, ENTITLED: SPARROWS POINT FACILITY; COLD SHEET MILL; SUBGRADE STRUCTURE LOCATION EXHIBIT; DATED 5/13/16;, JOB NO. 1511117.01 AND HAVE NOT BEEN VERIFIED BY BOHLER.
6. CONTRACTOR TO DEWATER AND REMOVE UNSUITABLE SOIL PER GEOTECHNICAL ENGINEER RECOMMENDATION PRIOR TO BACKFILLING.

50 25 12.5 0 50
1"= 50'

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER TM

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
LAND DEVELOPMENT CONSULTING
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	DEMO - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

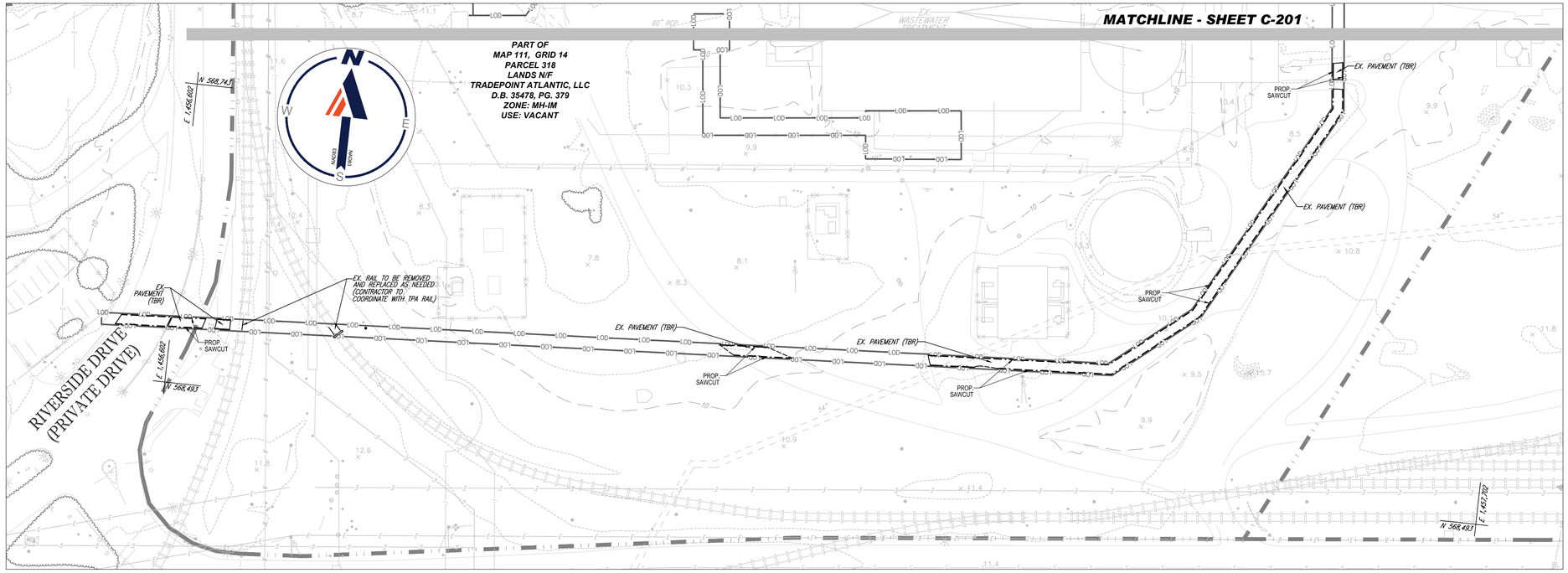
SHEET TITLE:

EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER:

C-201

REVISION 2 - 04/05/2022



SITE SPECIFIC DEMOLITION NOTES

1. ADDITIONAL EXISTING UTILITIES OR EXISTING FEATURES LOCATED WITHIN THE LIMIT OF DISTURBANCE NOT IDENTIFIED AS "TO BE REMOVED" OR "TO BE RELOCATED" MAY REQUIRE REMOVAL OR RELOCATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR TRADEPOINT DEVELOPMENT.
2. EXISTING UTILITIES NOTED AS "TO REMAIN" WITHIN THE LIMIT OF DISTURBANCE MUST BE MAINTAINED TO PROVIDE SERVICE FOR THE PROPOSED DEVELOPMENT.
3. THE LOCATION OF ALL UTILITIES SHOWN ARE APPROXIMATE BASED ON BETHLEHEM STEEL RECORD DRAWINGS (BS#), BALTIMORE COUNTY RECORD DRAWINGS (DWG #), AND THE AERIAL SURVEY CAD FILES NOTED ON THE COVER SHEET. THE CONTRACTOR IS ADVISED EXCAVATION MAY BE NECESSARY.
4. CONTRACTOR IS TO COORDINATE WITH TRADEPOINT DEVELOPMENT AND BGE FOR ANY UTILITY POLE RELOCATIONS THAT ARE REQUIRED TO CONSTRUCT THE IMPROVEMENTS SHOWN IN THIS PLAN SET.
5. SUBGRADE SITE FEATURES ARE SHOWN BASED UPON INFORMATION PROVIDED BY MCM MANAGEMENT CORPORATION, ENTITLED: SPARROWS POINT FACILITY; COLD SHEET MILL; SUBGRADE STRUCTURE LOCATION EXHIBIT; DATED 5/13/16; JOB NO. 1511117.01 AND HAVE NOT BEEN VERIFIED BY BOHLER.
6. CONTRACTOR TO DEWATER AND REMOVE UNSUITABLE SOIL PER GEOTECHNICAL ENGINEER RECOMMENDATION PRIOR TO BACKFILLING.

50 25 12.5 0 50
1"= 50'

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BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
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REVISIONS

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DATE:	3/5/2021
CAD I.D.:	DEMO - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
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MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

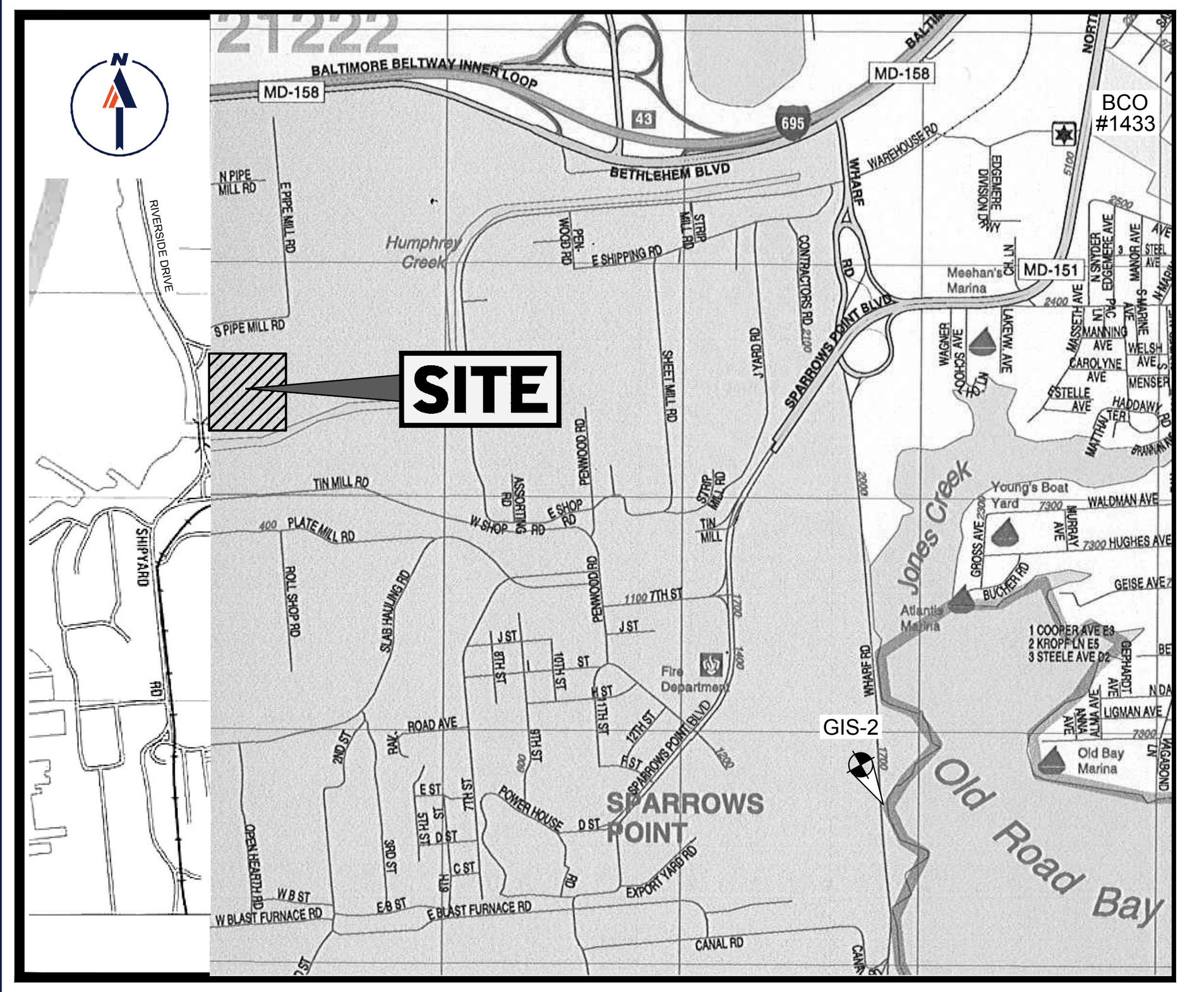
EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER:

C-202

REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - DEMO - 0----LAYOUT C-202 DEMO PLAN
MD



LOCATION MAP

COPYRIGHT ADC THE MAP PEOPLE
PERMIT USE NO. 20602153-5
SCALE: 1"=2000'

BENCHMARK INFORMATION

ELEVATIONS ARE BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER THE FOLLOWING MONUMENTS:

BCO# 1433 (CAPPED REBAR)
N 571,683.79, E 1,466,230.69, ELEV. 16.59
IN MEDIAN OF NORTH POINT BLVD SOUTH OF NORTH SNYDER AVE.

GIS #2 (BRASS DISK)
N 565,182.39, E. 1,464,480.72, ELEV. 9.95
EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

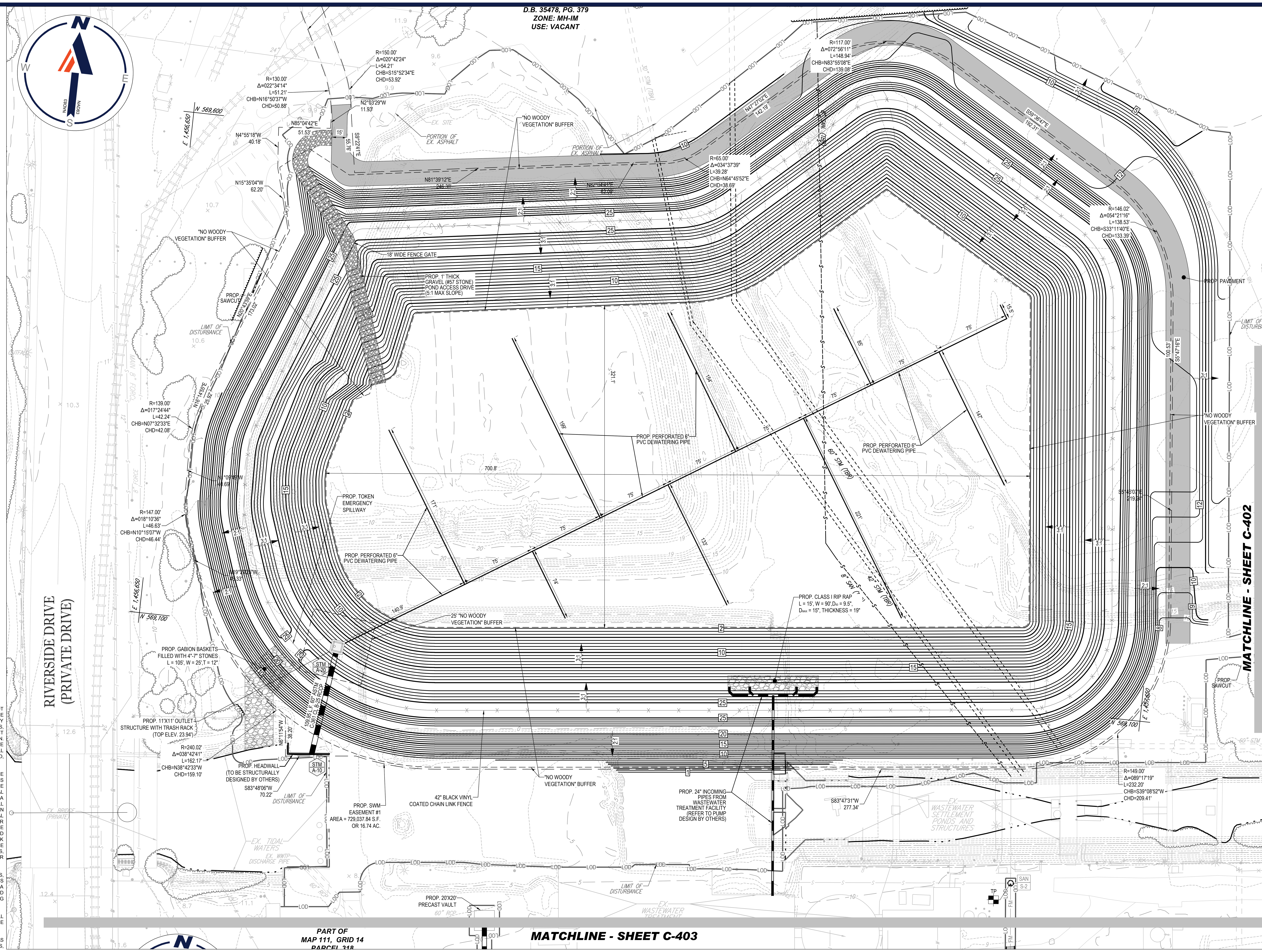
LEGEND

EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
	ONSITE PROPERTY LINE / R.O.W. LINE	
120 / 121	CONTOUR LINE	120 / 121
TC 516.4 OR 516.4	SPOT ELEVATIONS	TC 516.00 / TC 516.00 BC 515.50
SL	SANITARY SEWER LINE	SL / S
FM	SANITARY FORCE MAIN	FM
W	UNDERGROUND WATER LINE	W
I	INDUSTRIAL WATER LINE	I
E	UNDERGROUND ELECTRIC LINE	E
G	UNDERGROUND GAS LINE	G
OH	OVERHEAD WIRE	OH
T	UNDERGROUND TELEPHONE LINE	T
	STORM SEWER	
	LIMIT OF DISTURBANCE	LOD
	SAWCUT	
	CONCRETE CURB & GUTTER	CURB AND GUTTER / SPILL CURB
	RAIL TRACKS	

GENERAL GRADING NOTES

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT AND/OR DISCREPANCY BETWEEN THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE OR APPLICABLE CODES, REGULATIONS, LAWS, RULES, STATUTES AND/OR ORDINANCES, IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD, IN WRITING, OF SAID CONFLICT AND/OR DISCREPANCY PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR'S FAILURE TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE CONTRACTOR'S FULL AND COMPLETE ACCEPTANCE OF ALL RESPONSIBILITY TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, STATUTES, ORDINANCES AND CODES AND, FURTHER, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SAME.
2. SITE GRADING MUST BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT REFERENCED IN THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING UNSUITABLE MATERIALS WITH SUITABLE MATERIALS AS SPECIFIED IN THE GEOTECHNICAL REPORT. ALL EXCAVATED OR FILLED AREAS MUST BE COMPACTED AS OUTLINED IN THE GEOTECHNICAL REPORT. MOISTURE CONTENT AT TIME OF PLACEMENT MUST BE SUBMITTED IN A COMPACTION REPORT PREPARED BY A QUALIFIED GEOTECHNICAL ENGINEER, REGISTERED WITH THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT MUST BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE BY OWNER/DEVELOPER, OR OWNER/DEVELOPER'S REPRESENTATIVE, SUBBASE IS TO BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL COMPACTED AS DIRECTED BY THE GEOTECHNICAL REPORT. EARTHWORK ACTIVITIES INCLUDING, BUT NOT LIMITED TO, EXCAVATION, BACKFILL, AND COMPACTING MUST COMPLY WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT AND ALL APPLICABLE REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES. EARTHWORK ACTIVITIES MUST COMPLY WITH THE STANDARD STATE DOT SPECIFICATIONS FOR ROADWAY CONSTRUCTION (LATEST EDITION) AND ANY AMENDMENTS OR REVISIONS THERETO.
3. THE CONTRACTOR MUST COMPLY, TO THE FULLEST EXTENT, WITH THE LATEST OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES AND CONSULTANT SHALL HAVE NO RESPONSIBILITY FOR OR AS RELATED FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES.
4. PAVEMENT MUST BE SAW CUT IN STRAIGHT LINES, AND EXCEPT FOR EDGE OF BUTT JOINTS, MUST EXTEND TO THE FULL DEPTH OF THE EXISTING PAVEMENT. ALL DEBRIS FROM REMOVAL OPERATIONS MUST BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPILING OF DEBRIS WILL NOT BE PERMITTED.
5. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT TOPS MUST BE ADJUSTED, AS NECESSARY, TO MATCH PROPOSED GRADES IN ACCORDANCE WITH ALL APPLICABLE STANDARDS, REQUIREMENTS, RULES, STATUTES, LAWS, ORDINANCES AND CODES.
6. THE CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCING ANY CONSTRUCTION. CONTRACTOR MUST CONFIRM AND ENSURE 0.75% MINIMUM SLOPE AGAINST ALL ISLANDS, GUTTERS, AND CURBS; 1.0% ON ALL CONCRETE SURFACES; AND 1.0% MINIMUM ON ASPHALT (EXCEPT WHERE ADA REQUIREMENTS LIMIT GRADES), TO PREVENT PONDING. CONTRACTOR MUST IMMEDIATELY IDENTIFY, IN WRITING TO THE ENGINEER, ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE, OR PROJECT COST. IF CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER NOTIFICATION, MUST BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS THE DESIGN ENGINEER FOR ANY DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM SAME.
7. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 6" ABOVE EXISTING LOCAL ASPHALT GRADE UNLESS OTHERWISE NOTED. FIELD ADJUST TO CREATE A MINIMUM OF 0.75% GUTTER GRADE ALONG CURB FACE. IT IS CONTRACTOR'S OBLIGATION TO ENSURE THAT DESIGN ENGINEER APPROVES FINAL CURBING CUT SHEETS PRIOR TO INSTALLATION OF SAME.
8. REFER TO SITE PLAN FOR ADDITIONAL NOTES.
9. IN THE EVENT OF DISCREPANCIES AND/OR CONFLICTS BETWEEN PLANS OR RELATIVE TO OTHER PLANS, THE SITE PLAN WILL TAKE PRECEDENCE AND CONTROL. CONTRACTOR MUST IMMEDIATELY NOTIFY THE DESIGN ENGINEER, IN WRITING, OF ANY DISCREPANCIES AND/OR CONFLICTS.
10. CONTRACTOR IS REQUIRED TO SECURE ALL NECESSARY AND/OR REQUIRED PERMITS AND APPROVALS FOR ALL OFF SITE MATERIAL SOURCES AND DISPOSAL FACILITIES. CONTRACTOR MUST SUPPLY A COPY OF APPROVALS TO ENGINEER AND OWNER PRIOR TO INITIATING ANY WORK.
11. WHERE RETAINING WALLS (WHETHER OR NOT THEY MEET THE JURISDICTIONAL DEFINITION) ARE IDENTIFIED ON PLANS, ELEVATIONS IDENTIFIED ARE FOR THE EXPOSED PORTION OF THE WALL. WALL FOOTINGS/FOUNDATION ELEVATIONS ARE NOT IDENTIFIED HEREIN AND ARE TO BE SET/DETERMINED BY THE CONTRACTOR BASED ON FINAL STRUCTURAL DESIGN SHOP DRAWINGS PREPARED BY THE APPROPRIATE PROFESSIONAL LICENSED IN THE STATE WHERE THE CONSTRUCTION OCCURS.
12. CONSULTANT IS NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, SHALL HAVE NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS SUBSTANCES, OR POLLUTANTS ON, ABOUT OR UNDER THE PROPERTY.

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - GRAD - 1----->LAYOUT: C-401 GRADING PLAN
DD



SITE SPECIFIC GRADING NOTES

1. ALL UTILITIES SHOWN ARE PRIVATE.
2. THE SUBJECT DEVELOPMENT AREA IS LOCATED IN FLOOD ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, BALTIMORE COUNTY, MARYLAND (UNINCORPORATED AREAS) PANEL 555 OF 580", MAP NUMBER 240010555G, MAP REVISED MAY 5, 2014, AND PLAN PREPARED BY PAI, DEV. PLANS REVIEW, DATED SEPTEMBER 21, 2016, PER MAP 0555F, DATED SEPTEMBER 26, 2008
3. ADDITIONAL EXISTING UTILITIES AND SITE FEATURES LOCATED WITHIN THE LIMIT OF DISTURBANCE NOT IDENTIFIED AS "TO BE REMOVED" OR "TO BE RELOCATED" MAY REQUIRE REMOVAL OR RELOCATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
4. TOPOGRAPHY IS BASED UPON AERIAL SURVEY AND FIELD RUN SURVEY PROVIDED BY TRADEPOINT ATLANTIC; JUNE 2016.

BALTIMORE COUNTY STANDARD GRADING PLAN NOTES

1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT ON 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 CRITICAL AREA, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
4. STORMWATER MANAGEMENT HAS BEEN ADDRESSED BY CONSTRUCTION OF A WET POND.

GRADING 1 OF 3

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 OF OWNER/DEVELOPER | TITLE | DATE

PRINT NAME

LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC.

MARYLAND COORDINATE SYSTEM (MCS)

STORMWATER MANAGEMENT REQUIRED

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

APPROVED FOR GRADING

DATE

50 25 12.5 0 50
1"= 50'

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
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BOHLER //
SITE CIVIL AND CONSULTING ENGINEERING
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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	GRAD - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER //
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MGESELLE@BohlerEng.com

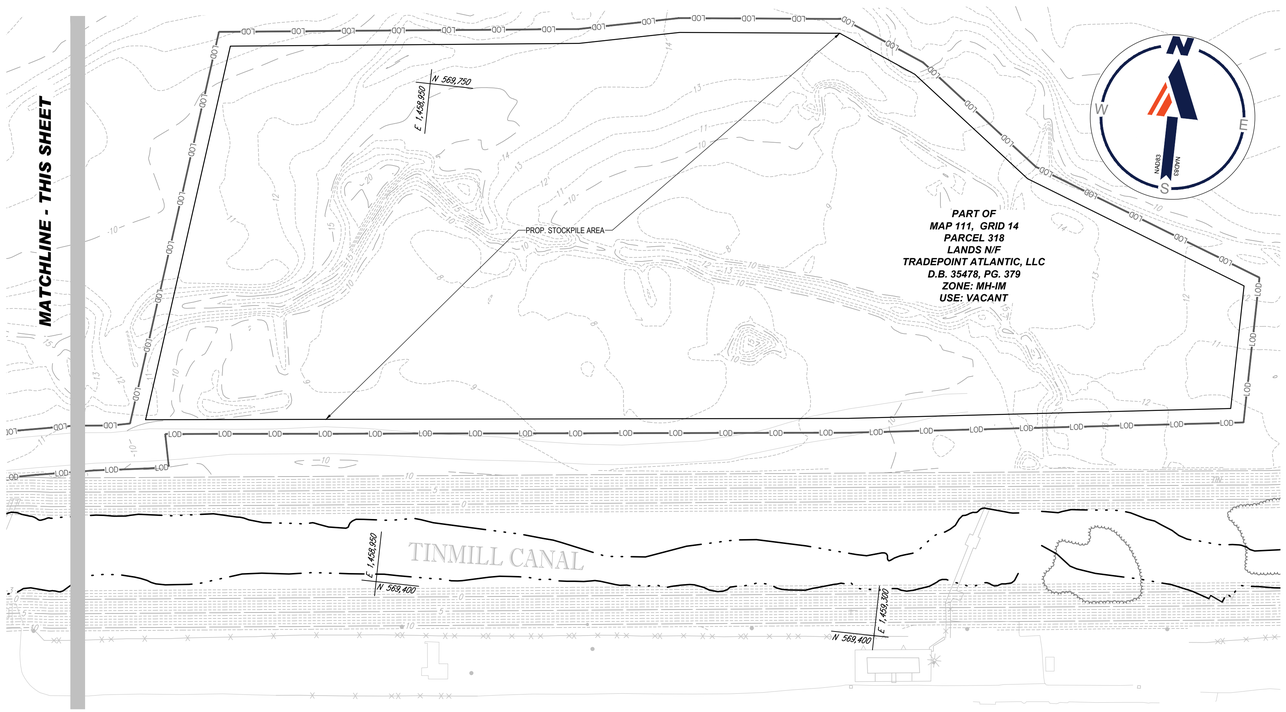
M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

FINAL GRADING PLAN

SHEET NUMBER:
C-401

REVISION 2 - 04/05/2022



LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC.

50 25 12.5 0 50

1"= 50'

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
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CONTACT: TOM CASO
PHONE: 410-382-6667

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

GRADING 2 OF 3

MARYLAND COORDINATE SYSTEM (MCS)

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DATE:	3/5/2021
CAD I.D.:	GRAD - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

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SHIPYARD ROAD AT
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M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

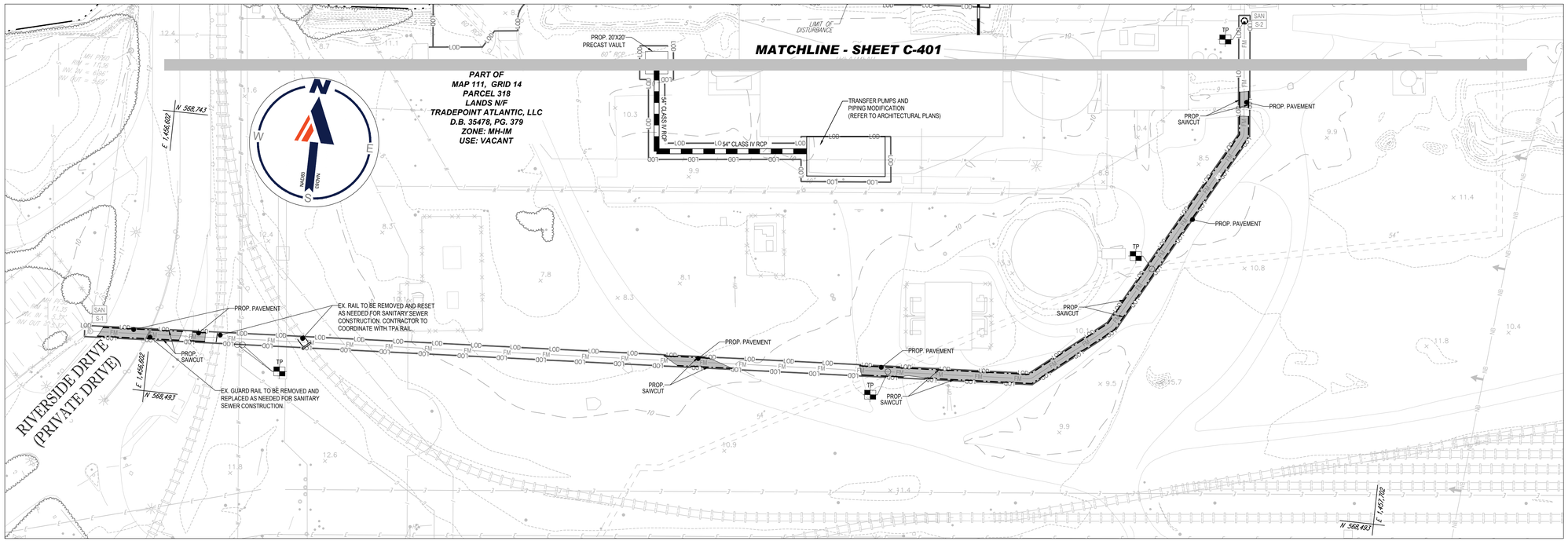
FINAL GRADING PLAN

SHEET NUMBER:

C-402

REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - GRAD - 1 - LAYOUT C-402 GRADING PLAN
MJG



PRIVATE SANITARY STRUCTURE SCHEDULE

NAME	TYPE	RIM ELEV. (FT.)	INVERTS
S-1	EXISTING MANHOLE	11.35'	INV OUT = 5.37' (EX. 12") INV IN = 5.37' (EX. 12") INV IN = 7.50 (2")
S-2	PUMP STATION	9.50'	INV IN = 5.25' (EX. 8") INV OUT = 5.50' (2")

PRIVATE SANITARY PIPE SCHEDULE

FROM	FROM INV	TO	TO INV	PIPE LENGTH	SLOPE (%)	DIAMETER (IN.)	MATERIAL
S-1	7.50'	S-2	5.50'	1232.00'	-	2"	HDPE (DR-11) FORCE MAIN

LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC.

