## RESPONSE AND DEVELOPMENT WORK PLAN

# AREA B: SUB-PARCEL B7-1 TRADEPOINT ATLANTIC SPARROWS POINT, MARYLAND

Prepared For:



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#### 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 B7-1 (the Site). Tradepoint Atlantic submitted a letter (**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 B7-1 consists of approximately 22.0 acres located within Parcel B7 and Parcel B25 of the approximately 3,100-acre former steel plant property. Section 2.0 provides a detailed Site Description and Site History for this portion of the property.

As shown on **Figure 2**, Sub-Parcel B7-1 is slated for development as a Baltimore County Park, including a community building, playground area, sports field, boat dock, and two constructed wetlands. Associated service utilities, car parking, access roads, and interior roads are also proposed. The planned development activities will generally include grading and landscaping; construction of the community building; installation of utilities; and paving of parking areas and roadways. Subsequent site-use will involve maintenance and community recreational activities. Outside of the main development area designated as Sub-Parcel B7-1, temporary construction zones (not intended for permanent occupancy) with a total area of less than 0.5 acre within the Limit of Disturbance (LOD) will be utilized to install the park entrance, limited roadside grading, and subgrade utility connections for the project.

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.

Sub-Parcel B7-1 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from USEPA on September 12, 2014. Based on this agreement, USEPA determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the USEPA's Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.



An application to enter the full Tradepoint Atlantic property (3,100 acres) into the 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 3B (Restricted Industrial) on most areas of the property, and plans for the property include demolition and redevelopment over several years. Sub-Parcel B7-1 will be transferred to Baltimore County and developed as a public park with an anticipated future use of Tier 4B (Restricted Public Recreational Area).

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 B7-1 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 B7 Baltimore County Property Transfer Phase II Investigation; 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 B7 and Parcel B25 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, temporary construction zones with a total area of less than 0.5 acre will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project outside of the sub-parcel. 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 scope of construction is covered by this RADWP.



#### 2.0 SITE DESCRIPTION AND HISTORY

#### 2.1 SITE DESCRIPTION

The Sub-Parcel B7-1 development project consists of approximately 22.0 acres comprising the northern portions of Parcel B7 and Parcel B25 (**Figure 1**). The Site will be transferred to Baltimore County and developed as a public park with an anticipated future use of Tier 4B (Restricted Public Recreational Area). The proposed development on this sub-parcel will include a community building, playground area, sports field, boat dock, and two constructed wetlands (**Figure 2**). Outside of the main development area designated as Sub-Parcel B7-1, temporary construction zones (not intended for permanent occupancy) with a total area of less than 0.5 acre within the construction LOD will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project. The Site is not currently occupied. There is no groundwater use on-site or within the surrounding Tradepoint Atlantic property.

The Site can be roughly split into northern and southern sections based on its current condition and proposed future use, as well as the historical uses of the sub-parcel (discussed in Section 2.2). The distinct current conditions and proposed uses for the northern and southern sections of the Site support the establishment of two exposure units (EUs) as more fully described in the SLRA within Section 3.3. Descriptions of the two EUs are provided below:

- The northern half of the Site and eastern shoreline are fully wooded. These wooded areas include existing natural resources such as wetlands, wetland buffers, and critical area easements (CAEs) along the shoreline. The northern half of the Site (and the eastern shoreline) will have no planned improvements or amenities; the natural resources will be retained. This portion of the park is only anticipated to be used sporadically by individuals. Anticipated uses could include walking in the woods for bird/wildlife watching.
- The southern half of the Site includes an historical rail yard that will be demolished during the proposed park development. The railyard is currently vacant with dirt/gravel and slag aggregate at the surface. The historical rail lines and ties have been mostly removed, and the remaining material will be removed prior to, or during, construction. Wooded areas border the historical rail yard on all sides except the west, where it is bordered by (and accessible from) Wharf Road. An existing drive provides access to a nearby yacht club to the south of the sub-parcel. The southern portion of the Site will be developed for public recreational use and will include the main planned improvements and amenities including the community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc.

Ground surface elevations at the Site range from approximately 0 to 20 feet above mean sea level (amsl). The elevations generally slope downward from the north to south and west to east across the Site. The rail yard in the southern portion of the Site is relatively flat and is positioned between



approximately 10 and 12 feet amsl. The eastern shoreline slopes steeply downward to meet the surface water body of Jones Creek. 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 is conveyed to the east toward Jones Creek. There are no permitted National Pollutant Discharge Elimination System (NPDES) outfalls located on the Site.

#### 2.2 SITE HISTORY

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

The majority of the Site (both the northern and southern portions) was formerly occupied by a golf course from at least as early as 1938 until 1952. During that time, the Site was clear cut with only a few small stands of trees. Beginning in c. 1957 a railyard was constructed on the southern portion of the Site, while the northern portion of the Site remained unused and gradually became wooded. Besides the operation of the rail yard, no other uses of the Site are apparent. There is no evidence to suspect that significant historical steel production activities were conducted on the Site.

The rail yard in the southern portion of the Site and associated fill/debris piles were identified in the historical Phase I ESA conducted by Weaver Boos dated May 19, 2014. The Phase I ESA findings are detailed in Section 3.1. As noted above, the historical rail yard will be demolished during the proposed park development. More information on the historical condition of the Site can be found in the agency-approved Baltimore County Property Transfer Pre-Development Investigation Work Plan (Revision 0 dated April 15, 2019) as amended by the associated Work Plan Update Letter (dated October 14, 2020).



#### 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 in 1991 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 VSI is regularly cited in the Description of Current Conditions (DCC) Report prepared by Rust Environment and Infrastructure, dated January 1998 (included with Weaver Boos' Phase I ESA).

Weaver Boos' distinction of a REC or Non-REC was based upon the findings of the DCC Report (which was prepared when the features remained on-site in 1998) or on observations of the general area during their site visit. Weaver Boos made the determination to identify a feature as a REC based on historical information, observations during the site visit, and prior knowledge and experience with similar facilities. The following REC was identified in Sub-Parcel B7-1:

#### Rail Yard Fill Materials (REC 12B):

During the Phase I ESA site visit conducted by Weaver Boos, several piles of fill soil or debris were observed along the small rail yard located to the north of the two existing yacht clubs (on Parcel B25). Based on a review of aerial photographs, Weaver Boos concluded that fill materials may have been historically placed on the north side of the rail yard. The Phase I ESA stated that the source and contents of the fill materials were unknown as well as their extent into the subsurface and potential impacts to soil and/or groundwater.

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. There were no SWMUs or AOCs identified within the Sub-Parcel B7-1 boundary.

#### 3.2 Phase II Investigation Results – Sub-Parcel B7-1

A Phase II Investigation specific to soil and groundwater conditions was performed for the area encompassing Sub-Parcel B7-1 in accordance with the requirements outlined in the ACO as further described in the agency-approved Baltimore County Property Transfer Pre-Development Investigation Work Plan (Revision 0 dated April 15, 2019) and the associated Work Plan Update Letter (dated October 14, 2020). This investigation also relied on data obtained from the combined



Phase II Investigation of Parcel B7 and Parcel B25, which was conducted in accordance with the preceding agency-approved Phase II Investigation Work Plan (dated May 22, 2018). All soil and groundwater samples were collected and analyzed in accordance with agency-approved protocols during the Phase II Investigation, the specific details of which can be reviewed in each Work Plan.

The 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 the identified REC 12B, as well as other targets from former operations that could have the potential for environmental contamination. Samples were also collected at site-wide locations to ensure full coverage of the investigation area. The full analytical results and conclusions have been presented in the Parcel B7 Baltimore County Property Transfer Phase II Investigation Report (Revision 0 dated January 28, 2021). This RADWP summarizes the relevant soil and groundwater findings from the Phase II Investigation with respect to the proposed development of Sub-Parcel B7-1.

#### 3.2.1 Phase II Soil Investigation Findings

Based on the scope of development for Sub-Parcel B7-1, all 66 soil samples collected from 19 soil borings included in the Parcel B7 Baltimore County Property Transfer Phase II Investigation Report were included for a representative evaluation of Sub-Parcel B7-1. The 19 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 Investigation 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). Soil samples from the 0 to 1 foot bgs and 1 to 2 foot bgs intervals were analyzed for pesticides. 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) are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

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. **Table 1**, **Table 2**, and **Table 3** provide summaries of the detected organic compounds, inorganics, and pesticides in the soil samples collected from the 19 soil borings at the Site. **Figure 4** presents the soil sample results that exceeded the PALs among these soil borings. The PALs for relevant PAHs have been adjusted upward based on revised toxicity data published by the USEPA. PAL exceedances were limited to arsenic and manganese.



No evidence of non-aqueous phase liquid (NAPL) was observed at any soil boring location. 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 Visual Slag Fill Delineation Investigation Findings

A visual slag delineation investigation was conducted along the perimeter of the former rail yard in the southern portion of the Site to characterize the horizontal extent of surficial slag fill. The horizontal extents of the slag fill were delineated via the completion of nine soil borings to a depth of 5 feet bgs. Five soil borings were completed at the ostensible edge of the former rail yard. A paired soil boring was completed along a transect at a distance of approximately 50 feet into the wooded area beyond the former rail yard to delineate the presence of slag aggregate. Therefore, five transects were completed along the perimeter of the former rail yard to characterize the horizontal extent of slag fill materials, as shown on **Figure 3**. The Baltimore County Property Transfer Work Plan proposed 10 visual slag delineation soil borings; however, due to a lack of access one boring (T1-2) was unable to be completed.

The visual results are summarized as follows:

Transect ID	Edge of Rail Yard Observed Slag Interval (ft bgs)	50-foot Step Out Boring Observed Slag Interval (ft bgs)
Transect 1	0 to 0.1	NA
Transect 2	(no slag observed)	(no slag observed)
Transect 3	0 to 2.3	(no slag observed)
Transect 4	0 to 4	0 to 1.2
Transect 5	0 to 4.5	2.6 to 2.7 and 4.1 to 4.2

NA indicates that a soil boring was unable to be completed at this location

The visual delineation investigation determined that slag fill material is largely absent in the soil column (above 5 feet bgs) at a distance of approximately 50 feet from the ostensible edge of the former rail yard. Among the soil borings completed directly within the former rail yard (B7-001-SB, B7-002-SB, B7-003-SB, B7-014-SB, B7-015-SB, B7-053-SB, and B7-054-SB), slag aggregate was observed primarily at depths from 0 to 2.5 feet bgs. All four of the manganese PAL exceedances (and the maximum arsenic PAL exceedance) were identified within the shallow soil samples (top 2 feet) collected from the historical rail yard.

#### 3.2.3 Phase II Groundwater Investigation Findings

Groundwater conditions were investigated in accordance with the Baltimore County Property Transfer Pre-Development Investigation Work Plan. During this groundwater investigation, samples were obtained from four temporary groundwater sample collection points (piezometers)



and one groundwater monitoring well (SW-046-MWS) within Sub-Parcel B7-1. A piezometer was originally specified to be installed at B7-032-SB; however, this location could not be installed due to significant access restrictions. B7-065-PZ was installed as a replacement for the originally planned location. The Baltimore County Property Transfer Work Plan proposed an additional sample to be collected from permanent groundwater monitoring well SW-047-MWS. However, during groundwater sampling activities, it was determined that SW-047-MWS had been destroyed (likely during recent construction activities on the highway ramps in the vicinity). Therefore, a groundwater sample could not be collected from SW-047-MWS during the 2020 groundwater sampling event. Groundwater data had previously been collected from SW-047-MWS on December 14, 2015 during the preceding Area B Groundwater Phase II Investigation. The historical data was incorporated into the Phase II Investigation Report and is included in this RADWP to provide characterization data in this portion of the Site.

The six groundwater points which provided relevant analytical data for the proposed development project are shown on **Figure 5**. There is no direct exposure risk for future Composite Workers or Recreators at the Site because there is no use of groundwater on the Tradepoint Atlantic property; however, groundwater may be encountered in the sub-parcel during some construction tasks.

The groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs and PAHs, TPH-DRO/GRO, Oil & Grease, TAL-dissolved metals, dissolved hexavalent chromium, and total cyanide. The groundwater samples collected from the permanent wells were also analyzed for total metals. The historical sample from SW-047-MWS included in this RADWP was also analyzed for PCBs (with no detections). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (30% validated groundwater data) 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. **Table 4** and **Table 5** provide summaries of the detected organic compounds and inorganics in the groundwater samples submitted for laboratory analysis, and **Figure 6** presents the groundwater results that exceeded the PALs. 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. PAL exceedances in the Phase II Investigation groundwater samples collected in the vicinity of the proposed development project consisted of one VOC (chloroform), five PAHs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthrancene, and indeno[1,2,3-c,d]pyrene), TPH-DRO, and eight total and/or dissolved metals (aluminum, beryllium, hexavalent chromium, cobalt, iron, lead, manganese, and thallium).

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. If groundwater is encountered during development, it will be managed to prevent exposures in accordance with the dewatering requirements outlined in Section 5.2.

#### 3.2.4 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. The VI risk evaluation is summarized in **Table 6**.

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 B7-1 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/Oil & Grease above the specified criteria.

Locations with physical evidence of NAPL are also considered to be locations of potential concern with respect to proposed development. No soil borings had visual observations or other physical evidence of NAPL. NAPL was not detected in any piezometers or permanent wells. Overall, no locations of potential concern have been identified.

#### 3.3 HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

#### 3.3.1 Analysis Process

A human health Screening Level Risk Assessment (SLRA) has been completed based on the analytical data obtained from the characterization of surface and subsurface soils. The SLRA was conducted to evaluate the existing soil conditions to determine if any response measures are necessary. Because the intended use of this Site is as a public park, risk was evaluated for the Composite Worker, Adult Recreator, Child Recreator, and Construction Worker scenarios.

The SLRA included the following evaluation process:

**Identification of Exposure Units (EUs):** The SLRA was evaluated using two EUs (EU1 and EU2) with land areas of 11.8 acres and 10.1 acres, respectively. EU1 corresponds with the southern half of the Site and EU2 corresponds with the northern half of the Site. These EUs were defined primarily based on the proposed development plans and uses for these portions of the Site, as discussed in detail in Section 2.1. The southern portion (EU1) will be developed for public recreational use and will include the main planned improvements



and amenities including the community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc. The northern portion (EU2) includes existing natural resources (wetlands, buffers, CAEs) that will be retained; this area will have no planned improvements or amenities but may be used sporadically by individuals for bird/wildlife watching, etc.

The EUs are shown in relation to the proposed development area and the 19 Phase II Investigation soil borings on **Figure 7**. The Construction Worker scenario was evaluated using the same two EUs with slightly larger areas (designated as EU1-EXP and EU2-EXP) with land areas of 12.1 acres and 10.2 acres, respectively, due to the inclusion of the temporary construction zones utilized to install the park entrance, roadside grading, and subgrade utility connections for the project.

**Identification of Constituents of Potential Concern (COPCs):** For the project-specific SLRA, compounds that were present at concentrations at or above the USEPA's Residential Regional Screening Levels (RSLs) set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. The Residential RSLs were used as a conservatism due to the intended use of this Site as a public park. A COPC screening analysis is provided in **Table 7** to identify all compounds above the relevant screening levels.

The results for antimony were eliminated from the SLRA because this compound was very infrequently detected in the dataset for Sub-Parcel B7-1. Antimony was only detected in 1.7% of the samples analyzed for this compound (1 sample out of 59). If the detection frequency of a COPC is less than 5% in a dataset with a minimum of 20 samples, the COPC can be eliminated from the SLRA assuming the detections are not extremely high (based on agency discretion). A single detection that is extremely high could require delineation rather than elimination. In this case it is reasonable to remove antimony. All remaining COPCs identified in **Table 7** have been retained for the SLRA.

**Exposure Point Concentrations (EPCs):** The COPC soil datasets for each EU were divided into surface (0 to 2 feet bgs), subsurface (>2 feet bgs), and pooled depths for estimation of potential EPCs. Thus, there are three soil datasets associated with each 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 average concentration was calculated for each depth category (presented in **Table 8**).

**Risk Ratios:** The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Worker, and site-specific Soil Screening Levels (SSLs) for the Adult Recreator, Child Recreator, and Construction Worker. Risk



ratios were calculated for each scenario with respect to 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 for each scenario. For the Adult Recreator and Child Recreator scenarios, the computed cancer risks are the cumulative risks for both age ranges combined. 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 HI for each scenario.

Adult Recreator and Child Recreator SSLs were calculated using the USEPA's online RSL calculator for the Recreator Scenario using the default input assumptions for chronic exposure. Based on the proposed development layout, EU1 was evaluated according to the MDE's high frequency use scenario of 250 days/year (and 8 hours/day), whereas EU2 was evaluated according to the MDE's moderate frequency use scenario of 182 days/year (and 8 hours/day). These use frequencies are supported by the proposed development plans and amenities for EU1 (including the main planned improvements such as the community building, playground, sports field, parking lots and access drives, etc.) and EU2 (no planned improvements but may be used sporadically for bird/wildlife watching, etc.). Construction Worker SSLs were calculated based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). The Construction Worker SSL spreadsheet and USEPA Recreator calculator outputs (for both the high frequency and moderate frequency use scenarios) are provided in **Appendix B**.

For the Construction Worker, site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum allowable exposure frequencies for EU1-EXP and EU2-EXP 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 frequencies before additional worker protections might be needed are 50 days and 250 days for EU1-EXP and EU2-EXP, respectively. The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU.

There is no potential for direct human exposure to groundwater for future Composite Workers or Recreators 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 temporary Construction Worker exposure to groundwater during development, health and safety plans and management procedures shall be followed to limit exposure risk.

**Assessment of Lead:** The average lead concentrations for surface soils, subsurface soils, and pooled soils for each EU are presented in **Table 8**. The averages were compared to the Composite Worker and Residential RSLs (800 mg/kg and 400 mg/kg, respectively) as



an initial screening. None of the computed average lead concentrations (or any individual lead results) exceeded the Composite Worker or Residential RSLs. The average lead concentrations were additionally evaluated in the Adult Lead Model (ALM) and Integrated Exposure Uptake Biokinetic Model (IEUBK). Since the surface lead concentrations were the highest in each case (57.8 mg/kg and 38.3 mg/kg in EU1 and EU2, respectively) these concentrations were evaluated. The 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 generated 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. The average lead concentrations in EU1 and EU2 were significantly below 1,050 mg/kg. The average surface concentrations for EU1 and EU2 were also input into the IEUBK using default exposure assumptions, and the outputs are provided in **Appendix B**. EU1 and EU2 present negligible risk with respect to lead, with computed 0.335% and 0.126% probabilities of a blood lead concentration above 5 ug/dL. Both EUs are identified as requiring no further action for lead.

**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). No soil samples exceeded the PAL for TPH/Oil & Grease. No physical evidence of NAPL was identified in any soil boring. 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. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability of the COPC. 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.

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.



Due to the grading activities including cut and fill which will be implemented during development at the Site, the SLRA was evaluated to determine baseline Composite Worker, Adult Recreator, Child Recreator, and Construction Worker exposures to surface, subsurface, and pooled data.

#### 3.3.2 Sub-Parcel B7-1 SLRA Results and Risk Characterization

Soil data were divided into three datasets (surface, subsurface, and pooled) for Sub-Parcel B7-1 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 Composite Worker, Adult Recreator, Child Recreator, and Construction Worker.