50 25 12.5 0 50
1"= 50'

GRADING 3 OF 3

MARYLAND COORDINATE SYSTEM (MCS)

OWNER/DEVELOPER
TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23.

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	GRAD - 0

PROJECT:
WASTEWATER TREATMENT PLANT REPLACEMENT PLAN
FOR
TRADEPOINT ATLANTIC
SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MGESELLE@BohlerEng.com

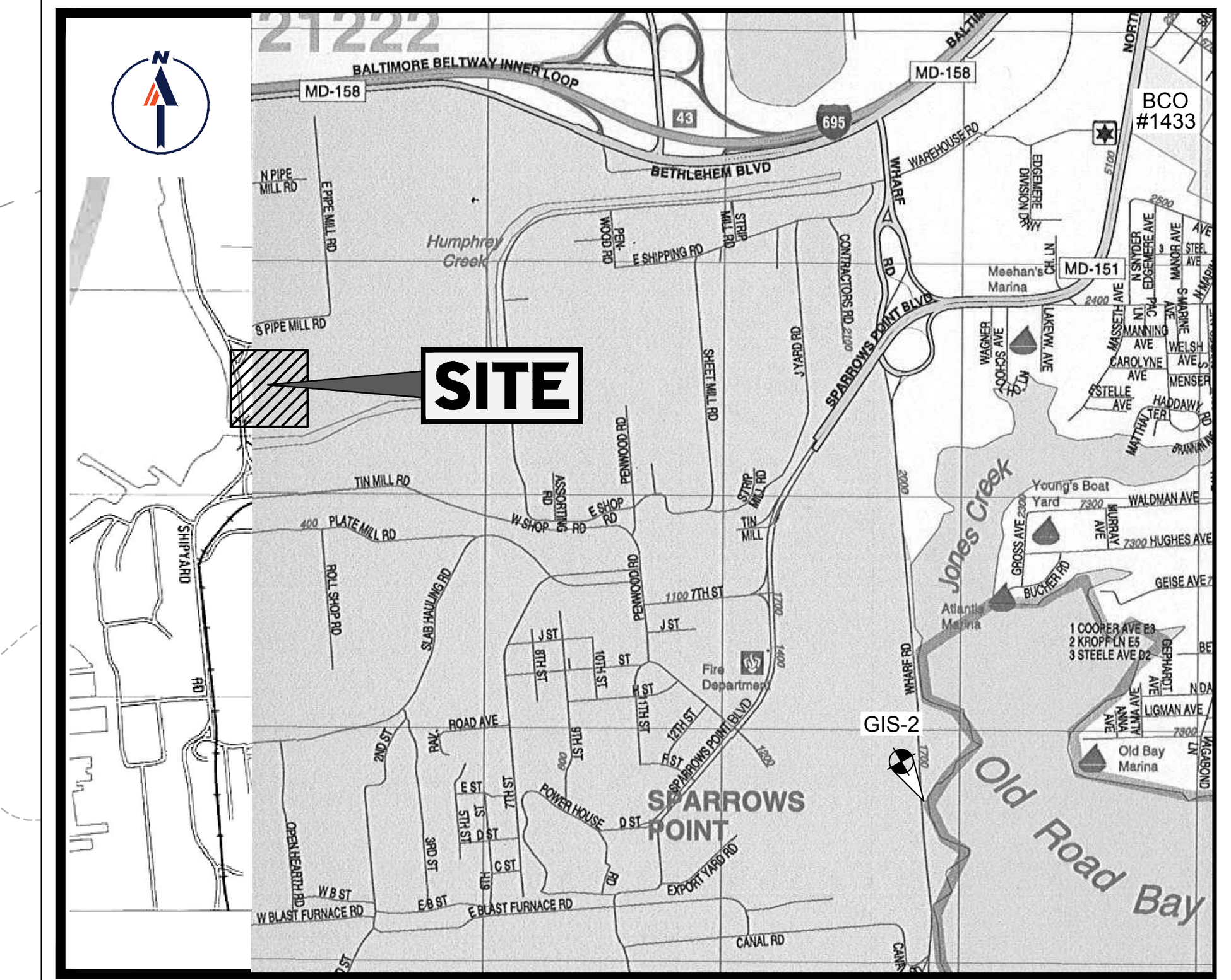
M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:
FINAL GRADING PLAN

SHEET NUMBER:
C-403

REVISION 2 - 04/05/2022

Apr 05, 2022
I:\1\DMD\16206639\DRAWINGS\PLAN SETS\DMD16206639 - GRAD - 1 — LAYOUT C-403 GRADING PLAN.DWG



LOCATION MAP

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PERMIT USE NO. 20602153-5
SCALE: 1"=2000'

BENCHMARK INFORMATION

ELEVATIONS ARE BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER THE FOLLOWING MONUMENTS:

BCO# 1433 (CAPPED REBAR)
N 571,683.79, E 1,466,230.69, ELEV. 16.59
IN MEDIAN OF NORTH POINT BLVD SOUTH OF NORTH SNYDER AVE.

GIS #2 (BRASS DISK)
N 565,182.39, E. 1,464,480.72, ELEV. 9.95
EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

STANDARD SYMBOLS

FOR EROSION AND SEDIMENT CONTROL PRACTICES

TITLE	KEY	SYMBOL
STABILIZED STONE CONSTRUCTION ENTRANCE	SCE	
MOUNTABLE BERM	MB	
SUPER SILT FENCE	SSF	SSF
FILTER BAG	FB	
LIMITS OF DISTURBANCE		LOD
REMOVABLE PUMPING STATION		RPS
SOIL STABILIZATION MATTINGS		

WORK OUTSIDE PERIMETER CONTROLS NOTES

CONTRACTOR SHALL ONLY DISTURB THAT AREA WHICH CAN BE COMPLETED AND STABILIZED BY THE END OF EACH WORKING DAY. STABILIZATION SHALL BE AS FOLLOWS:

1. FOR AREA TO BE PAVED, THE APPLICATION OF STONE BASE
2. FOR AREAS TO BE VEGETATIVELY STABILIZED
   a. PERMANENT SEED AND SOIL STABILIZATION MATTING OR SOD FOR ALL STEEP SLOPES, CHANNELS OR SWALES
   b. PERMANENT SEED AND MULCH FOR ALL OTHER AREAS.

ANY AREAS WHICH CAN NOT BE STABILIZED BY THE END OF EACH WORKING DAY MUST HAVE SILT FENCE INSTALLED ON THE DOWN SLOPE SIDE.

WORK TO BE COMPLETED OUTSIDE THE SEDIMENT CONTROL MEASURES SHALL BE DONE PER THE "WORK OUTSIDE PERIMETER CONTROLS NOTES" AND "UTILITY NOTES" ON THIS SHEET.

SITE SPECIFIC DEMOLITION NOTES

1. ADDITIONAL EXISTING UTILITIES OR EXISTING FEATURES LOCATED WITHIN THE LIMIT OF DISTURBANCE NOT IDENTIFIED AS "TO BE REMOVED" OR "TO BE RELOCATED" MAY REQUIRE REMOVAL OR RELOCATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR TRADEPOINT DEVELOPMENT.
2. EXISTING UTILITIES NOTED AS "TO REMAIN" WITHIN THE LIMIT OF DISTURBANCE MUST BE MAINTAINED TO PROVIDE SERVICE FOR THE PROPOSED DEVELOPMENT.
3. THE LOCATION OF ALL UTILITIES SHOWN ARE APPROXIMATE BASED ON BETHLEHEM STEEL RECORD DRAWINGS (BS#), BALTIMORE COUNTY RECORD DRAWINGS (DWG #), AND THE AERIAL SURVEY CAD FILES NOTED ON THE COVER SHEET. THE CONTRACTOR IS ADVISED EXCAVATION MAY BE NECESSARY.

SAME DAY STABILIZATION NOTES

1. WHERE NO SCE IS PROVIDED, THE CONTRACTOR SHALL DESIGNATE PIECES OF CONSTRUCTION EQUIPMENT THAT SHALL BE ALLOWED WITHIN THE LOD. THIS EQUIPMENT SHALL BE KEPT WITHIN THE LOD UNTIL THE PROPOSED WORK IS COMPLETE AND SHALL HAVE TREADS/TIRES CLEANED PRIOR TO LEAVING THE LOD. ALL MATERIAL REMOVAL/LOAD OUT SHALL BE LIFTED FROM THE LOD.
2. THE WORK SHOWN IN THIS AREA SHALL BE DONE USING THE METHOD OF 'SAME DAY STABILIZATION.' NO MORE LAND AREA (OR LENGTH OF TRENCH, SWALE, CHANNEL, ETC.) SHALL BE DISTURBED THAN CAN BE STABILIZED BY THE END OF THE WORKDAY. ALL DISTURBED AREAS THAT DO NOT DRAIN TO A SEDIMENT CONTROL DEVICE SHALL BE STABILIZED BY THE END OF THE WORKDAY. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN MDE APPROVED SEDIMENT CONTROL DEVICE. FOR WORK ACTIVITIES IN PAVED AREAS, THE STONE BASE COURSE LAYER MUST BE PLACED BY THE END OF THE SAME DAY TO QUALIFY AS SAME DAY STABILIZATION.

SOIL STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

MAPPED SOIL TYPES				
UuB	URBAN LAND-UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES	D	NO	NO

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 OF) THE TRENCH.
2. PLACE ALL EXCAVATED MATERIAL ON UPHILL SIDE OF TRENCH.
3. ANY SEDIMENT CONTROL DISTURBED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

MAINTENANCE NOTE

CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SEDIMENT CONTROL MEASURES AND DEVICES AFTER EVERY STORM EVENT. MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, THE REMOVAL OF ALL ACCUMULATED SEDIMENT. GEOTEXTILE FABRIC SHALL BE REPLACED AS NEEDED TO ENSURE PROPER FUNCTION. SUPER SILT FENCE STORAGE AREAS SHALL BE DEWATERED AND SEDIMENT CLEANED OUT AFTER EVERY STORM EVENT.

QUANTITY TAKEOFF OF SEDIMENT CONTROL MEASURES

**ALL PHASES	
SUPER SILT FENCE:	5,752.28 L.F.
STABILIZED CONSTRUCTION ENTRANCE:	3 EA.
REMOVAL PUMPING STATION	1 EA.
FILTER BAG	1 EA.
EARTH WORK (TOTAL DEVELOPMENT)	
CUT:	10,590 C.Y.
FILL:	68,850 C.Y.
NET:	58,260 C.Y. (FILL)

SPOIL MATERIAL SHALL BE DISCARDED AT A SITE WITH AN ACTIVE GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN. BORROW MATERIAL SHALL BE OBTAINED FROM AN APPROVED SITE WITH AN ACTIVE GRADING PERMIT AND AN APPROVED SEDIMENT CONTROL PLAN.

EARTH QUANTITIES LISTED ABOVE ARE FOR SEDIMENT CONTROL USE ONLY. CONTRACTOR SHALL NOT RELY ON THESE FIGURES FOR ESTIMATING AND BONDING PURPOSES. EARTH QUANTITIES ARE DETERMINED BY COMPARING TOP OF EXISTING GRADE TO TOP OF FINAL GRADE.

TEMPORARY STOCKPILE NOTES

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.

THESE ITEMS SHOULD BE INCORPORATED INTO ANY NOTE REFERENCING TEMPORARY STOCKPILES, AND WHEN ACTUALLY DELINEATING THEM ON PLAN VIEWS.

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 ROAD 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. THE REMOVAL OF ANY INLET PROTECTION DEVICES WILL REQUIRE APPROVAL FROM THE INSPECTOR.

*STORM DRAIN TO BE FLUSHED PRIOR TO TRAPPING DEVICE REMOVAL.

50 25 12.5 0 50
1"= 50'

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY ______ DATE ______

MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTE TO CONTRACTOR:

EROSION/SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

E&S 2 OF 8

MDE PROJECT #: xx-SF-xxxx

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

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BOHLER //
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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	EROS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER //
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

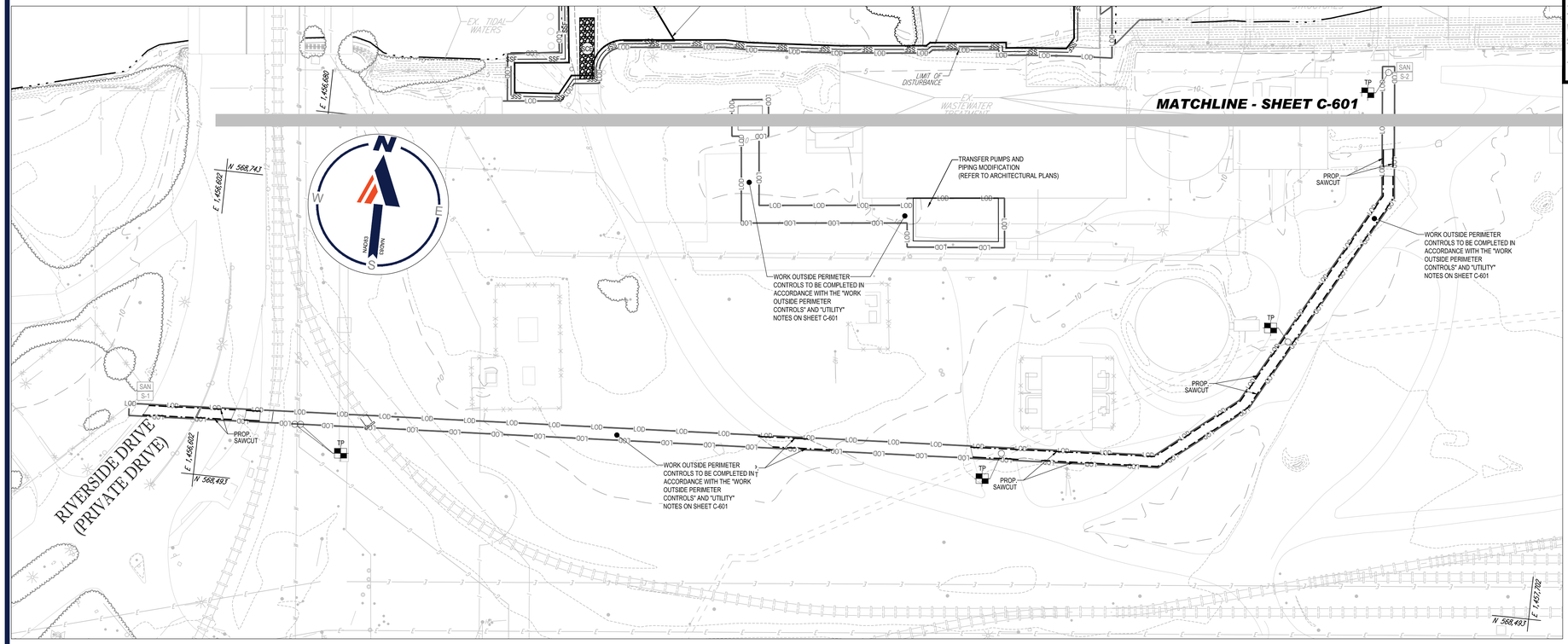
PHASE I EROSION AND SEDIMENT CONTROL PLAN

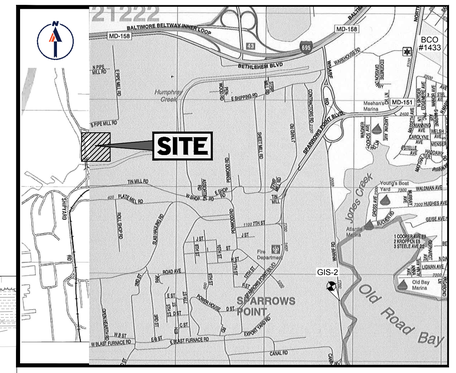
SHEET NUMBER:

C-601

REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - EROS - 0----->LAYOUT: C-601 PHASE I EROS
DD





LOCATION MAP

COPYRIGHT ADC THE MAP PEOPLE
PERMIT USE NO. 20602153-5
SCALE: 1"=2000'

BENCHMARK INFORMATION

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GIS #2 (BRASS DISK)
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EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

STANDARD SYMBOLS

FOR EROSION AND SEDIMENT CONTROL PRACTICES

TITLE	KEY	SYMBOL
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MOUNTABLE BERM	MB	
SUPER SILT FENCE	SSF	SSF
FILTER BAG	FB	
LIMITS OF DISTURBANCE		LOD
REMOVABLE PUMPING STATION		RPS
SOIL STABILIZATION MATTINGS		

50 25 12.5 0 50
1"= 50'

MAPPED SOIL TYPES				
UuB	URBAN LAND-UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES	D	NO	NO

OWNER/DEVELOPER
TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTE TO CONTRACTOR:

EROSION/SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC

E&S 3 OF 8

MDE PROJECT #:
xx-SF-xxxx

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PROJECT No.: MD16206639
DRAWN BY: CPH
CHECKED BY: MJG
DATE: 3/5/2021
CAD I.D.: EROS - 0

PROJECT:
WASTEWATER TREATMENT PLANT REPLACEMENT PLAN
FOR
TRADEPOINT ATLANTIC
SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
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MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:
PHASE I EROSION AND SEDIMENT CONTROL PLAN
SHEET NUMBER:
C-602

REVISION 2 - 04/05/2022

Apr 05, 2022
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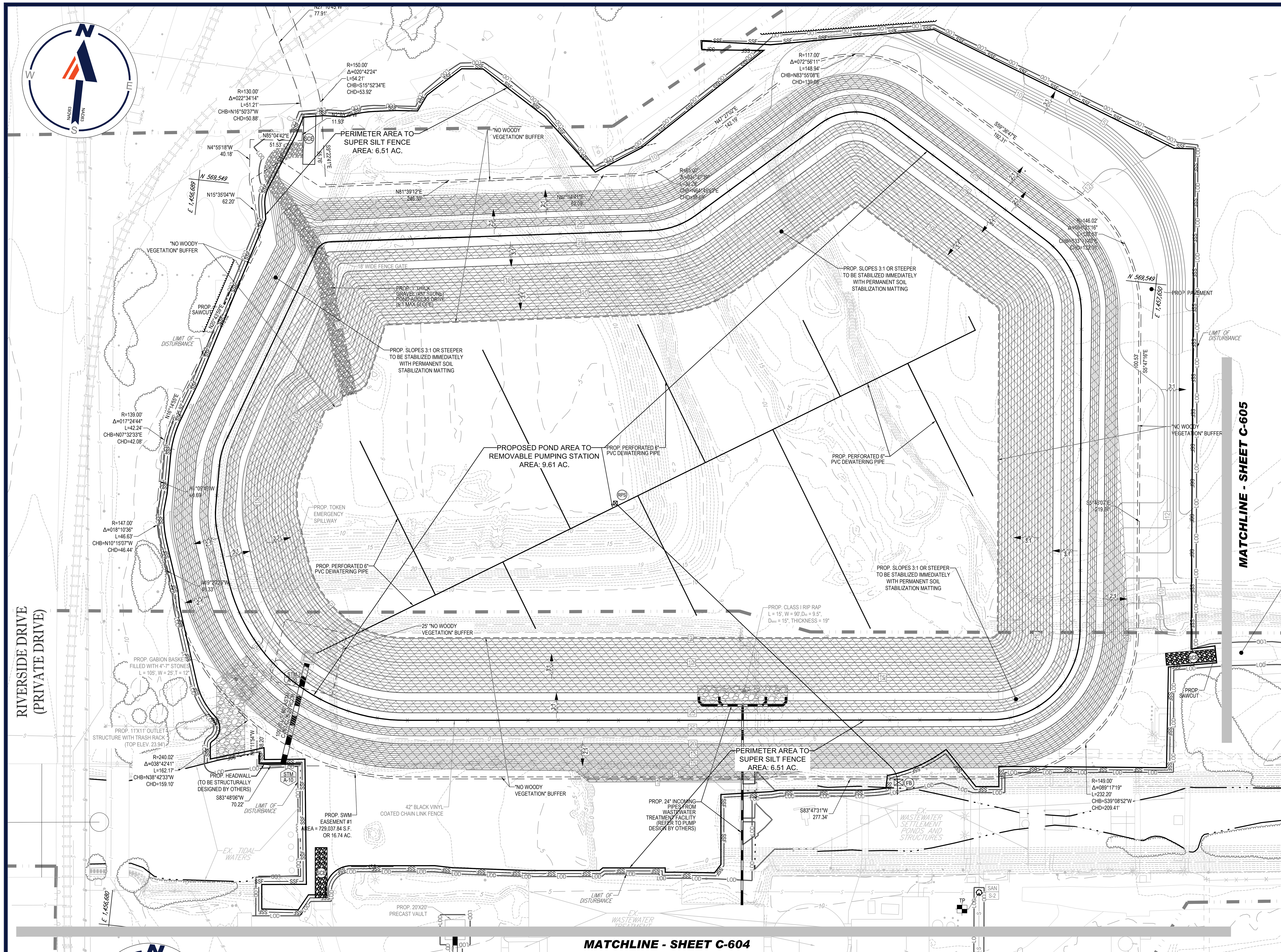

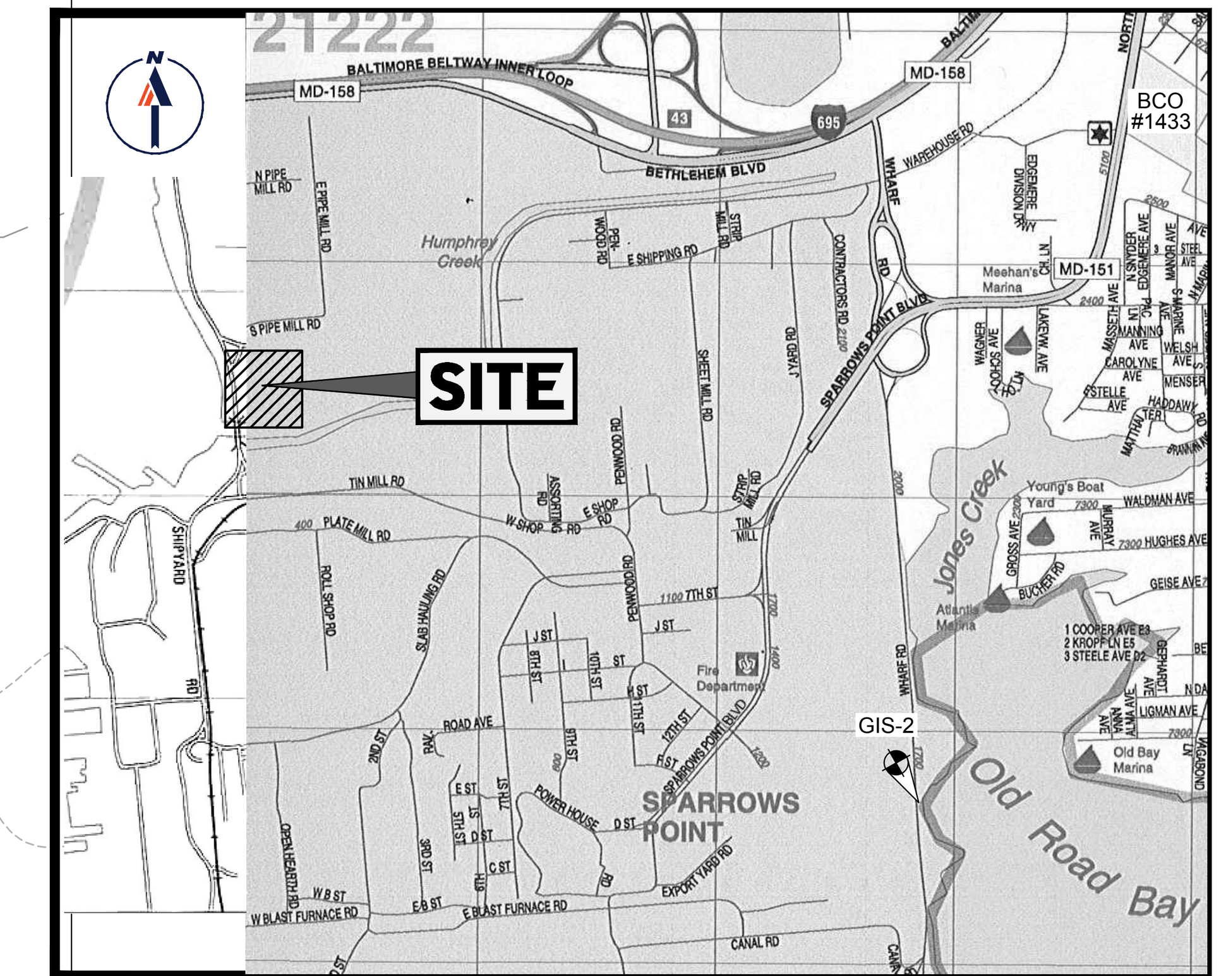

LOCATION MAP

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SCALE: 1"=2000'

BENCHMARK INFORMATION

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EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

STANDARD SYMBOLS

FOR EROSION AND SEDIMENT CONTROL PRACTICES

TITLE	KEY	SYMBOL
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FILTER BAG	FB	
LIMITS OF DISTURBANCE		LOD
REMOVABLE PUMPING STATION		RPS
SOIL STABILIZATION MATTINGS		

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CHECKED BY:	MJG
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PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
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OWNER/DEVELOPER

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1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY ____________ DATE ______

MARYLAND DEPARTMENT OF THE ENVIRONMENT

E&S 4 OF 8

MDE PROJECT #: xx-SF-xxxx

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MAPPED SOIL TYPES

UuB	URBAN LAND-UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES	D	NO	NO

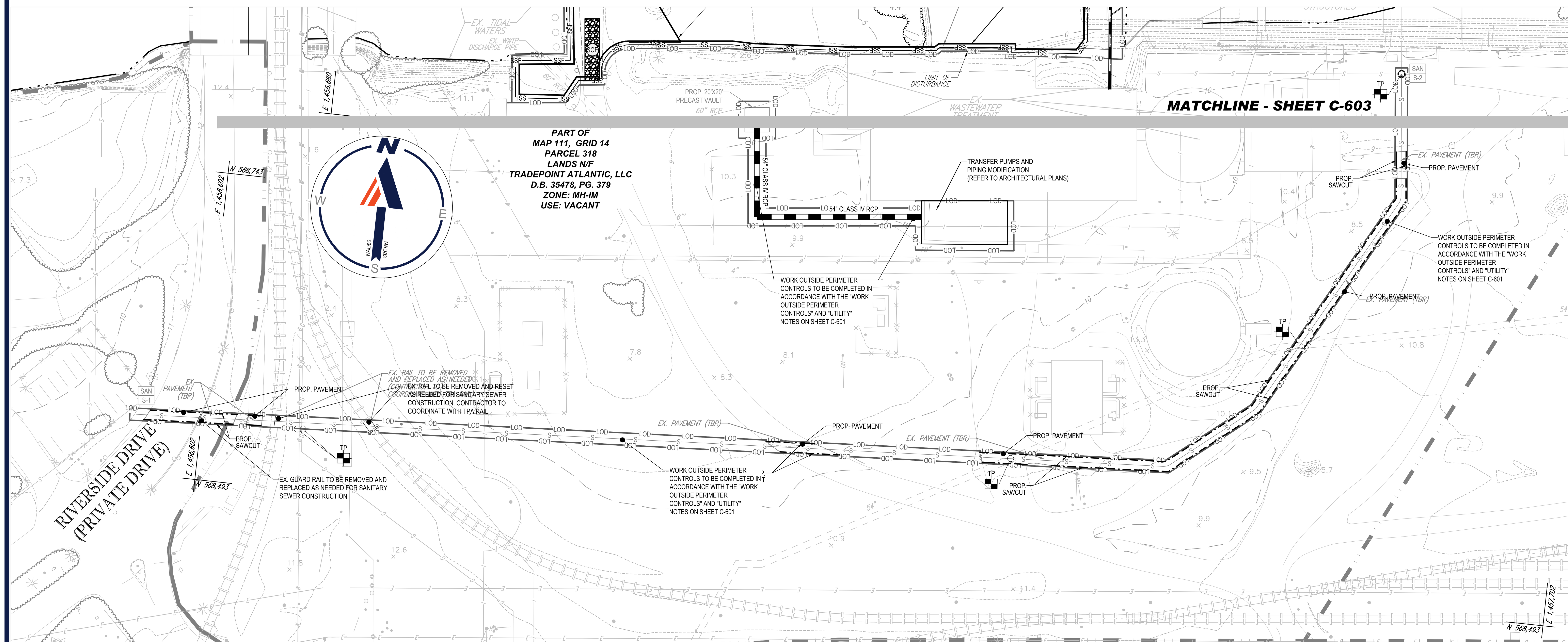
SHEET TITLE:

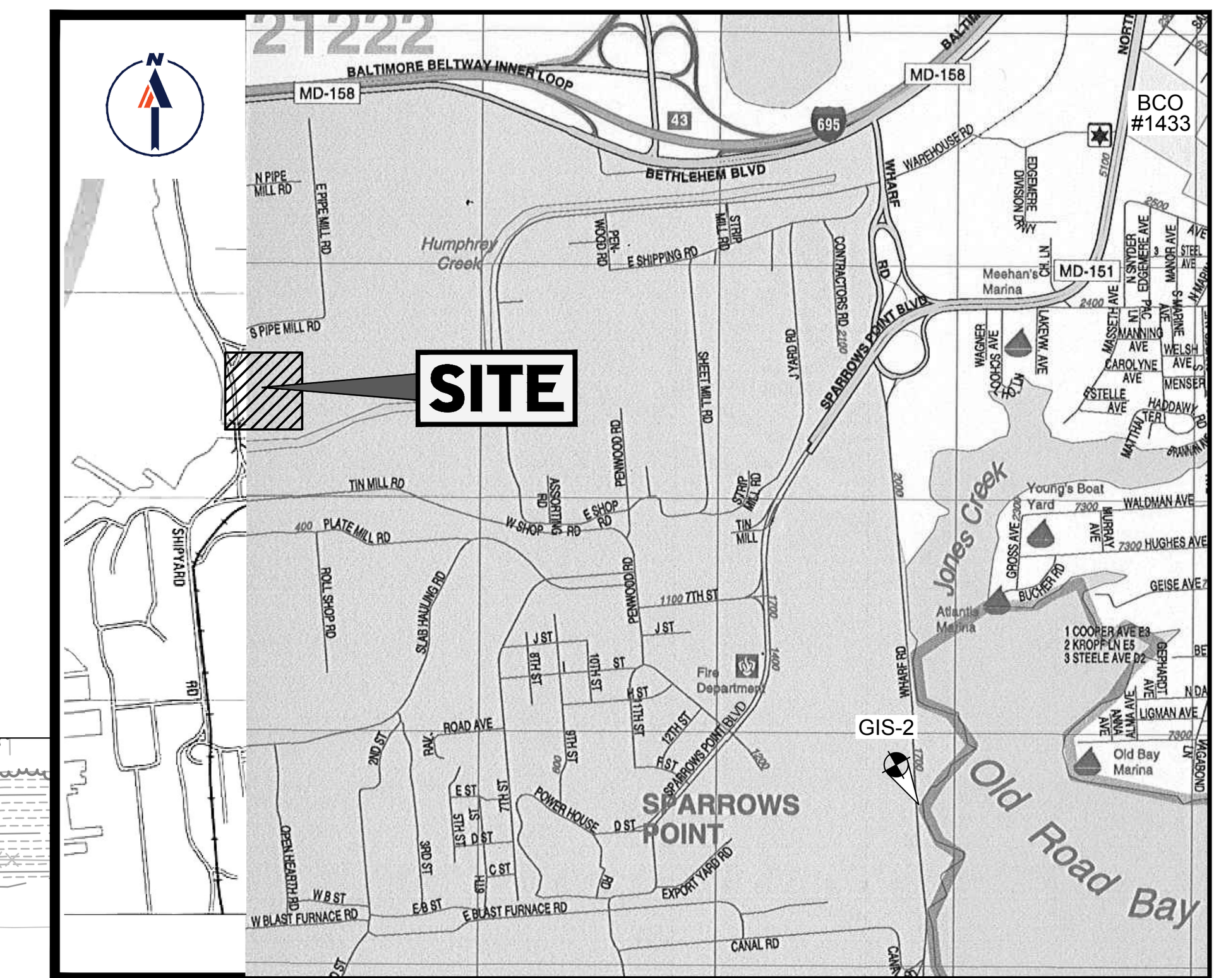
PHASE II EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER:

C-603

REVISION 2 - 04/05/2022





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SOIL STABILIZATION MATTINGS		

E&S 5 OF 8

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BY ____ DATE ____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

OWNER/DEVELOPER

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1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	EROS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

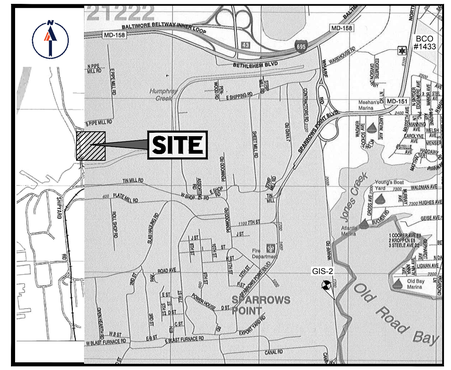
SHEET TITLE:

PHASE II EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER:

C-604

REVISION 2 - 04/05/2022



LOCATION MAP

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SCALE: 1"=2000'

BENCHMARK INFORMATION

ELEVATIONS ARE BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER THE FOLLOWING MONUMENTS:

BCO# 1433 (CAPPED REBAR)
N 571,683.79, E 1,466,230.69, ELEV. 16.59
IN MEDIAN OF NORTH POINT BLVD SOUTH OF NORTH SNYDER AVE.

GIS #2 (BRASS DISK)
N 565,182.39, E 1,464,480.72, ELEV. 9.95
EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

50 25 12.5 0 50
1"= 50'

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY DATE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTE TO CONTRACTOR:

EROSION/SEDIMENT CONTROL WILL BE STRICTLY ENFORCED.

LIMIT OF DISTURBANCE: ±913,133 S.F. OR 20.96 AC

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

E&S 6 OF 8

MDE PROJECT #:
xx-SF-xxxx

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER
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LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL SERVICES
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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PROJECT No.: MD16206639
DRAWN BY: CPH
CHECKED BY: MJG
DATE: 3/5/2021
CAD I.D.: EROS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
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M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

EROSION AND SEDIMENT CONTROL STOCKPILE

SHEET NUMBER:

C-605

REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD16206639\DRAWINGS\PLAN SETS\MD16206639 - EROS - 0 - LAYOUT C-605 STOCKPILE AREA
MJG

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

DEFINITION

USING VEGETATION AS COVER TO PROTECT EXPOSED SOIL FROM EROSION.

PURPOSE

TO PROMOTE THE ESTABLISHMENT OF VEGETATION ON EXPOSED SOIL.

CONDITIONS WHERE PRACTICE APPLIES

ON ALL DISTURBED AREAS NOT STABILIZED BY OTHER METHODS. THIS SPECIFICATION IS DIVIDED INTO SECTIONS ON INCREMENTAL STABILIZATION; SOIL PREPARATION, SOIL AMENDMENTS AND TOPSOILING; SEEDING AND MULCHING; TEMPORARY STABILIZATION; AND PERMANENT STABILIZATION.

EFFECTS ON WATER QUALITY AND QUANTITY

STABILIZATION PRACTICES 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, THEREBY REDUCING SEDIMENT LOADS AND RUNOFF TO DOWNSTREAM AREAS.

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. OVER TIME, VEGETATION 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 PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING, AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT

INSPECT SEEDED AREAS FOR VEGETATIVE ESTABLISHMENT AND MAKE NECESSARY REPAIRS, REPLACEMENTS, AND RESEEDINGS WITHIN THE PLANTING SEASON.

1. ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95 PERCENT GROUNDCOVER.
2. IF AN AREA HAS LESS THAN 40 PERCENT GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION, AND SEEDING.
3. IF AN AREA HAS BETWEEN 40 AND 94 PERCENT GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY SPECIFIED.
4. MAINTENANCE FERTILIZER RATES FOR PERMANENT SEEDING ARE SHOWN IN TABLE B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

DEFINITION

ESTABLISHMENT OF VEGETATIVE COVER ON CUT AND FILL SLOPES.

PURPOSE

TO PROVIDE TIMELY VEGETATIVE COVER ON CUT AND FILL SLOPES AS WORK PROGRESSES.

CONDITIONS WHERE PRACTICE APPLIES

ANY CUT OR FILL SLOPE GREATER THAN 15 FEET IN HEIGHT. THIS PRACTICE ALSO APPLIES TO STOCKPILES.

CRITERIA

A. INCREMENTAL STABILIZATION - CUT SLOPES

1. EXCAVATE AND STABILIZE CUT SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL CUT SLOPES AS THE WORK PROGRESSES.
2. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.1):
   a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
   b. PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED, AND STABILIZE.
   c. PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY.
   d. PERFORM FINAL PHASE EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

NOTE: ONCE EXCAVATION HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

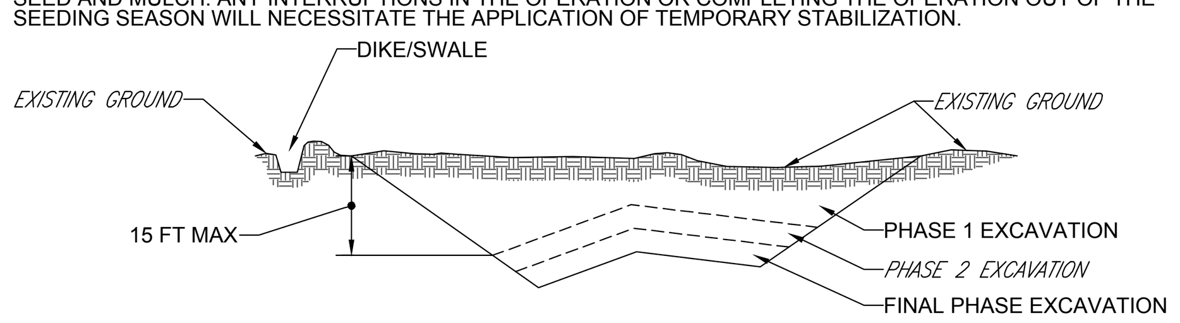

FIGURE B.1: INCREMENTAL STABILIZATION - CUT

B. INCREMENTAL STABILIZATION - FILL SLOPES

1. CONSTRUCT AND STABILIZE FILL SLOPES IN INCREMENTS NOT TO EXCEED 15 FEET IN HEIGHT. PREPARE SEEDBED AND APPLY SEED AND MULCH ON ALL SLOPES AS THE WORK PROGRESSES.
2. STABILIZE SLOPES IMMEDIATELY WHEN THE VERTICAL HEIGHT OF A LIFT REACHES 15 FEET, OR WHEN THE GRADING OPERATION CEASES AS PRESCRIBED IN THE PLANS.
3. AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
4. CONSTRUCTION SEQUENCE EXAMPLE (REFER TO FIGURE B.2):
   a. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO DIVERT RUNOFF AROUND THE FILL. CONSTRUCT SILT FENCE ON LOW SIDE OF FILL UNLESS OTHER METHODS SHOWN ON THE PLANS ADDRESS THIS AREA.
   b. AT THE END OF EACH DAY, INSTALL TEMPORARY WATER CONVEYANCE PRACTICE(S), AS NECESSARY, TO INTERCEPT SURFACE RUNOFF AND CONVEY IT DOWN THE SLOPE IN A NON-EROSIVE MANNER.
   c. PLACE PHASE 1 FILL, PREPARE SEEDBED, AND STABILIZE.
   d. PLACE PHASE 2 FILL, PREPARE SEEDBED, AND STABILIZE.
   e. PLACE FINAL PHASE FILL, PREPARE SEEDBED, AND STABILIZE. OVERSEED PREVIOUSLY SEEDED AREAS AS NECESSARY.

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

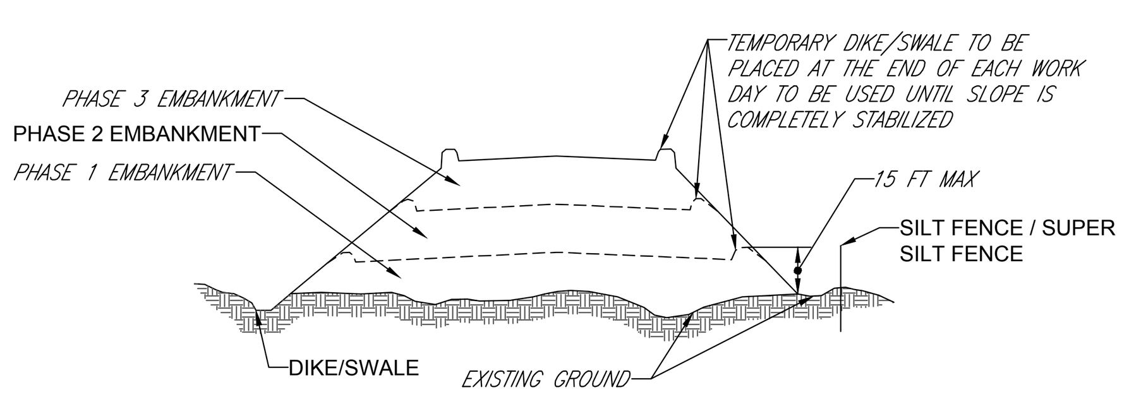

FIGURE B.2: INCREMENTAL STABILIZATION - FILL

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

DEFINITION

THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES

WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

CRITERIA

A. SOIL PREPARATION

1. TEMPORARY STABILIZATION
   a. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED 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 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT STABILIZATION
   a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
   i. SOIL PH BETWEEN 6.0 AND 7.0.
   ii. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
   iii. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE ACCEPTABLE.
   iv. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
   v. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
   b. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
   c. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
   d. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
   e. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

B. TOPSOILING

1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.
2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.
3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
   a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
   b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
   c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
   d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
   a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½ INCHES IN DIAMETER.
   b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
   c. TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
   a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
   b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
   c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY OF THE PRODUCER.
3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEEDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.
4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

DEFINITION

THE APPLICATION OF SEED AND MULCH TO ESTABLISH VEGETATIVE COVER.

PURPOSE

TO PROTECT DISTURBED SOILS FROM EROSION DURING AND AT THE END OF CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES

TO THE SURFACE OF ALL PERIMETER CONTROLS, SLOPES, AND ANY DISTURBED AREA NOT UNDER ACTIVE GRADING.

CRITERIA

A. SEEDING

1. SPECIFICATIONS
   a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.
   b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.
   c. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE 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 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.
   d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
2. APPLICATION
   a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
   i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.
   ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
   b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
   i. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
   ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
   c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).
   i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P2O5 (PHOSPHOROUS), 200 POUNDS PER ACRE; K2O (POTASSIUM), 200 POUNDS PER ACRE.
   ii. 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.
   iii. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.
   iv. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING

1. MULCH MATERIALS (IN ORDER OF PREFERENCE)
   a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
   b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
   i. WCFM IS TO 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.
   ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
   iii. WCFM MATERIALS ARE TO 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 HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
   iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
   v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.
2. APPLICATION
   i. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
   j. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
   k. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
3. ANCHORING
   a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE 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 MINIMUM OF 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 FOLLOW THE CONTOUR.
   ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
   iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
   iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

PURPOSE

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE (from Figure B.3): ZONE 7A SEED MIXTURE (from Table B.1)					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
COOL SEASON GRASSES						
1	ANNUAL RYEGRASS	40	2/15 - 4/30 8/15 - 11/30	0.5"	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
2	BARLEY	96	2/15 - 4/30 8/15 - 11/30	1"		
3	OATS	72	2/15 - 4/30 8/15 - 11/30	1"		
4	WHEAT	120	2/15 - 4/30 8/15 - 11/30	1"		
5	CEREAL RYE	112	2/15 - 4/30 8/15 - 12/15	1"		
WARM SEASON GRASSES						
6	FOXTAIL MILLET	30	5/1 - 8/14	0.5"	436 LB/AC (10 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
7	PEARL MILLET	20	5/1 - 8/14	0.5"		

1. SEEDING RATES FOR THE WARM-SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS). ACTUAL PLANTING RATES SHALL BE ADJUSTED TO REFLECT PERCENT SEED GERMINATION AND PURITY, AS TESTED. ADJUSTMENTS ARE USUALLY NOT NEEDED FOR THE COOL-SEASON GRASSES.

   SEEDING RATES LISTED ABOVE ARE FOR TEMPORARY SEEDINGS, WHEN PLANTED ALONE. WHEN PLANTED AS A NURSE CROP WITH PERMANENT SEED MIXES, USE 1/3 OF THE SEEDING RATE LISTED ABOVE FOR BARLEY, OATS, AND WHEAT. FOR SMALLER-SEEDED GRASSES (ANNUAL RYEGRASS, PEARL MILLET, FOXTAIL MILLET), DO NOT EXCEED MORE THAN 5% (BY WEIGHT) OF THE OVERALL PERMANENT SEEDING MIX. CEREAL RYE GENERALLY SHOULD NOT BE USED AS A NURSE CROP, UNLESS PLANTING WILL OCCUR IN VERY LATE FALL BEYOND THE SEEDING DATES FOR OTHER TEMPORARY SEEDINGS. CEREAL RYE HAS ALLELOPATHIC PROPERTIES THAT INHIBIT THE GERMINATION AND GROWTH OF OTHER PLANTS. IF IT MUST BE USED AS A NURSE CROP, SEED AT 1/3 OF THE RATE LISTED ABOVE.

   OATS ARE THE RECOMMENDED NURSE CROP FOR WARM-SEASON GRASSES.
2. FOR SANDY SOILS, PLANT SEEDS AT TWICE THE DEPTH LISTED ABOVE.
3. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE AND MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONE.

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

DEFINITION

TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE

TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA

A. SEED MIXTURES

1. GENERAL USE
   a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
   b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA PLANTING.
   c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
   d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 ½ POUNDS PER 1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY .
2. TURFGRASS MIXTURES
   a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
   b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
   i. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL 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 CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
   iii. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES; CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 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. MIXTURE INCLUDES; CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1½ TO 3 POUNDS PER 1000 SQUARE FEET.

   NOTES:

   SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND"

   CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR 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
   c. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES

      WESTERN MD: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)

      CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)

      SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)
   d. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED. REMOVE STONES AND DEBRIS OVER 1½ INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
   e. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (½ TO 1 INCH 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.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (from Figure B.3): ZONE 7A SEED MIXTURE (from Table B.3)					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P2O5	K2O	
MIXTURE FOR SHADY AREAS					45 LB/AC (1.0 LB/1000 SF)	90 LB/AC (2 LB/1000 SF).	90 LB/AC (2 LB/1000 SF)	2 TONS/AC (90 LB/1000 SF)
7	CREEPING RED FESCUE KENTUCKY BLUEGRASS	60 15	2/15 - 4/30** 8/15 - 10/31	1/4" - 1/2"				
MIXTURE FOR LAWN AREAS								
9	TALL FESCUE KENTUCKY BLUEGRASS PERENNIAL RYE GRASS	60 40 20	2/15 - 4/30** 8/15 - 10/31	1/4" - 1/2"				
MIXTURE FOR STEEP SLOPE AREAS								
1	SWITCH GRASS CREEPING RED FESCUE PARTRIDGE PEA	10 15 4	2/15 - 4/30++ 5/1 - 5/31*	1/4" - 1/2"	**FOR SEEDING PERIODS 5/1 - 8/14 PROVIDE NURSE CROP (SEE TEMPORARY SEEDING SUMMARY NOTES).			

1) THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE. THESE DATES MAY REQUIRE ADJUSTMENTS TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONES. WHEN SEEDING TOWARD THE END OF THE LISTED PLANTING DATES, OR WHEN CONDITIONS ARE EXPECTED TO BE LESS THAN OPTIMAL, SELECT AN APPROPRIATE NURSE CROP FROM TEMPORARY SEEDING SUMMARY FOR SITE STABILIZATION AND PLANT TOGETHER WITH THE PERMANENT SEEDING MIX.
2) WHEN PLANTED DURING THE GROWING SEASON, MOST OF THESE MATERIALS MUST BE PURCHASED AND KEPT IN A DORMANT CONDITION UNTIL PLANTING. BARE-ROOT GRASSES ARE THE EXCEPTION - THEY MAY BE SUPPLIED AS GROWING (NON-DORMANT) PLANTS.
* ADDITIONAL PLANTING DATES DURING WHICH SUPPLEMENTAL WATERING MAY BE NEEDED TO ENSURE PLANT ESTABLISHMENT.
++WARM-SEASON GRASSES NEED A SOIL TEMPERATURE OF AT LEAST 50 DEGREES F IN ORDER TO GERMINATE. IF SOIL TEMPERATURES ARE COLDER THAN 50 DEGREES, OR MOISTURE IS NOT ADEQUATE, THE SEEDS WILL REMAIN DORMANT UNTIL CONDITIONS ARE FAVORABLE. IN GENERAL, PLANTING DURING THE LATTER PORTION OF THIS PERIOD ALLOWS MORE TIME FOR WEED EMERGENCE AND WEED CONTROL PRIOR TO PLANTING. WHEN SELECTING A PLANTING DATE, CONSIDER THE NEED FOR WEED CONTROL VS. THE LIKELIHOOD OF HAVING SUFFICIENT MOISTURE FOR LATER PLANTINGS, ESPECIALLY ON DROUGHTY SITES.
ΔADDITIONAL PLANTING DATES FOR THE LOWER COASTAL PLAIN, DEPENDENT ON ANNUAL RAINFALL AND TEMPERATURE TRENDS. RECOMMEND ADDING A NURSE CROP, AS NOTED ABOVE, IF PLANTING DURING THIS PERIOD.
+FREQUENT FREEZING AND THAWING OF WET SOILS MAY RESULT IN FROST-HEAVING OF MATERIALS PLANTED IN LATE FALL, IF PLANTS HAVE NOT SUFFICIENTLY ROOTED IN PLACE. SOD USUALLY NEEDS 4 TO 6 WEEKS TO BECOME SUFFICIENTLY ROOTED. LARGE CONTAINERIZED AND BALLED-AND-BURLAPPED STOCK MAY BE PLANTED INTO THE WINTER MONTHS AS LONG AS THE GROUND IS NOT FROZEN AND SOIL MOISTURE IS ADEQUATE.

B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).

1. GENERAL SPECIFICATIONS
   a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
   b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF ¾ INCH, PLUS OR MINUS ¼ INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
   c. STANDARD SIZE SECTIONS OF SOD MUST 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.
   d. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
   e. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.
2. SOD INSTALLATION
   a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
   b. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS 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 VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
   c. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
   d. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.
3. SOD MAINTENANCE
   a. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
   b. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
   c. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN ⅓ OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

B-4-6 STANDARDS AND SPECIFICATIONS FOR SOIL STABILIZATION MATTING

DEFINITION

MATERIAL USED TO TEMPORARILY OR PERMANENTLY STABILIZE CHANNELS OR STEEP SLOPES UNTIL GROUNDCOVER IS ESTABLISHED.

PURPOSE

TO PROTECT THE SOILS UNTIL VEGETATION IS ESTABLISHED.

CONDITIONS WHERE PRACTICE APPLIES

ON NEWLY SEEDED SURFACES TO PREVENT THE APPLIED SEED FROM WASHING OUT; IN CHANNELS AND ON STEEP SLOPES WHERE THE FLOW HAS EROSIVE VELOCITIES OR CONVEYS CLEAR WATER; ON TEMPORARY SWALES, EARTH DIKES, AND PERIMETER DIKE SWALES AS REQUIRED BY THE RESPECTIVE DESIGN STANDARD; AND, ON STREAM BANKS WHERE MOVING WATER IS LIKELY TO WASH OUT NEW VEGETATIVE PLANTINGS.

MAINTENANCE

VEGETATION MUST BE ESTABLISHED AND MAINTAINED SO THAT THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND DEPARTMENT OF THE ENVIRONMENT SEDIMENT CONTROL 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 MARYLAND DEPARTMENT OF THE ENVIORNMENT.
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) 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 (7) 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 THE MARYLAND DEPARTMENT OF THE ENVIRONMENT 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 THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND THE MARYLAND DEPARTMENT OF THE ENVIRONMENT 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'S GUIDELINES TO WATERWAY CONSTRUCTION" BY THE WATER MANAGEMENT ADMINISTRATION OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, REVISED NOVEMBER, 2000, FOR STANDARD DETAILS AND DETAILED 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 WITHIN THE LIMIT OF DISTURBANCE.