EPCs were calculated for each soil dataset in each 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 soils are provided in **Table 9**. These EPCs were used for all risk scenarios.

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 average lead concentrations are presented in **Table 8**. The average surface lead concentrations for EU1 and EU2 were input into the IEUBK using default exposure assumptions (**Appendix B**), and both present negligible risk. Both EUs are identified as requiring no further action for lead.

#### **Composite Worker and Recreator Assessment:**

Risk ratios for the estimates of potential EPCs for the Composite Worker, Adult Recreator, and Child Recreator baseline scenarios at the Site are shown in **Table 10** through **Table 18**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
	EU1 (11.8 acres)	Surface Soil	none	4E-6
		Subsurface Soil	none	3E-6
Composite		Pooled Soil	none	3E-6
Worker	EU2 (10.1 acres)	Surface Soil	none	3E-6
		Subsurface Soil	none	3E-6
		Pooled Soil	none	3E-6



Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
		Surface Soil	none	2E-5
	EU1 (11.8 acres)	Subsurface Soil	none	1E-5
Adult		Pooled Soil	none	1E-5
Recreator	EU2 (10.1 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	8E-6
	(10.1 deres)	Pooled Soil	none	9E-6

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
	EU1	Surface Soil	Dermal = 4 Gastro. = 2 Nervous =10	2E-5
	(11.8 acres)	Subsurface Soil	none	1E-5
Child Recreator		Pooled Soil	Dermal = 3 Nervous =10	1E-5
	EU2 (10.1 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	8E-6
		Pooled Soil	none	9E-6

Based on the risk ratios for Sub-Parcel B7-1, environmental capping of EU1 is an acceptable remedy to be protective of future Composite Workers, Adult Recreators, and Child Recreators for the surface, subsurface, and pooled soils. The carcinogenic risk estimates for the Adult Recreator and Child Recreator scenarios (cumulative for both age ranges combined) exceed 1E-5 in EU1. The dermal system, gastrointestinal system, and nervous system HI values exceed 1 for the Child Recreator scenario in EU1. Capping and institutional controls (to maintain the integrity of the cap) will provide adequate protection for these risk-based exceedances in EU1. No capping remedy is required in EU2.

#### **Construction Worker Assessment:**

Intrusive activities which could result in potential Construction Worker exposures are expected to be limited primarily to utility installation tasks performed by specific crews. Construction Worker risks were evaluated for several different exposure scenarios to determine the maximum exposure frequency for each 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 durations (50 and 250 exposure days for EU1-EXP and EU2-EXP, respectively) are shown in **Table 19** through **Table 21**. 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
	EU1-EXP (12.1 acres) (50 exposure days)	Surface Soil	none	1E-7
		Subsurface Soil	none	1E-7
Construction		Pooled Soil	none	1E-7
Worker	EU2-EXP (10.2 acres) (250 exposure days)	Surface Soil	none	6E-7
		Subsurface Soil	none	7E-7
		Pooled Soil	none	6E-7

Using the selected exposure durations for EU1-EXP (50 days) and EU2-EXP (250 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 these allowable exposure durations were to be exceeded for an individual worker.

The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, 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 during 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 future Construction Workers in the event of any future long-term construction projects which could include 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 capping remedy for EU1 with site-wide institutional controls will be acceptable to mitigate potential risks to Composite Workers, Adult Recreators, and Child Recreators resulting from on-site soil conditions. No capping remedy is required in EU2. 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 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 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 workers and visitors by preventing exposure to areas of the Site where soil concentrations exceed a cancer risk of 1E-5 or a HI of 1. 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 and visitors by eliminating or controlling potential exposure pathways, thus, reducing potential intake and contact of soil/groundwater 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 and future workers and visitors from potential exposures to COPCs present in soil or groundwater at levels that may result in risks of adverse health effects. The proposed capping of EU1 and site-wide institutional controls will prevent contact with any soil or groundwater exceeding risk-based screening levels. 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 contaminants. This is achieved by eliminating the potential for groundwater use and requiring proper planning associated with future intrusive activities.

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 conditions at the Site.

#### **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 treatment residuals and/or untreated wastes. The proposed capping measures have been proven to be effective in the long-term at similar sites with similar conditions. The capping remedy on EU1 will permanently contain the potentially contaminated media in place. In order for the cap to effectively act as a barrier, regular inspections will be required to determine if erosion or cracks have formed that could expose workers and visitors to contaminated materials.

Institutional controls will be implemented to protect future workers and visitors 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 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 in EU1 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 somewhat 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 future site users 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 uncontrolled discharge(s) offsite. Security and fences will be used to maintain controlled access during construction.

**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 for EU1 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 will be incurred as part of the proposed site development. The estimated costs for implementation are relatively low in both the short term and long term.

**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 for EU1 with site-wide institutional controls will satisfy the RCRA Threshold Criteria and Balancing Criteria and will do so in a manner that ensures reliable implementation and effectiveness.



#### 4.0 PROPOSED SITE DEVELOPMENT PLAN

Sub-Parcel B7-1 is proposed to be developed as a Baltimore County Park facility. The Site encompasses 22.0 acres to be transferred to Baltimore County with an anticipated future use of Tier 4B (Restricted Public Recreational Area). The remainder of Parcel B7 will be addressed in separate development plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. Outside of the main development area, temporary construction zones with a total area of less than 0.5 acre will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project. 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 scope of construction work is covered by this RADWP.

The Site was evaluated as two EUs (EU1 and EU2) with land areas of 11.8 acres and 10.1 acres, respectively. These EUs were defined primarily based on the proposed development plans and uses for the southern and northern portions of the Site, as discussed in detail in Section 2.1. The southern portion (EU1) will include the main planned improvements and amenities including a community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc. EU1 will be fully capped by surface engineering controls. The northern portion (EU2) includes existing natural resources (wetlands, buffers, CAEs) that will be retained; this area will have no planned improvements or amenities but may be used sporadically by individuals for bird/wildlife watching, etc. No capping remedy is required in EU2.

Certain compounds are present in the soils located near the surface and in the subsurface at concentrations in excess of the PALs (shown on **Figure 4**). Therefore, soil is considered a potential media of concern. Potential risks to workers and visitors associated with impacts to soil and groundwater will be addressed through a remedy consisting of surface engineering controls (capping of EU1) and site-wide institutional controls (deed restrictions).

Construction Workers may contact impacted surface and/or subsurface soil during earth movement activities associated with construction activities, including within the temporary construction zones outside of the main development area. The findings of the Construction Worker SLRA using the selected exposure frequencies for EU1-EXP (50 days) and EU2-EXP (250 days) indicated the estimates of Construction Worker cancer risk were less than 1E-5 and no HI values above 1 were identified for any organ system (the acceptable thresholds for no further action).

The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, 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 a 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 during 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 for any purpose at the Site 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 workers and visitors 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 overall development plan for the Site is shown on **Figure 2**. Detailed development drawings (provided by Baltimore County) and undercut section drawings (provided by MK Consulting Engineers, LLC) are included as **Appendix D**. The various types of surface engineering controls proposed on EU1 (concrete, asphalt, and landscaping) are summarized on **Figure 8**. A permanent fence will be installed along the southern boundary of the Site to restrict access between the Baltimore County Park facility and the nearby yacht clubs on the adjacent Parcel B25. The approximate fence alignment is also shown on **Figure 8**.

The process of constructing the proposed Baltimore County Park facility will involve the tasks listed below. Documentation for the outlined tasks and procedures will be provided in a Sub-Parcel B7-1 Development Completion Report.

### 4.1 RESPONSE PHASE – WELL RETENTION

All temporary groundwater sample collection points (piezometers) within Parcel B7-1 have previously been abandoned in accordance with COMAR 26.04.04.34 through 36. Records of all piezometer abandonments (including abandonment forms) will be included in the Development Completion Report.

As noted in Section 3.2.3, SW-047-MWS was previously destroyed (likely during construction activities on the highway ramps in the vicinity of the Site). The existing permanent groundwater monitoring well SW-046-MWS will be retained for future use. The location of this well is shown on **Figure 9**. To ensure that the location is not damaged/destroyed during construction, the well should be protected using a sonotube, flagging, and/or barriers as needed prior to grading in this area. Following development, SW-046-MWS will be either 1) converted to a flush-mount well with a protective manhole cover, or 2) retained as a stick-up well with protective steel casing. Tradepoint Atlantic will be granted access for the purpose of future groundwater monitoring as may be required.



#### 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 replaced on-site within each respective EU.

#### 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 B7-1 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. Materials approved by the MDE for industrial use may be used as fill on EU1 only, unless otherwise approved. EU1 will be capped by surface engineering controls.

In the case that there is excess material, the spoils will be stockpiled at a suitable location in accordance with the Materials Management Plan (MMP) for the Sparrows Point Facility (Papadopulos & Associates, et al., June 17, 2015). This work will be coordinated with MDE accordingly. No excess material will leave the 3,100-acre property without prior approval from MDE.

#### 4.2.3 Installation of Structures and Underground Utilities

The community center building, utilities, parking lots, and other infrastructure will be installed as shown on the development plans in **Appendix D**. Excavated soils may be replaced on-site within each respective EU. All utility trenches in EU1 will be backfilled with bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils from within EU1). All utility trenches in EU2 will be backfilled with VCP clean fill or other material approved by the MDE (which may include approved utility trench spoils from within EU2). Additional protocols for 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 Floor Slabs and Paving

Much of EU1 will be covered with floor slabs or paving as indicated in the development plans provided in **Appendix D** and summarized on **Figure 8**. Undercut section drawings are also included in **Appendix D**. The paved areas on EU1 will receive a layer of subbase material which will consist of compacted aggregate base approved by the MDE.



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**. All paved areas will require a minimum of 4 inches of compacted aggregate base and a minimum of 4 inches of overlying pavement surface (asphalt or concrete). <u>Please note</u>, the only exception to the minimum capping sections will be the asphalt trail sections, with 3 inches of asphalt overlying 6 inches of stone base (for a total cap thickness of 9 inches). Due to the light use of the asphalt trails, a thicker pavement section is not necessary.

#### 4.2.5 Landscaping

Much of EU1 will be covered with landscaping caps as indicated in the development plans provided in **Appendix D** and summarized on **Figure 8**. Undercut section drawings are also included in **Appendix D**. 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 underlying material.

#### 4.2.6 Playground

The playground on EU1 will be capped by 24 inches of VCP clean fill constituting the cap. The cap will be further covered by a play surface, likely a pour-in-place rubber product to provide Americans with Disabilities Act (ADA) accessibility. Baltimore County has not yet selected a playground vendor and is not able to definitively state what the final play surface will be at this time. A playground undercut drawing is provided with the development plans in **Appendix D**.

#### 4.2.7 **Artificial Turf**

The sport field on EU1 will consist of synthetic turf manufactured by FieldTurf $^{\otimes}$  or an approved equally protective product. The synthetic turf layer will be underlain by 8 inches of stone. A typical turf field section and undercut drawing are provided with the development plans in **Appendix D**.

#### 4.2.8 **Stormwater Management**

The proposed stormwater utility layout for the Site is provided on the development plan drawings in **Appendix D**. New stormwater infrastructure will be installed throughout the Site, and will include two constructed submerged gravel wetlands. The required minimum thicknesses of all pond sections (which shall apply to the constructed wetlands) are shown in the minimum capping section details provided in **Appendix E**. According to the development plans, the constructed wetlands will be installed with an impermeable PVC liner on all sides and bottom. The liner will be placed between the existing subgrade and varying thickness of overlying clean soil and stone layers above the liner. The pond/wetland sections meet the minimum capping requirements.



Tradepoint Atlantic is working with the MDE Industrial & General Permits Division to renew the property-wide NPDES permit. This Site will not be maintained in the property-wide NPDES permit after property transfer and development. 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 B7-1. 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 (as shown on **Figure 4**). 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/Oil & Grease (6,200 mg/kg). NAPL was not identified in any soil boring.

Following completion of the SLRA, the findings of the Construction Worker evaluation using the selected exposure frequencies for EU1-EXP (50 days) and EU2-EXP (250 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). The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, 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 a 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 on EU1 to be protective of Composite Workers, Adult Recreators, and Child Recreators who otherwise 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**. No capping remedy is required in EU2.



#### 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 inverts. 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 Utility Excavation NAPL Contingency Plan (discussed below) must also be reviewed during the pre-excavation meeting. The HASP and PPE SOP for the project shall also be reviewed and discussed.

The EP will provide oversight of soil excavation/trenching activities as described in Section 5.6. 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 within each respective EU. However, 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 within the Site footprint, and in a location that is not subjected to concentrated stormwater runoff. Stockpiles shall be managed as necessary to prevent the erosion and off-site migration of stockpiled materials, and in accordance with the applicable provisions of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. 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 material 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. NAPL is not anticipated to be encountered during development at the Site.

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 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 and transported to an appropriate 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 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 sampling Work Plan including a description of the material, estimated volume, and sampling parameters will be submitted to the MDE for approval. The resulting analytical data will be submitted to the MDE 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 may be used as structural fill on EU1 only, unless otherwise approved. EU1 will be capped by surface engineering controls. No capping remedy is required in EU2. In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the Site within each respective EU, unless materials are determined by the EP and MDE to be unsuitable for use as outlined in Section 5.1.2 and Section 5.1.3.

All utility trenches in EU1 will be backfilled with bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils from within EU1). 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. All utility trenches in EU2 will be backfilled with VCP clean fill or other material approved by the MDE (which may include approved utility trench spoils from within EU2). Materials placed in areas outside of the Site boundary (i.e., within the temporary construction zones outside of Sub-Parcel B7-1) must meet the VCP clean fill requirements or be otherwise approved by the MDE prior to placement. 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/m³. 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 B7-1 development.

#### 5.2.1 Groundwater PAL Exceedances

Groundwater samples were collected during the preceding Phase II Investigation from four temporary groundwater sample collection points (piezometers) and two permanent monitoring wells within and surrounding the Site. Aqueous PAL exceedances in groundwater in the vicinity of the development LOD included both inorganic and organic compounds. The aqueous PAL exceedances obtained during the Parcel B7 Phase II Investigation are summarized on **Figure 6**.

While the concentrations of PAL exceedances are not deemed to be a significant human health hazard for potential future workers and visitors 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 the installation of underground utilities and within excavations/trenches. **Figure 10** 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 that any water that must be removed will be ultimately sent (via pumping or trucking) to the HCWWTP via the TMC, following any pretreatment, if necessary. Water in the TMC feeds into the HCWWTP where it is treated prior to release into Bear Creek. 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. 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 50 days in EU1-EXP and 250 days in EU2-EXP. The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP. 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 the 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 pavement cap 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 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 owner/operator 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 potential contamination that may not have been previously identified. 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. 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). Based on the scope of proposed earth disturbance, a grading permit will be required as part of this development project. Erosion and Sediment Control Plans will be submitted to, and approved by, the MDE prior to initiation of land disturbance for development. Wetlands have previously been identified within the project area, so a permit will be required from the MDE Water Resources Administration.

# Contingency measures will include the following:

- 1. The MDE will be notified immediately of any previously undiscovered contamination, previously undiscovered storage tanks and other oil-related issues, and citations from regulatory entities related to health and safety practices.
- 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
- Soil Management (imported materials, screening, stockpiling)
- Soil Sampling and Disposal
- Water Management
- Dust Monitoring
- Notable Occurrences (if applicable)
- Additional Associated Work (if applicable)

The proposed implementation schedule is shown below:

Task	<b>Proposed Completion Date</b>
Anticipated RADWP Approval	July 2, 2021
Task	<b>Proposed Completion Date</b>
Installation of Erosion and Sediment Controls	December 2021
Well Protection	December 2021
Site Preparation/Grading – Building Pad & Parking	March 2022
Utility Installations	May 2022
Installation of Pavements	September 2022
Installation of Turf Field	October 2022
Construction of Building	June 2023
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	July 2023
Request for NFA from the MDE	August 2023



Recordation of institutional controls in the land records office of Baltimore County

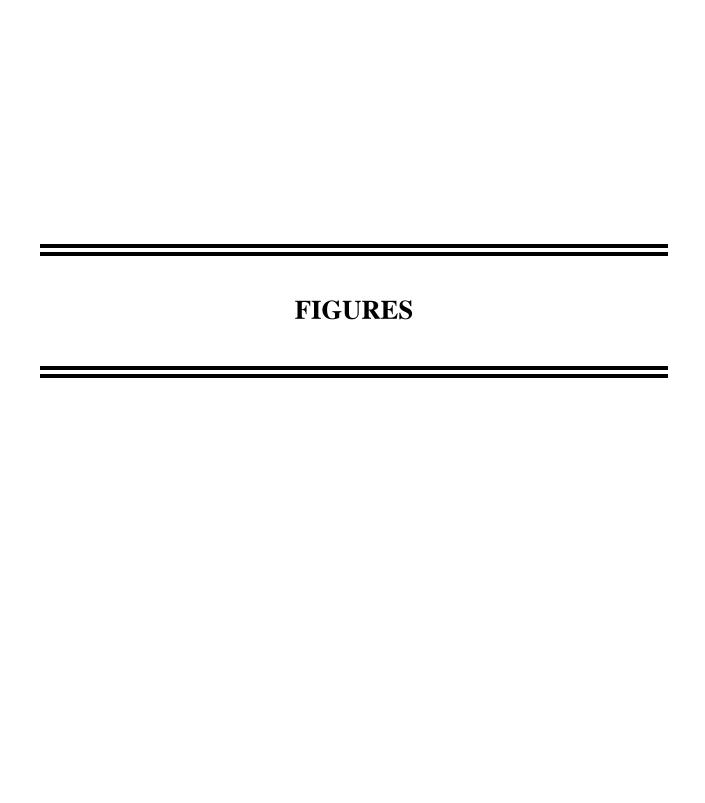
Within 30 days of receiving the approval of NFA from the MDE