E&S 7 OF 8

MDE PROJECT #: xx-SF-xxxx

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY ____ DATE ____

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD MJG

NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	ODET - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
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M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

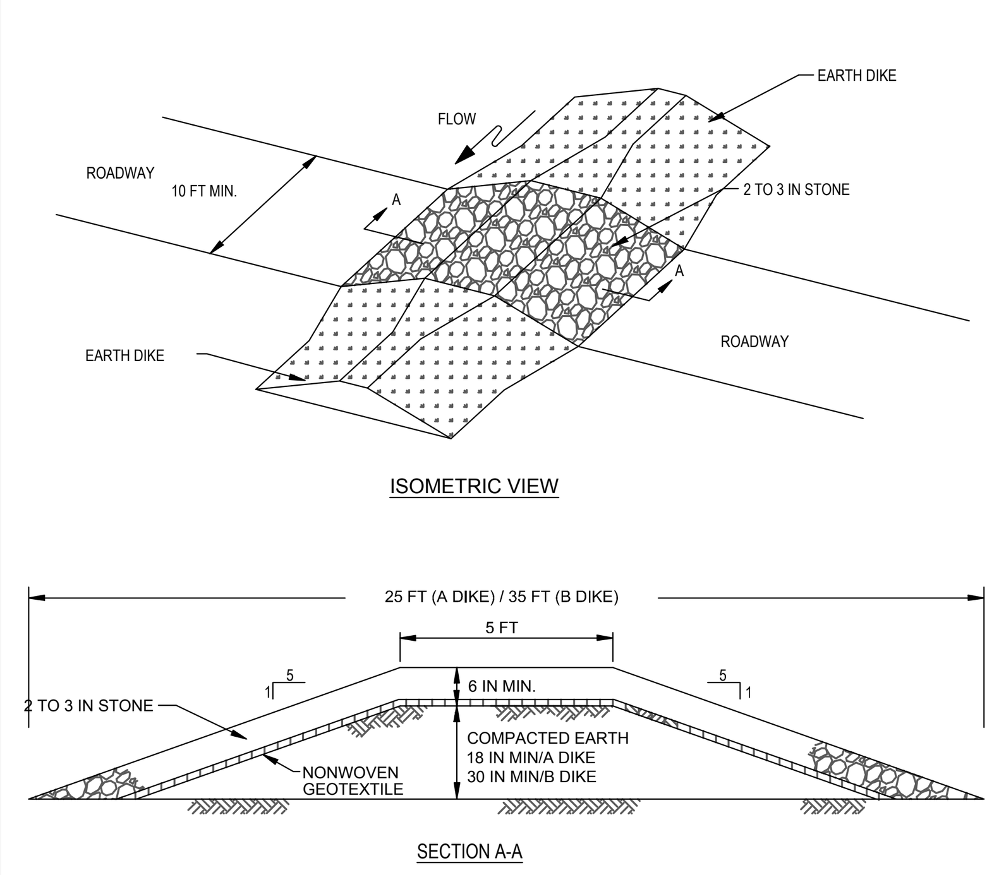
SHEET NUMBER:

C-606

REVISION 2 - 04/05/2022

DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB



CONSTRUCTION SPECIFICATIONS

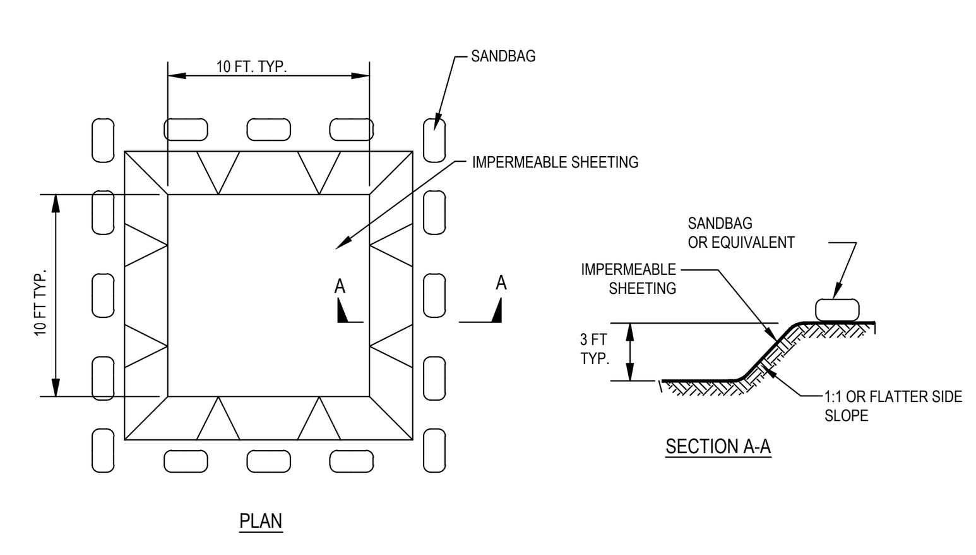
1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

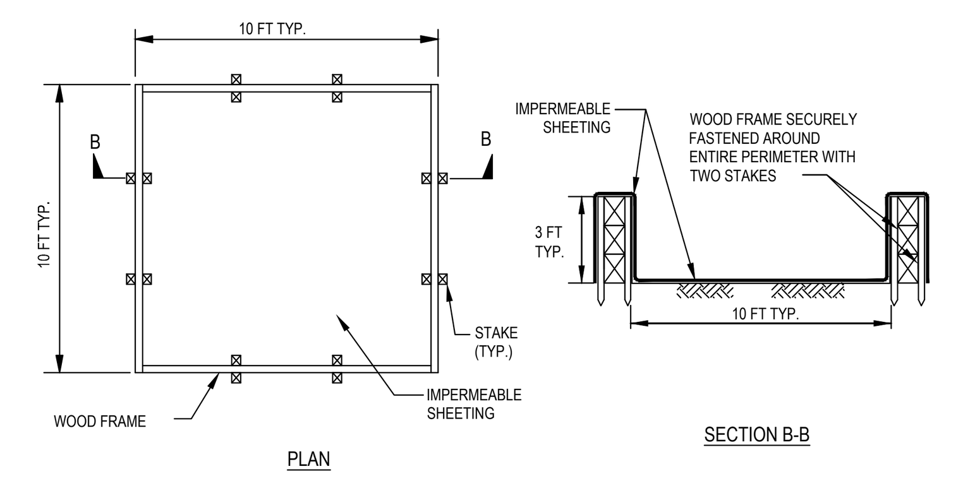
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



EXCAVATED WASHOUT STRUCTURE



WASHOUT STRUCTURE WITH WOOD PLANKS

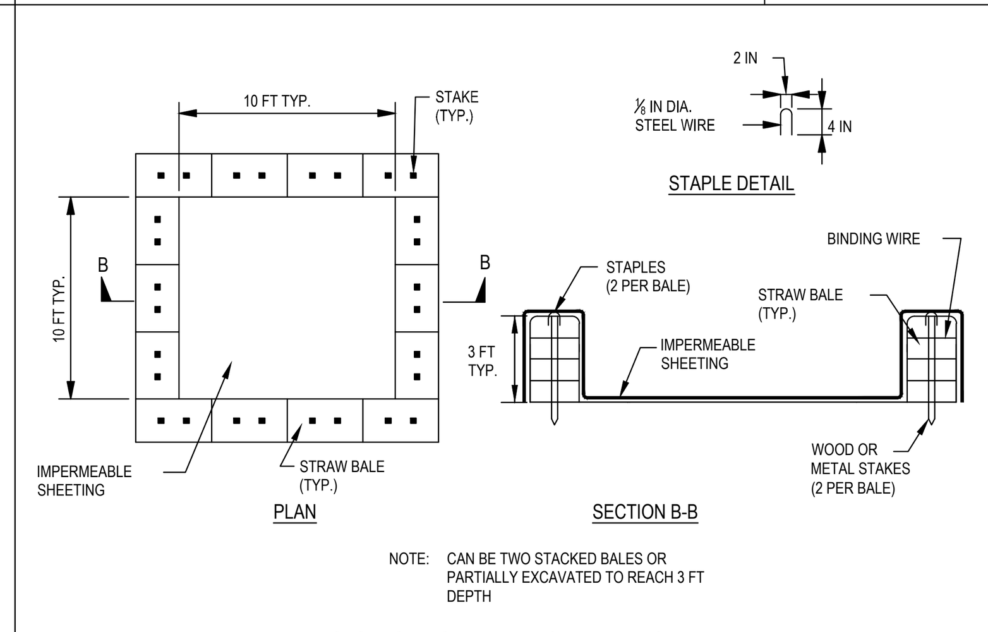
1 OF 2

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 H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



NOTE: CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

WASHOUT STRUCTURE WITH STRAW BALES

CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

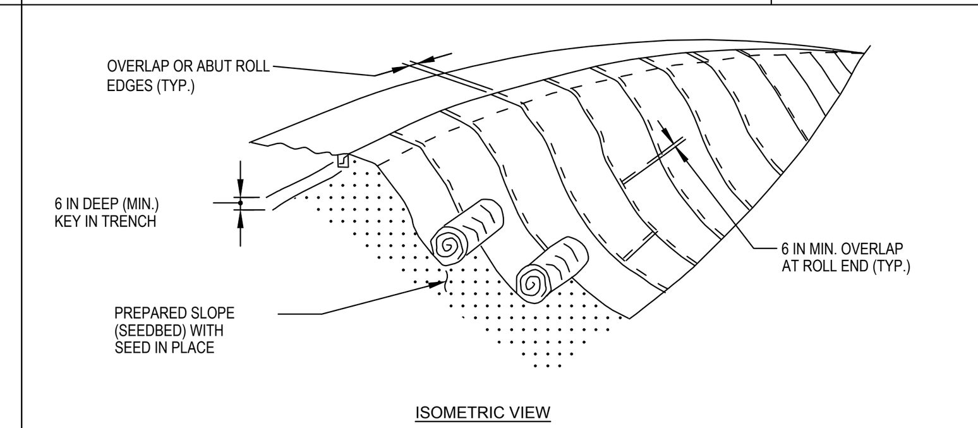
2 OF 2

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-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: TSSMS - *>= 2.25 lb/ft² (* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

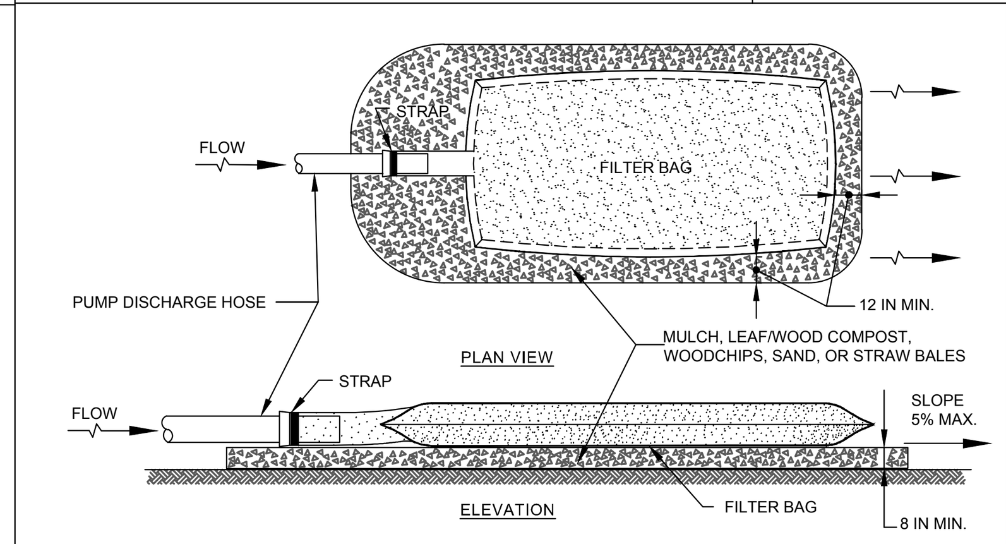
1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION 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 1½ 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 & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
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

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

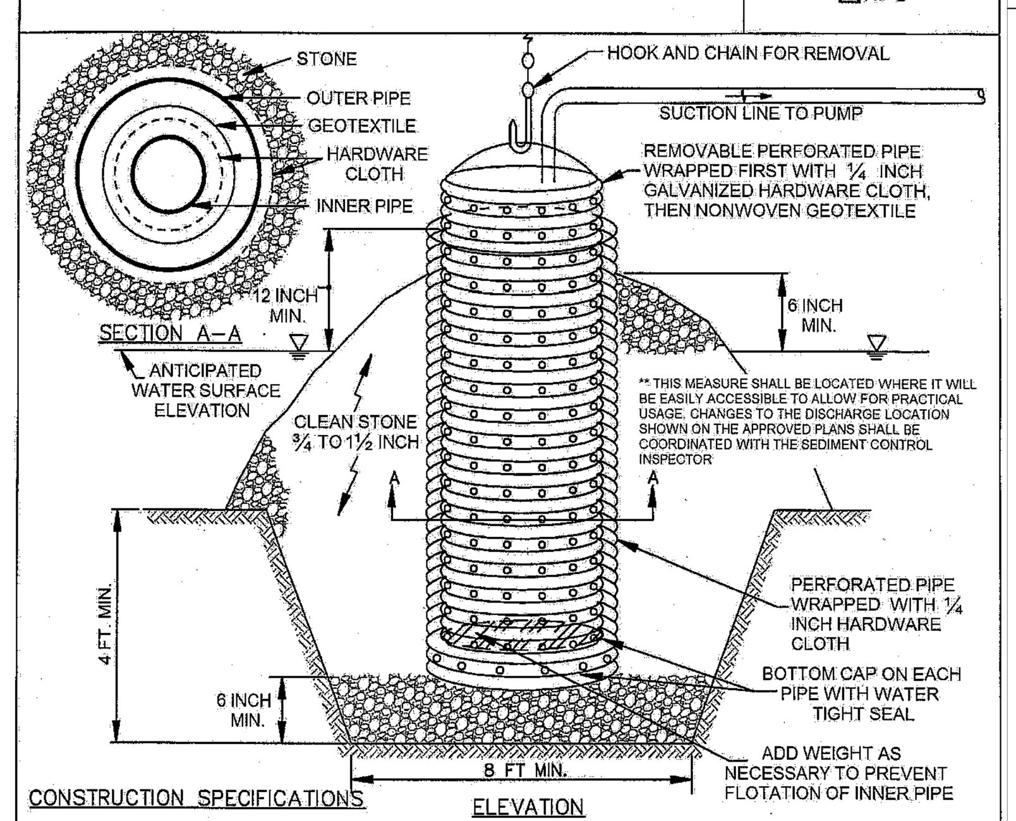
6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

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 F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL: RPS



CONSTRUCTION SPECIFICATIONS

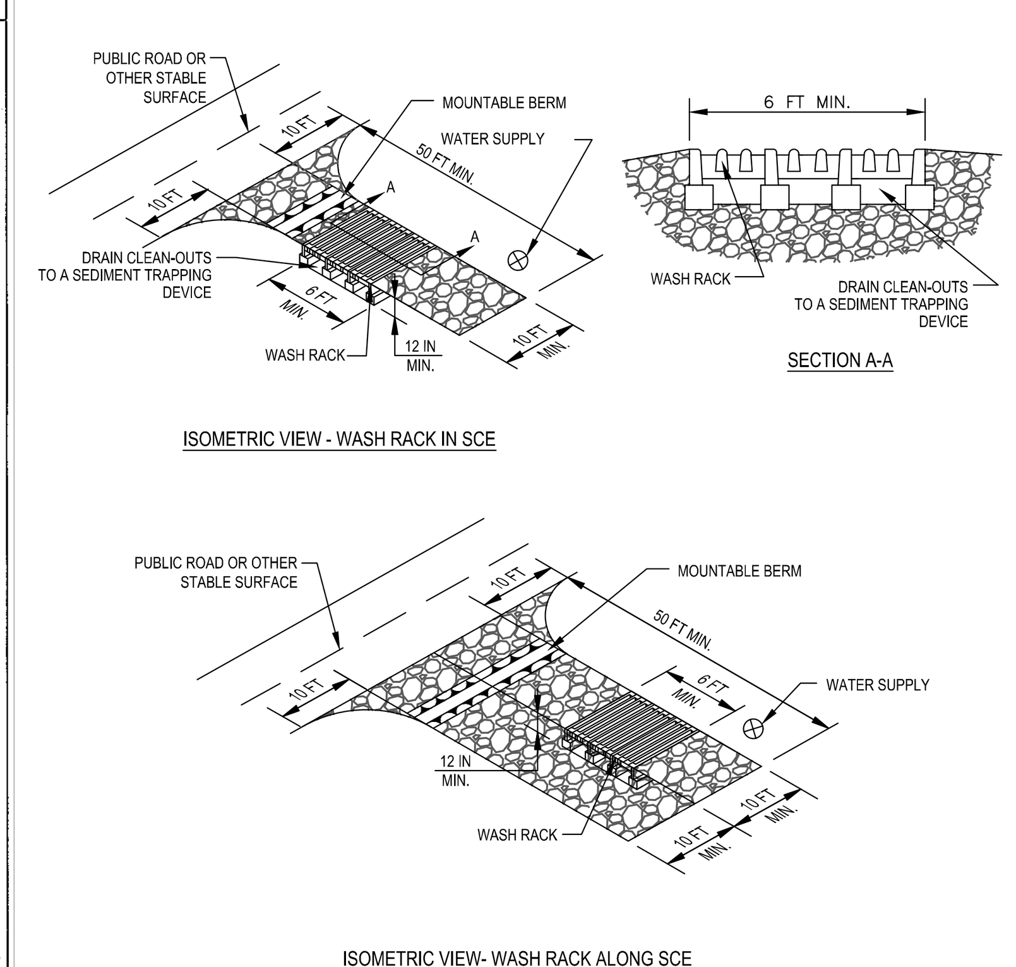
1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
MODIFIED FOR USE IN BALTIMORE COUNTY

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | MODIFIED - 2012 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-2 WASH RACK OPTION

STANDARD SYMBOL: WR



CONSTRUCTION SPECIFICATIONS

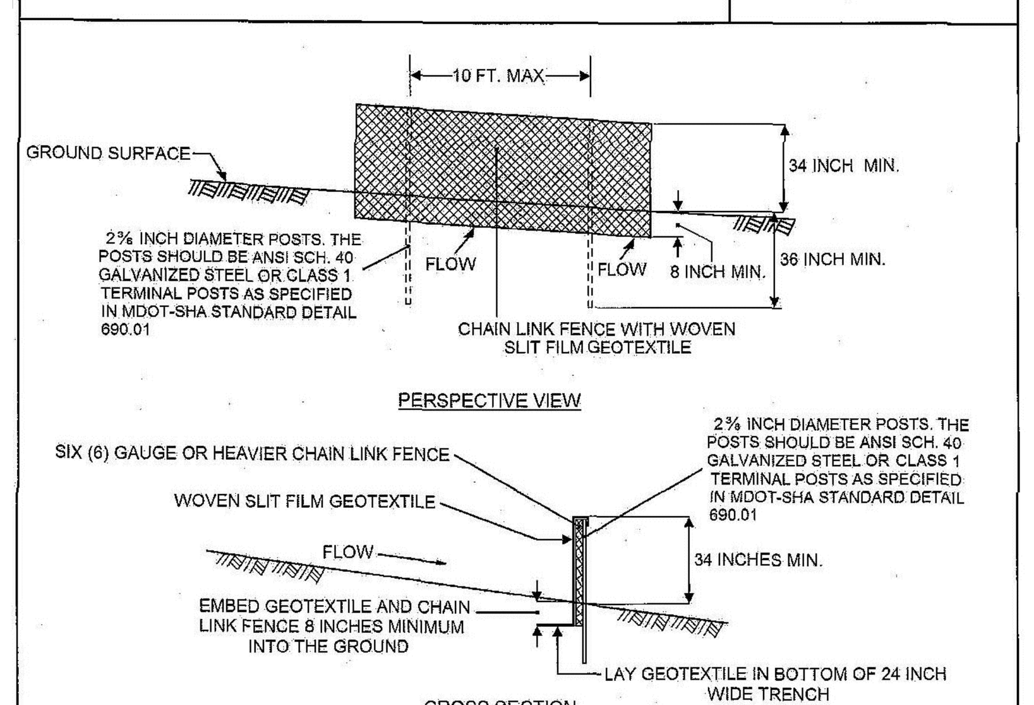
1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET x 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE SCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

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

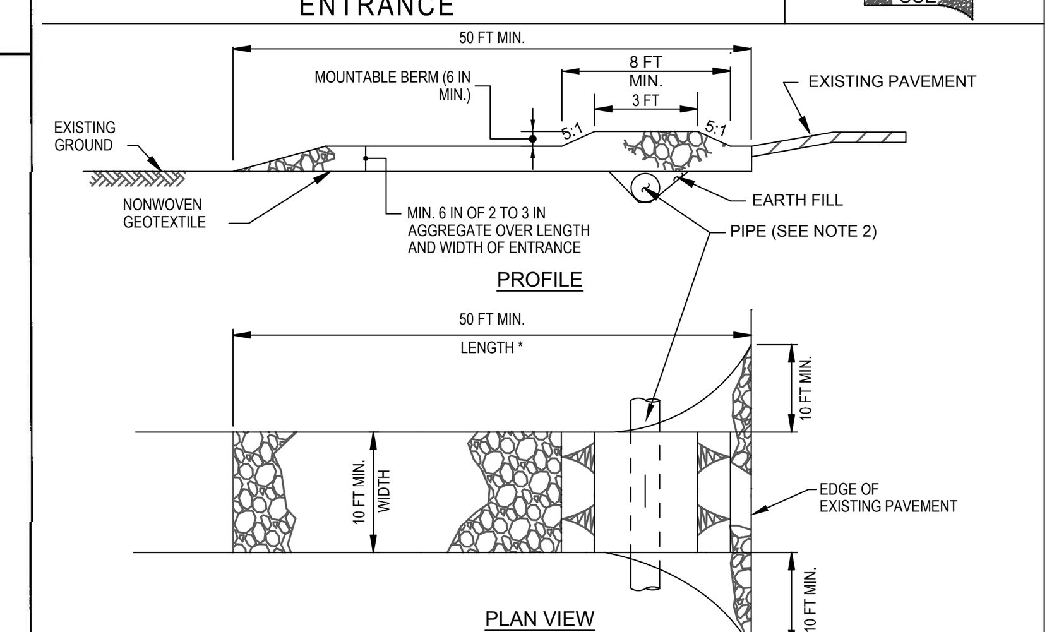
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 6 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY 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 THE 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. LAY THE GEOTEXTILE IN THE BOTTOM OF THE 24 INCH WIDE TRENCH.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BYPASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE UPHILL A MINIMUM OF 3 VERTICAL FEET TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURERS CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE 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 THE 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
MODIFIED FOR USE IN BALTIMORE COUNTY

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | MODIFIED - 2012 | MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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

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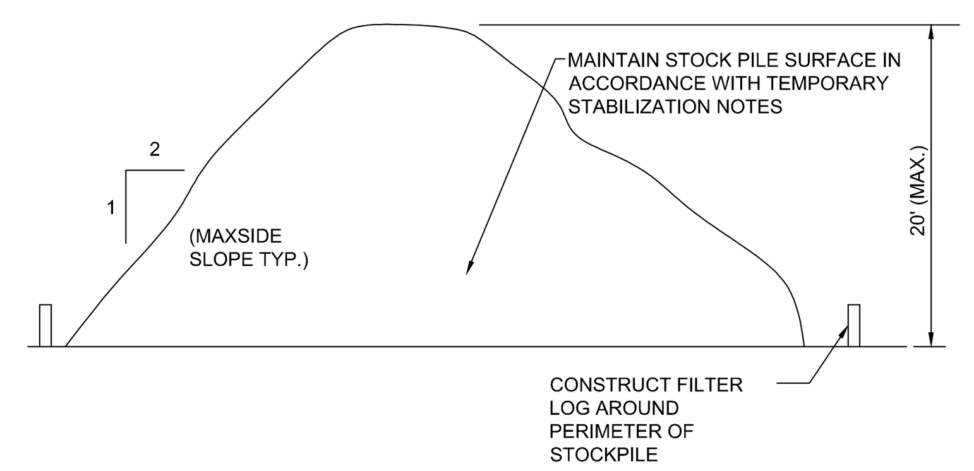


TEMPORARY STOCKPILE DETAIL

NOT TO SCALE

H-1 STANDARDS AND SPECIFICATIONS FOR MATERIALS

Table H.1: Geotextile Fabrics

PROPERTY	TEST METHOD	WOVEN SLIT FILM GEOTEXTILE MD	WOVEN SLIT FILM GEOTEXTILE CD	WOVEN MONOFILAMENT GEOTEXTILE MD	WOVEN MONOFILAMENT GEOTEXTILE CD	NONWOVEN GEOTEXTILE MD	NONWOVEN GEOTEXTILE CD
		MINIMUM AVERAGE ROLL VALUE[1]					
Grab Tensile Strength	ASTM D-4632	200 lb	200 lb	370 lb	250 lb	200 lb	200 lb
Grab Tensile Elongation	ASTM D-4632	15%	10%	15%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D-4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D-6241	450 lb		900 lb		450 lb	
Apparent Opening Size[2]	ASTM D-4751	U.S. Sieve 30 (0.59 mm)		U.S. Sieve 70 (0.21 mm)		U.S. Sieve 70 (0.21 mm)	
Permittivity	ASTM D-4491	0.05 sec^{-1}		0.28 sec^{-1}		1.1 sec^{-1}	
Ultraviolet Resistance Retained at 500 hours	ASTM D-4355	70% strength		70% strength		70% strength	

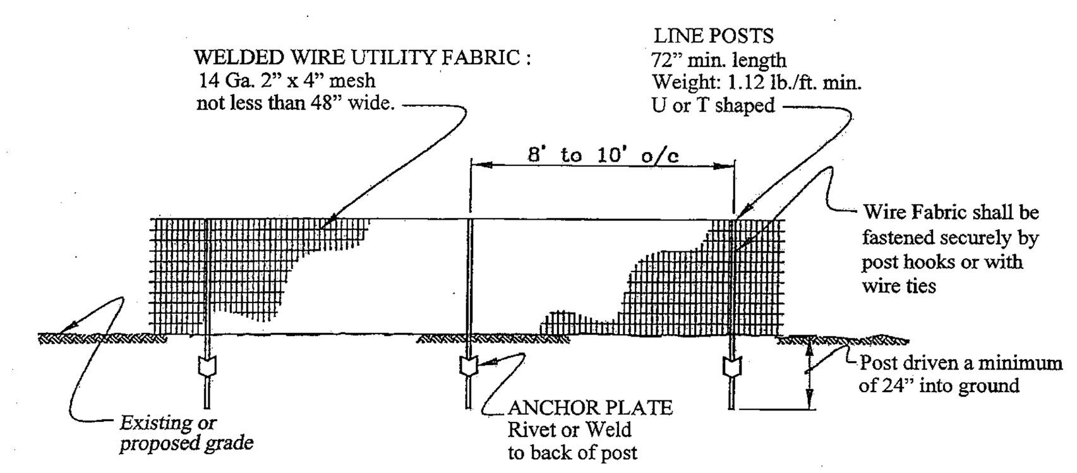
[1] All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.

[2] Values for AOS represent the average maximum opening.

Geotextiles must be evaluated by the National Transportation Product Evaluation Program (NTPEP) and conform to the values in Table H.1.

The geotextile must be inert to commonly encountered chemicals and hydrocarbons and must be rot and mildew resistant. The geotextile must be manufactured from fibers consisting of long chain synthetic polymers and composed of a minimum of 95 percent by weight of polyolefins or polyesters, and formed into a stable network so the filaments or yarns retain their dimensional stability relative to each other, including selvages.

When more than one section of geotextile is necessary, overlap the sections by at least one foot. The geotextile must be pulled taut over the applied surface. Equipment must not run over exposed fabric. When placing riprap on geotextile, do not exceed a one foot drop height.



TEMPORARY SAFETY FENCE FOR SEDIMENT TRAPPING DEVICES

NOT TO SCALE

Baltimore County
Department of Environmental Protection and Resource Management

SEQUENCE OF CONSTRUCTION PHASE 1:

1. NOTIFY BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS, AND INSPECTIONS, SEDIMENT CONTROL (410-887-3226) AT LEAST 48 HOURS PRIOR TO BEGINNING WORK ON SITE. HIGH VISIBILITY ORANGE SAFETY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE (LOD) WHEREVER THE LOD IS WITHIN 50 FEET OF ANY FOREST BUFFER OR FOREST CONSERVATION EASEMENT. THIS FENCE SHALL BE INSPECTED BY DEPS AT THE PRECONSTRUCTION MEETING.
2. STAKE OVERALL LIMIT OF DISTURBANCE PER THE APPROVED EROSION AND SEDIMENT CONTROL PLANS. INSTALL SAFETY FENCE AS NECESSARY.
3. CLEAR, GRUB AND REMOVE ANY NECESSARY EXISTING FEATURES INTERFERING WITH PERIMETER SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES ONLY. INSTALL STABILIZED CONSTRUCTION ENTRANCES WITH MOUNTABLE BERMS, SUPER SILT FENCE AND REMOVABLE PUMPING STATION. SUPER SILT FENCE SHALL BE INSPECTED & MAINTAINED EACH DAY AND AFTER EACH STORM EVENT. MAINTENANCE SHALL INCLUDE BUT NO BE LIMITED TO REMOVAL OF ALL ACCUMULATED SEDIMENT. GEOTEXTILE FABRIC SHALL BE REPLACED AS NEEDED TO ENSURE PROPER FUNCTION. (WEEKS 1-2)
4. WITH THE APPROVAL OF BALTIMORE COUNTY DEPARTMENT OF PERMITS, APPROVALS, AND INSPECTIONS, SEDIMENT CONTROL AND THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINDER OF THE SITE. THE EXISTING DETENTION PONDS SHALL BE DEWATERED THROUGH AN APPROVED SEDIMENT CONTROL MEASURE OR THROUGH THE EXISTING WASTE WATER TREATMENT PLANT. REMOVE REMAINDER OF PAVING, CURB, STRUCTURE SLABS, NECESSARY UTILITIES, ETC. AS SHOWN ON THE PLANS. ALL OPEN PIPE ENDS TO BE BLOCKED DAILY TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM. ALL AREAS OUTSIDE THE PERIMETER CONTROL MEASURES SHALL BE COMPLETED PER THE "WORK OUTSIDE PERIMETER CONTROLS NOTES" AND "UTILITY NOTES". DISPOSAL MATERIAL WILL EITHER NEED TO BE TAKEN TO A RUBBLE LANDFILL WITH AN ACTIVE GRADING PERMIT AND APPROVED SEDIMENT CONTROL PLAN, OR AN EXISTING ASPHALT RECYCLING FACILITY SUBJECT TO THE SAME. (WEEKS 3-6)

SEQUENCE OF CONSTRUCTION PHASE 2:

1. BEGIN GRADING THE SITE. BEGIN INSTALLATION OF ANY UNDERGROUND UTILITIES. STORMWATER MANAGEMENT POND (INCLUDING IMPERVIOUS LINER, IMPERVIOUS CORE, CUTOFF TRENCH, DEWATERING PIPES, AND OUTLET STRUCTURE) TO BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED STORMWATER MANAGEMENT PLANS. (WEEKS 7-23)
2. COMPLETE FINE GRADING OF SITE. SITE SHALL BE BROUGHT TO GRADE AS SOON AS POSSIBLE AND STABILIZED WITH EITHER STONE SUBBASE OR PERMANENT SEED AND MULCH. AREAS WITH SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH PERMANENT SEED AND SOIL STABILIZATION MATTING. (WEEKS 24-30)
3. INSTALL ANY STONE SUBBASE AND BEGIN PAVING (WEEKS 31-32)
4. UPON STABILIZATION OF THE SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE THOSE AREAS DISTURBED BY THIS PROCESS. (WEEKS 33-34)

E&S 8 OF 8

MDE PROJECT #: xx-SF-xxxx

REVIEWED AND APPROVED FOR SEDIMENT CONTROL UNDER SECTION 4-105

BY ______ DATE ______

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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NOT APPROVED FOR CONSTRUCTION

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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	ODET - 0

PROJECT:
WASTEWATER TREATMENT PLANT REPLACEMENT PLAN
FOR
TRADEPOINT ATLANTIC

SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

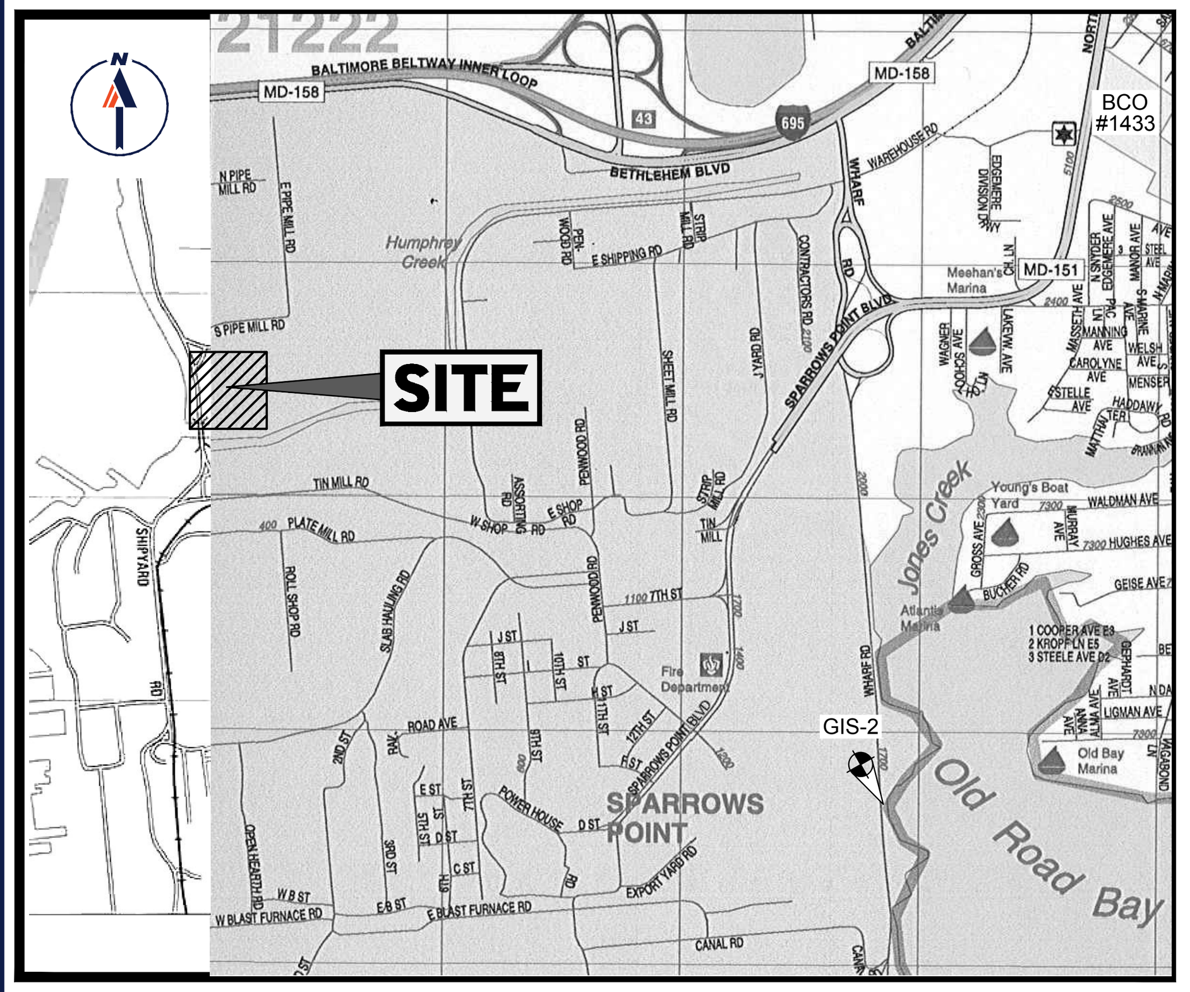
BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

SHEET NUMBER:
C-607

REVISION 2 - 04/05/2022



LOCATION MAP

COPYRIGHT ADC THE MAP PEOPLE
PERMIT USE NO. 20602153-5
SCALE: 1"=2000'

STORMWATER MANAGEMENT SUMMARY

LIMIT OF DISTURBANCE: 942,461.24 SF OR 21.64 AC
EX. IMPERVIOUS AREA: 37,248.18 SF OR 0.86 AC
PROP. IMPERVIOUS AREA:50,306.76 SF OR 1.15 AC
REQUIRED WQv VOLUME (Pe = 1.00") = 5,556,097 CF +/-
PROVIDED WQv VOLUME = 5,486,195 CF

WATERSHED: BALTIMORE HARBOR

BENCHMARK INFORMATION

ELEVATIONS ARE BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER THE FOLLOWING MONUMENTS:

BCO# 1433 (CAPPED REBAR)
N 571,683.79, E 1,466,230.69, ELEV. 16.59
IN MEDIAN OF NORTH POINT BLVD SOUTH OF NORTH SNYDER AVE.