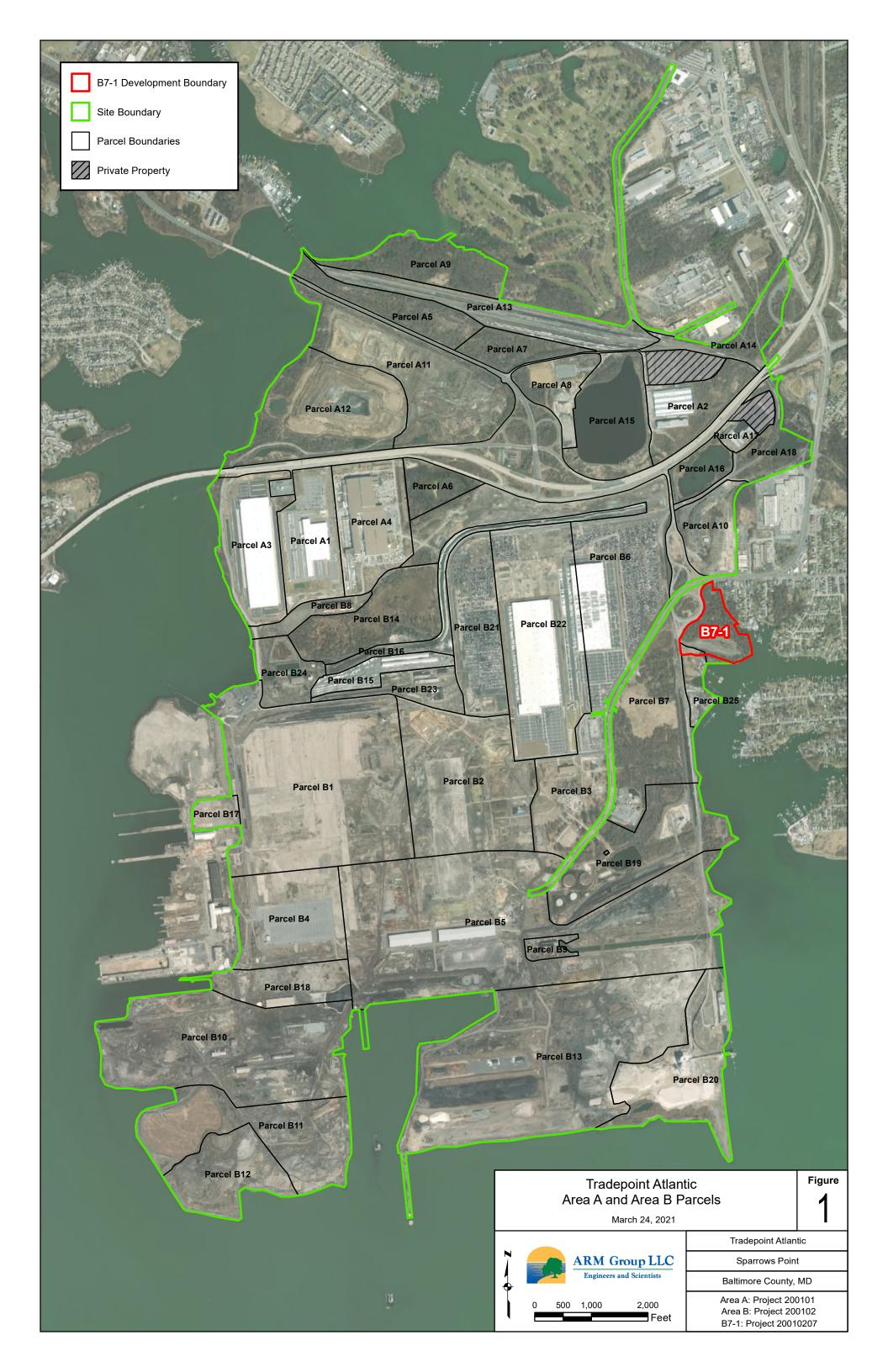
Submit proof of recordation with Baltimore County

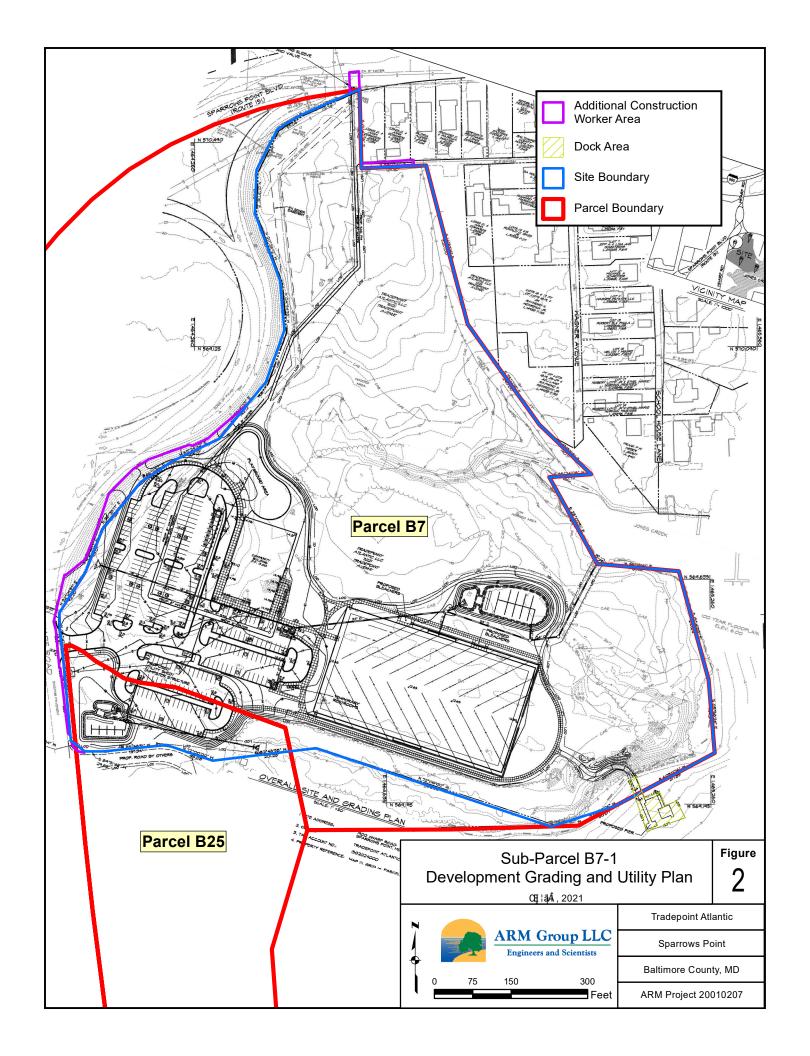
Upon receipt from Baltimore County

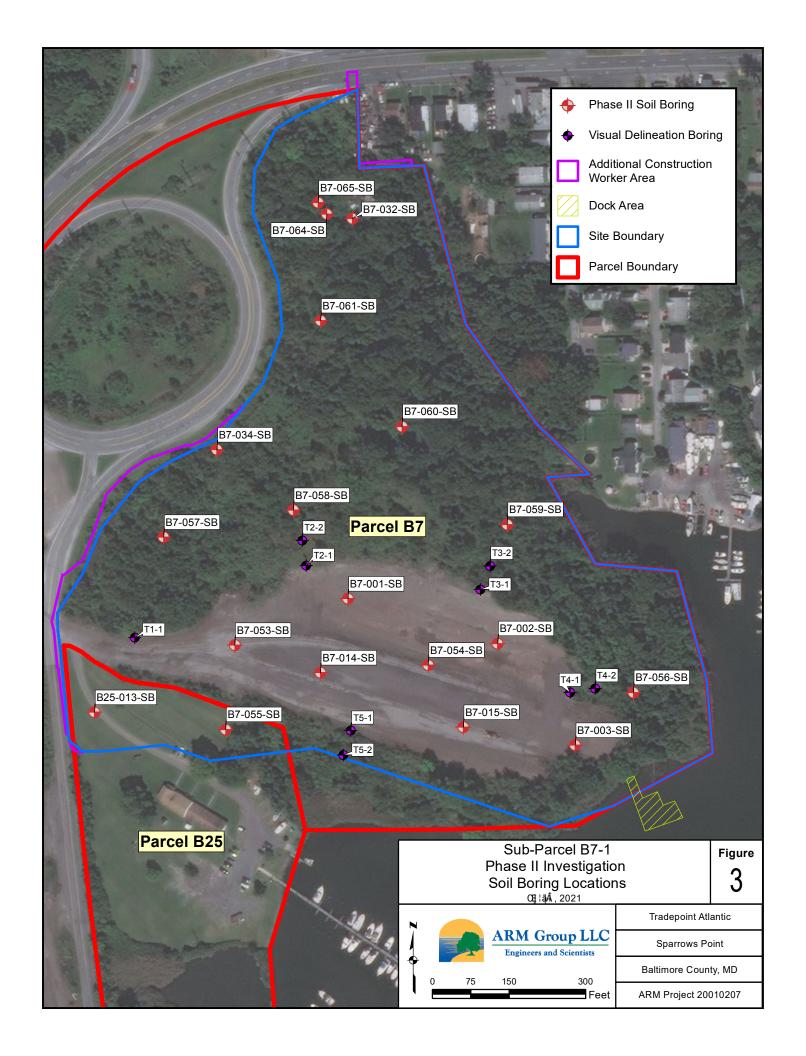
\*Notice of Completion of Remedial Actions will be prepared by Professional Engineer registered in Maryland and submitted with the Development Completion Report to certify that the work is consistent with the requirements of this RADWP and the Site is suitable for occupancy and use.