GIS #2 (BRASS DISK)
N 565,182.39, E. 1,464,480.72, ELEV. 9.95
EAST SIDE OF WHARF ROAD 420'± NORTH OF LIGHT TOWER

LEGEND

EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
	ONSITE PROPERTY LINE / R.O.W. LINE	
120 / 121	CONTOUR LINE	120 / 121
TC 516.4 OR 516.4	SPOT ELEVATIONS	TC 516.00 / TC 516.00 BC 515.55
SL	SANITARY SEWER LINE	SL / S
W / I	UNDERGROUND WATER LINE	W / I
E	UNDERGROUND ELECTRIC LINE	E
G	UNDERGROUND GAS LINE	G
OH	OVERHEAD WIRE	OH
T	UNDERGROUND TELEPHONE LINE	T
	STORM SEWER	
	LIMIT OF DISTURBANCE	LOD LOD
	CONCRETE CURB & GUTTER	CURB AND GUTTER / SPILL CURB
	BORING LOCATIONS	#

NARRATIVE

INTRODUCTION:
TRADEPOINT DEVELOPMENT IS PROPOSING A REGIONAL STORMWATER MANAGEMENT FACILITY ADJACENT TO THE HUMPHREY'S CREEK WASTEWATER TREATMENT PLANT IN ORDER TO PROVIDE STORMWATER MANAGEMENT FOR THE OVERALL TRADEPOINT ATLANTIC PROPERTY. THE TOTAL PARCEL AREA IS 3,035.49 ACRES, WITH THIS PROJECT'S LIMIT OF DISTURBANCE BEING 18.44 ACRES ENTIRELY ZONED MH-IM (MANUFACTURING - HEAVY - INDUSTRIAL - MAJOR). THE SITE IS LOCATED WITHIN THE BALTIMORE HARBOR WATERSHED AND DISCHARGES DIRECTLY INTO THE BEAR CREEK TIDAL WATERS.

EXISTING CONDITIONS:
CURRENTLY, 1,258.96 ACRES OF RUNOFF DRAIN TO THE EXISTING TIN MALL CANAL TO BE TREATED AT THE HUMPHREY'S CREEK WASTEWATER TREATMENT PLANT. 960.10 ACRES OF THE TOTAL AREA CONSIST OF ON-SITE TRADEPOINT ATLANTIC PROPERTY, AND THE REMAINING 298.86 ACRES ARE OFF-SITE DRAINAGE AREAS EAST OF WHARF ROAD. THE EXISTING HUMPHREY'S CREEK WASTEWATER TREATMENT PLANT DISCHARGES DIRECTLY INTO BEAR CREEK, A TIDAL TRIBUTARY OF THE PATAPSCO RIVER, VIA SIX (6) PUMPS THAT PUMP AT A RATE OF 25,000 GPM EACH. THE AREA WHERE THE PROPOSED REGIONAL STORMWATER MANAGEMENT FACILITY WILL BE CONSTRUCTED CURRENTLY CONSISTS OF A SMALLER EXCAVATED POND, AND EXISTING GRASS AND PAVED AREAS LEFTOVER FROM THE FORMER BETHLEHEM STEEL MILL.

PROPOSED CONDITIONS:
A REGIONAL STORMWATER MANAGEMENT FACILITY IS PROPOSED IMMEDIATELY ADJACENT TO THE EXISTING HUMPHREY'S CREEK WASTEWATER TREATMENT PLANT. THIS FACILITY WILL BE A WET POND (APPROVED MDE STORMWATER PRACTICE P-2) AND IS DESIGNED TO MEET CURRENT BALTIMORE COUNTY AND MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) REGULATIONS. SINCE THE DRAINAGE AREA DISCHARGES INTO TIDALS WATERS, THE ENTIRE DEVELOPMENT IS SUBJECT TO PROVIDING TREATMENT OF THE REQUIRED IMPERVIOUS AREA FOR AN ESTABLISHED PE OF 1.0 INCHES. IN ORDER TO ACHIEVE THIS, TWO (2) OF THE EXISTING SIX (6) PUMPS WILL DIVERT THE RUNOFF FROM A 24-HOUR 1.0" STORM INTO THE PROPOSED REGIONAL STORMWATER MANAGEMENT FACILITY, WHICH WILL THEN DISCHARGE VIA A 60" PRINCIPAL SPILLWAY DIRECTLY INTO BEAR CREEK NEAR THE EXISTING APPROVED MDE OUTFALL LOCATION FOR THE EXISTING TREATMENT PLANT. DURING LARGER STORM EVENTS, ALL SIX (6) PUMPS WILL BE RUNNING TO CONTINUE SAFELY DISCHARGING THE RUNOFF INTO BEAR CREEK AS THEY HAVE BEEN DOING FOR YEARS.

THE WATER QUALITY VOLUME FOR THE PROPOSED WET POND WILL BE 5,486,195 CF. THIS VOLUME WILL PROVIDE TREATMENT FOR APPROXIMATELY 1,533.36 ACRES OF IMPERVIOUS AREA. THE TREATMENT OF THE IMPERVIOUS AREA WITHIN THE DRAINAGE AREA OF THE FACILITY WILL BE USED TO ESTABLISH A CREDIT BANK TO PROVIDE FOR THE TREATMENT OF CURRENT AND FUTURE DEVELOPMENTS THAT MAY OR MAY NOT ULTIMATELY DRAIN DIRECTLY TO THE FACILITY. IN ADDITION, ANY OUTSTANDING TREATMENT REQUIREMENTS FOR PREVIOUSLY APPROVED DEVELOPMENT PROJECTS WILL BE DEDUCTED FROM THE STARTING VALUE OF THE BANK. PLEASE REFER TO THE APPROVED SWM VARIANCE FOR MORE DETAILED INFORMATION ON THE CALCULATION OF THE CREDIT BANK.

CONCLUSION:
IN CONCLUSION, THE PROPOSED REGIONAL STORMWATER MANAGEMENT FACILITY WILL PROVIDE 5,486,195 CF OF WQV, OR THE EQUIVALENT OF 1,533.36 ACRES OF IMPERVIOUS AREA BASED ON A REQUIREMENT OF PE = 1.0". THIS WQV VOLUME WILL BE USED TO CREATE A CREDIT BANK TO BE USED FOR TREATMENT OF CURRENT AND FUTURE PROJECTS ON THE TRADEPOINT ATLANTIC PROPERTY.

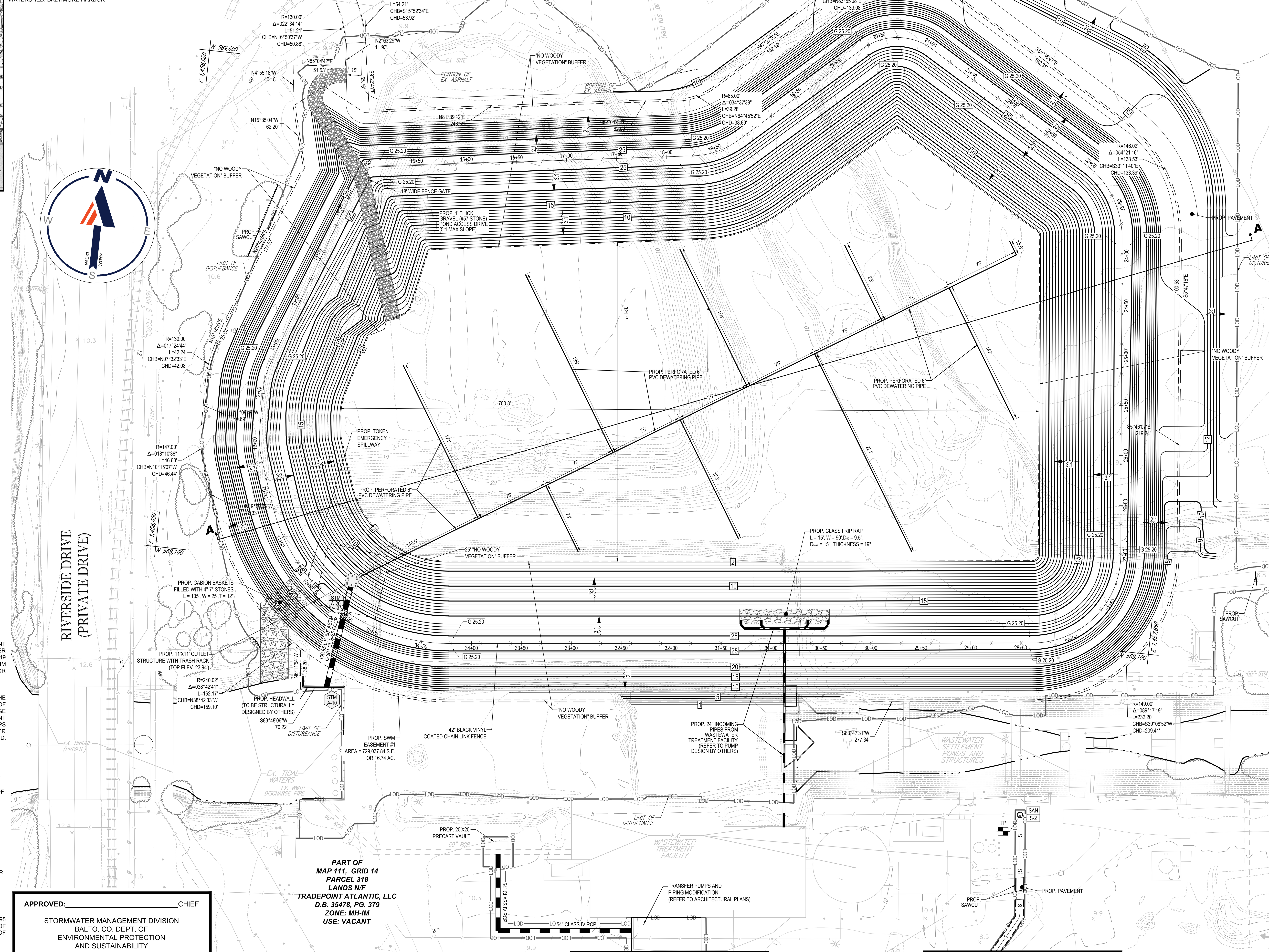
FACILITY	PRACTICE	PRACTICE AREA	IMPERVIOUS AREA	PERVIOUS AREA	TOTAL DRAINAGE AREA	TREATMENT VOLUME	OWNERSHIP
A	WET POND	364,928 SF	1,121.86 ACRES	39.96 ACRES	1,258.96 ACRES	5,486,195 CF	PRIVATE

BLANKET ACCESS NOTE FOR SWM

OWNERS OF LOTS CONTAINING STORMWATER EASEMENTS OR DRAINAGE AND UTILITY EASEMENTS SHALL GRANT TO AUTHORIZED BALTIMORE COUNTY PERSONNEL A RIGHT OF ENTRY FOR THE PURPOSE OF INSPECTION AND/OR MONITORING SITE VISITS. SAID INSPECTION AND/OR MONITORING VISITS SHALL ONLY BE CONDUCTED DURING NORMAL BALTIMORE COUNTY WORKING HOURS (8 AM TO 4 PM MONDAY THROUGH FRIDAY).

SOILS INFORMATION

SYMBOL	NAME	SLOPE	STRUCTURAL LIMITATIONS	HYDROLOGIC GROUP	K VALUE > 0.35
UuB	URBAN LAND-UDORTHENTS	0% TO 8%	NOT RATED	D	N/A



APPROVED:_____________________CHIEF
STORMWATER MANAGEMENT DIVISION BALTO. CO. DEPT. OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

DEDICATION TABLE

THIS TABLE DEPICTS VARIOUS RIGHTS-OF-WAY THAT MAY NEED TO BE CONVEYED TO BALTIMORE COUNTY BY THE DEVELOPER/OWNER. CHOOSE THE RIGHT(S)-OF-WAY THAT APPLY TO YOUR PROJECT, AND THEN CREATE THE TABLE ACCORDINGLY.

TYPE OF CONVEYANCE	NO.	TOTAL AREA**
STORMWATER EASEMENT	1	729,037 S.F.

**NOTE: DURING THE PROCESSING OF DEVELOPMENT PLANS AND PRIOR TO FINAL DEVELOPMENT PLAN (FDP) SUBMITTAL, TOTAL AREAS SHOWN IN THIS TABLE MAY BE APPROXIMATE.

BALTIMORE COUNTY SOIL CONSERVATION DISTRICT
APPROVED FOR SMALL POND
DISTRICT OFFICIAL DATE PLAN NO.
TECHNICAL REVIEW FOR DISTRICT
BY:________ ________________ ______
BALTO. CO. DEPT. OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY DATE

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SWM 1 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

BALTIMORE COUNTY SOIL CONSERVATION DISTRICT
APPROVED FOR STORMWATER MANAGEMENT
DISTRICT OFFICIAL DATE PLAN NO.
TECHNICAL REVIEW FOR DISTRICT
BY:________ ________________ ______
BALTO. CO. DEPT. OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY DATE

50 25 12.5 0 50
1"= 50'

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

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SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
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2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	BMPS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
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Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

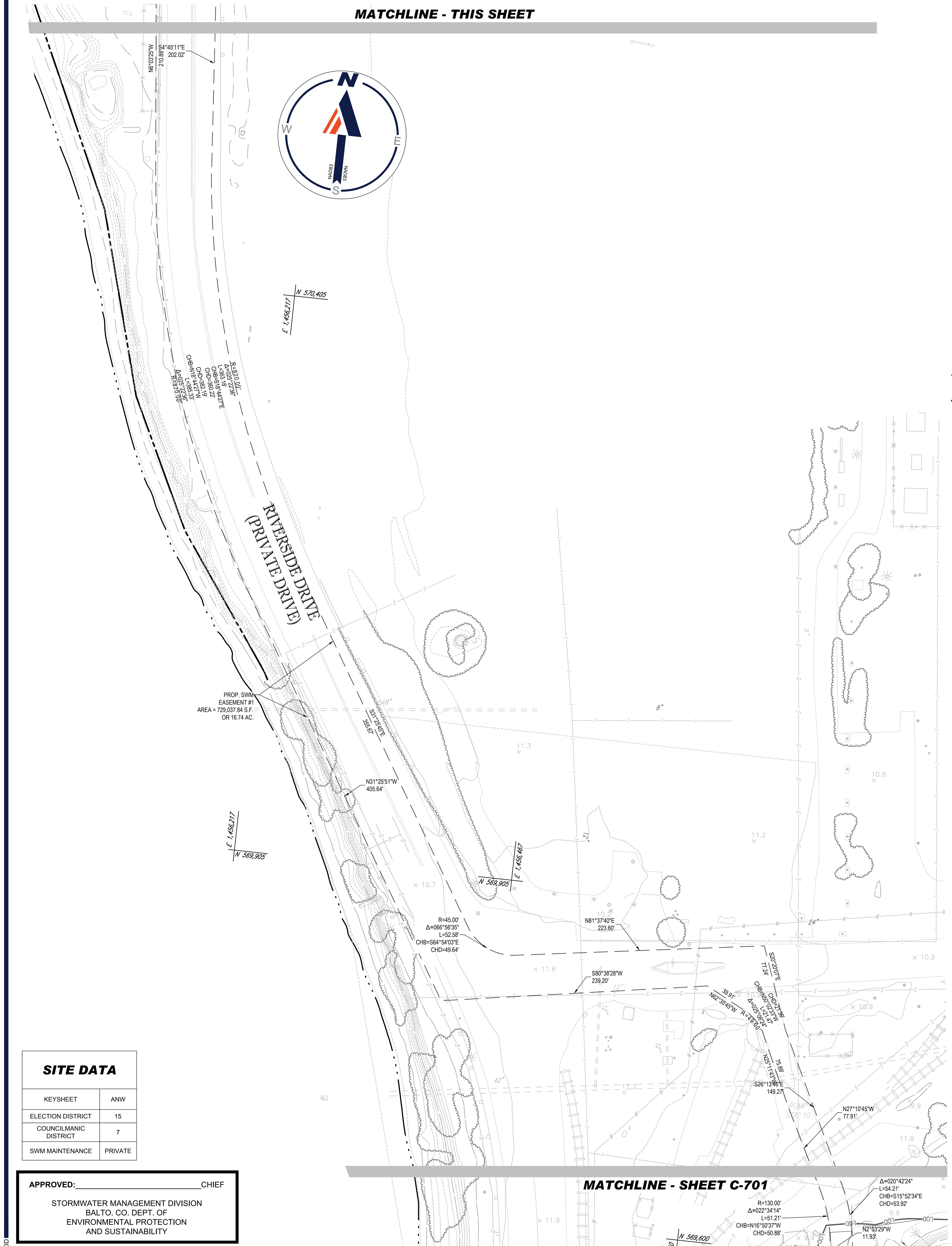
M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

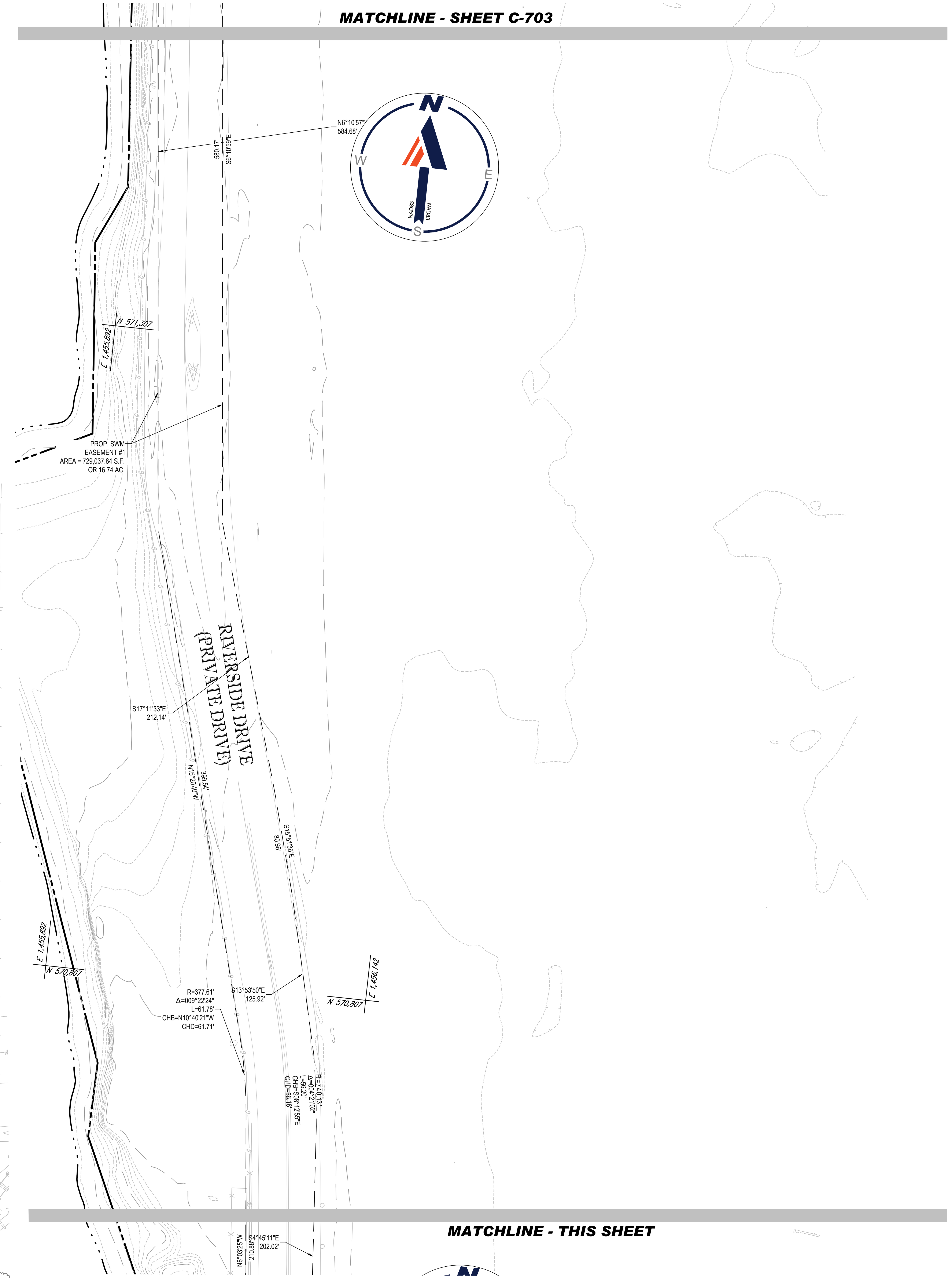
SHEET TITLE:

STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-701

REVISION 2 - 04/05/2022





SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

APPROVED:______________________________CHIEF

STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SWM 2 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

50 25 12.5 0 50
1"= 50'

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PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

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TM 111, GRID 14 PARCEL 318
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Fax: (410) 821-7987
MD@BohlerEng.com

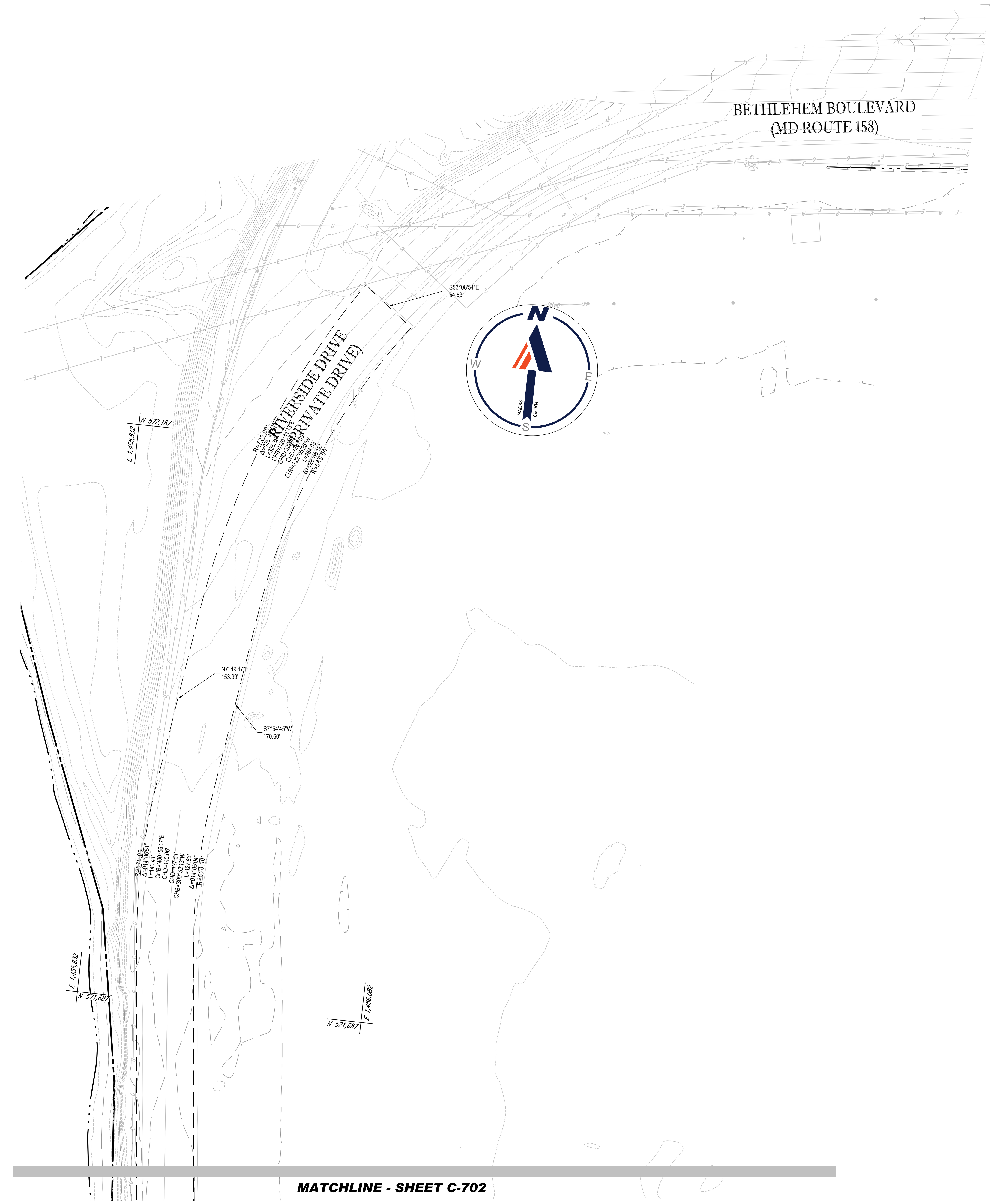
M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-702