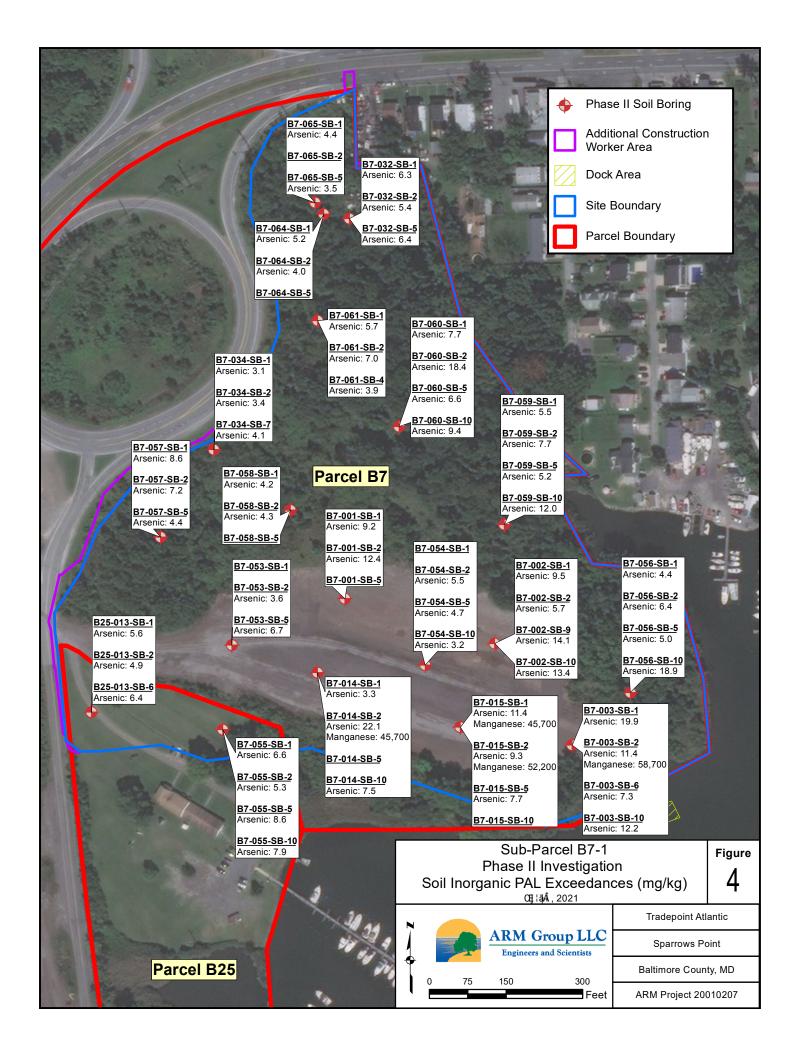


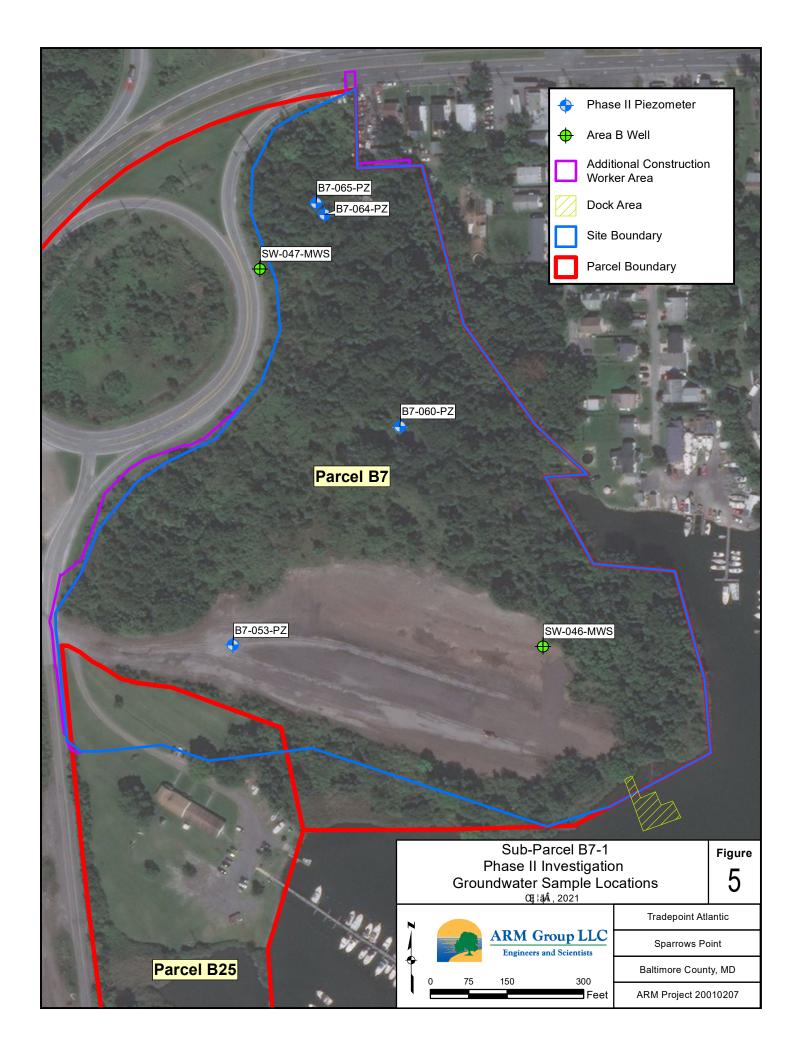


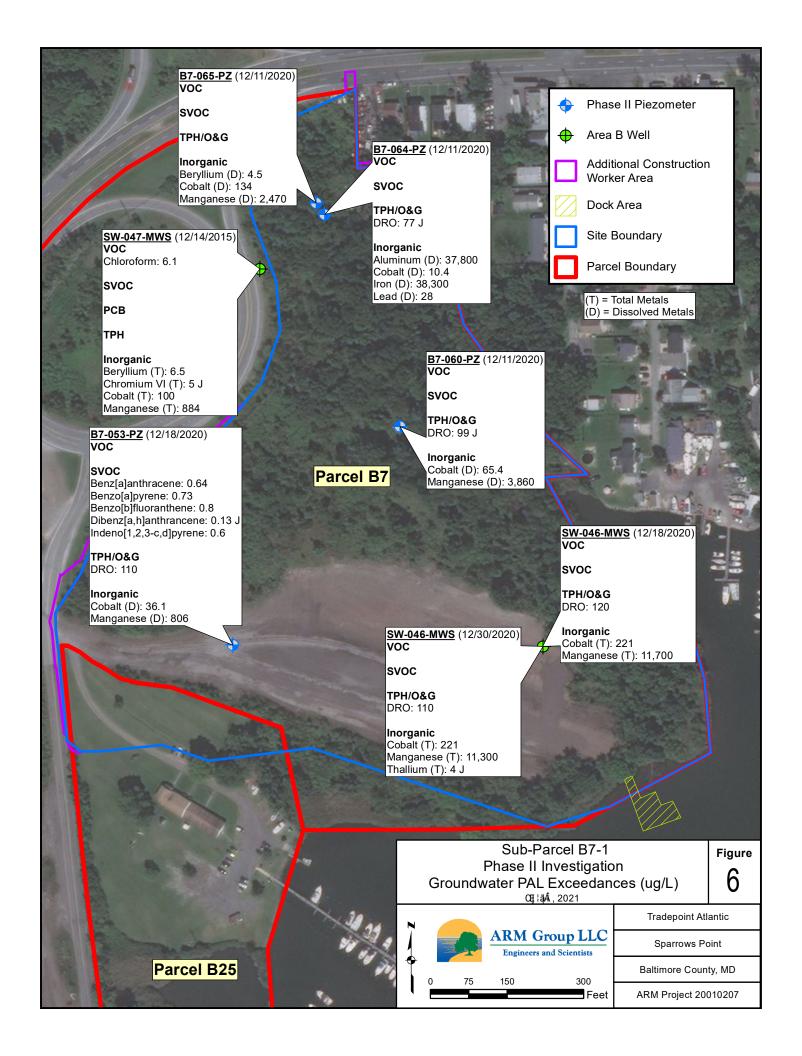


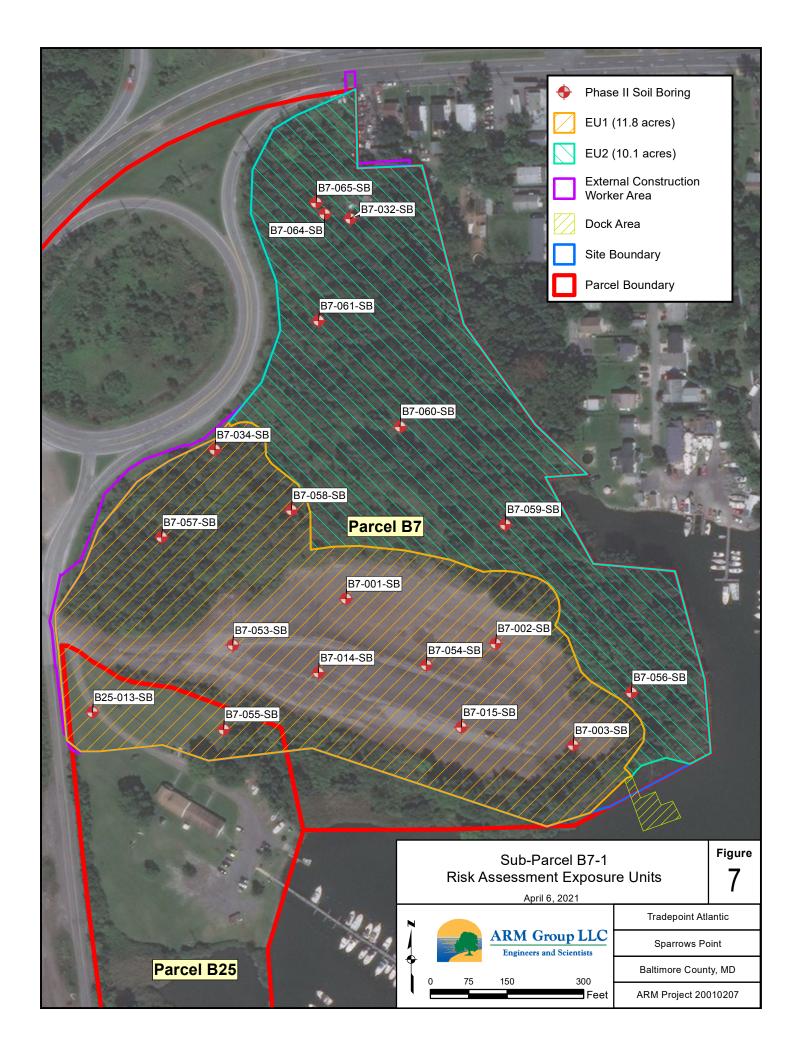


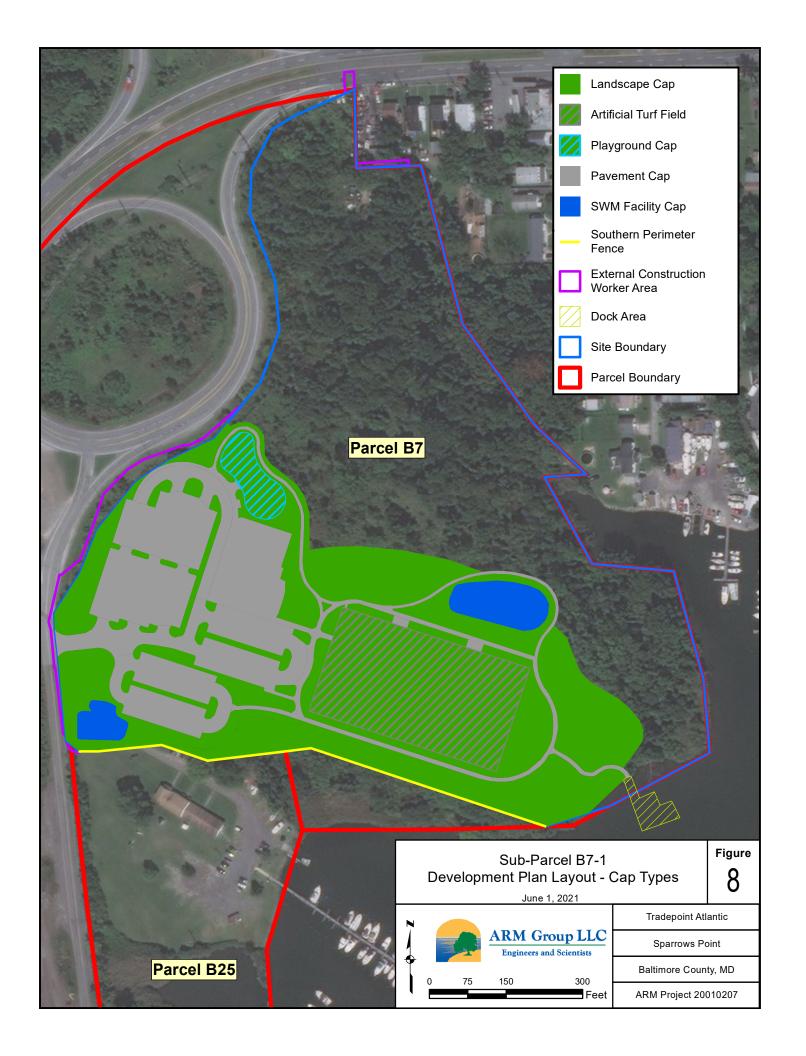


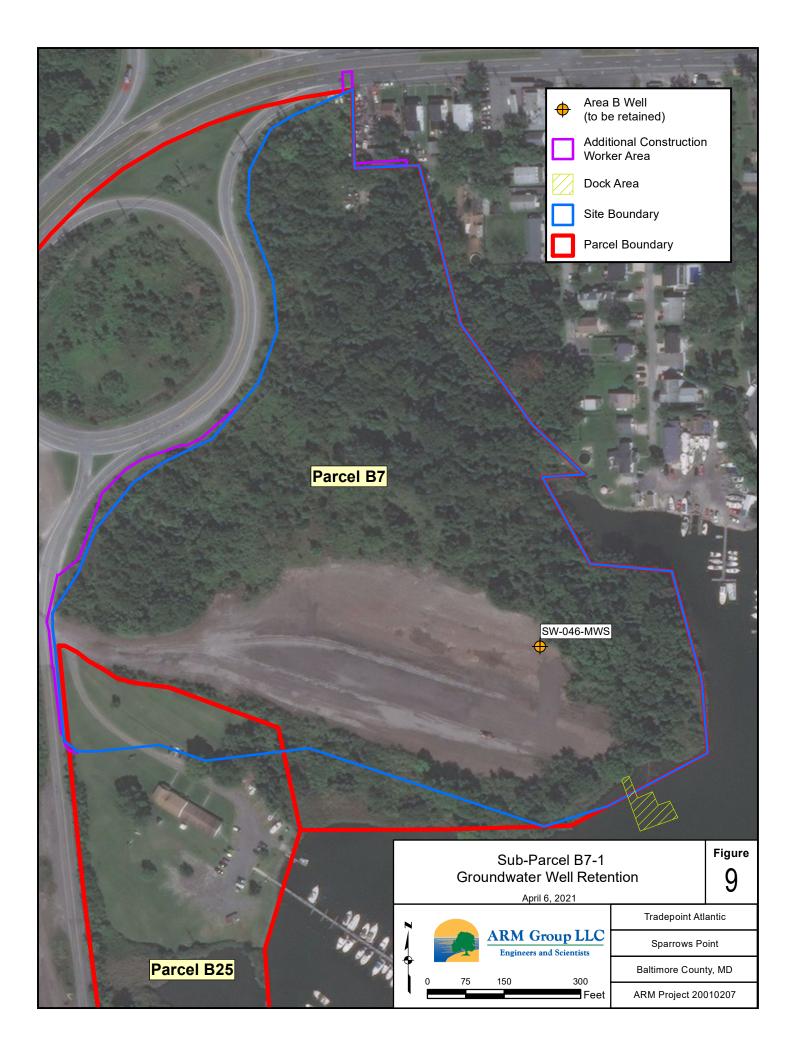


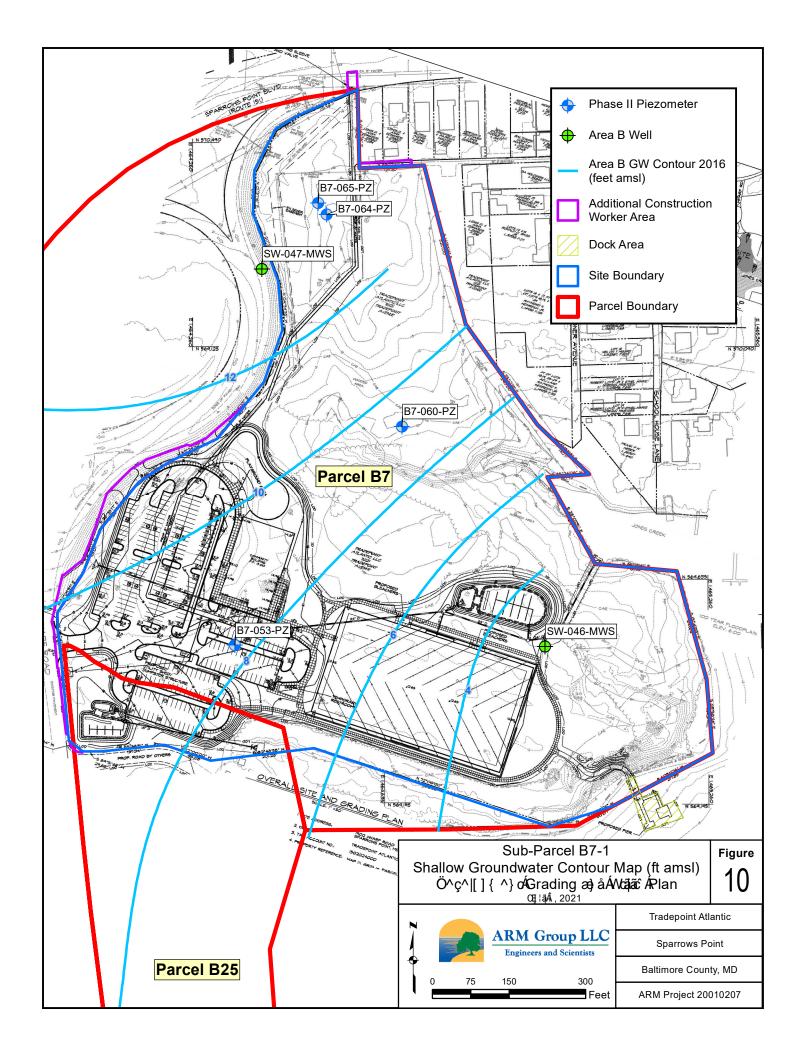












# **TABLES**

Table 1 - Sub-Parcel B7-1 Summary of Organics Detected in Soil

_			B25-013-SB-1*	B25-013-SB-2*	B25-013-SB-6*	B7-001-SB-1*	B7-001-SB-2*	B7-001-SB-5*	B7-002-SB-1*	B7-002-SB-2*	B7-002-SB-9*	B7-003-SB-1*	B7-003-SB-2*	B7-003-SB-6*
Parameter	Units	PAL	10/17/2018	10/17/2018	10/17/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018
Volatile Organic Compounds														
Acetone	mg/kg	670,000	0.013 U	0.0082 J	0.0094 U	N/A	0.21	N/A	N/A	N/A	0.01 U	0.012 U	0.01 U	0.022
Ethylbenzene	mg/kg	25	0.018	0.0018 J	0.0047 U	N/A	0.0048 U	N/A	N/A	N/A	0.005 U	0.0061 U	0.005 U	0.008 U
Xylenes	mg/kg	2,800	0.13	0.014	0.014 U	N/A	0.014 U	N/A	N/A	N/A	0.015 U	0.018 U	0.015 U	0.024 U
Semi-Volatile Organic Compou	ınds^													
2-Methylnaphthalene	mg/kg	3,000	0.0049 J	0.0078 U	0.0079 U	0.019	0.028	0.0076 U	0.046	0.0073 U	0.0084 U	0.0092	0.06	0.028
Acenaphthene	mg/kg	45,000	0.008 U	0.0078 U	0.0079 U	0.01	0.041	0.0076 U	0.031	0.0073 U	0.0084 U	0.0041 J	0.048	0.039
Acenaphthylene	mg/kg	45,000	0.0016 J	0.0078 U	0.0079 U	0.0063 J	0.027	0.0076 U	0.0098	0.0073 U	0.0084 U	0.014	0.49	0.053
Anthracene	mg/kg	230,000	0.0012 J	0.0078 U	0.0079 U	0.014	0.13	0.0076 U	0.039	0.0073 U	0.0084 U	0.013	0.66	0.13
Benz[a]anthracene	mg/kg	21	0.0069 J	0.0018 J	0.0079 U	0.075	0.28	0.0076 U	0.22	0.0073 U	0.0084 U	0.06	2	0.24
Benzaldehyde	mg/kg	120,000	0.078 U	0.077 U	0.077 U	0.072 U	0.027 J	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Benzo[a]pyrene	mg/kg	2.1	0.007 J	0.0011 J	0.0079 U	0.098	0.24	0.0076 U	0.34	0.0073 U	0.0084 U	0.077	1.4	0.2
Benzo[b]fluoranthene	mg/kg	21	0.014	0.002 J	0.0079 U	0.21	0.46	0.0076 U	0.49	0.0073 U	0.0084 U	0.13	2.2	0.28
Benzo[g,h,i]perylene	mg/kg		0.0052 J	0.0078 U	0.0079 U	0.054	0.099	0.0076 U	0.17	0.0073 U	0.0084 U	0.047	0.47	0.054
Benzo[k]fluoranthene	mg/kg	210	0.013	0.0019 J	0.0079 U	0.19	0.14	0.0076 U	0.16	0.0073 U	0.0084 U	0.05	0.89	0.12
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.078 U	0.077 U	0.077 U	0.03 J	0.093	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Caprolactam	mg/kg	400,000	0.2 U	0.19 U	0.19 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.21 U	0.18 U	1.9 U	0.2 U
Carbazole	mg/kg		0.078 U	0.077 U	0.077 U	0.072 U	0.075 U	0.075 U	0.02 J	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Chrysene	mg/kg	2,100	0.0077 J	0.0009 J	0.0079 U	0.098	0.31	0.0076 U	0.25	0.0073 U	0.0084 U	0.08	1.4	0.22
Dibenz[a,h]anthracene	mg/kg	2.1	0.008 U	0.0078 U	0.0079 U	0.021	0.045	0.0076 U	0.068	0.0073 U	0.0084 U	0.019	0.22	0.026
Di-n-butylphthalate	mg/kg	82,000	0.078 U	0.077 U	0.077 U	0.072 U	0.031 J	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Di-n-ocytlphthalate	mg/kg	8,200	0.078 U	0.077 U	0.077 U	0.057 J	0.059 J	0.056 J	0.057 J	0.054 J	0.062 J	0.055 J	0.74 U	0.08 U
Fluoranthene	mg/kg	30,000	0.012	0.0017 J	0.0079 U	0.079	0.33	0.0076 U	0.22	0.0073 U	0.0084 U	0.06	4.7	0.81
Fluorene	mg/kg	30,000	0.008 U	0.0078 U	0.0079 U	0.0036 J	0.024	0.0076 U	0.01	0.0073 U	0.0084 U	0.002 J	0.25	0.035
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.0045 J	0.0078 U	0.0079 U	0.062	0.12	0.0076 U	0.2	0.0073 U	0.0084 U	0.053	0.61	0.07
Naphthalene	mg/kg	8.6	0.0098	0.0078 U	0.0079 U	0.022	0.017	0.0076 U	0.061	0.0073 U	0.0084 U	0.024	0.22	0.062
Phenanthrene	mg/kg		0.0063 J	0.00086 J	0.0079 U	0.065	0.26	0.0012 J	0.15	0.0073 U	0.0084 U	0.034	2.9	0.18
Pyrene	mg/kg	23,000	0.01	0.0017 J	0.0079 U	0.069	0.25	0.0076 U	0.2	0.0073 U	0.0084 U	0.051	3.6	0.55
PCBs														
Aroclor 1248	mg/kg	0.94	0.02 U	N/A	N/A	0.045	N/A	N/A	0.027	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	0.02 U	N/A	N/A	0.019 U	N/A	N/A	0.018 U	N/A	N/A	0.13	N/A	N/A
Aroclor 1260	mg/kg	0.99	0.02 U	N/A	N/A	0.064	N/A	N/A	0.058	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1268	mg/kg		0.014 J	N/A	N/A	0.019 U	N/A	N/A	0.044	N/A	N/A	0.032	N/A	N/A
PCBs (total)	mg/kg	0.97	0.18 U	N/A	N/A	0.11 J	N/A	N/A	0.13 J	N/A	N/A	0.16 J	N/A	N/A
TPH/Oil & Grease														
Diesel Range Organics	mg/kg	6,200	17.4	5.4 J	7.8 U	42.9	42.8	7.6 U	76.8	7.4 U	8.5 U	16.4	55.6	84.6
Gasoline Range Organics	mg/kg	6,200	4 J	11.5 U	9.8 U	13 U	12.2 U	12.5 U	10.8 U	10.1 U	10.7 U	11.9 U	14 U	10.1 U
Oil & Grease	mg/kg	6,200	770	527	557	184	280	369	288	424	467	248	526	906

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

N/A indicates that the 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: This analyte was not detected substantially above the level of the associated method blank or field blank.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds were analyzed via SIM

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

Table 1 - Sub-Parcel B7-1 Summary of Organics Detected in Soil

D 4	TT '	DAT	B7-014-SB-1*	B7-014-SB-2*	B7-014-SB-5*	B7-014-SB-10*	B7-015-SB-1*	B7-015-SB-2*	B7-015-SB-5*	B7-015-SB-10*	B7-032-SB-1*	B7-032-SB-2*	B7-032-SB-5*	B7-034-SB-1*
Parameter	Units	PAL	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	12/21/2020	12/21/2020	12/21/2020	10/2/2018
Volatile Organic Compounds														
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
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
Xylenes	mg/kg	2,800	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 Compo	ounds^													
2-Methylnaphthalene	mg/kg	3,000	0.019	0.0023 J	0.0079 U	0.0085 U	0.008	0.0018 J	0.008 U	0.0077 U	0.005 J	0.0094	0.0084 U	0.0032 J
Acenaphthene	mg/kg	45,000	0.0099	0.00094 J	0.0079 U	0.0085 U	0.0014 J	0.0075 U	0.008 U	0.0077 U	0.0013 J	0.0022 J	0.0084 U	0.0013 J
Acenaphthylene	mg/kg	45,000	0.011	0.0044 J	0.0079 U	0.0085 U	0.019	0.0039 J	0.008 U	0.0077 U	0.0024 J	0.0056 J	0.0084 U	0.0066 J
Anthracene	mg/kg	230,000	0.017	0.004 J	0.0079 U	0.0085 U	0.022	0.0097	0.008 U	0.0077 U	0.0035 J	0.0097	0.0084 U	0.0087
Benz[a]anthracene	mg/kg	21	0.08	0.019	0.0012 J	0.0085 U	0.088	0.034	0.008 U	0.0077 U	0.019	0.043	0.0084 U	0.032
Benzaldehyde	mg/kg	120,000	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	0.079 U	0.083 U	0.081 U
Benzo[a]pyrene	mg/kg	2.1	0.11	0.019	0.0079 U	0.0085 U	0.078	0.021	0.008 U	0.0077 U	0.024	0.047	0.0084 U	0.026
Benzo[b]fluoranthene	mg/kg	21	0.14	0.042	0.0012 J	0.0085 U	0.14	0.039	0.008 U	0.0077 U	0.061	0.11	0.0084 U	0.039
Benzo[g,h,i]perylene	mg/kg		0.1	0.015	0.0079 U	0.0085 U	0.059	0.015	0.008 U	0.0077 U	0.011	0.01	0.0084 U	0.0089
Benzo[k]fluoranthene	mg/kg	210	0.059	0.038	0.0079 U	0.0085 U	0.056	0.014	0.008 U	0.0077 U	0.055	0.096	0.0084 U	0.016
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.23 J	0.02 J	0.025 J	0.081 U
Caprolactam	mg/kg	400,000	0.18 U	0.18 U	0.19 U	0.21 U	0.18 U	0.18 U	0.2 U	0.19 U	2 U	0.2 U	0.028 J	0.2 U
Carbazole	mg/kg		0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	0.079 U	0.083 U	0.081 U
Chrysene	mg/kg	2,100	0.097	0.021	0.0079 U	0.0085 U	0.094	0.038	0.008 U	0.0077 U	0.026	0.051	0.0084 U	0.03
Dibenz[a,h]anthracene	mg/kg	2.1	0.029	0.0039 J	0.0079 U	0.0085 U	0.018	0.0056 J	0.008 U	0.0077 U	0.0036 J	0.0044 J	0.0084 U	0.0032 J
Di-n-butylphthalate	mg/kg	82,000	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	0.026 J	0.048 J	0.081 U
Di-n-ocytlphthalate	mg/kg	8,200	0.056 B	0.054 B	0.058 J	0.063 J	0.055 J	0.056 J	0.06 J	0.057 J	0.82 U	0.079 U	0.083 U	0.059 J
Fluoranthene	mg/kg	30,000	0.11	0.03	0.0079 U	0.0085 U	0.14	0.049	0.008 U	0.0077 U	0.027	0.087	0.0084 U	0.05
Fluorene	mg/kg	30,000	0.0057 J	0.00069 J	0.0079 U	0.0085 U	0.0025 J	0.00084 J	0.008 U	0.0077 U	0.0014 J	0.0034 J	0.0084 U	0.0014 J
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.09	0.012	0.0079 U	0.0085 U	0.051	0.016	0.008 U	0.0077 U	0.0094	0.011	0.0084 U	0.0098
Naphthalene	mg/kg	8.6	0.031	0.0046 J	0.0079 U	0.0081 J	0.013	0.004 J	0.008 U	0.0077 U	0.0067 J	0.0066 J	0.0029 J	0.0032 J
Phenanthrene	mg/kg		0.063	0.011	0.0079 U	0.0085 U	0.041	0.027	0.008 U	0.0077 U	0.013	0.059	0.0084 U	0.03
Pyrene	mg/kg	23,000	0.091	0.026	0.0079 U	0.0085 U	0.13	0.043	0.008 U	0.0077 U	0.027	0.079	0.0084 U	0.05
PCBs														
Aroclor 1248	mg/kg	0.94	0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1254	mg/kg	0.97	0.089	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1260	mg/kg	0.99	0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1268	mg/kg		0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
PCBs (total)	mg/kg	0.97	0.089 J	0.16 U	0.17 U	0.19 U	0.16 U	0.17 U	0.18 U	0.18 U	0.21 U	N/A	N/A	0.18 U
TPH/Oil & Grease														
Diesel Range Organics	mg/kg	6,200	15.7	7.5	7.9 U	8.5 U	6.2 J	7.5	8.1 U	7.8 U	195	28.8	11.7 J	9.8
Gasoline Range Organics	mg/kg	6,200	13.4 U	12.6 U	10.1 U	11.8 U	16.1 U	11.4 U	9.8 U	9.5 U	15 U	13.4 U	12.4 U	10.6 U
Oil & Grease	mg/kg	6,200	916	325	570	768	279	299	797	493	1,090	315 J	500 U	364