REVISION 2 - 04/05/2022



SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

APPROVED:______________________CHIEF

STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

MATCHLINE - SHEET C-702

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SWM 3 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

50 25 12.5 0 50
1"= 50'

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

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PROJECT:

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MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

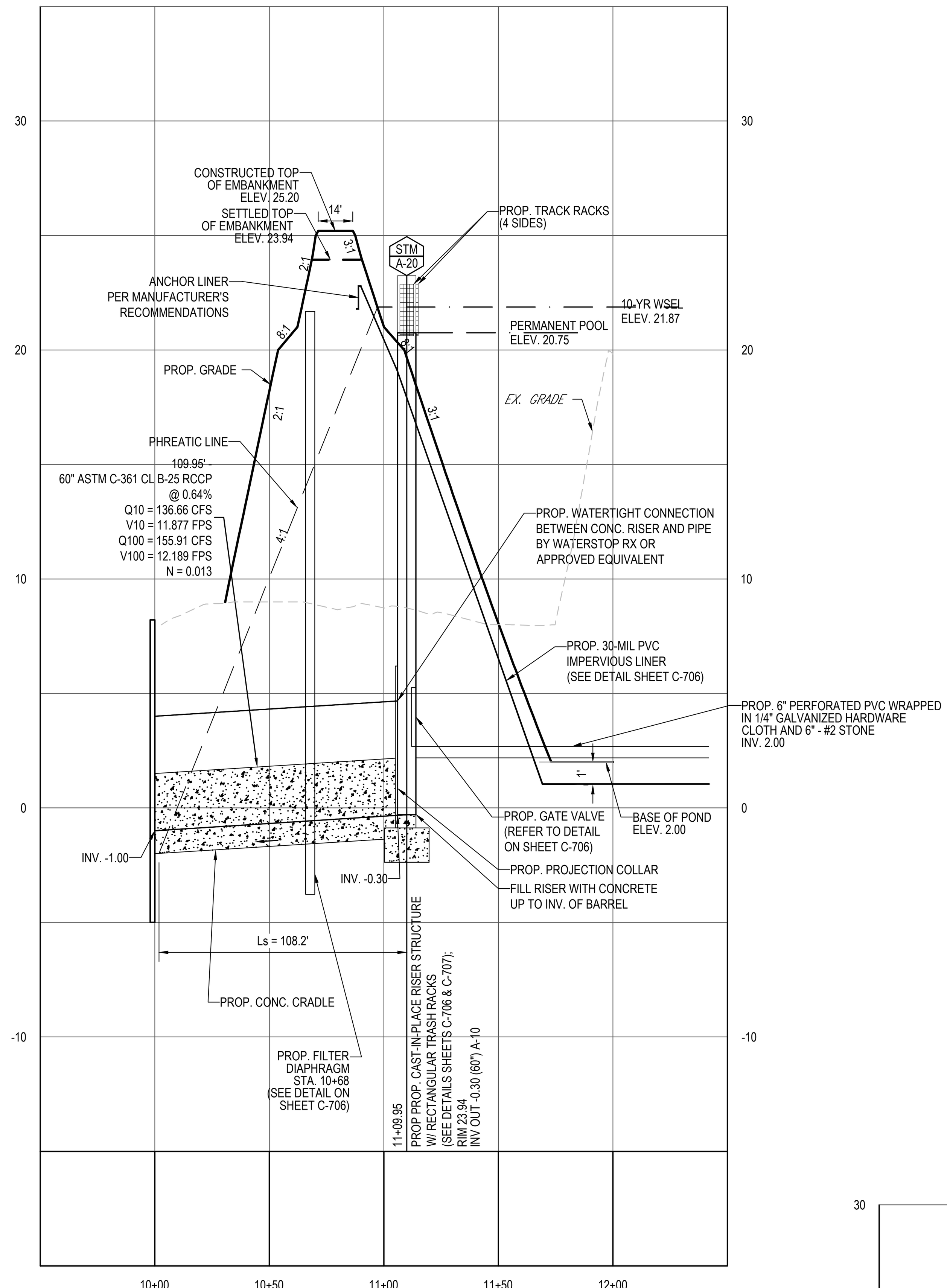
SHEET TITLE:

STORMWATER MANAGEMENT PLAN

SHEET NUMBER:

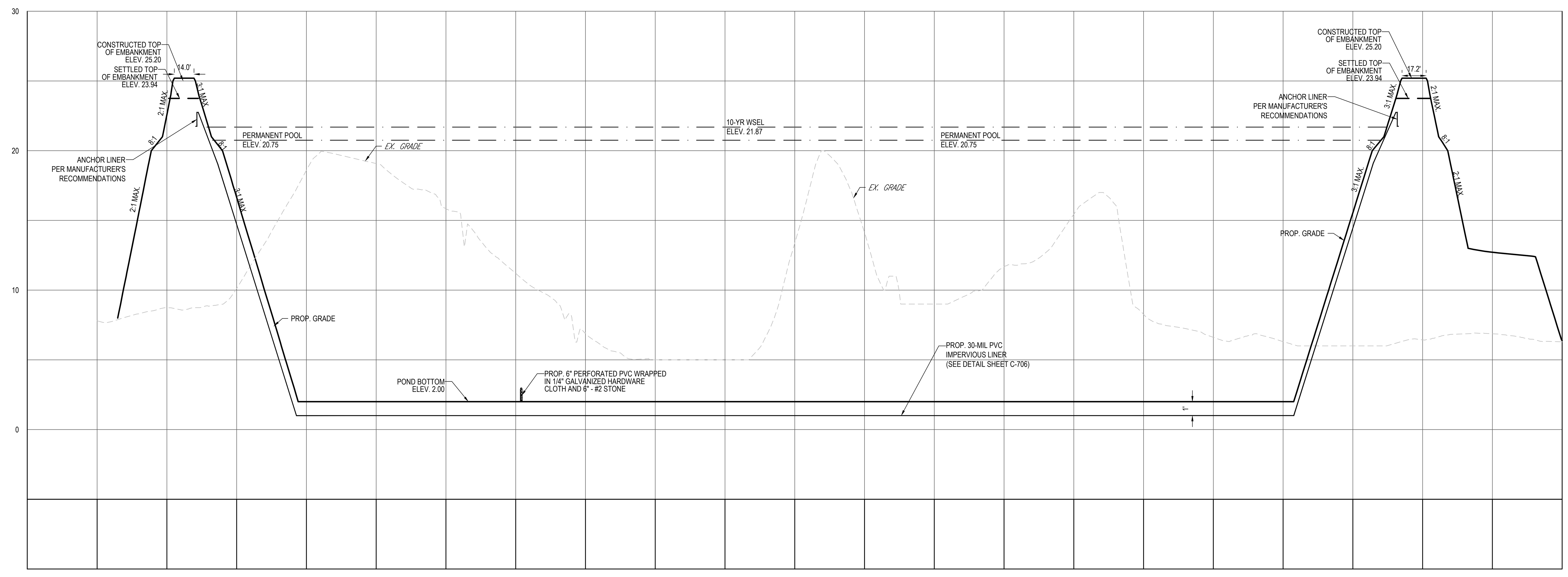
C-703

REVISION 2 - 04/05/2022



PRINCIPAL SPILLWAY PROFILE - WWTP POND

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



PROPOSED POND SECTION A-A

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

WET POND FACILITY

PHASE	DATE	INITIALS	REMARKS - DESCRIPTION OF ACTION TAKEN
1. EXCAVATION A. SIZE AND LOCATION B. SIDE SLOPE STABILITY C. SOIL PERMEABILITY D. GROUNDWATER/BEDROCK E. SETBACKS PER DESIGN MANUAL			
2. AGGREGATE MATERIAL A. TYPE (SLAG. # CRUSHED, GRAVEL) B. SIZE C. PLACEMENT			
3. SURFACE LAYER A. AGGREGATE SURFACE B. VEGETATIVE SURFACE C. PAVED SURFACE			
4. RISER STRUCTURE A. INVERTS AND ELEVATIONS B. RECEIVES DESIGNED DRAINAGE AREA			
5. FINAL GRADING & PERMANENT STABILIZATION A. FINAL GRADES, PLANTINGS, AND MULCH			

I HEREBY CERTIFY THAT I PERSONALLY REVIEWED OR A PERSON UNDER MY DIRECT SUPERVISION PROVIDED THE INFORMATION REPORTED ON THIS CHECKLIST AND TO THE BEST OF MY KNOWLEDGE DO HEREBY INSURE THAT THE SUBMITTAL IS COMPLETE AND ACCURATE.

PROFESSIONAL ENGINEER SIGNATURE AND DATE

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED STORMWATER PONDS

ROUTINE MAINTENANCE

1. OWNER SHALL INSPECT THE FACILITY ANNUALLY AND AFTER EVERY HEAVY STORM. INSPECTIONS SHALL BE PREFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. THE OWNER SHALL MOW THE TOP AND SIDE SLOPES OF THE EMBANKMENT A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED. PLANTED AREAS SHALL BE ALLOWED TO GROW TO THEIR DESIGNED SIZE, AND SHALL BE WEEDED AS NEEDED. CONSULT LANDSCAPE ARCHITECT FOR DETAILS.
3. THE OWNER SHALL REMOVE ANY DEBRIS AND LITTER FROM THE FACILITY.
4. THE OWNER SHALL REPAIR ANY EROSION IN THE POND AS WELL AS THE RIP-RAP OR GABION OUTLET AREA AS SOON AS IT IS NOTICED.
5. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE EMBANKMENT, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
6. THE OWNER SHALL REMOVE SEDIMENT FROM THE POND, AND FOREBAY, NO LATER THAN WHEN THE CAPACITY OF THE POND, OR FOREBAY, IS HALF FULL OF SEDIMENT, OR WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS.

BALTIMORE COUNTY STORMWATER MANAGEMENT NOTES

1. VOLUME SEPARATED FOR QUALITY STORAGE: 5,486,195 C.F.
2. TYPE OF WATER QUALITY FEATURED USED: WET POND
3. MD-378 POND: YES
4. WATERSHED NAME: BALTIMORE HARBOR
5. STRUCTURE TYPE: 11'X11' CAST-IN-PLACE CONCRETE OUTLET STRUCTURE WITH TRASH RACK
6. STORAGE HEIGHT: 20.75 FEET
7. DRAINAGE AREA TO FACILITY: 58,840,298 S.F. OR 1,258.96 AC. (TOTAL)
8. LEVEL OF MANAGEMENT PROPOSED: WATER QUALITY
9. STORMWATER MANAGEMENT APPROVED UNDER BILL NO. 25-10
10. MAINTENANCE RESPONSIBILITY: PRIVATE
11. STRUCTURE CLASSIFICATION: A
12. RCN TO FACILITY: 92
13. HEIGHT TO EMERGENCY SPILLWAY CREST: 22.00'
14. MAXIMUM HEIGHT OF FILL: N/A
15. PERMANENT POOL, WATER SURFACE AREA: 307,938 S.F. OR 7.07 AC.
16. PRINCIPAL SPILLWAY CAPACITY AT DESIGN STORM: 74.81 CFS
17. EMERGENCY SPILLWAY CAPACITY AT DESIGN STORM: N/A
18. FREEBOARD REQUIRED: 2.0
19. FREEBOARD PROVIDED: 2.06 FEET
20. DESIGN STORM: 10 YR. AND 100 YR.
21. ALLOWABLE RELEASE RATE: N/A
22. FACILITY INFLOW: 10 YR.: 176.65 CFS 100 YR.: 224.44 CFS
23. FACILITY DISCHARGE: 10 YR.: 136.66 CFS 100 YR.: 155.91 CFS
24. WATER SURFACE ELEVATION: 10 YR.: 21.87 100 YR.: 21.98 CFS
25. STORAGE VOLUME: N/A
26. UNLESS OTHERWISE NOTED, ALL CONSTRUCTION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH:
    A. BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS FOR CONSTRUCTION MATERIALS, DECEMBER 2007, ERRATA AND ADDENDA
    B. NATURAL RESOURCES CONSERVATION SERVICE OF MARYLAND STANDARDS AND SPECIFICATIONS, POND CODE 378, JANUARY 2000.
    C. MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION, JULY 2008, STANDARD SPECIFICATIONS FOR CONSTRUCTION MATERIAL.

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SWM 4 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

APPROVED:______________________________CHIEF

STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

50 25 12.5 0 50
1"= 50'

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BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

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PROJECT No.: MD16206639
DRAWN BY: CPH
CHECKED BY: MJG
DATE: 3/5/2021
CAD I.D.: BMPS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

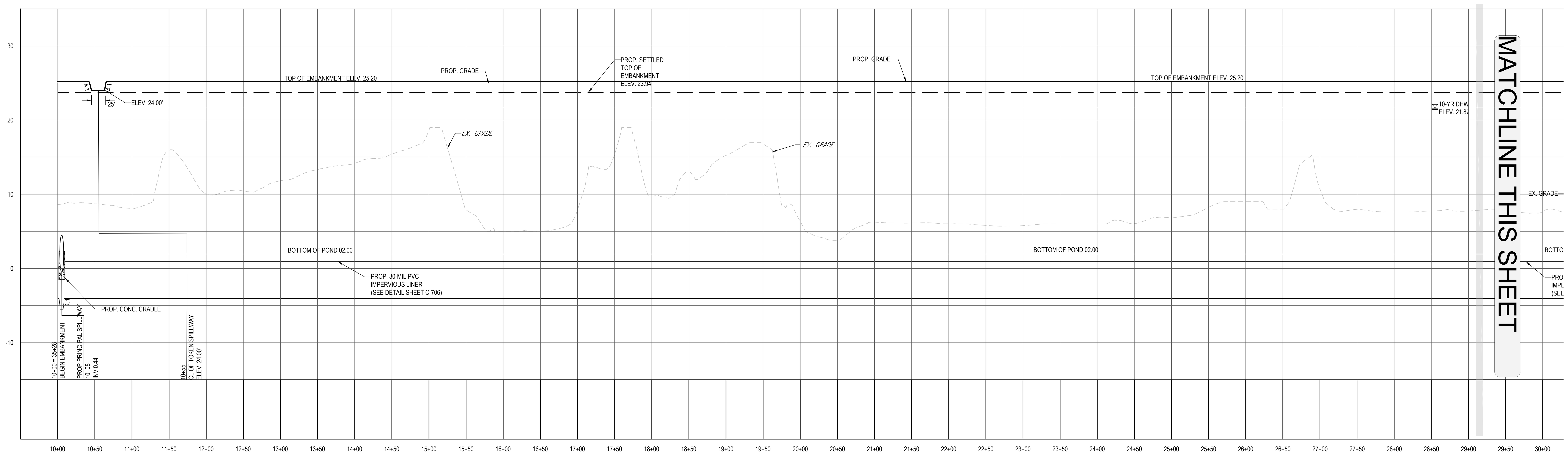
BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
Fax: (410) 821-7987
MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER

SHEET TITLE:
STORMWATER MANAGEMENT NOTES AND DETAILS

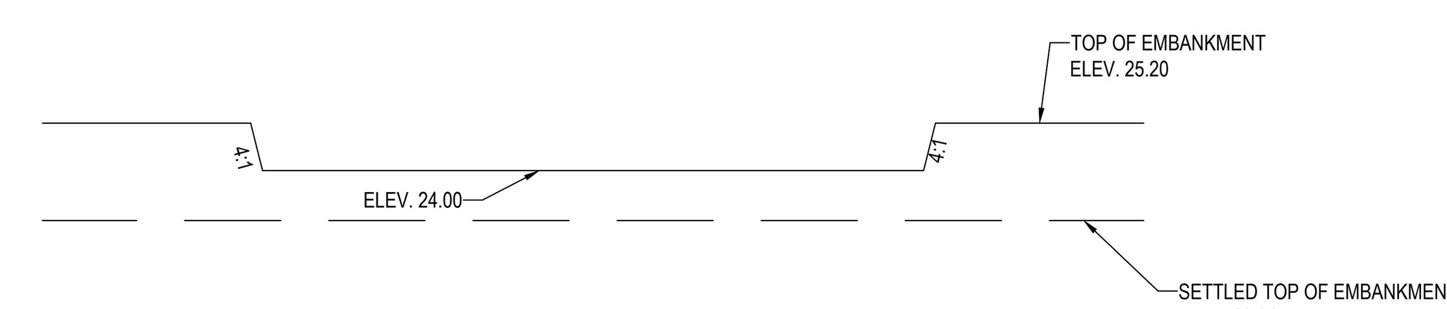
SHEET NUMBER:
C-704

REVISION 2 - 04/05/2022



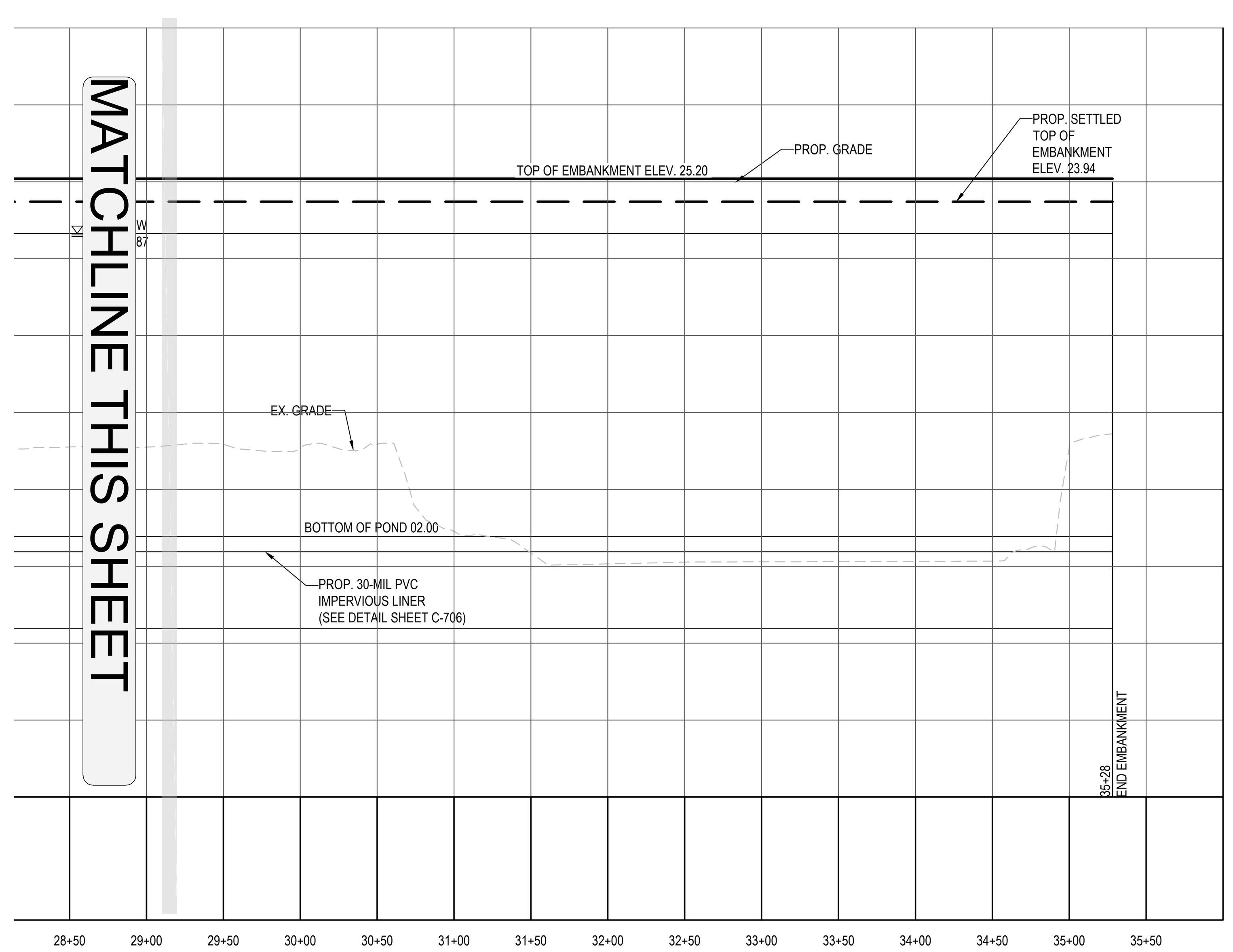
EMBANKMENT PROFILE - WWTP POND

SCALE: 1"= 80 ' HORIZONTAL
1"= 8 ' VERTICAL



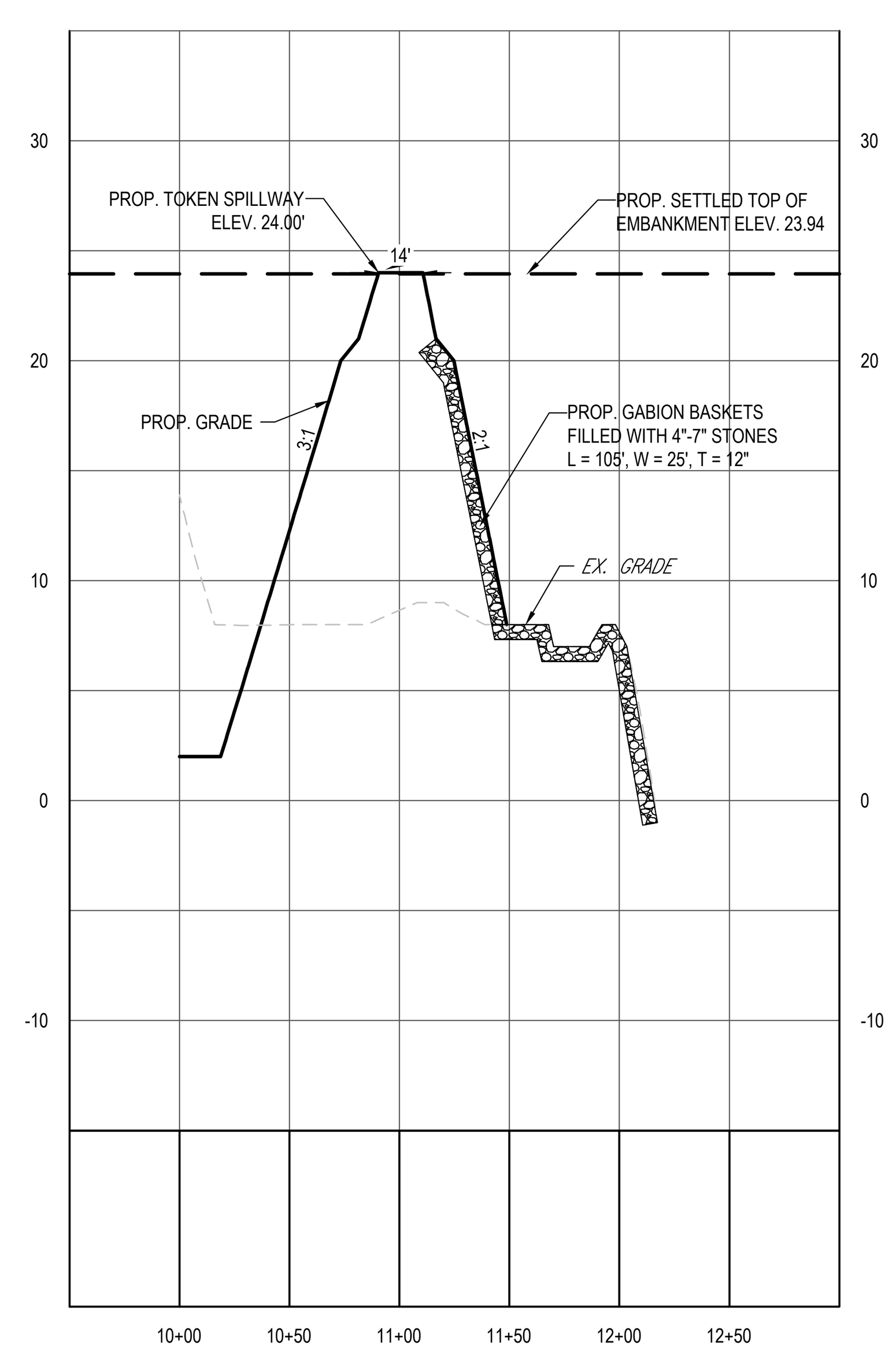
TOKEN EMERGENCY SPILLWAY SECTION

NOT TO SCALE



EMBANKMENT PROFILE - WWTP POND

SCALE: 1"= 80 ' HORIZONTAL
1"= 8 ' VERTICAL



PROP. EMERGENCY TOKEN SPILLWAY

SCALE: 1"= 80 ' HORIZONTAL
1"= 8 ' VERTICAL

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SWM 5 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

APPROVED:______________________CHIEF
STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

80 40 20 0 80
1"= 80'

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

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LAND SURVEYING
PROGRAM MANAGEMENT
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TRANSPORTATION SERVICES

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PROJECT No.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	BMPS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

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M.J. GESELL
PROFESSIONAL ENGINEER

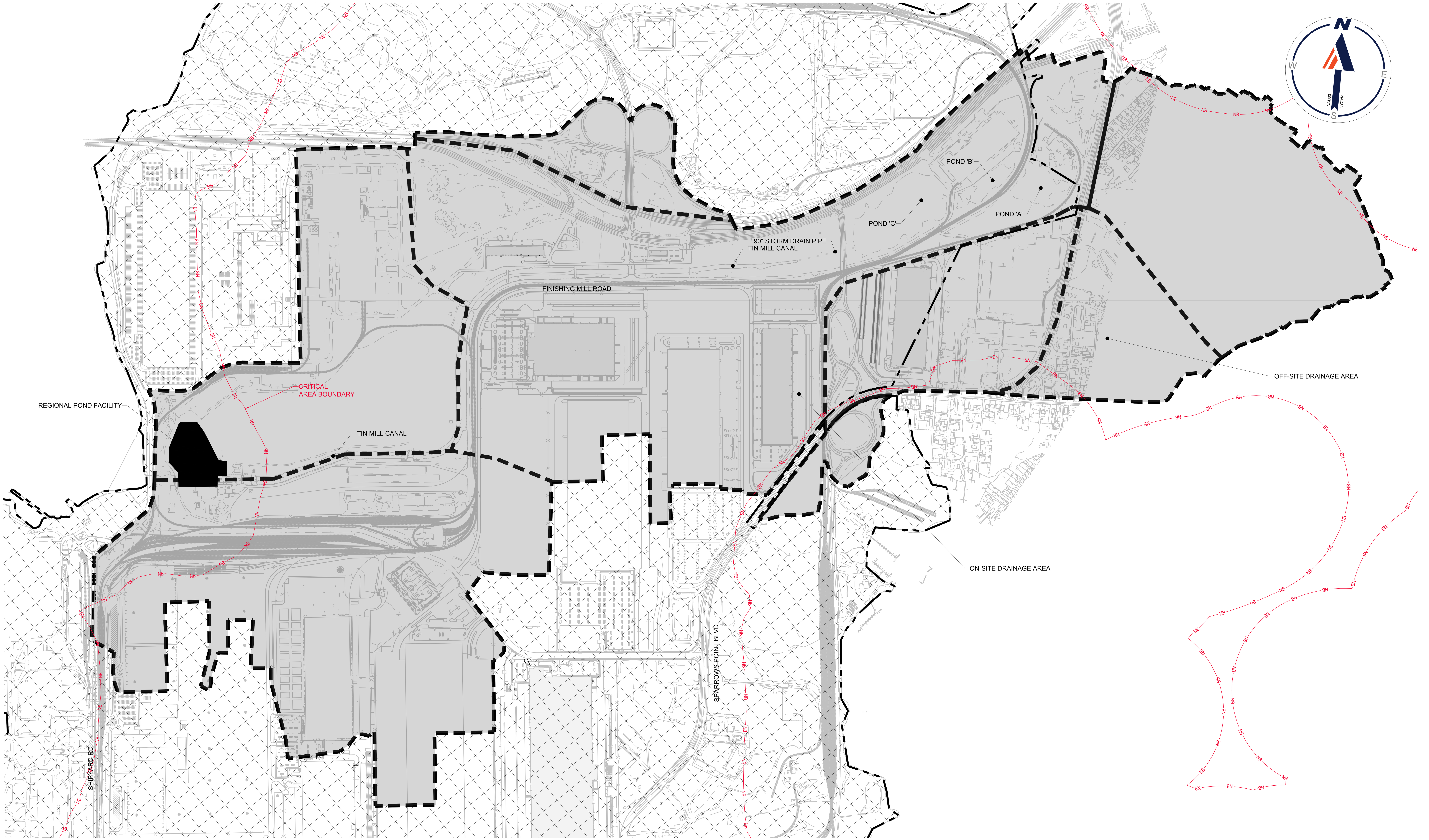
SHEET TITLE:

STORMWATER MANAGEMENT NOTES AND DETAILS

SHEET NUMBER:

C-705

REVISION 2 - 04/05/2022



DRAINAGE AREA

ONSITE IMPERVIOUS AREA = 823 ACRES
OFF SITE IMPERVIOUS AREA = 298.86 ACRES
PERVIOUS AREA = 137.10 ACRES
TOTAL AREA = 1,258.96 ACRES

TOTAL AREA WITHIN CRITICAL AREA BOUNDARY = 4,373,358 SF OR 100.4 ACRES
PROPOSED IMPERVIOUS AREA = 3,348,457 SF OR 76.87 ACRES
PROPOSED PERVIOUS AREA = 1,024,901 SF OR 23.53 ACRES

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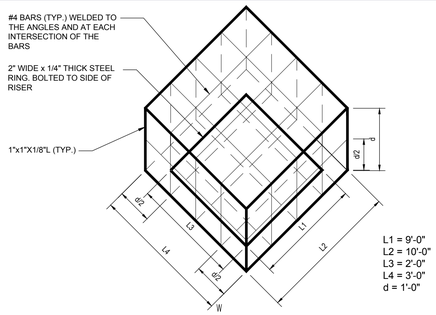
M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

TIN MILL CANAL DRAINAGE AREA

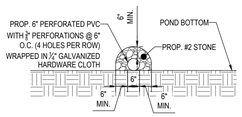
SHEET NUMBER:
C-706

REVISION 2 - 04/05/2022



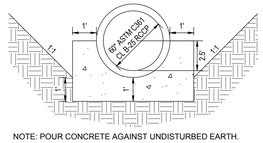
TRASH RACK DETAIL FOR STRUCTURE A-20

NOT TO SCALE



POND DRAWDOWN DETAIL

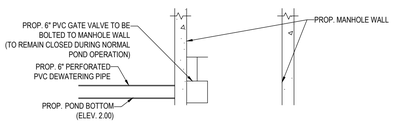
NOT TO SCALE



NOTE: POUR CONCRETE AGAINST UNDISTURBED EARTH. CONCRETE SHALL HAVE A MINIMUM f'c = 3,500 PSI (MSHA MIX NO. 3) @ 28 DAYS

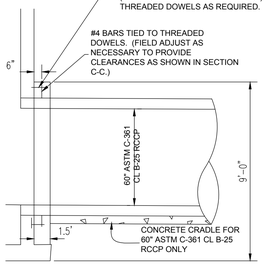
CONCRETE CRADLE DETAIL

NOT TO SCALE



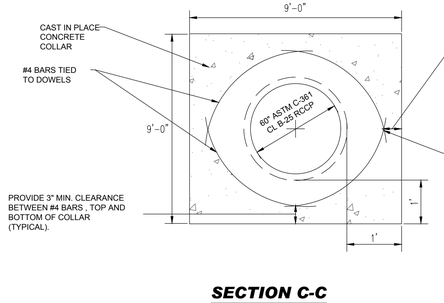
POND DEWATERING VALVE LOCATION DETAIL

NOT TO SCALE

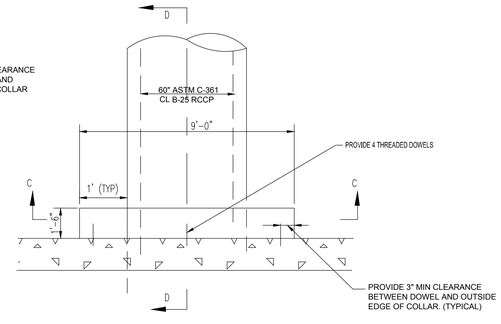


SECTION D-D

NOT TO SCALE



SECTION C-C

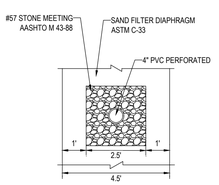


PLAN VIEW

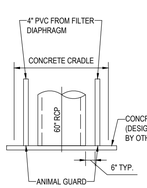
NOT TO SCALE

CAST-IN-PLACE CONCRETE COLLAR DETAIL

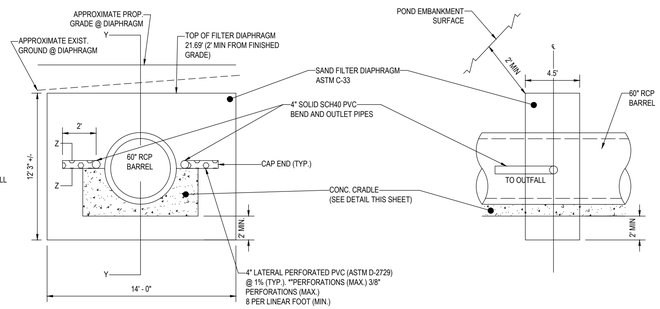
NOT TO SCALE



SECTION 'Z-Z' PVC LATERAL DETAIL



DIAPHRAGM OUTLET @ HEADWALL



SECTION 'D-D'

SECTION 'Y-Y'

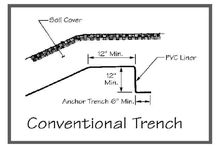
FILTER-DRAINAGE DIAPHRAGM NOTES:

THE FILTER-DRAINAGE DIAPHRAGM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS SECTION AND AS SHOWN ON THE PLANS. THE MATERIAL SHALL BE PLACED ON CONTINUOUS, APPROXIMATELY HORIZONTAL LAYERS NOT MORE THAN 12 INCHES IN LOOSE THICKNESS. THE WATER CONTENT OF THE DRAINAGE MATERIAL BEFORE AND DURING COMPACTION SHALL BE UNIFORM THROUGHOUT EACH LAYER OF THE MATERIAL. THE WATER CONTENT SHALL BE SUFFICIENT TO ATTAIN THE REQUIRED DENSITY OF THE MATERIAL IN PLACE WHEN COMPACTED. THE MATERIAL SHALL BE COMPACTED AS SPECIFIED IN "EARTH FILL". THE DIAPHRAGM SHALL BE THOROUGHLY FLOODED UPON COMPACTION AND THE OUTLET DRAINS OBSERVED FOR PROPER FUNCTION. CARE SHOULD BE TAKEN SO THAT THE DRAINAGE MATERIAL DOES NOT BECOME CONTAMINATED. CONTAMINATED DRAINAGE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL. DURING PERIODS OF SHUTDOWN AND AT ALL EQUIPMENT CROSSINGS, THE DRAINAGE MATERIAL SHOULD BE PROTECTED BY PROTECTIVE COVERING MATERIAL SUCH AS POLYETHYLENE SHEETING, PVC SHEETING OR EQUAL. AT EQUIPMENT CROSSINGS, THE SHEETING MATERIAL SHALL BE COVERED WITH A SUFFICIENT DEPTH OF EMBANKMENT MATERIAL TO PREVENT DAMAGE TO THE SHEETING BY THE EQUIPMENT, OR A MINIMUM OF 12 INCHES, WHICHEVER PROVIDES GREATER PROTECTION. PRIOR TO PLACING ADDITIONAL DRAINAGE MATERIAL AFTER SHUTDOWN AT EQUIPMENT CROSSINGS, THE CONTRACTOR SHALL REMOVE ANY TEMPORARY PROTECTIVE COVERINGS AND REPLACE ANY MATERIAL THAT MAY HAVE BECOME CONTAMINATED. 4 INCH PVC OUTLET DRAIN TO PROTECT A MINIMUM OF 4 INCHES FROM THE FACE OF ENDWALL. A REMOVABLE ANIMAL GUARD (AGRIDRAIN RATGUARD OR EQUAL) IS TO BE ATTACHED TO THE OUTLET END OF THE 4 INCH PVC DRAINS. AN ALTERNATIVE IS 1/4" X 1/4" HARDWARE CLOTH ATTACHED WITH STAINLESS STEEL HOSE CLAMP. A GEOTECHNICAL ENGINEER SHALL BE PRESENT DURING CONSTRUCTION.

FILTER DIAPHRAGM DETAILS

NOT TO SCALE

Anchor Trench Details



Typical Anchor Treach

The anchor trench will be excavated to the line, grade and width shown on the construction drawings, prior to liner placement. The OWNER or ENGINEER will verify that the anchor trench has been constructed according to construction drawings.

If the anchor trench is located in a subgrade susceptible to desiccation; no more than the amount of trench required for the geomembrane to be anchored in one day will be excavated to minimize desiccation of the anchor trench soils.

TYPICAL APPLICATIONS:

- Reservoirs
- Canals
- Sewage Lagoons
- Landfill Closures
- Soil Remediation
- Farm Ponds
- Water Features
- Irrigation Ponds
- Golf Course Ponds
- Heap Leach Pads
- Industrial Waste Ponds
- Tailing Ponds

30 mil PVC Geomembrane Specifications

PVC liners fabricated by EPI are a single-ply construction with Polyvinyl Chloride as the principle polymer. Only first quality virgin resins are used and all materials meet or exceed the requirements of ASTM D7176 Standard Specification for PVC geomembranes used in buried applications.

EPI utilizes statistical process control (SPC) to ensure the integrity of each panel produced. Samples from actual factory seams are removed during the welding process for a rigorous, proven testing procedure that assures you of the highest quality factory-fabricated PVC geomembranes available.

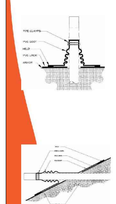
PVC Liners are fabricated by EPI in panels, accordion-folded in both directions, and packaged for shipment to your site for quick, easy installation to save you time and money.

Thickness ± 5%	ASTM D-5199	.030"
Specific Gravity (min)	ASTM D-792	1.20
Tensile (lb/in-width, min)	ASTM D-882	73
Elongation at Break (% min)	ASTM D-882	380
Modulus (lb/in-width, min)	ASTM D-882	30
Tear Resistance (lb/in, min)	ASTM D-1004	8
Resistance to Soil Burial (% change, max)	ASTM G-160	
1. Breaking Factor		5
2. Elongation At Break		20
3. Modulus at 100% Elongation		20
Impact Cold Crack (°C)	ASTM D-1790	-29
Dimensional Stability (% change, max)	ASTM D-1204 (212°F/15 min.)	3
Water Extraction (%,max)	ASTM D-1239	0.15
Volatile Loss (%, max)	ASTM D-1203(A)	0.70
Hydrostatic Resistance (psi, min)	ASTM D-751(A)	100
Plasticizer Min Ave Molec Wt	ASTM 2124	400
Factory Fabricated Seams:		
Peal Strength (lbs/in, min)	ASTM D-7408	15
Shear Strength (lbs/in, min)	ASTM D-7408	58.4

These data are based on tests believed to be reliable. However, these are laboratory tests that may not simulate actual use conditions. They are provided for your informational purposes only. No warranty, express or implied, including any other further warranty of fitness for a particular purpose or merchantability, is made by this promotional literature.

Preserving water resources for future generations

Pipe Boot Installation



Step 1:

Prepare the subgrade around the area of the pipe. The sub-grade must be smooth, uniform, and free of any protrusions.

Step 2:

Clean the surface of the liner around the penetration where the boot will be welded in place. Wipe away any dirt or dust particles. The surfaces of the liner, boot, and the pipe must be completely clean and dry.

Step 3:

Slide the boot sleeve on the pipe, making sure the boot is aligned and all surfaces are smooth.

It may be necessary to trim the excess tapered portion of the boot sleeve.

Step 4:

Weld the boot apron to the liner using EPI provided adhesive. Apply the adhesive to the liner and the boot apron. Let the adhesive setup for several seconds before pressing the boot apron and the liner together using a roller. Make sure to smooth out any bubbles or wrinkles.

Step 5:

Seal the boot sleeve to the pipe using the stainless steel hose clamp. The clamp around the pipe will form a watertight seal to the pipe.

For technical assistance, call EPI toll free 800-655-4637

Preserving water resources for future generations

CONTRACTOR'S "AS-BUILT" NOTE

AS-BUILT PLANS AND SPECIFICATIONS ARE REQUIRED FOR THIS STORMWATER MANAGEMENT FACILITY. THESE MUST BE PREPARED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. BALTIMORE COUNTY WILL NOT PERFORM THE INSPECTION OR PREPARE THE AS-BUILT PLANS OR CERTIFICATION. THE STORMWATER MANAGEMENT PERMIT SECURITY WILL NOT BE RELEASED UNTIL THE AS-BUILT PLANS AND CERTIFICATION ARE APPROVED BY BALTIMORE COUNTY.

IN ORDER TO PREPARE THE REQUIRED AS-BUILT PLANS AND CERTIFICATION, THIS STORMWATER MANAGEMENT FACILITY MUST BE INSPECTED BY THE ENGINEER AT SPECIFIC STAGES DURING CONSTRUCTION AS REQUIRED BY THE CURRENT BALTIMORE COUNTY STORMWATER MANAGEMENT POLICY AND DESIGN MANUAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST (5) WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS.

AS-BUILT CERTIFICATION

I CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE 'AS-BUILT' PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

SIGNED:_____ P.E. NO.:_____
DATE:_____

LANDOWNER'S/DEVELOPER'S CERTIFICATION

I/WE HEREBY CERTIFY THAT ALL WORK SHOWN ON THESE CONSTRUCTION DRAWINGS WILL BE ACCOMPLISHED PURSUANT TO THESE PLANS. I/WE ALSO UNDERSTAND THAT IT IS MY/OUR RESPONSIBILITY TO HAVE THE CONSTRUCTION SUPERVISED AND CERTIFIED, INCLUDING THE SUBMITTAL OF "AS-BUILT" PLANS WITHIN THIRTY (30) DAYS OF COMPLETION, BY A MARYLAND REGISTERED PROFESSIONAL ENGINEER.

BY:_____ DATE:_____

PRINT NAME: _____

ENGINEER'S DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND MEETS THE MINIMUM STANDARDS OF THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT.

SIGNED: _____ P.E. NO.: 44097

PRINT NAME: MICHAEL GESELL, P.E. DATE:_____

WET POND SEQUENCE OF CONSTRUCTION

1. NOTIFY CERTIFYING ENGINEER FIVE (5) WORKING DAYS PRIOR TO BEGINNING STORMWATER MANAGEMENT FACILITY CONSTRUCTION.
2. NOTIFY BALTIMORE COUNTY AT LEAST 48 HOURS PRIOR TO DOING ANY WORK.
3. CLEAR AND GRUB EXISTING POND AREA.
4. CONSTRUCT ACCESS ROAD PER PLANS.
5. ROUGH GRADE FOR EMBANKMENT ELEVATIONS SHOWN ON PLAN.
6. INSTALL RISER STRUCTURE AS SHOWN ON APPROVED STORMWATER MANAGEMENT PLAN.
7. INSTALL STORMDRAIN PIPE AND CONCRETE CRADLE FROM RISER STRUCTURE TO DOWNSTREAM END WALL. INSTALL FILTER DIAPHRAGM
8. INSTALL 30-MIL PVC IMPERVIOUS LINER AND 12-INCHES OF CLEAN FILL ON TOP OF IMPERVIOUS LINER.
9. FINE GRADE AND PERMANENTLY STABILIZE POND AREAS.
10. INSTALL PVC DEWATERING PIPE AND STONE AROUND PIPE.
11. CONTRACTOR TO PROVIDE PROOF OF DELIVERY AND INSTALLATION OF SOIL AMENITIES, GRASS SEED, AND LANDSCAPING IN QUANTITIES REQUIRED TO INSPECTING AGENT AT COMPLETION OF STABILIZATION.
12. CONDUCT 'AS-BUILT' SURVEY OF FACILITY AND STORMDRAIN AND SUBMIT TO APPROPRIATE AGENCIES WITHIN 30 DAYS OF COMPLETION.

CONSULTANT'S HAZARD CLASS CERTIFICATION

CERTIFY THAT THESE FACILITIES MEET ALL REQUIREMENTS FOR HAZARD CLASS (A). [REQUIREMENTS AS STATED IN THE USDA NATURAL RESOURCES CONSERVATION SERVICE - MARYLAND CONSERVATION PRACTICE STANDARD FOR POND, CODE 378, JANUARY 2000.] ALL NECESSARY INVESTIGATIONS AND COMPUTATIONS HAVE BEEN PERFORMED TO VERIFY THIS FINDING.

SIGNED: _____ MD LICENSE NO.: 44097

SIGNEE: MICHAEL GESELL, P.E. DATE:_____

STORMWATER MANAGEMENT NOTES

1. STORMWATER QUALITY HAS BEEN ADDRESSED BY THE PROPOSED WET POND IN CONJUNCTION WITH THE EXISTING WASTEWATER TREATMENT FACILITY.
2. STORMWATER MANAGEMENT FACILITIES TO BE PRIVATELY OWNED AND MAINTAINED.

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

APPROVED:_____CHIEF

STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

SWM 6 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

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NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: MD16206639
DRAWN BY: CPH
CHECKED BY: MJG
DATE: 3/5/2021
CAD I.D.: BMPS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
BALTIMORE COUNTY

BOHLER
901 DULANEY VALLEY ROAD, SUITE 801
TOWSON, MARYLAND 21204
Phone: (410) 821-7900
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MD@BohlerEng.com

M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

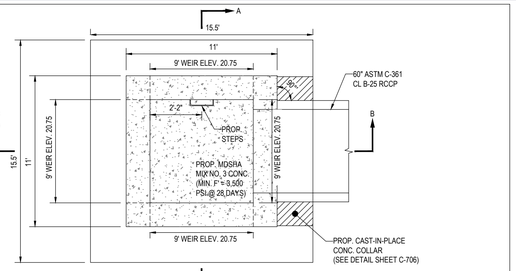
STORMWATER MANAGEMENT NOTES AND DETAILS

SHEET NUMBER:

C-706

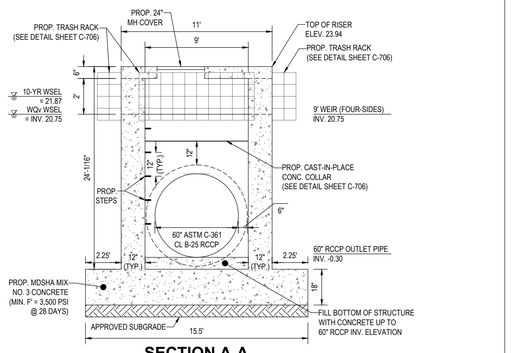
REVISION 2 - 04/05/2022

Apr 05, 2022
H:\16\MD\16206639\DRAWINGS\PLANSETS\MD16206639_BMPS_0-----1\LAYOUT C-706 SWM NOTES AND DETAILS

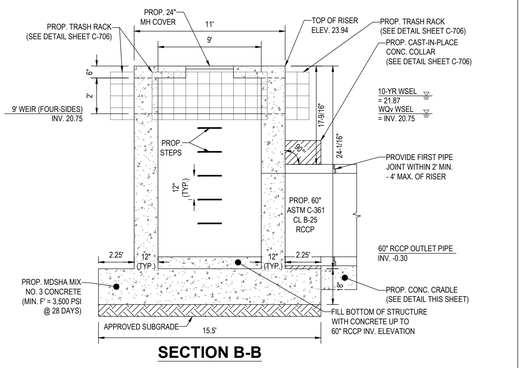


PLAN VIEW

WITHOUT TOP SLAB AND TRASH RACKS



SECTION A-A



SECTION B-B

CAST-IN-PLACE CONCRETE RISER STRUCTURE DETAILS (STRUCTURE A-20)

NOT TO SCALE

NOTE: DETAIL SHOWN IS FOR SCHEMATIC PURPOSES ONLY. FINAL DESIGN TO BE PROVIDED BY STRUCTURAL ENGINEER. BOHLER ENGINEERING TO BE HELD HARMLESS IN THE EVENT OF STRUCTURAL FAILURE.

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Earth Fill

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.

Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ±2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, as tested and certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structural backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

   Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.

   Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.

   Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "**Structure Backfill**".

6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

   All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepunched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding / cradle for their entire length. This bedding / cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" – 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding -The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

OPERATION AND MAINTENANCE

An operation and maintenance plan in accordance with Local or State Regulations will be prepared for all ponds. As a minimum, the dam inspection checklist located in Appendix A shall be included as part of the operation and maintenance plan and performed at least annually. Written records of maintenance and major repairs needs to be retained in a file. The issuance of a Maintenance and Repair Permit for any repairs or maintenance that involves the modification of the dam or spillway from its original design and specifications is required. A permit is also required for any repairs or reconstruction that involve a substantial portion of the structure. All indicated repairs are to be made as soon as practical.

SWM 7 OF 7

MARYLAND COORDINATE SYSTEM (MCS)

APPROVED: _____ CHIEF

STORMWATER MANAGEMENT DIVISION
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

OWNER/DEVELOPER

TRADEPOINT DEVELOPMENT, LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
CONTACT: TOM CASO
PHONE: 410-382-6667

SITE DATA

KEYSHEET	ANW
ELECTION DISTRICT	15
COUNCILMANIC DISTRICT	7
SWM MAINTENANCE	PRIVATE

ELEVATIONS BASED ON NAVD 88, COORDINATES AND MERIDIAN ARE BASED ON THE MARYLAND COORDINATE SYSTEM (MCS) PER MONUMENTS BCO #1433 AND GIS 2

PROFESSIONAL CERTIFICATION
I, MICHAEL J. GESELL, 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. 44097, EXPIRATION DATE: 6/9/23

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
LAND PLANNING SERVICES
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	11/18/2021	UPDATED PER DAM BREACH ANALYSIS	MJR / MJG
2	04/05/2022	REVISION PER COUNTY COMMENTS	DMD / MJG

Know what's below. Call before you dig.

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NOT APPROVED FOR CONSTRUCTION

PROJECT NO.:	MD16206639
DRAWN BY:	CPH
CHECKED BY:	MJG
DATE:	3/5/2021
CAD I.D.:	BMPS - 0

PROJECT:

WASTEWATER TREATMENT PLANT REPLACEMENT PLAN

FOR

TRADEPOINT ATLANTIC

SHIPYARD ROAD AT
TRADEPOINT AVENUE
BALTIMORE, MD 21219
TM 111, GRID 14 PARCEL 318
ELECTION DISTRICT 15
COUNCILMANIC DISTRICT 7
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M.J. GESELL
PROFESSIONAL ENGINEER
MARYLAND LICENSE No. 44097

SHEET TITLE:

STORMWATER MANAGEMENT NOTES AND DETAILS

SHEET NUMBER:

C-707

REVISION 2 - 04/05/2022

Apr 05, 2022
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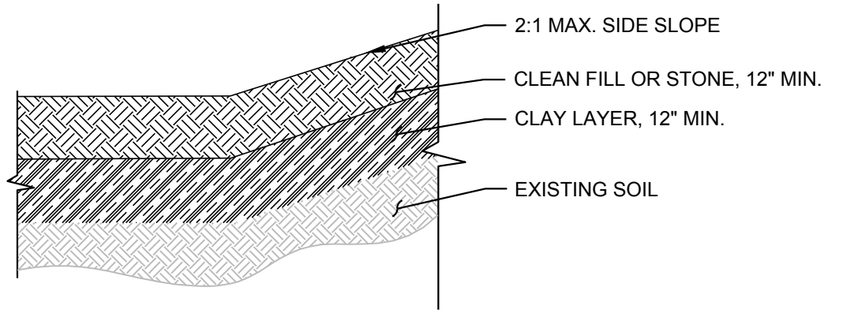
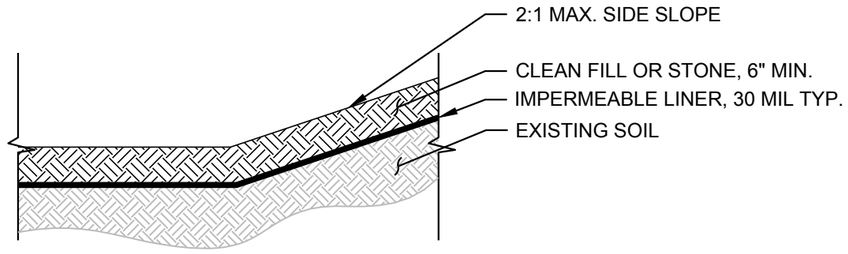
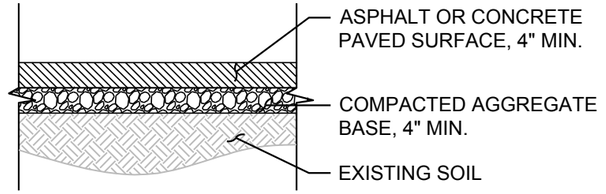
APPENDIX E





TYPICAL POND SECTIONS
NOT TO SCALE

TYPICAL LANDSCAPE SECTION
NOT TO SCALE



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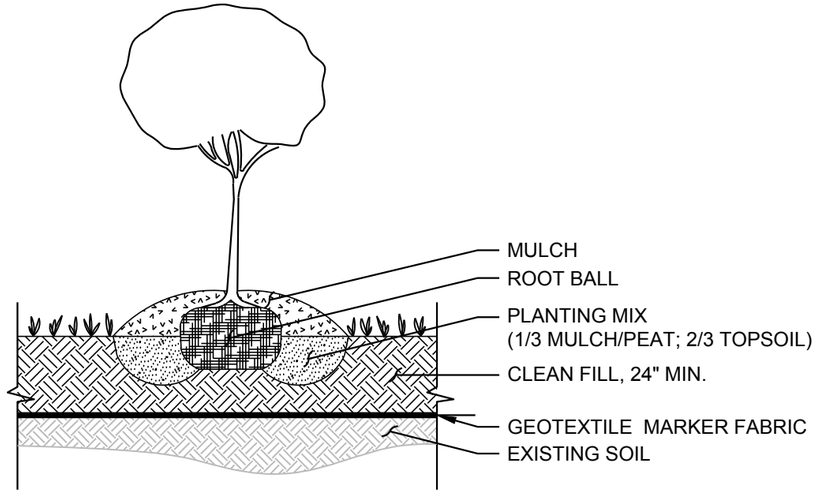


TYPICAL PLANTING SECTION
NOT TO SCALE

GEOTEXTILE MARKER FABRIC SPECIFICATIONS

THE GEOTEXTILE MARKER FABRIC SHALL BE A NONWOVEN PERVIOUS SHEET OF POLYPROPYLENE MATERIAL. ADD STABILIZERS AND/OR INHIBITORS TO THE BASE MATERIAL, AS NEEDED, TO MAKE THE FILAMENTS RESISTANT TO DETERIORATION BY ULTRAVIOLET LIGHT, OXIDATION AND HEAT EXPOSURE. REGRIND MATERIAL, WHICH CONSISTS OF EDGE TRIMMINGS AND OTHER SCRAPS THAT HAVE NEVER REACHED THE CONSUMER, MAY BE USED TO PRODUCE THE GEOTEXTILE. POST-CONSUMER RECYCLED MATERIAL MAY BE USED. GEOTEXTILE SHALL BE FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING THE EDGES. GEOTEXTILES SHALL MEET THE REQUIREMENTS SPECIFIED IN TABLE 1. WHERE APPLICABLE, TABLE 1 PROPERTY VALUES REPRESENT THE MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPAL DIRECTION. VALUES FOR APPARENT OPENING SIZE (AOS) REPRESENT MAXIMUM AVERAGE ROLL VALUES

TABLE 1

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
			Maximum Opening Size	
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
			Minimum Roll Value	
Permittivity	ASTM D4491	sec^{-1}	1.7	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	135 (5500)	
			Minimum Test Value	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

ARM Group LLC
Engineers and Scientists

designed RJC
checked TNP
drawn RJC
scale N/A
date 9/8/2020
project no. 160443M

drawing title: MINIMUM CAPPING SECTION DETAILS

project title: SPARROWS POINT TRADEPOINT ATLANTIC

SPARROWS POINT
BALT. COUNTY, MARYLAND

Sheet 1

APPENDIX F

GENERAL NOTES:

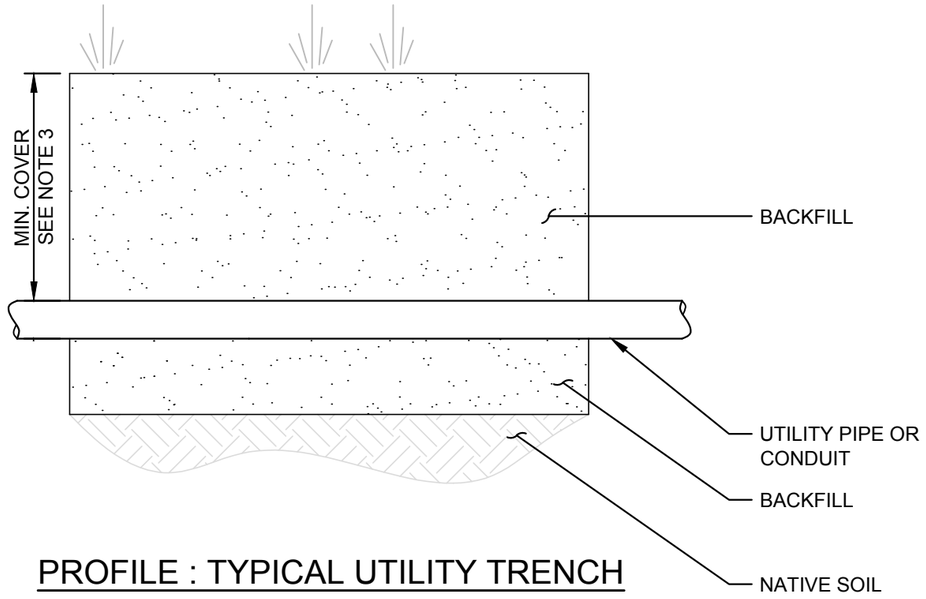
1. ALL PIPES OR CONDUIT SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.

2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.

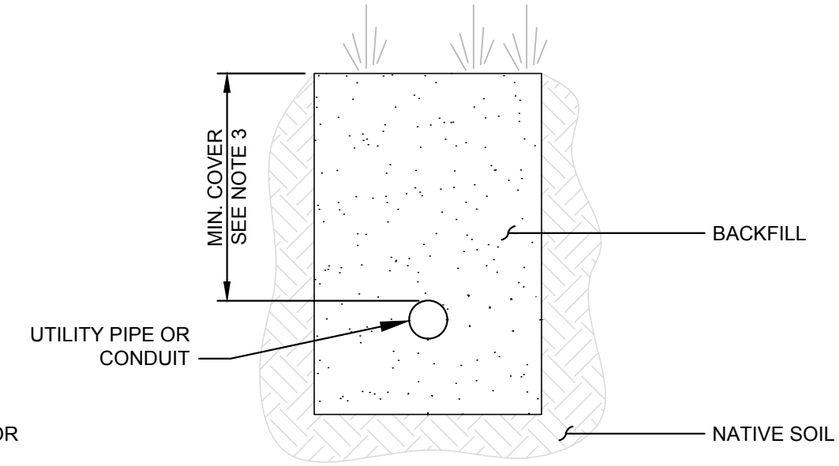
3. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.

4. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.

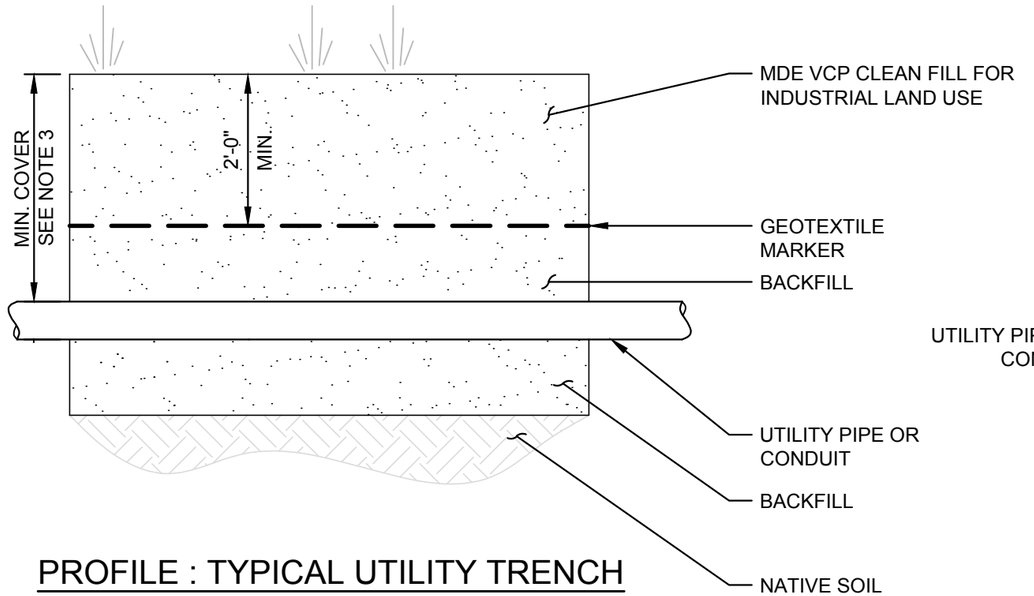
5. FOR ANY UTILITY SEGMENT WHICH GOES THROUGH AN AREA WHICH IS DESIGNATED TO RECEIVE A LANDSCAPED CAP, THE UPPER 2 FEET OF BACKFILL MUST MEET THE REQUIREMENTS OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE. IN THIS CASE THE MDE VCP CLEAN FILL WILL BE UNDERLAIN BY A GEOTEXTILE MARKER FABRIC. UTILITY SEGMENTS WHICH GO THROUGH AREAS WHICH DO NOT REQUIRE CAPPING OR ARE DESIGNATED TO RECEIVED A PAVED CAP WILL BE BACKFILLED WITH MATERIALS APPROVED BY MDE FOR THIS USE.



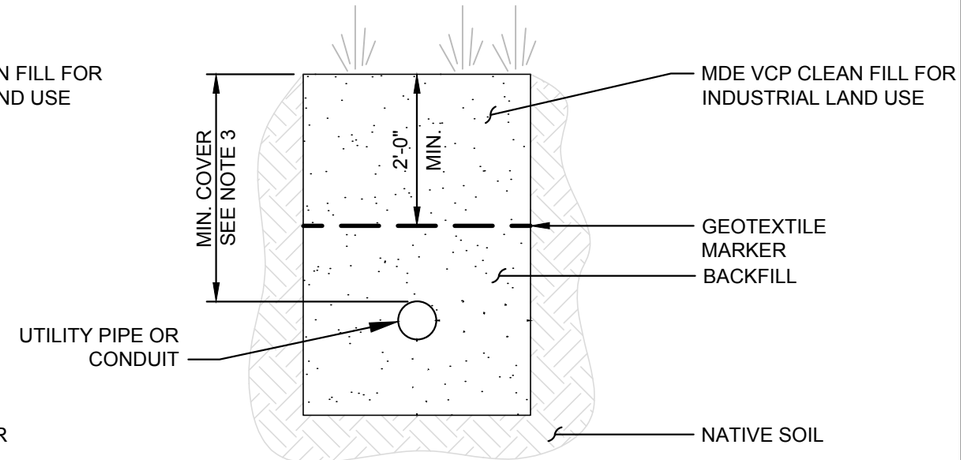
PROFILE : TYPICAL UTILITY TRENCH



SECTION : TYPICAL UTILITY



PROFILE : TYPICAL UTILITY TRENCH
(SEE NOTE 5)



SECTION : TYPICAL UTILITY
(SEE NOTE 5)

ARM Group LLC
Engineers and Scientists

TYPICAL UTILITY
CROSS SECTIONS
Sparrows Point Site
Tradepoint Atlantic

September 2020
1/2" = 1'-0"
160443M

Figure
1

APPENDIX G

Utility Excavation NAPL Contingency Plan

Revision 4 – June 19, 2017

Introduction:

Proposed underground utilities and excavations necessary for the redevelopment of the Tradepoint Atlantic property may encounter areas of petroleum and/or Oil & Grease contamination in soil. The assessment of total petroleum hydrocarbons (TPH) diesel range organics (DRO), gasoline range organics (GRO), Oil & Grease, and/or non-aqueous phase liquid (NAPL) completed as part of each Phase II Investigation includes the following:

- Each soil boring with evidence of NAPL (i.e., containing a sheen or free oil in the soil core), whether located near utilities or not, is investigated via the installation of a piezometer to assess mobility to groundwater. If measureable NAPL is present in the initial piezometer, additional soil borings and shallow temporary piezometers are installed surrounding the initial detection to delineate the impacts. Each piezometer installed to delineate the presence or absence of NAPL is checked with an oil-water interface probe immediately after installation, 48 hours after installation, and at least 30 days after installation.
- TPH-DRO/GRO and Oil & Grease data, once received, are assessed in their magnitude and location respective to subsurface utilities, stormwater conveyances, and surface waters.
- Locations that exhibit elevated detections of TPH/Oil & Grease or evidence of NAPL, that are within reasonable proximity (i.e. 25 feet) to subsurface utilities or stormwater conveyances and/or within reasonable proximity (i.e. 100 feet) to surface waters, are identified for further delineation and selective removal (if warranted).

Any NAPL identified in soil borings or piezometers during the Phase II Investigation would be noted on relevant logs and identified in Response and Development Work Plans for construction planning purposes. Despite these planning efforts, unidentified pockets of contamination (including NAPL) may still be encountered during construction. This contingency plan provides the procedures to be utilized during construction work to properly address response and construction techniques if any materials impacted with NAPL are encountered.

Objectives:

The purpose of this plan is to describe procedures to be followed in the event that NAPL is encountered in utility trenches or other excavations during development of the Tradepoint Atlantic property. The specific objectives of this plan and the procedures outlined herein are:

1. To ensure identification and proper management of Oil & Grease and petroleum-contaminated soils.
2. To ensure proper worker protection for working in areas of Oil & Grease and petroleum contamination.
3. To ensure that the installation of new utilities does not create new preferential flow paths for the migration of free-phase hydrocarbons (Oil & Grease, TPH-DRO/GRO, etc.) or soil vapors.

Identification of Oil & Grease and Petroleum Contaminated Soil:

An Environmental Professional (EP) will be on-site to determine if soils show evidence of the presence of Oil & Grease or TPH present as NAPL during installation of utility trenches or other excavation activities completed during development. Oil & Grease or petroleum-contaminated soils can be identified by the presence of free oil, oil staining, a petroleum odor, or any combination of these conditions. Free oil (NAPL) is liquid oil which could potentially be drained or otherwise extracted from the soil, and is the focus of this contingency plan, although severe staining accompanied by odors should be addressed via the same contingency measures provided herein (based on the judgement of the EP). The appearance of oil staining is not always consistent, but varies depending on the nature of the oil, the soil type, and the age of the release. Staining associated with old petroleum contamination often has a greenish hue, but may also be brown or black. The olfactory sense is the most sensitive instrument for identifying petroleum contamination in the field. Therefore, a petroleum odor may be noted although there is no visible sign of oil or staining. In some instances, decaying organic matter can produce an odor similar to petroleum, but this is rare.

If NAPL is encountered during construction, the extent of impacts shall be delineated by excavating trenches or installing four soil borings (two in each direction) perpendicular to the utility alignment or excavation to examine the soil for physical evidence of NAPL. Perpendicular transects will be investigated every 50 feet along the section of the utility trench or excavation where there is physical evidence of NAPL. Each transect will extend to a distance of 10 feet from the edge of the utility trench or excavation. This represents the maximum distance which would require mandatory excavation to mitigate potential migration risks (see below).

NAPL delineation will be guided primarily by screening observations from the perpendicular borings or trenches, and samples will be collected to test for extractable Oil & Grease or petroleum-contaminated soil using the Oil Sticks™ test kit. This test kit provides a determination of whether hydrocarbons are present in soil and extractable (i.e. could mobilize as a NAPL). Oil Sticks™ change from a pale blue to a deep blue color when they come in contact with free product. This instantaneous change in color occurs even when miniscule amounts of product come in contact with the strip. The sensitivity of Oil Sticks™ to determine the presence/absence of oil is reported by the manufacturer to be about 1,000 to 2,000 mg/kg. The

field test is performed by placing approximately 3 tablespoons of soil in a clean sample cup and adding enough water to cover the sample. After stirring the sample and waiting ~1 minute, the Oil Sticks™ test strip should be swished through the water, making sure to touch the strip to the sides of the cup where product may collect at the interface (meniscus) between the cup, water, and air. If the strip turns deep blue, or deep blue spots appear, oil or hydrocarbon is present. However, the MDE has observed that the Oil Sticks™ method may produce inconsistent results. Therefore, documentation of all screening methods is necessary during boring/trenching work. This documentation shall include an accurate record of visual and olfactory screening, along with a narrative with photographs. Field screening will be aided by photoionization detector (PID) results, and Oil Sticks™ samples should be biased to target elevated PID readings, if any. The agencies have requested that all soil samples prepared for the Oil Sticks™ field test be photographed for evidence of sheen/residue on the cup sides. Detailed records are required to be submitted with the project-specific Completion Report.

If petroleum or Oil & Grease impacts are identified in Site soils based on use of the Oil Sticks™ test kit or other field screening methods, disposal requirements will be determined using the quantitative PetroFLAG™ hydrocarbon analysis system or fixed laboratory analysis (see following section). The PetroFLAG™ hydrocarbon analysis system is a broad spectrum field test kit suitable for TPH contamination regardless of the source or state of degradation (Dexsil Corporation). PetroFLAG™ field test kits do not distinguish between aromatic and aliphatic hydrocarbons, but quantify all fuels, oils, and greases as TPH. Dilutions can be used to determine concentrations of TPH/Oil & Grease above the normal calibration range. Dexsil notes that positive results for TPH may occur if naturally occurring waxes and oils, such as vegetable oils, are present in the sample. Additional detail regarding the procedure for the PetroFLAG™ kit is given in **Attachment 1**.

Soil Excavation, Staging, Sampling and Disposal:

The EP will monitor all utility trenching and excavation activities for signs of potential contamination. In particular, soils will be monitored with a hand-held PID for potential VOCs, and will also be visually inspected for the presence of staining, petroleum waste materials, or other indications of NAPL contamination that may be different than what was already characterized. Excavated material that is visibly stained or that exhibits a sustained PID reading of greater than 10 ppm will be segregated and containerized or placed in a stockpile on polyethylene or impervious surface until the material can be analyzed using the PetroFLAG™ test kit to characterize the material for appropriate disposal. If a PetroFLAG™ test kit is not available to the contractor, or if the contractor prefers to use fixed laboratory analysis, samples may be characterized via submittal to a laboratory for TPH/Oil & Grease analysis. However, any excavated material containing NAPL (i.e., containing free oil) cannot be characterized for waste disposal using the PetroFLAG™ test kit and must instead be characterized via fixed laboratory analysis, as described in the final paragraph of this section. In addition, any hydrocarbon contaminated soil discovered during construction activities that was not previously

characterized must also be analyzed for PCBs prior to removal and transport to an appropriate disposal facility. If excavated and stockpiled, such materials will be covered with a plastic tarp so that the entire stockpile is encapsulated, and anchored to prevent the elements from affecting the integrity of the containment. The MDE will be notified if such materials are encountered during utility work.

Soil exhibiting physical evidence of NAPL contamination or elevated TPH/Oil & Grease with detections in the low percentage range, which is located within 10 feet of a proposed new utility or subsurface structure (i.e., foundation, sump, electrical vault, underground tank, etc.), will be excavated and segregated for disposal at the on-site nonhazardous landfill (Greys Landfill) or an off-site facility pending the completion of any required PCB analytical testing. Impacted soil which is located greater than 10 feet away from the proposed utility or subsurface structure may be left in place and undisturbed. The extent of the excavation will be determined in the field following visual/olfactory screening supplemented by the PID and Oil Sticks™ test kit, but soil disposal requirements will be determined with the PetroFLAG™ test kit (since the Oil Sticks™ method is not quantitative) or via fixed laboratory analysis for TPH/Oil & Grease (if preferred by the contractor or if the PetroFLAG™ test kit is unavailable to the contractor).

Any recovered NAPL will be collected for off-site disposal. As required by the appropriate and MDE approved facility, samples impacted by NAPL (i.e., containing free oil) will be collected for profiling/waste characterization and submitted to a fixed laboratory, as mentioned above, for the following analyses: metals, VOCs, TPH-DRO/GRO, and/or additional analysis required by the selected disposal facility. Upon receipt of any additional characterization analytical results, the MDE will be notified of the proposed disposal facility. Non-impacted material with no evidence of NAPL (i.e. soils that may contain measureable concentrations of TPH/Oil & Grease but below percentage levels) may be placed on the Site in areas to be paved or capped as long as all other requirements specified in the Response and Development Work Plan (or similar governing document) are met.

Initial Reporting:

If evidence of NAPL in soil or groundwater is encountered during excavation, it will be reported to the MDE within two hours. Information regarding the location and characteristics of any NAPL contaminated soil will be documented as follows:

- Location (exact stationing);
- Extent of contamination (horizontally and vertically – prepare a sketch including dimensions);
- Relative degree of contamination (i.e. free oil with strong odor vs. staining); and
- Visual documentation (take photographs and complete a photograph log)

Utility Installations in Impacted Areas:

Underground piping or conduits installed through areas of Oil & Grease or petroleum contamination shall be leak proof and water tight. All joints will be adequately sealed or gasketed, and pipes or conduits will be properly bedded and placed to prevent leakage. All trench backfill will meet the MDE definition of clean fill, or otherwise be approved by the MDE. Pipe bedding will be installed to minimize the potential for accumulation of water and concentrated infiltration. This can be achieved by using a relatively small amount of low-permeability pipe bedding; open-graded stone will be avoided or only used in thicknesses of 6 inches or less. Bedding must be properly placed and compacted below the haunches of the pipe. Clay, flowable fill, or concrete plugs will be placed every 100 feet across any permeable bedding to minimize the preferential flow and concentration of water along the bedding of such utilities.

If required, each trench plug will be constructed with a 2-foot-thick clay plug or 1-foot-thick flowable fill or concrete plug, perpendicular to the pipe, which extends at least 1 foot in all directions beyond the permeable pipe bedding. The plug acts as an anti-seep collar, and will extend above the top of the pipe. Installation of each trench plug will follow the completion of the trench excavation, installation of granular pipe bedding (because dense-graded aggregate or soil or other pipe bedding is difficult to properly compact below the haunches of the pipe), and seating of the pipe. The trench plug will then be installed by digging out a 1-foot trench below and around the pipe corridor, and placing clay, flowable fill, or concrete to construct the plug. A specification drawing for installation of the trench plug has been provided as **Figure 1**.

Attachment 1 - PetroFLAG™ Procedure

PetroFLAG™ field test kits use a proprietary turbidimetric reaction to determine the TPH concentration of solvent extracted samples (USEPA). Calibration standards provided with the unit are used to perform a two-point calibration for the PetroFLAG™. A blank and a 1,000 ppm standard are run by the analyzer unit to create an internal calibration curve.

Analysis of a soil sample is performed using three simple steps: extraction, filtration, and analysis. The PetroFLAG™ analysis is performed as follows:

- Place a 10 gram soil sample in a test tube.
- Add extraction solvent to the tube.
- Shake the tube intermittently for four minutes.
- Filter the extract into a vial that contains development solution
- Allow the solution to react for 10 minutes.

The filtration step is important because the PetroFLAG™ analyzer measures the turbidity or "optical density" of the final solution. Approximately 25 samples can be analyzed per hour. The vial of developed solution is placed in the meter, and the instrument produces a quantitative reading that reveals the concentration of hydrocarbons in the soil sample. The PetroFLAG™ method quantifies all fuels, oils, and greases as TPH between 15 and 2000 ppm (Dexsil Corporation). A 10x dilution of the filtered extraction solvent will be completed to allow for quantification of soil concentrations in excess of 10,000 ppm. The specially designed PetroFLAG™ analyzer allows the user to select, in the field, the response factor that is appropriate for the suspected contaminant at each site. Vegetable-based oils have been shown to exhibit a response factor of 18% (EPA Method 9074). Using the selected response factor, the analyzer compensates for the relative response of each analyte and displays the correct concentration in parts per million (ppm).

References:

U.S. Environmental Protection Agency (EPA). Contaminated Site Clean-up Information (Clu-IN): Test Kits. Office of Superfund Remediation and Technology Innovation. http://www.clu-in.net/characterization/technologies/color.cfm

Dexsil Corporation. 2016. PetroFLAG Analyzer System (PF-MTR-01). http://www.dexsil.com/products/detail.php?product_id=23

EPA SW-846 Method Number 9074 - Turbidimetric Screening Procedure for Total Recoverable Hydrocarbons in Soil

GENERAL NOTES:

1. ALL PIPES OR CONDUIT PASSING THROUGH AREAS OF PETROLEUM CONTAMINATION SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.

2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.

3. ANTI-SEEP COLLARS FROM THE PIPE MANUFACTURER, THAT ARE PRODUCED SPECIFICALLY FOR THE PURPOSE OF PREVENTING SEEPAGE AROUND THE PIPE, ARE ACCEPTABLE IF INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND ONLY WITH PRIOR APPROVAL BY TPA.

4. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.

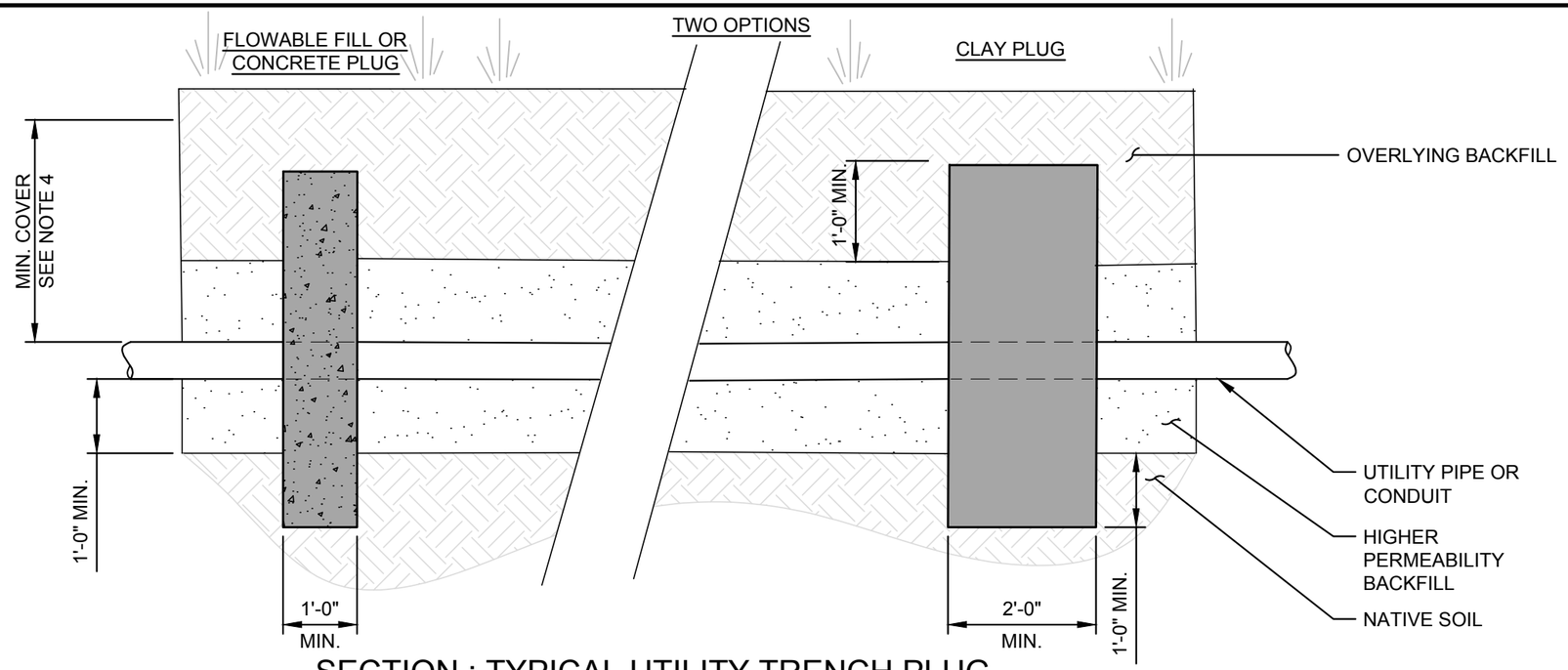
5. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.

6. FOR ADDITIONAL REQUIREMENTS, INCLUDING THE USE OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE AND INSTALLATION OF GEOTEXTILE MARKER FABRIC, REFER TO NOTE 5 ON THE TYPICAL UTILITY CROSS SECTIONS.

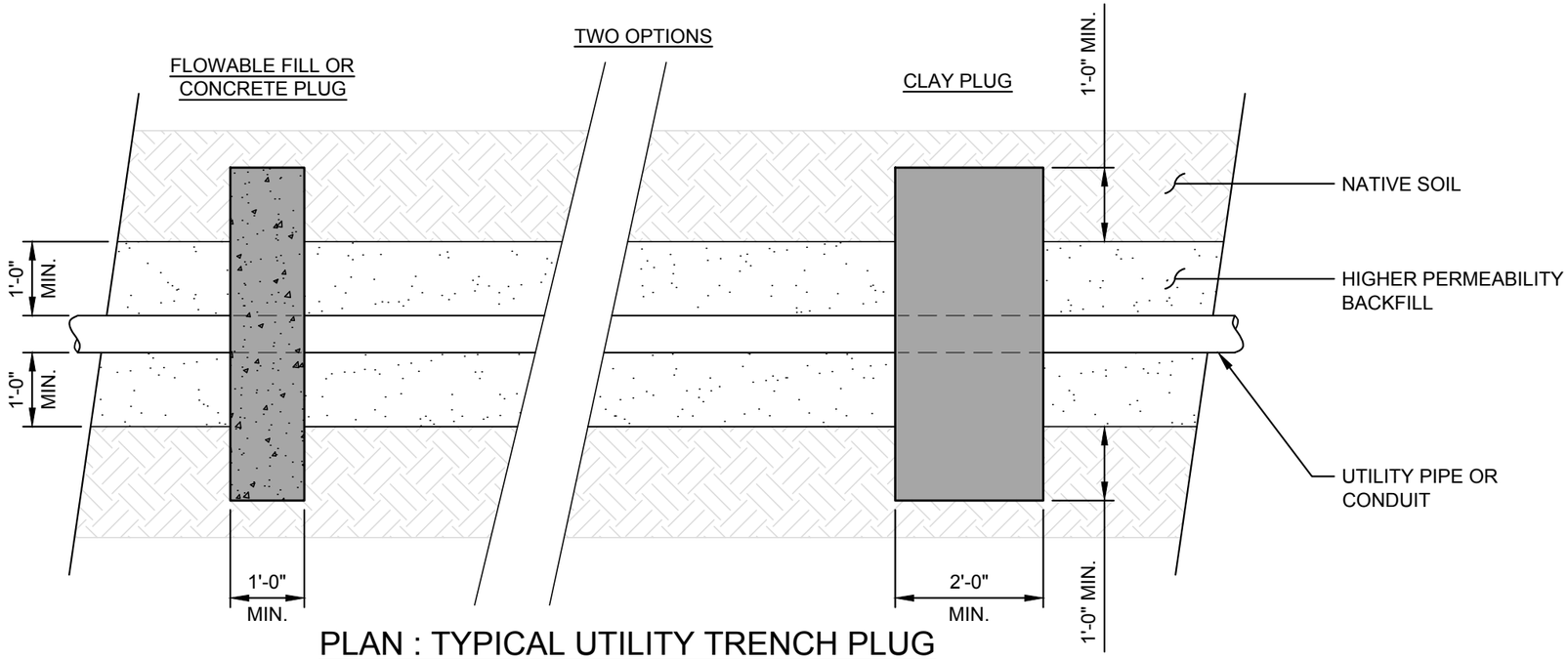
7. ALL UTILITIES INSTALLED THROUGH AREAS CONTAINING NAPL OR ELEVATED CHEMICAL IMPACTS WITH THE POTENTIAL TO TRANSMIT VAPORS ALONG PREFERENTIAL FLOW PATHWAYS SHALL BE EITHER 1) BACKFILLED WITH LOW PERMEABILITY BACKFILL MATERIAL (LESS THAN OR EQUAL TO THE PERMEABILITY OF THE EXISTING SUBGRADE), OR 2) INSTALLED WITH TRENCH PLUGS ALONG THE ALIGNMENT IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN AND THE FOLLOWING NOTES:

   A.) UTILITY TRENCH PLUGS SHALL BE INSTALLED AT 100-FOOT (MAX.) INTERVALS THROUGH ALL AREAS OF NAPL CONTAMINATION.

   B.) UTILITY TRENCH PLUGS SHALL EXTEND A MINIMUM OF 1-FOOT IN ALL DIRECTIONS BEYOND ANY HIGHER PERMEABILITY BACKFILL MATERIALS (I.E., MATERIALS EXCEEDING THE PERMEABILITY OF THE EXISTING SUBGRADE).



SECTION : TYPICAL UTILITY TRENCH PLUG



PLAN : TYPICAL UTILITY TRENCH PLUG

ARM Group LLC
Engineers and Scientists

UTILITY TRENCH PLUG
Sparrows Point Site
Tradepoint Atlantic

September 2020	Figure
Not to Scale	1
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