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

N/A indicates that the 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.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds were analyzed via SIM

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

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

Table 1 - Sub-Parcel B7-1 Summary of Organics Detected in Soil

			B7-034-SB-2*	B7-034-SB-7*	B7-053-SB-1	B7-053-SB-2	B7-053-SB-5	B7-054-SB-1	B7-054-SB-2	B7-054-SB-5	B7-055-SB-1*	B7-055-SB-2*	B7-055-SB-5*	B7-056-SB-1	B7-056-SB-2
Parameter	Units	PAL	10/2/2018	10/2/2018	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/8/2020	12/8/2020	12/8/2020	12/7/2020	12/7/2020
<b>Volatile Organic Compounds</b>															
Acetone	mg/kg	670,000	N/A	0.0088 U	N/A	N/A	N/A	N/A	N/A						
Ethylbenzene	mg/kg	25	N/A	0.0044 U	N/A	N/A	N/A	N/A	N/A						
Xylenes	mg/kg	2,800	N/A	0.013 U	N/A	N/A	N/A	N/A	N/A						
Semi-Volatile Organic Compou	nds^														
2-Methylnaphthalene	mg/kg	3,000	0.0023 J	0.0077 U	0.0069 J	0.0021 J	0.0081 U	0.0016 J	0.0029 J	0.012	0.0023 J	0.0018 J	0.0085 U	0.024	0.0078
Acenaphthene	mg/kg	45,000	0.0078 U	0.0077 U	0.007 J	0.0077 U	0.0081 U	0.0017 J	0.002 J	0.0012 J	0.0083 U	0.0081 U	0.0085 U	0.0087	0.0011 J
Acenaphthylene	mg/kg	45,000	0.0049 J	0.0077 U	0.0076	0.002 J	0.0081 U	0.047	0.0025 J	0.0028 J	0.0027 J	0.0079 J	0.0085 U	0.31	0.023
Anthracene	mg/kg	230,000	0.0033 J	0.0077 U	0.011	0.0032 J	0.0081 U	0.027	0.0046 J	0.0031 J	0.0016 J	0.0021 J	0.0085 U	0.098	0.011
Benz[a]anthracene	mg/kg	21	0.015	0.0077 U	0.038	0.013	0.0081 U	0.073	0.018	0.011	0.01	0.0096	0.0085 U	0.3	0.037
Benzaldehyde	mg/kg	120,000	0.078 U	0.076 U	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 U	1.5 U
Benzo[a]pyrene	mg/kg	2.1	0.014	0.0077 U	0.045	0.013	0.0081 U	0.088	0.018	0.012	0.013	0.02	0.0085 U	0.68	0.059
Benzo[b]fluoranthene	mg/kg	21	0.028	0.0077 U	0.081	0.026	0.0081 U	0.24	0.032	0.023	0.021	0.032	0.0085 U	1.3	0.11
Benzo[g,h,i]perylene	mg/kg		0.005 J	0.0077 U	0.034	0.0092	0.0081 U	0.17	0.011	0.0086	0.0096	0.026	0.0085 U	0.22	0.041
Benzo[k]fluoranthene	mg/kg	210	0.026	0.0077 U	0.08	0.026	0.0081 U	0.23 J	0.032	0.023	0.021	0.032	0.0085 U	1.3	0.11
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.078 U	0.076 U	0.035 B	0.041 B	0.037 B	0.028 B	0.041 B	0.038 B	0.081 U	0.08 U	0.084 U	0.032 B	1.5 U
Caprolactam	mg/kg	400,000	0.19 U	0.19 U	0.18 U	0.19 U	0.2 U	0.18 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	3.8 U
Carbazole	mg/kg		0.078 U	0.076 U	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 U	1.5 U
Chrysene	mg/kg	2,100	0.013	0.0077 U	0.041	0.013	0.0081 U	0.11	0.019	0.013	0.011	0.011	0.0085 U	0.33	0.042
Dibenz[a,h]anthracene	mg/kg	2.1	0.0017 J	0.0077 U	0.0089	0.0034 J	0.0081 U	0.041	0.0041 J	0.003 J	0.0035 J	0.0074 J	0.0085 U	0.1	0.014
Di-n-butylphthalate	mg/kg	82,000	0.078 U	0.076 U	0.045 B	0.06 B	0.051 B	0.037 B	0.046 B	0.048 B	0.042 J	0.053 J	0.034 J	0.04 B	1.5 U
Di-n-ocytlphthalate	mg/kg	8,200	0.058 J	0.057 J	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 UJ	1.5 U
Fluoranthene	mg/kg	30,000	0.023	0.0077 U	0.066	0.02	0.0081 U	0.1	0.036	0.02	0.013	0.011	0.0085 U	0.48	0.086
Fluorene	mg/kg	30,000	0.0078 U	0.0077 U	0.0061 J	0.0013 J	0.0081 U	0.0025 J	0.0021 J	0.0028 J	0.0083 U	0.0081 U	0.0085 U	0.023	0.0038 J
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.0053 J	0.0077 U	0.031	0.0084	0.0081 U	0.14	0.011	0.0079 J	0.0084	0.022	0.0085 U	0.26	0.04
Naphthalene	mg/kg	8.6	0.0055 J	0.0077 U	0.011	0.0035 J	0.0081 U	0.007 J	0.0048 J	0.0068 J	0.0027 J	0.0044 J	0.0085 U	0.057	0.016
Phenanthrene	mg/kg		0.0098	0.0077 U	0.029	0.0081	0.0081 U	0.021	0.022	0.0088	0.0062 J	0.005 J	0.0085 U	0.19	0.031
Pyrene	mg/kg	23,000	0.019	0.0077 U	0.061	0.018	0.0081 U	0.13	0.033	0.019	0.013	0.0096	0.0085 U	0.44	0.075
PCBs															
Aroclor 1248	mg/kg	0.94	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1254	mg/kg	0.97	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1268	mg/kg		N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
PCBs (total)	mg/kg	0.97	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
TPH/Oil & Grease															
Diesel Range Organics	mg/kg	6,200	5.8 J	7.9 U	16.3	64.9	16.4 U	221	20.5	49.9	12.4 J	16 U	16.5 U	60.7	44.8
Gasoline Range Organics	mg/kg	6,200	11.9 U	8.9 U	11.8 U	9.4 U	10.1 U	8.2 U	9.9 U	10.3 U	12.2 U	8.9 U	11.6 U	10 U	9.5 U
Oil & Grease	mg/kg	6,200	378	325	219 U	314	495 U	189 J	224 J	492 U	500 U	492 U	504 U	226 J	464 U

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

N/A indicates that the 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.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds were analyzed via SIM

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

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

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

Table 1 - Sub-Parcel B7-1 Summary of Organics Detected in Soil

			B7-056-SB-5	B7-057-SB-1*	B7-057-SB-2*	B7-057-SB-5*	B7-058-SB-1	B7-058-SB-2	B7-058-SB-5	B7-059-SB-1	B7-059-SB-2	B7-059-SB-5	B7-060-SB-1*	B7-060-SB-2*
Parameter	Units	PAL	12/7/2020	12/10/2020	12/10/2020	12/10/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/8/2020	12/8/2020
Volatile Organic Compounds														
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
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
Xylenes	mg/kg	2,800	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 Compou	nds^													
2-Methylnaphthalene	mg/kg	3,000	0.0075 U	0.057	0.038	0.019	0.0027 J	0.0082 U	0.0078 U	0.008 U	0.008 J	0.008 U	0.079	0.037
Acenaphthene	mg/kg	45,000	0.0075 U	0.069	0.011	0.0068 J	0.0016 J	0.0082 U	0.0078 U	0.008 U	0.0022 J	0.008 U	0.032	0.041
Acenaphthylene	mg/kg	45,000	0.0021 J	0.2	0.19	0.14	0.014	0.0082 U	0.0078 U	0.0011 J	0.0075 J	0.008 U	0.25	0.091
Anthracene	mg/kg	230,000	0.002 J	0.38	0.14	0.055	0.0068 J	0.0082 U	0.0078 U	0.00078 J	0.017	0.008 U	0.17	0.14
Benz[a]anthracene	mg/kg	21	0.016	0.95	0.66	0.29	0.048	0.0082 U	0.0078 U	0.0033 J	0.038	0.008 U	0.78	0.48
Benzaldehyde	mg/kg	120,000	0.074 U	0.077 U	0.087 U	0.079 U	0.078 U	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	0.84 U
Benzo[a]pyrene	mg/kg	2.1	0.018	0.81	0.8	0.44	0.05	0.0082 U	0.0078 U	0.0032 J	0.037	0.008 U	0.91	0.5
Benzo[b]fluoranthene	mg/kg	21	0.029	1.5	1.5	0.77	0.096	0.0082 U	0.0078 U	0.0057 J	0.062	0.008 U	1.5	0.79
Benzo[g,h,i]perylene	mg/kg		0.01	0.35	0.37	0.25	0.024	0.0082 U	0.0078 U	0.002 J	0.016	0.008 U	0.58	0.26
Benzo[k]fluoranthene	mg/kg	210	0.029	1.3	1.3	0.7	0.095	0.0082 U	0.0078 U	0.0057 J	0.062	0.008 U	1.5	0.79
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.036 B	0.077 U	0.087 U	0.079 U	0.042 B	0.032 B	0.023 B	0.035 B	0.044 B	0.033 B	0.85 U	0.84 U
Caprolactam	mg/kg	400,000	0.19 U	0.19 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.23 U	0.2 U	2.1 U	2.1 U
Carbazole	mg/kg		0.074 U	0.043 J	0.036 J	0.079 U	0.078 U	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	0.2 J
Chrysene	mg/kg	2,100	0.015	0.88	0.67	0.32	0.061	0.0082 U	0.0078 U	0.003 J	0.038	0.008 U	0.77	0.46
Dibenz[a,h]anthracene	mg/kg	2.1	0.0031 J	0.13	0.14	0.085	0.0097	0.0082 U	0.0078 U	0.008 U	0.0072 J	0.008 U	0.22	0.1
Di-n-butylphthalate	mg/kg	82,000	0.042 B	0.043 J	0.043 J	0.036 J	0.049 B	0.036 B	0.03 B	0.042 B	0.055 B	0.04 B	0.85 U	0.84 U
Di-n-ocytlphthalate	mg/kg	8,200	0.074 U	0.077 U	0.087 U	0.079 U	0.078 UJ	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	0.84 U
Fluoranthene	mg/kg	30,000	0.025	2.1	0.99	0.34	0.15	0.0082 U	0.0078 U	0.0043 J	0.072	0.008 U	1.3	0.9
Fluorene	mg/kg	30,000	0.0075 U	0.097	0.021	0.011	0.0058 J	0.0082 U	0.0078 U	0.008 U	0.0027 J	0.008 U	0.038	0.049
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.0096	0.36	0.38	0.25	0.024	0.0082 U	0.0078 U	0.002 J	0.018	0.008 U	0.62	0.28
Naphthalene	mg/kg	8.6	0.0029 J	0.16	0.25	0.19	0.0045 J	0.0082 U	0.0078 U	0.0034 J	0.038	0.008 U	0.64	0.18
Phenanthrene	mg/kg		0.0064 J	1.1	0.32	0.1	0.11	0.0082 U	0.0078 U	0.0018 J	0.033	0.00072 J	0.54	0.49
Pyrene	mg/kg	23,000	0.024	1.7	0.84	0.31	0.11	0.0082 U	0.0078 U	0.0037 J	0.056	0.008 U	0.95	0.71
PCBs														
Aroclor 1248	mg/kg	0.94	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A
Aroclor 1254	mg/kg	0.97	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A
Aroclor 1268	mg/kg		N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A
PCBs (total)	mg/kg	0.97	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A
TPH/Oil & Grease														
Diesel Range Organics	mg/kg	6,200	13.2 B	772	54.4	30.3	19	12.2 B	10.4 B	20.3	28.2	10.4 B	52.7	91.8
Gasoline Range Organics	mg/kg	6,200	9 U	11.3 U	13.2 U	11.8 U	10.5 U	10.5 U	9.5 U	10.4 U	11.7 U	10.5 U	12 U	10.6 U
Oil & Grease	mg/kg	6,200	226 U	483 U	534 U	243 J	480 U	247 U	235 U	482 U	550 U	243 U	233 J	509 U

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

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

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

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

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds were analyzed via SIM

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

Table 1 - Sub-Parcel B7-1 Summary of Organics Detected in Soil

	77.1	D. 1	B7-060-SB-5*	B7-061-SB-1*	B7-061-SB-2*	B7-061-SB-4*	B7-064-SB-1*	B7-064-SB-2*	B7-064-SB-5*	B7-065-SB-1*	B7-065-SB-2*	B7-065-SB-5*
Parameter	Units	PAL	12/8/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020
<b>Volatile Organic Compounds</b>												
Acetone	mg/kg	670,000	N/A									
Ethylbenzene	mg/kg	25	N/A									
Xylenes	mg/kg	2,800	N/A									
Semi-Volatile Organic Compou												
2-Methylnaphthalene	mg/kg	3,000	0.0016 J	0.008 U	0.008 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.008 U	0.0084 U	0.0022 J
Acenaphthene	mg/kg	45,000	0.0077 U	0.008 U	0.008 U	0.0079 U	0.0015 J	0.0078 U	0.0079 U	0.00075 J	0.0084 U	0.0013 J
Acenaphthylene	mg/kg	45,000	0.0011 J	0.008 U	0.008 U	0.0079 U	0.0022 J	0.0078 U	0.0079 U	0.0022 J	0.0084 U	0.0079 U
Anthracene	mg/kg	230,000	0.0011 J	0.00084 J	0.008 U	0.0079 U	0.0027 J	0.0078 U	0.0079 U	0.0013 J	0.0084 U	0.0079 U
Benz[a]anthracene	mg/kg	21	0.008	0.0049 J	0.008 U	0.0079 U	0.017	0.0078 U	0.0079 U	0.012	0.0084 U	0.0079 U
Benzaldehyde	mg/kg	120,000	0.076 U	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Benzo[a]pyrene	mg/kg	2.1	0.0083	0.0043 J	0.008 U	0.0079 U	0.019	0.0078 U	0.0079 U	0.014	0.0084 U	0.0079 U
Benzo[b]fluoranthene	mg/kg	21	0.013	0.0051 J	0.008 U	0.0079 U	0.031	0.0078 U	0.0079 U	0.023	0.0084 U	0.0079 U
Benzo[g,h,i]perylene	mg/kg		0.0062 J	0.0026 J	0.008 U	0.0079 U	0.011	0.0078 U	0.0079 U	0.0079 J	0.0084 U	0.0079 U
Benzo[k]fluoranthene	mg/kg	210	0.013	0.0022 J	0.008 U	0.0079 U	0.028	0.0078 U	0.0079 U	0.021	0.0084 U	0.0079 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.076 U	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Caprolactam	mg/kg	400,000	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U	0.21 U	0.2 U
Carbazole	mg/kg		0.076 U	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Chrysene	mg/kg	2,100	0.008	0.0046 J	0.008 U	0.0079 U	0.019	0.00042 J	0.0079 U	0.014	0.0084 U	0.0079 U
Dibenz[a,h]anthracene	mg/kg	2.1	0.0018 J	0.008 U	0.008 U	0.0079 U	0.0033 J	0.0078 U	0.0079 U	0.0026 J	0.0084 U	0.0079 U
Di-n-butylphthalate	mg/kg	82,000	0.045 J	0.037 J	0.036 J	0.032 J	0.037 J	0.042 J	0.048 J	0.04 J	0.046 J	0.039 J
Di-n-ocytlphthalate	mg/kg	8,200	0.076 U	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Fluoranthene	mg/kg	30,000	0.013	0.007 J	0.008 U	0.0079 U	0.034	0.0078 U	0.0079 U	0.023	0.00079 J	0.00072 J
Fluorene	mg/kg	30,000	0.0077 U	0.008 U	0.008 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.008 U	0.0084 U	0.0079 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.0053 J	0.0021 J	0.008 U	0.0079 U	0.0091	0.0078 U	0.0079 U	0.0073 J	0.0084 U	0.0079 U
Naphthalene	mg/kg	8.6	0.0021 J	0.008 U	0.008 U	0.0079 U	0.0021 J	0.0078 U	0.0079 U	0.008 U	0.0084 U	0.0053 J
Phenanthrene	mg/kg		0.0057 J	0.0039 J	0.008 U	0.0079 U	0.018	0.0078 U	0.0079 U	0.0093	0.0084 U	0.0011 J
Pyrene	mg/kg	23,000	0.012	0.0072 J	0.008 U	0.0079 U	0.031	0.0078 U	0.0079 U	0.02	0.0084 U	0.0079 U
PCBs												
Aroclor 1248	mg/kg	0.94	N/A	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	N/A	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1260	mg/kg	0.99	N/A	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1268	mg/kg		N/A	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
PCBs (total)	mg/kg	0.97	N/A	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
TPH/Oil & Grease												
Diesel Range Organics	mg/kg	6,200	12.9 J	10.7 J	16 U	10 J	15.3 U	15.4 U	15.4 U	15.6 U	16.9 U	15.4 U
Gasoline Range Organics	mg/kg	6,200	9.1 U	9.5 U	9.1 U	9.5 U	9.4 U	9.3 U	8.6 U	9.9 U	10.8 U	11.1 U
Oil & Grease	mg/kg	6,200	140 J	480 U	486 U	479 U	474 U	468 U	476 U	487 U	512 U	476 U

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

N/A indicates that the 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.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds were analyzed via SIM

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

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

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

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

_			B25-013-SB-1*	B25-013-SB-2*	B25-013-SB-6*	B7-001-SB-1*	B7-001-SB-2*	B7-001-SB-5*
Parameter	Units	PAL	10/17/2018	10/17/2018	10/17/2018	10/2/2018	10/2/2018	10/2/2018
Metals								
Aluminum	mg/kg	1,100,000	11,400	16,200	18,800	5,860	6,510	4,960
Antimony	mg/kg	470	2.8 U	2.7 U	2.8 U	2.5 U	2.6 U	2.6 U
Arsenic	mg/kg	3	5.6	4.9	6.4	9.2	12.4	2.2 U
Barium	mg/kg	220,000	170	43.9	46.2	63.4	174	13.2
Beryllium	mg/kg	2,300	0.85 J	0.65 J	0.68 J	0.42 J	0.27 J	0.88 U
Cadmium	mg/kg	980	0.6 J	1.3 U	1.4 U	1.3 U	0.76 J	1.3 U
Chromium	mg/kg	120,000	120	26.1	67.3	903	844	5.3
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.2 U	0.77 J	1.1 U	1.1 U
Cobalt	mg/kg	350	6.7	6.6	6.2	5.3	6.1	2.8 J
Copper	mg/kg	47,000	26.2	12.6	8.3	60.5	84	4.4 U
Iron	mg/kg	820,000	30,600	25,900	20,000	215,000	189,000	3,670
Lead	mg/kg	800	66.7	13.2	12.1	63.5	291	3.9
Manganese	mg/kg	26,000	4,070	168	99.6	22,500	20,200	39.4
Mercury	mg/kg	350	0.078 J	0.11 U	0.11 U	0.021 J	0.41	0.0073 J
Nickel	mg/kg	22,000	15.5	13.3	64.4	26.7	39.2	3.1 J
Vanadium	mg/kg	5,800	189	36.4	39.7	2,410	471	14.2
Zinc	mg/kg	350,000	300	38.4	27	142	414	8.4
Other								
Cyanide	mg/kg	150	0.25 J	1.1 U	1.2 U	0.45 J	1.5	1.1 U

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

D	TT '4	DAT	B7-002-SB-1*	B7-002-SB-2*	B7-002-SB-9*	B7-002-SB-10	B7-003-SB-1*	B7-003-SB-2*
Parameter	Units	PAL	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018
Metals								
Aluminum	mg/kg	1,100,000	8,300	14,800	21,500	N/A	12,100	14,200
Antimony	mg/kg	470	2.4 U	2.6 U	2.8 U	N/A	2.6 U	2.5 U
Arsenic	mg/kg	3	9.5	5.7	14.1	13.4	19.9	11.4
Barium	mg/kg	220,000	85	38.7	97.4	N/A	142	176
Beryllium	mg/kg	2,300	0.64 J	0.45 J	1.7	N/A	1.5	1.3
Cadmium	mg/kg	980	1.2 U	1.3 U	1.4 U	N/A	1.3 U	1.3 U
Chromium	mg/kg	120,000	1,040	33.2	45.5	N/A	379	1,270
Chromium VI	mg/kg	6.3	0.7 J	1.1 U	0.65 J	N/A	1.1 U	1.1 U
Cobalt	mg/kg	350	8.3	5.8	8	N/A	32.9	9
Copper	mg/kg	47,000	292	8.3	29.4	N/A	191	133
Iron	mg/kg	820,000	223,000	21,800	53,200	N/A	299,000	158,000
Lead	mg/kg	800	281	15.8	22.9	N/A	79.1	32
Manganese	mg/kg	26,000	19,500	287	177	N/A	9,650	58,700
Mercury	mg/kg	350	0.035 J	0.019 J	0.13 U	N/A	0.028 J	0.019 J
Nickel	mg/kg	22,000	54.9	12.6	19.5	N/A	97.4	73.5
Vanadium	mg/kg	5,800	1,790	43.1	57.5	N/A	558	4,020
Zinc	mg/kg	350,000	180	37.8	80.3	N/A	207	68.1
Other								
Cyanide	mg/kg	150	0.49 J	1.1 U	1.3 U	N/A	0.34 J	0.14 J

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

	1		D7 002 CD (*	D7 003 CD 10	D7 014 CD 1*	D7 014 CD 3*	D7 014 CD 5*	D7 014 CD 10*
Parameter	Units	PAL	B7-003-SB-6*	B7-003-SB-10	B7-014-SB-1*	B7-014-SB-2*	B7-014-SB-5*	B7-014-SB-10*
T drameter	Cints	TTIE	10/2/2018	10/2/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018
Metals								
Aluminum	mg/kg	1,100,000	19,800	N/A	38,700	27,100	14,000	18,400
Antimony	mg/kg	470	10.3	N/A	2.7 U	2.5 U	2.8 U	3.1 U
Arsenic	mg/kg	3	7.3	12.2	3.3	22.1	2.3 U	7.5
Barium	mg/kg	220,000	103	N/A	422	406	50.7	64.4
Beryllium	mg/kg	2,300	0.98	N/A	4.2	2.4	0.58 J	1
Cadmium	mg/kg	980	1.4 U	N/A	1.3 U	1.2 U	1.4 U	1.5 U
Chromium	mg/kg	120,000	43.9	N/A	149	2,440	20.5	37.8
Chromium VI	mg/kg	6.3	1.2 U	N/A	1.1 U	1.1 U	0.65 J	1.2 J
Cobalt	mg/kg	350	16.6	N/A	9.9	4.1 U	6.5	7.8
Copper	mg/kg	47,000	27.9	N/A	50.6	35.8	8.1	14.5
Iron	mg/kg	820,000	27,200	N/A	110,000	98,200	12,900	32,400
Lead	mg/kg	800	52.1	N/A	87.3	9.1	9.3	12
Manganese	mg/kg	26,000	773	N/A	7,530	45,700	90.4	127
Mercury	mg/kg	350	2.6	N/A	0.011 J	0.0068 J	0.11 U	0.12 U
Nickel	mg/kg	22,000	32.9	N/A	14	5.2 J	14.4	18.5
Vanadium	mg/kg	5,800	48.7	N/A	244	1,850	22.8	41.1
Zinc	mg/kg	350,000	91.2	N/A	83.3	54.6	36.4	55.9
Other								
Cyanide	mg/kg	150	0.25 J	N/A	0.97	0.48 J	0.95 U	1.3 U

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

I Inite	DAI	B7-015-SB-1*	B7-015-SB-2*	B7-015-SB-5*	B7-015-SB-10*	B7-032-SB-1*	B7-032-SB-2*
Ollits	FAL	10/1/2018	10/1/2018	10/1/2018	10/1/2018	12/21/2020	12/21/2020
mg/kg	1,100,000	16,300	17,600	14,700	20,200	8,410	11,100
mg/kg	470	2.6 U	2.7 U	2.9 U	2.7 U	3.1 U	2.8 U
mg/kg	3	11.4	9.3	7.7	2.2 U	6.3	5.4
mg/kg	220,000	277	353	87.5	62.9	61.5	78.5
mg/kg	2,300	1.3	1.9	0.69 J	0.72 J	1.2	0.52 J
mg/kg	980	1.3 U	1.3 U	1.4 U	1.3 U	1.2 J	0.44 J
mg/kg	120,000	1,950	1,670	26.1	32.7	38.6	22.6
mg/kg	6.3	1.1 U	1.1 U	1.2 U	1.2 U	1.3 U	1.2 U
mg/kg	350	3.1 J	1.6 J	9.5	10.3	8.9	5.7
mg/kg	47,000	44.1	38.4	8.6	9	36	20.4
mg/kg	820,000	138,000	124,000	23,600	15,700	26,900	14,900
mg/kg	800	30.9	22.9	11.7	10.6	107	66.4
mg/kg	26,000	45,700	52,200	204	150	322	237
mg/kg	350	0.025 J	0.11 U	0.0076 J	0.12 U	0.095 J	0.11 J
mg/kg	22,000	12	9.2	14.1	18.5	22.9	12.6
mg/kg	5,800	3,130	3,410	35.6	31.8	44.5	32.5
mg/kg	350,000	90.2	53.1	36.4	54.9	203	165
mg/kg	150	0.26 J	0.35 J	1.1 U	0.93 U	0.27 J	0.18 J
	mg/kg	mg/kg         1,100,000           mg/kg         470           mg/kg         3           mg/kg         220,000           mg/kg         2,300           mg/kg         980           mg/kg         120,000           mg/kg         6.3           mg/kg         350           mg/kg         820,000           mg/kg         800           mg/kg         26,000           mg/kg         350           mg/kg         22,000           mg/kg         5,800           mg/kg         350,000	mg/kg         1,100,000         16,300           mg/kg         470         2.6 U           mg/kg         3         11.4           mg/kg         220,000         277           mg/kg         2,300         1.3           mg/kg         980         1.3 U           mg/kg         120,000         1,950           mg/kg         6.3         1.1 U           mg/kg         350         3.1 J           mg/kg         47,000         44.1           mg/kg         820,000         138,000           mg/kg         800         30.9           mg/kg         26,000         45,700           mg/kg         350         0.025 J           mg/kg         5,800         3,130           mg/kg         5,800         3,130           mg/kg         350,000         90.2	Units         PAL         10/1/2018         10/1/2018           mg/kg         1,100,000         16,300         17,600           mg/kg         470         2.6 U         2.7 U           mg/kg         3         11.4         9.3           mg/kg         220,000         277         353           mg/kg         2,300         1.3         1.9           mg/kg         980         1.3 U         1.3 U           mg/kg         120,000         1,950         1,670           mg/kg         6.3         1.1 U         1.1 U           mg/kg         350         3.1 J         1.6 J           mg/kg         47,000         44.1         38.4           mg/kg         820,000         138,000         124,000           mg/kg         800         30.9         22.9           mg/kg         350         0.025 J         0.11 U           mg/kg         350         0.025 J         0.11 U           mg/kg         5,800         3,130         3,410           mg/kg         350,000         90.2         53.1	mg/kg         1,100,000         16,300         17,600         14,700           mg/kg         470         2.6 U         2.7 U         2.9 U           mg/kg         3         11.4         9.3         7.7           mg/kg         220,000         277         353         87.5           mg/kg         2,300         1.3         1.9         0.69 J           mg/kg         980         1.3 U         1.3 U         1.4 U           mg/kg         120,000         1,950         1,670         26.1           mg/kg         6.3         1.1 U         1.1 U         1.2 U           mg/kg         350         3.1 J         1.6 J         9.5           mg/kg         47,000         44.1         38.4         8.6           mg/kg         820,000         138,000         124,000         23,600           mg/kg         800         30.9         22.9         11.7           mg/kg         26,000         45,700         52,200         204           mg/kg         350         0.025 J         0.11 U         0.0076 J           mg/kg         5,800         3,130         3,410         35.6           mg/kg         350,	Units         PAL         10/1/2018         10/1/2018         10/1/2018         10/1/2018         10/1/2018           mg/kg         1,100,000         16,300         17,600         14,700         20,200           mg/kg         470         2.6 U         2.7 U         2.9 U         2.7 U           mg/kg         3         11.4         9.3         7.7         2.2 U           mg/kg         220,000         277         353         87.5         62.9           mg/kg         2,300         1.3         1.9         0.69 J         0.72 J           mg/kg         980         1.3 U         1.3 U         1.4 U         1.3 U           mg/kg         120,000         1,950         1,670         26.1         32.7           mg/kg         6.3         1.1 U         1.1 U         1.2 U         1.2 U           mg/kg         350         3.1 J         1.6 J         9.5         10.3           mg/kg         47,000         44.1         38.4         8.6         9           mg/kg         820,000         138,000         124,000         23,600         15,700           mg/kg         800         30.9         22.9         11.7         10.6<	Units         PAL         10/1/2018         10/1/2018         10/1/2018         10/1/2018         10/1/2018         12/21/2020           mg/kg         1,100,000         16,300         17,600         14,700         20,200         8,410           mg/kg         470         2.6 U         2.7 U         2.9 U         2.7 U         3.1 U           mg/kg         3         11.4         9.3         7.7         2.2 U         6.3           mg/kg         220,000         277         353         87.5         62.9         61.5           mg/kg         2,300         1.3         1.9         0.69 J         0.72 J         1.2           mg/kg         980         1.3 U         1.3 U         1.4 U         1.3 U         1.2 J           mg/kg         120,000         1,950         1,670         26.1         32.7         38.6           mg/kg         6.3         1.1 U         1.1 U         1.2 U         1.3 U         1.3 U           mg/kg         350         3.1 J         1.6 J         9.5         10.3         8.9           mg/kg         47,000         44.1         38.4         8.6         9         36           mg/kg         800

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

D	TT '.	DAT	B7-032-SB-5*	B7-034-SB-1*	B7-034-SB-2*	B7-034-SB-7*	B7-053-SB-1	B7-053-SB-2	B7-053-SB-5
Parameter	Units	PAL	12/21/2020	10/2/2018	10/2/2018	10/2/2018	12/7/2020	12/7/2020	12/7/2020
Metals									
Aluminum	mg/kg	1,100,000	21,200	20,000	15,100	16,400	31,900	13,400	16,600
Antimony	mg/kg	470	2.9 U	2.8 U	2.8 U	2.7 U	2.7 UJ	2.7 UJ	2.9 UJ
Arsenic	mg/kg	3	6.4	3.1	3.4	4.1	2.2 UJ	3.6	6.7
Barium	mg/kg	220,000	83.5	222	115	67.9	350 J	61.2 J	34.3 J
Beryllium	mg/kg	2,300	1	1.4	0.77 J	0.57 J	4.8	0.5 J	0.65 J
Cadmium	mg/kg	980	1.4 U	0.48 J	1.4 U	1.3 U	0.35 J	1.4 U	1.4 U
Chromium	mg/kg	120,000	24.9	28	30.2	20.1	22.3 J	20.5 J	26.7 J
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.2 U	1.2 U	1.1 R	1.2 R	0.79 B
Cobalt	mg/kg	350	5.4	5.2	5.7	5	4.4 U	5.7	6.2
Copper	mg/kg	47,000	10.4	16.8	13.7	4.4 J	3.1 J	12.2	13.1
Iron	mg/kg	820,000	16,300	14,400	14,600	14,100	4,480 J	17,900 J	16,200 J
Lead	mg/kg	800	15.7	37.1	31.7	9.7	5.8	20.9	11.4
Manganese	mg/kg	26,000	54.4	1,650	584	25.2	2,370 J	243 J	67.9 J
Mercury	mg/kg	350	0.12 U	0.14	0.91	0.12 U	0.1 U	0.14	0.022 J
Nickel	mg/kg	22,000	14.6	21.2	19.8	11	1.6 J	12.2	13.9
Vanadium	mg/kg	5,800	30.5	72.1	46.3	25.1	39.9 J	32.8 J	33.1 J
Zinc	mg/kg	350,000	26.3	77.2	63.9	25.8	5.9	48	43.5
Other									
Cyanide	mg/kg	150	1.3 U	0.15 J	1.2 U	1.1 U	0.37 J	0.25 J	0.17 J

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

Linita	DAI	B7-054-SB-1	B7-054-SB-2	B7-054-SB-5	B7-054-SB-10*	B7-055-SB-1*	B7-055-SB-2*
Units	PAL	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/8/2020	12/8/2020
mg/kg	1,100,000	15,700	12,000	15,000	N/A	13,600	12,400
mg/kg	470	2.5 UJ	3 UJ	3 UJ	N/A	3 U	3 U
mg/kg	3	2.1 UJ	5.5	4.7	3.2	6.6	5.3
mg/kg	220,000	314 J	63.8 J	123 J	N/A	111	71.1
mg/kg	2,300	2	0.58 J	0.6 J	N/A	1.1	0.64 J
mg/kg	980	0.54 J	1.5 U	1.5 U	N/A	0.38 J	1.5 U
mg/kg	120,000	445 J	19.8 J	27.4 J	N/A	29	23.9
mg/kg	6.3	0.8 B	1.2 R	1.2 R	N/A	1.3 U	1.3 U
mg/kg	350	3.2 J	8.4	5.3	N/A	5.6	5.4
mg/kg	47,000	24.2	16.3	14.2	N/A	19	14.4
mg/kg	820,000	55,900 J	13,200 J	16,800 J	N/A	21,000	16,000
mg/kg	800	30.7	42.9	10.4	N/A	38.5	37.1
mg/kg	26,000	25,900 J	195 J	84.9 J	N/A	1,140	261
mg/kg	350	0.11 U	0.2	0.12 U	N/A	0.041 J	0.056 J
mg/kg	22,000	5.3 J	14	13.1	N/A	12.9	11.9
mg/kg	5,800	1,230 J	28 J	34.5 J	N/A	58.6	27.1
mg/kg	350,000	91.3	81.3	41.4	N/A	153	67.9
mg/kg	150	0.38 J	0.19 J	0.16 J	N/A	1.1 U	0.14 J
	mg/kg	mg/kg         1,100,000           mg/kg         470           mg/kg         3           mg/kg         220,000           mg/kg         2,300           mg/kg         980           mg/kg         120,000           mg/kg         6.3           mg/kg         350           mg/kg         820,000           mg/kg         800           mg/kg         26,000           mg/kg         350           mg/kg         5,800           mg/kg         350,000	Market         PAL           mg/kg         1,100,000         15,700           mg/kg         470         2.5 UJ           mg/kg         3         2.1 UJ           mg/kg         220,000         314 J           mg/kg         2,300         2           mg/kg         980         0.54 J           mg/kg         120,000         445 J           mg/kg         6.3         0.8 B           mg/kg         350         3.2 J           mg/kg         47,000         24.2           mg/kg         820,000         55,900 J           mg/kg         360         30.7           mg/kg         26,000         25,900 J           mg/kg         350         0.11 U           mg/kg         5,800         1,230 J           mg/kg         350,000         91.3	PAL         12/7/2020         12/7/2020           mg/kg         1,100,000         15,700         12,000           mg/kg         470         2.5 UJ         3 UJ           mg/kg         3         2.1 UJ         5.5           mg/kg         220,000         314 J         63.8 J           mg/kg         2,300         2         0.58 J           mg/kg         980         0.54 J         1.5 U           mg/kg         120,000         445 J         19.8 J           mg/kg         6.3         0.8 B         1.2 R           mg/kg         350         3.2 J         8.4           mg/kg         47,000         24.2         16.3           mg/kg         820,000         55,900 J         13,200 J           mg/kg         800         30.7         42.9           mg/kg         26,000         25,900 J         195 J           mg/kg         350         0.11 U         0.2           mg/kg         5,800         1,230 J         28 J           mg/kg         350,000         91.3         81.3	Male         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020         15,000           mg/kg         3         2.1 UJ         5.5         4.7           mg/kg         220,000         314 J         63.8 J         123 J           mg/kg         2,300         2         0.58 J         0.6 J           mg/kg         980         0.54 J         1.5 U         1.5 U           mg/kg         980         0.54 J         1.5 U         1.5 U           mg/kg         120,000         445 J         19.8 J         27.4 J           mg/kg         6.3         0.8 B         1.2 R         1.2 R           mg/kg         350         3.2 J         8.4         5.3           mg/kg         47,000         24.2         16.3         14.2           mg/kg         800         30.7         42.9         10.4           mg/kg         26,000         25,900 J         195 J         84.9 J	Units         PAL         12/7/2020         12/7/2020         12/7/2020         12/7/2020         12/7/2020           mg/kg         1,100,000         15,700         12,000         15,000         N/A           mg/kg         470         2.5 UJ         3 UJ         N/A           mg/kg         3         2.1 UJ         5.5         4.7         3.2           mg/kg         220,000         314 J         63.8 J         123 J         N/A           mg/kg         2,300         2         0.58 J         0.6 J         N/A           mg/kg         980         0.54 J         1.5 U         1.5 U         N/A           mg/kg         120,000         445 J         19.8 J         27.4 J         N/A           mg/kg         6.3         0.8 B         1.2 R         1.2 R         N/A           mg/kg         350         3.2 J         8.4         5.3         N/A           mg/kg         47,000         24.2         16.3         14.2         N/A           mg/kg         820,000         55,900 J         13,200 J         16,800 J         N/A           mg/kg         26,000         25,900 J         195 J         84.9 J         N/A	Units         PAL         12/7/2020         12/8/2020         20/8         10/8         10/8         10/8         10/8         10/8         10/8         10/8         10/8         10/8         11

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

	T	DAT	B7-055-SB-5*	B7-055-SB-10*	B7-056-SB-1	B7-056-SB-2	B7-056-SB-5	B7-056-SB-10*
Parameter	Units	PAL	12/8/2020	12/8/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020
Metals								
Aluminum	mg/kg	1,100,000	16,900	N/A	15,800	13,100	8,770	N/A
Antimony	mg/kg	470	3 U	N/A	2.7 UJ	2.8 UJ	2.6 UJ	N/A
Arsenic	mg/kg	3	8.6	7.9	4.4	6.4	5	18.9
Barium	mg/kg	220,000	38.2	N/A	99.4 J	49.2 J	46.6 J	N/A
Beryllium	mg/kg	2,300	0.9 J	N/A	0.92	0.63 J	0.47 J	N/A
Cadmium	mg/kg	980	1.5 U	N/A	0.36 J	1.4 U	1.3 U	N/A
Chromium	mg/kg	120,000	30.5	N/A	39.6 J	33.9 J	12.8 J	N/A
Chromium VI	mg/kg	6.3	1.3	N/A	1.2 R	1.2 R	1.1 R	N/A
Cobalt	mg/kg	350	6.6	N/A	5.4	4.8	5.1	N/A
Copper	mg/kg	47,000	15.6	N/A	14.7	13.9	12.2	N/A
Iron	mg/kg	820,000	36,200	N/A	18,500 J	24,500 J	9,650 J	N/A
Lead	mg/kg	800	12.3	N/A	29.6	27.5	27.8	N/A
Manganese	mg/kg	26,000	75.1	N/A	1,120 J	263 J	78.7 J	N/A
Mercury	mg/kg	350	0.12 U	N/A	0.04 J	0.011 J	0.52	N/A
Nickel	mg/kg	22,000	15.7	N/A	12.7	13.2	10.1	N/A
Vanadium	mg/kg	5,800	41.7	N/A	72.7 J	35.7 J	16.1 J	N/A
Zinc	mg/kg	350,000	46.8	N/A	68.3	48.3	40.9	N/A
Other								
Cyanide	mg/kg	150	1 U	N/A	0.19 J	1.1 U	0.13 J	N/A

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

N/A indicates that the 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.

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<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

	п	1	T = = 1 = = 1 + 1							
Parameter	Units	PAL	B7-057-SB-1*	B7-057-SB-2*	B7-057-SB-5*	B7-058-SB-1	B7-058-SB-2	B7-058-SB-5	B7-059-SB-1	
1 arameter	Onits	TAL	12/10/2020	12/10/2020	12/10/2020	12/7/2020	12/7/2020	12/7/2020	12/7/2020	
Metals										
Aluminum	mg/kg	1,100,000	14,300	22,700	16,700	13,200	13,200	8,340	7,880	
Antimony	mg/kg	470	2.8 U	3.2 U	2.9 U	2.9 UJ	3.1 UJ	2.8 UJ	3 UJ	
Arsenic	mg/kg	3	8.6	7.2	4.4	4.2	4.3	2.3 J-	5.5	
Barium	mg/kg	220,000	71.4	87.7	138	47.7 J	27.6 J	18.7 J	29.3 J	
Beryllium	mg/kg	2,300	0.88 J	1.4	1.2	0.44 J	0.25 J	0.15 J	0.3 J	
Cadmium	mg/kg	980	0.52 J	0.48 J	0.65 J	1.4 U	1.5 U	1.4 U	1.5 U	
Chromium	mg/kg	120,000	49.7	78.9	89.9	20.3 J	21.3 J	8.8 J	28.8 J	
Chromium VI	mg/kg	6.3	1.2 U	1.3 U	1.2 U	1.2 R	0.86 B	1.2 R	1.2 R	
Cobalt	mg/kg	350	10	16.7	15.2	6	3.8 J	2.1 J	3.9 J	
Copper	mg/kg	47,000	41.8	26.2	22.2	10.5	7.9	3.6 J	11.4	
Iron	mg/kg	820,000	34,000	37,700	25,200	16,200 J	17,000 J	6,920 J	24,700 J	
Lead	mg/kg	800	74.1	47.7	82.3	19.1	8.2	4	11.8	
Manganese	mg/kg	26,000	719	1,220	2,250	200 J	80.3 J	33.4 J	174 J	
Mercury	mg/kg	350	0.66	0.092 J	0.22	0.043 J	0.013 J	0.11 U	0.016 J	
Nickel	mg/kg	22,000	32.6	67.2	78.7	12.1	8.5 J	5.8 J	19.3	
Vanadium	mg/kg	5,800	86.2	72.1	101	28.8 J	27.1 J	12 J	36.1 J	
Zinc	mg/kg	350,000	191	137	181	62.8	21.9	15.8	32.3	
Other										
Cyanide	mg/kg	150	0.31 J	0.68 J	1.1	0.16 J	0.17 J	0.15 J	0.27 J	

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<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

D (	TT '4	DAT	B7-059-SB-2	B7-059-SB-5	B7-059-SB-10*	B7-060-SB-1*	B7-060-SB-2*	B7-060-SB-5*
Parameter	Units	PAL	12/7/2020	12/7/2020	12/7/2020	12/8/2020	12/8/2020	12/8/2020
Metals								
Aluminum	mg/kg	1,100,000	17,200	16,400	N/A	13,700	18,200	11,600
Antimony	mg/kg	470	3.4 UJ	2.9 UJ	N/A	3.2 U	3 U	2.7 U
Arsenic	mg/kg	3	7.7	5.2	12	7.7	18.4	6.6
Barium	mg/kg	220,000	77.1 J	43.1 J	N/A	86.2	153	57
Beryllium	mg/kg	2,300	0.49 J	0.5 J	N/A	0.96 J	1.4	0.62 J
Cadmium	mg/kg	980	1.7 U	1.4 U	N/A	0.6 J	0.85 J	1.4 U
Chromium	mg/kg	120,000	129 J	25.6 J	N/A	61.7	109	18.6
Chromium VI	mg/kg	6.3	1.4 R	0.87 B	N/A	1.3 U	1.3 U	1.2 U
Cobalt	mg/kg	350	8.9	5.4	N/A	11.4	36.3	8.4
Copper	mg/kg	47,000	35.5	11.4	N/A	48.7	560	14.1
Iron	mg/kg	820,000	44,100 J	20,600 J	N/A	32,000	311,000	16,000
Lead	mg/kg	800	45.3	10.6	N/A	103	51.2	27
Manganese	mg/kg	26,000	222 J	89.8 J	N/A	1,100	1,650	187
Mercury	mg/kg	350	0.041 J	0.12 U	N/A	0.69	0.15	0.061 J
Nickel	mg/kg	22,000	40.1	14	N/A	40.4	99.4	12.3
Vanadium	mg/kg	5,800	54.1 J	35.5 J	N/A	83.2	115	27.7
Zinc	mg/kg	350,000	73.4	32.8	N/A	229	123	58.8
Other								
Cyanide	mg/kg	150	0.22 J	0.17 J	N/A	0.45 J	0.32 J	1.2 U

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

D 4	TT. '4	DAI	B7-060-SB-10*	B7-061-SB-1*	B7-061-SB-2*	B7-061-SB-4*	B7-064-SB-1*	B7-064-SB-2*
Parameter	Units	PAL	12/8/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020
Metals								
Aluminum	mg/kg	1,100,000	N/A	14,300	21,200	16,000	15,600	19,300
Antimony	mg/kg	470	N/A	2.9 U	2.8 U	2.8 U	2.8 U	2.7 U
Arsenic	mg/kg	3	9.4	5.7	7	3.9	5.2	4
Barium	mg/kg	220,000	N/A	62.7	75.4	65.9	50.8	74.3
Beryllium	mg/kg	2,300	N/A	0.59 J	0.66 J	0.51 J	0.34 J	0.53 J
Cadmium	mg/kg	980	N/A	0.36 J	1.4 U	1.4 U	1.4 U	1.4 U
Chromium	mg/kg	120,000	N/A	25.7	26.3	12.5	18.6	18.7
Chromium VI	mg/kg	6.3	N/A	1.2 U				
Cobalt	mg/kg	350	N/A	6.3	4.8	3 J	4.6 J	4.2 J
Copper	mg/kg	47,000	N/A	18.5	11.6	5	8.8	9.2
Iron	mg/kg	820,000	N/A	19,600	19,300	15,800	18,200	25,800
Lead	mg/kg	800	N/A	42.2	10.7	10.8	10.9	11.5
Manganese	mg/kg	26,000	N/A	221	51.9	19.6	71.8	28.4
Mercury	mg/kg	350	N/A	0.12 U	0.12 U	0.12 U	0.018 J	0.12 U
Nickel	mg/kg	22,000	N/A	13.4	12.1	8.4 J	9.6	9.3
Vanadium	mg/kg	5,800	N/A	35.4	30.8	18.5	29.3	25.1
Zinc	mg/kg	350,000	N/A	106	23.3	15.3	35.2	26.4
Other								
Cyanide	mg/kg	150	N/A	1 U	0.14 J	1.1 U	0.16 J	1.1 U

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- 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 the sample.

<sup>\*</sup>indicates non-validated data

Table 2 - Sub-Parcel B7-1 Summary of Inorganics Detected in Soil

			B7-064-SB-5*	B7-065-SB-1*	B7-065-SB-2*	B7-065-SB-5*
Parameter	Units	PAL	12/10/2020	12/10/2020	12/10/2020	12/10/2020
Metals						
Aluminum	mg/kg	1,100,000	11,900	14,700	24,300	11,600
Antimony	mg/kg	470	2.9 U	2.9 U	3.1 U	2.8 U
Arsenic	mg/kg	3	2.4 U	4.4	2.8	3.5
Barium	mg/kg	220,000	33.1	47.1	103	45.7
Beryllium	mg/kg	2,300	0.28 J	0.31 J	0.62 J	0.31 J
Cadmium	mg/kg	980	1.5 U	1.5 U	1.5 U	1.4 U
Chromium	mg/kg	120,000	16	17.6	24.3	11.9
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.3 U	1.2 U
Cobalt	mg/kg	350	2.7 J	3.6 J	4.6 J	2.7 J
Copper	mg/kg	47,000	6.5	8.1	8.7	7.2
Iron	mg/kg	820,000	6,650	14,200	11,100	12,500
Lead	mg/kg	800	8	9.4	10.1	8.3
Manganese	mg/kg	26,000	22.9	45.9	28.1	17.6
Mercury	mg/kg	350	0.11 U	0.11 U	0.13 U	0.11 U
Nickel	mg/kg	22,000	8.6 J	9.4 J	11.6	9.4
Vanadium	mg/kg	5,800	15.4	25.3	21.1	13.3
Zinc	mg/kg	350,000	21.5	29.6	30.2	17.2
Other						
Cyanide	mg/kg	150	1 U	1.2 U	0.15 J	0.15 J

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

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

<sup>\*</sup>indicates non-validated data

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

D	TT *	DAT	B25-013-SB-1*	B25-013-SB-2*	B7-001-SB-1*	B7-001-SB-2*	B7-002-SB-1*	B7-002-SB-2*	B7-003-SB-1*
Parameter	Units	PAL	10/17/2018	10/17/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018	10/2/2018
Pesticides									
4,4'-DDE	mg/kg	9.3	0.004 U	0.0039 U	0.0022 J	0.0029 J	0.0035 U	0.0037 U	0.0022 J
4,4'-DDT	mg/kg	8.5	0.004 U	0.0039 U	0.0038	0.0413	0.0031 J	0.0037 U	0.0096
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.0018 U	0.0015 J	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	mg/kg	0.36	0.0028	0.002 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane^	mg/kg	7.7	0.00037 J	0.002 U	0.0018 U	0.00077 J	0.0018 U	0.0018 U	0.00051 J
Dieldrin	mg/kg	0.14	0.0008 J	0.0039 U	0.0027 J	0.0155	0.0025 J	0.0037 U	0.0068
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.002 U	0.002 U	0.00065 J	0.0019	0.0018 U	0.0018 U	0.0014 J
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.004 U	0.0039 U	0.0015 J	0.0106	0.001 J	0.0037 U	0.0027 J
Endosulfan sulfate	mg/kg	4,900	0.004 U	0.0039 U	0.0016 J	0.011	0.0035 U	0.0037 U	0.0016 J
Endrin	mg/kg	250	0.004 U	0.0039 U	0.0036 U	0.03	0.0032 J	0.0037 U	0.0056
Endrin aldehyde	mg/kg		0.004 U	0.0039 U	0.0021 J	0.0037 U	0.0021 J	0.0037 U	0.0021 J
Endrine ketone	mg/kg		0.0016 J	0.0039 U	0.0056	0.0263	0.0066	0.0037 U	0.0037 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.0018 U	0.0021	0.00082 J	0.0018 U	0.0018 J
gamma-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.0018 U	0.0095	0.0018 U	0.0018 U	0.0039
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.0018 U	0.0012 J	0.0005 J	0.0018 U	0.00092 J
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.0018 U	0.0075	0.0018 U	0.0018 U	0.0018 U
Methoxychlor	mg/kg	4,100	0.0199 U	0.0196 U	0.0064 J	0.0079 J	0.0042 J	0.0184 U	0.0031 J

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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.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

_			B7-003-SB-2*	B7-014-SB-1*	B7-014-SB-2*	B7-015-SB-1*	B7-015-SB-2*	B7-032-SB-1*	B7-032-SB-2*
Parameter	Units	PAL	10/2/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	12/21/2020	12/21/2020
Pesticides									
4,4'-DDE	mg/kg	9.3	0.0038	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
4,4'-DDT	mg/kg	8.5	0.0054	0.0088	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Aldrin	mg/kg	0.18	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
alpha-BHC	mg/kg	0.36	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
alpha-Chlordane^	mg/kg	7.7	0.0011 J	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0492	0.0029 J
Dieldrin	mg/kg	0.14	0.0043	0.0045	0.0036 U	0.00074 J	0.0037 U	0.0157 J	0.0199 U
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.0014 J	0.0018 J	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endosulfan sulfate	mg/kg	4,900	0.0013 J	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrin	mg/kg	250	0.0038	0.0035 J	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrin aldehyde	mg/kg		0.0037 U	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrine ketone	mg/kg		0.0047	0.0038 U	0.00034 J	0.0012 J	0.00072 J	0.0414 U	0.0199 U
gamma-BHC (Lindane)	mg/kg	2.5	0.0025	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
gamma-Chlordane^	mg/kg	7.7	0.0039	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0725	0.0099 U
Heptachlor	mg/kg	0.63	0.0018 J	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
Heptachlor epoxide	mg/kg	0.33	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0104 J	0.0099 U
Methoxychlor	mg/kg	4,100	0.017 J	0.0189 U	0.0179 U	0.0181 U	0.0185 U	0.207 U	0.0993 U

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<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

D	IIie.	DAI	B7-034-SB-1*	B7-034-SB-2*	B7-053-SB-1	B7-053-SB-2	B7-054-SB-1	B7-054-SB-2
Parameter	Units	PAL	10/2/2018	10/2/2018	12/7/2020	12/7/2020	12/7/2020	12/7/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
4,4'-DDT	mg/kg	8.5	0.004 U	0.004 U	0.0184 UJ	0.0038 UJ	0.0177 UJ	0.0039 UJ
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
alpha-BHC	mg/kg	0.36	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
alpha-Chlordane^	mg/kg	7.7	0.002 U	0.00047 J	0.0092 U	0.0019 U	0.0089 U	0.002 U
Dieldrin	mg/kg	0.14	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endosulfan sulfate	mg/kg	4,900	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrin	mg/kg	250	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrin aldehyde	mg/kg		0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrine ketone	mg/kg		0.004 U	0.00076 J	0.0184 U	0.0038 U	0.0177 U	0.0039 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
gamma-Chlordane^	mg/kg	7.7	0.002 U	0.0011 J	0.0092 U	0.0019 U	0.0089 U	0.002 U
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Methoxychlor	mg/kg	4,100	0.0202 U	0.02 U	0.0918 UJ	0.0192 UJ	0.0887 UJ	0.0196 UJ

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<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

D (	TT '4	DAT	B7-055-SB-1*	B7-055-SB-2*	B7-056-SB-1	B7-056-SB-2	B7-057-SB-1*	B7-057-SB-2*
Parameter	Units	PAL	12/8/2020	12/8/2020	12/7/2020	12/7/2020	12/10/2020	12/10/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0028 J
4,4'-DDT	mg/kg	8.5	0.0041 U	0.02 U	0.0196 UJ	0.019 UJ	0.0194 U	0.0216 U
Aldrin	mg/kg	0.18	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
alpha-BHC	mg/kg	0.36	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
alpha-Chlordane^	mg/kg	7.7	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Dieldrin	mg/kg	0.14	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endosulfan sulfate	mg/kg	4,900	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrin	mg/kg	250	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrin aldehyde	mg/kg		0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrine ketone	mg/kg		0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
gamma-BHC (Lindane)	mg/kg	2.5	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
gamma-Chlordane^	mg/kg	7.7	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Heptachlor	mg/kg	0.63	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Heptachlor epoxide	mg/kg	0.33	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Methoxychlor	mg/kg	4,100	0.0205 U	0.0998 U	0.0979 UJ	0.0952 UJ	0.097 U	0.108 U

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

<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

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.

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

D	IIie.	DAI	B7-058-SB-1	B7-058-SB-2	B7-059-SB-1	B7-059-SB-2	B7-060-SB-1*	B7-060-SB-2*
Parameter	Units	PAL	12/7/2020	12/7/2020	12/7/2020	12/7/2020	12/8/2020	12/8/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
4,4'-DDT	mg/kg	8.5	0.0039 UJ	0.0041 UJ	0.004 UJ	0.0045 UJ	0.0429 U	0.021 U
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
alpha-BHC	mg/kg	0.36	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
alpha-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Dieldrin	mg/kg	0.14	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endosulfan sulfate	mg/kg	4,900	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrin	mg/kg	250	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrin aldehyde	mg/kg		0.0039 U	0.026	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrine ketone	mg/kg		0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
gamma-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Methoxychlor	mg/kg	4,100	0.0196 UJ	0.0204 UJ	0.0202 UJ	0.0225 UJ	0.214 U	0.105 U

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

<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

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.

Table 3 - Sub-Parcel B7-1 Summary of Pesticides Detected in Soil

D	II'4	DAI	B7-061-SB-1*	B7-061-SB-2*	B7-064-SB-1*	B7-064-SB-2*	B7-065-SB-1*	B7-065-SB-2*
Parameter	Units	PAL	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020	12/10/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
4,4'-DDT	mg/kg	8.5	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Aldrin	mg/kg	0.18	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
alpha-BHC	mg/kg	0.36	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
alpha-Chlordane^	mg/kg	7.7	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Dieldrin	mg/kg	0.14	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endosulfan I <sup>+</sup>	mg/kg	7,000	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Endosulfan II <sup>+</sup>	mg/kg	7,000	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endosulfan sulfate	mg/kg	4,900	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrin	mg/kg	250	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrin aldehyde	mg/kg		0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrine ketone	mg/kg		0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
gamma-BHC (Lindane)	mg/kg	2.5	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
gamma-Chlordane^	mg/kg	7.7	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Heptachlor	mg/kg	0.63	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Heptachlor epoxide	mg/kg	0.33	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Methoxychlor	mg/kg	4,100	0.0195 U	0.02 U	0.0196 U	0.0194 U	0.0198 U	0.0209 U

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

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

<sup>\*</sup>indicates non-validated data

<sup>^</sup>The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane

<sup>&</sup>lt;sup>+</sup>The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

Table 4 - Sub-Parcel B7-1 Summary of Organics Detected in Groundwater

D	II:4-	DAI	B7-053-PZ*	B7-060-PZ	B7-064-PZ	B7-065-PZ	SW-046-MWS*	SW-046-MWS*	SW-047-MWS
Parameter	Units	PAL	12/18/2020	12/11/2020	12/11/2020	12/11/2020	12/18/2020	12/30/2020	12/14/2015
Volatile Organic Compounds									
1,2-Dichloroethene (Total)	μg/L	70	2 U	2 U	2 U	2 U	2 U	2 U	0.58 J
Acetone	μg/L	14,000	12.3	10 U	10 U	10 U	10 U	10 U	10 UJ
Chloroform	μg/L	0.22	1 U	1 U	1 U	1 U	1 U	1 U	6.1
cis-1,2-Dichloroethene	μg/L	70	1 U	1 U	1 U	1 U	1 U	1 U	0.58 J
Methyl tert-butyl ether (MTBE)	μg/L	14	1 U	0.68 J	1 U	1 U	10.4	9.7	1 U
Semi-Volatile Organic Compounds^									
1,4-Dioxane	μg/L	0.46	0.5 U	0.098 U	0.1 U	0.016 J	0.033 J	0.049 J	0.1 U
2-Methylnaphthalene	μg/L	36	0.091 J	0.098 U	0.01 J	0.098 U	0.095 U	0.094 U	0.1 U
Acenaphthene	μg/L	530	0.11 J	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Anthracene	μg/L	1,800	0.34 J	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benz[a]anthracene	μg/L	0.03	0.64	0.02 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[a]pyrene	μg/L	0.2	0.73	0.023 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[b]fluoranthene	μg/L	0.25	0.8	0.023 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[g,h,i]perylene	μg/L		0.56	0.021 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[k]fluoranthene	μg/L	2.5	0.69	0.024 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Chrysene	μg/L	25	0.84	0.024 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Dibenz[a,h]anthracene	μg/L	0.025	0.13 J	0.069 U	0.07 U	0.068 U	0.066 U	0.066 U	0.1 U
Diethylphthalate	μg/L	15,000	15 U	2.9 U	1.7 J	2.9 U	2.8 U	2.8 U	1 U
Dimethylphthalate	μg/L		15 U	2.9 U	0.42 J	2.9 U	2.8 U	2.8 U	N/A
Di-n-butylphthalate	μg/L	900	15 U	2.9 U	0.54 J	0.44 J	2.8 U	2.8 U	1 U
Fluoranthene	μg/L	800	1.4	0.041 J	0.1 U	0.011 J	0.095 U	0.094 U	0.1 U
Fluorene	μg/L	290	0.086 J	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Indeno[1,2,3-c,d]pyrene	μg/L	0.25	0.6	0.022 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Phenanthrene	μg/L		0.63	0.027 J	0.015 J	0.013 J	0.095 U	0.094 U	0.1 U
Pyrene	μg/L	120	1.2	0.034 J	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
TPH/Oil & Grease									
Diesel Range Organics	μg/L	47	110	99 J	77 J	100 UJ	120	110	65 B

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

N/A indicates that the 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.
- J: The positive result reported for this analyte is a quantitative estimate.
- B: This analyte was not detected substantially above the level of the associated method blank or field blank.

<sup>\*</sup>indicates non-validated data

<sup>^</sup>PAH compounds and 1,4-dioxane (2020) were analyzed via SIM.

Table 5 - Sub-Parcel B7-1 Summary of Inorganics Detected in Groundwater

Donomaton	Liuita	DAI	B7-053-PZ*	B7-060-PZ	B7-064-PZ	B7-065-PZ	SW-046-MWS*	SW-046-MWS*	SW-047-MWS
Parameter	Units	PAL	12/18/2020	12/11/2020	12/11/2020	12/11/2020	12/18/2020	12/30/2020	12/14/2015
Metals									
Aluminum	μg/L	20,000	N/A	N/A	N/A	N/A	126	154	2,810
Barium	μg/L	2,000	N/A	N/A	N/A	N/A	22.5	20.1	44.3
Beryllium	μg/L	4	N/A	N/A	N/A	N/A	0.49 J	0.59 J	6.5
Cadmium	μg/L	5	N/A	N/A	N/A	N/A	1.3 J	1 J	1.5 J
Chromium	μg/L	100	N/A	N/A	N/A	N/A	1.4 J	1.6 J	1.6 J
Chromium VI	μg/L	0.035	N/A	N/A	N/A	N/A	N/A	N/A	5 J
Cobalt	μg/L	6	N/A	N/A	N/A	N/A	221	221	100
Copper	μg/L	1,300	N/A	N/A	N/A	N/A	5 U	5 U	7.9
Iron	μg/L	14,000	N/A	N/A	N/A	N/A	6,680	6,720	83.2 B
Manganese	μg/L	430	N/A	N/A	N/A	N/A	11,700	11,300	884
Mercury	μg/L	2	N/A	N/A	N/A	N/A	0.2 U	0.2 U	0.03 J
Nickel	μg/L	390	N/A	N/A	N/A	N/A	89.6	85.3	99.4 J
Thallium	μg/L	2	N/A	N/A	N/A	N/A	10 U	4 J	10 U
Vanadium	μg/L	86	N/A	N/A	N/A	N/A	5 U	0.82 J	1 B
Zinc	μg/L	6,000	N/A	N/A	N/A	N/A	133	128	130
Dissolved Metals		<u> </u>							
Aluminum, Dissolved	μg/L	20,000	224	180	37,800	3,280	109	110	2,860
Arsenic, Dissolved	μg/L	10	3.6 J	5 U	7	5 U	5 U	5 U	4.5 J
Barium, Dissolved	μg/L	2,000	34.6	13.6	154	48	22.8	20.5	42.9
Beryllium, Dissolved	μg/L	4	0.68 J	0.31 J	1.2	4.5	0.4 J	0.23 J	6.6
Cadmium, Dissolved	μg/L	5	2 B	1.1 J	0.68 J	1.7 J	1.2 B	1 J	1.4 B
Chromium, Dissolved	μg/L	100	1.1 J	1.1 J	58.6	2 J	1.5 J	1.5 J	0.98 B
Cobalt, Dissolved	μg/L	6	36.1	65.4	10.4	134	219	228	105
Copper, Dissolved	μg/L	1,300	5 U	5 U	26.9	10	5 U	5 U	7.8
Iron, Dissolved	μg/L	14,000	1,070	2,650	38,300	465	6,410	6,330	30.4 B
Lead, Dissolved	μg/L	15	5 U	5 U	28	7.7	5 U	5 U	5 U
Manganese, Dissolved	μg/L	430	806	3,860	241	2,470	11,700	11,700	850 J
Nickel, Dissolved	μg/L	390	48.3	64.4	33.2	104	91.2	87.4	106 J
Vanadium, Dissolved	μg/L	86	9	5 U	60.3	5 U	5 U	0.58 J	0.81 B
Zinc, Dissolved	μg/L	6,000	69.6	50.9	86.2	144	135	131	134 J
Other									
Cyanide	μg/L	200	10 U	11	10 U	10 U	7.4 J	7.9 J	10 U

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

 $\ensuremath{\mathrm{N/A}}$  inidicates that the 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.

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

<sup>\*</sup>indicates non-validated data

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

Table 6 - Sub-Parcel B7-1 Cumulative Vapor Intrusion Criteria Comparison

				B7-053-PZ 12/18/2020		B7-060-PZ 12/11/2020		B7-064-PZ 12/11/2020		B7-065-PZ 12/11/2020	
Parameter	Туре	Organ	VI Screening	Conc.	Risk/	Conc.	Risk/	Conc.	Risk/	Conc.	Risk/
Cancer Risk		Systems	Criteria	(ug/L)	Hazard	(ug/L)	Hazard	(ug/L)	Hazard	(ug/L)	Hazard
Calicer Risk											
1,4-Dioxane	SVOC		130,000	0.5 U	0	0.098 U	0	0.1 U	0	0.016 J	1.2E-12
Naphthalene	SVOC		200	0.5 U	0	0.098 U	0	0.1 U	0	0.098 U	0
Chloroform	VOC		36	1 U	0	1 U	0	1 U	0	1 U	0
Methyl tert-butyl ether (MTBE)	VOC		20,000	1 U	0	0.68 J	3.4E-10	1 U	0	1 U	0
		0		3E-10		0		1E-12			
Non-Cancer Hazard											
Cumulative		0		0		0		0			

					5-MWS /2020	~ • .	6-MWS //2020	SW-047-MWS 12/14/2015			
Parameter	Туре	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	0.033 J	2.5E-12	0.049 J	3.8E-12	0.1 U	0		
Naphthalene	SVOC		200	0.095 U	0	0.094 U	0	0.045 B	0		
Chloroform	VOC		36	1 U	0	1 U	0	6.1	1.7E-06		
Methyl tert-butyl ether (MTBE)	VOC		20,000	10.4	5.2E-09	9.7	4.9E-09	1 U	0		
	Cumulat	ive Vapor In	trusion Risk =		5E-09		5E-09		2E-06		
Non-Cancer Hazard	Non-Cancer Hazard										
Cumulative	ncer 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.

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

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

Table 7 - Sub-Parcel B7-1 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?
2-Methylnaphthalene	91-57-6	B7-060-SB-1	0.079		0.0016	0.02	59	55.93		24	no
4,4'-DDE	72-55-9	B7-003-SB-2	0.0038		0.0022	0.003	38	13.16	2	2.3	no
4,4'-DDT	50-29-3	B7-001-SB-2	0.0413		0.0031	0.01	38	15.79	1.9	3.7	no
Acenaphthene	83-32-9	B7-057-SB-1	0.069		0.00075	0.01	59	47.46		360	no
Acenaphthylene	208-96-8	B7-003-SB-2	0.49		0.0011	0.05	59	61.02			no
Acetone	67-64-1	B7-001-SB-2	0.21		0.0082	0.08	9	33.33		6,100	no
Aldrin	309-00-2	B7-001-SB-2	0.0015	J	0.0015	0.002	38	2.63	0.039	0.23	no
alpha-BHC	319-84-6	B25-013-SB-1	0.0028		0.0028	0.003	38	2.63	0.086	51	no
alpha-Chlordane <sup>#</sup>	5103-71-9	B7-032-SB-1	0.0492		0.00037	0.008	38	18.42	1.7	3.5	no
Aluminum	7429-90-5	B7-014-SB-1	38,700		4,960	15,612	59	100.00		7,700	YES (NC)
Anthracene	120-12-7	B7-003-SB-2	0.66		0.00078	0.06	59	62.71		1,800	no
Antimony	7440-36-0	B7-003-SB-6	10.3		10.3	10.3	59	1.69		3.1	YES (NC)
Aroclor 1248	12672-29-6	B7-001-SB-1	0.045		0.027	0.04	25	8.00	0.23		no
Aroclor 1254	11097-69-1	B7-003-SB-1	0.13		0.089	0.11	25	8.00	0.24	0.12	YES (NC)
Aroclor 1260	11096-82-5	B7-001-SB-1	0.064		0.058	0.06	25	8.00	0.24		no
Arsenic	7440-38-2	B7-014-SB-2	22.1		2.3	7.48	66	90.91	0.68	3.5	YES (C/NC)
Barium	7440-39-3	B7-014-SB-1	422		13.2	106	59	100.00		1,500	no
Benz[a]anthracene	56-55-3	B7-003-SB-2	2		0.0012	0.18	59	66.10	1.1		YES (C)
Benzaldehyde	100-52-7	B7-001-SB-2	0.027	J	0.027	0.03	59	1.69	170	780	no
Benzo[a]pyrene	50-32-8	B7-003-SB-2	1.4		0.0011	0.19	59	64.41	0.11	1.8	YES (C)
Benzo[b]fluoranthene	205-99-2	B7-003-SB-2	2.2		0.0012	0.32	59	66.10	1.1		YES (C)
Benzo[g,h,i]perylene	191-24-2	B7-060-SB-1	0.58		0.002	0.10	59	62.71			no
Benzo[k]fluoranthene	207-08-9	B7-060-SB-1	1.5		0.0019	0.25	59	64.41	11		no
Beryllium	7440-41-7	B7-053-SB-1	4.8		0.15	0.93	59	98.31	1,600	16	no
bis(2-Ethylhexyl)phthalate	117-81-7	B7-032-SB-1	0.23	J	0.02	0.08	59	8.47	39	130	no
Cadmium	7440-43-9	B7-032-SB-1	1.2	J	0.35	0.57	59	25.42	2,100	7.1	no
Caprolactam	105-60-2	B7-032-SB-5	0.028	J	0.028	0.03	59	1.69		3,100	no
Carbazole	86-74-8	B7-060-SB-2	0.2	J	0.02	0.07	59	6.78			no
Chromium (salts)	7440-47-3	B7-014-SB-2	2,440		5.3	217	59	100.00		12,000	no
Chromium VI	18540-29-9	B7-055-SB-5	1.3		0.65	0.88	48	12.50	0.3	23	YES (C)

Table 7 - Sub-Parcel B7-1 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?
Chrysene	218-01-9	B7-003-SB-2	1.4		0.00042	0.17	59	66.10	110		no
Cobalt	7440-48-4	B7-060-SB-2	36.3		1.6	7.46	59	96.61	420	2.3	YES (NC)
Copper	7440-50-8	B7-060-SB-2	560		3.1	38.5	59	98.31		310	YES (NC)
Cyanide (calcium cyanide)	57-12-5	B7-001-SB-2	1.5		0.13	0.33	59	64.41		7.8	no
Dibenz[a,h]anthracene	53-70-3	B7-060-SB-1 & B7-003-SB-2	0.22		0.0017	0.04	59	57.63	0.11		YES (C)
Dieldrin	60-57-1	B7-032-SB-1	0.0157	J	0.00074	0.006	38	23.68	0.034	0.32	no
Di-n-butylphthalate	84-74-2	B7-055-SB-2	0.053	J	0.026	0.04	59	32.20		630	no
Di-n-ocytlphthalate	117-84-0	B7-014-SB-10	0.063	J	0.054	0.06	59	27.12		63	no
Endosulfan I <sup>+</sup>	959-98-8	B7-001-SB-2	0.0019		0.00065	0.001	38	7.89		47	no
Endosulfan II <sup>+</sup>	33213-65-9	B7-001-SB-2	0.0106		0.001	0.003	38	15.79		47	no
Endosulfan sulfate	1031-07-8	B7-001-SB-2	0.011		0.0013	0.004	38	10.53		38	no
Endrin	72-20-8	B7-001-SB-2	0.03		0.0032	0.009	38	13.16		1.9	no
Endrin aldehyde	7421-93-4	B7-058-SB-2	0.026		0.0021	0.008	38	10.53			no
Endrine ketone	53494-70-5	B7-001-SB-2	0.0263		0.00034	0.005	38	23.68			no
Ethylbenzene	100-41-4	B25-013-SB-1	0.018		0.0018	0.01	9	22.22	5.8	340	no
Fluoranthene	206-44-0	B7-003-SB-2	4.7		0.00072	0.34	59	67.80		240	no
Fluorene	86-73-7	B7-003-SB-2	0.25		0.00069	0.02	59	45.76		240	no
gamma-BHC (Lindane)	58-89-9	B7-003-SB-2	0.0025		0.00082	0.002	38	10.53	0.57	2.1	no
gamma-Chlordane#	5103-74-2	B7-032-SB-1	0.0725		0.0011	0.02	38	13.16	1.7	3.5	no
Heptachlor	76-44-8	B7-003-SB-2	0.0018	J	0.0005	0.001	38	10.53	0.13	3.9	no
Heptachlor epoxide	1024-57-3	B7-032-SB-1	0.0104	J	0.0075	0.009	38	5.26	0.07	0.10	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B7-060-SB-1	0.62		0.002	0.10	59	62.71	1.1		no
Iron	7439-89-6	B7-060-SB-2	311,000		3,670	49,174	59	100.00		5,500	YES (NC)
Lead^	7439-92-1	B7-001-SB-2	291		3.9	38.9	59	100.00		400	no
Manganese	7439-96-5	B7-003-SB-2	58,700		17.6	5,610	59	100.00		180	YES (NC)
Mercury (salts)	7439-97-6	B7-003-SB-6	2.6		0.0068	0.21	59	61.02		2.3	YES (NC)
Methoxychlor	72-43-5	B7-003-SB-2	0.017	J	0.0031	0.008	38	13.16		32	no
Naphthalene	91-20-3	B7-060-SB-1	0.64		0.0021	0.06	59	64.41	2	13	no
Nickel	7440-02-0	B7-060-SB-2	99.4		1.6	22.4	59	100.00	15,000	150	no

Table 7 - Sub-Parcel B7-1 COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Defection	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
PCBs (total)*	1336-36-3	B7-003-SB-1	0.16	J	0.089	0.12	25	16.00	0.23		no
Phenanthrene	85-01-8	B7-003-SB-2	2.9		0.00072	0.17	59	69.49			no
Pyrene	129-00-0	B7-003-SB-2	3.6		0.0017	0.28	59	64.41		180	no
Vanadium	7440-62-2	B7-003-SB-2	4,020		12	360	59	100.00		39	YES (NC)
Xylenes	1330-20-7	B25-013-SB-1	0.13		0.014	0.07	9	22.22		58	no
Zinc	7440-66-6	B7-001-SB-2	414		5.9	81.7	59	100.00		2,300	no

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

COPC = Constituent of Potential Concern C = Compound was identified as a cancer COPC

TR = Target Risk NC = Compound was identified as a non-cancer COPC

HQ = Hazard Quotient

<sup>\*</sup>PCBs (total) include the sum of all detected aroclor mixtures, including those without RSLs (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.

<sup>^</sup>Lead is assessed separately through the ALM and IEUBK models.

<sup>&</sup>lt;sup>+</sup>The USEPA Screening Levels for Endosulfan were used for both Endosulfan I and II

<sup>&</sup>lt;sup>#</sup>The USEPA Screening Levels for Chlordane (technical mixture) were used for both alpha- and gamma-Chlordane

Table 8 - Sub-Parcel B7-1 Assessment of Lead

Exposure Unit	Surface/Sub-Surface	Arithmetic Mean (mg/kg)
EU1 & EU1-EXP	Surface	57.8
	Sub-Surface	18.9
(11.8 ac. & 12.1 ac.)	Pooled	43.4
ELIO 0 ELIO EXD	Surface	38.3
EU2 & EU2-EXP	Sub-Surface	15.5
(10.1 ac. & 10.2 ac.)	Pooled	30.7

**Table 9 - Sub-Parcel B7-1 Soil Exposure Point Concentrations** 

	EU1 & EU1-EXP (11.8 ac. & 12.1 ac.)											
	EPCs - Surfac	e Soils	EPCs - Sub-Surf	face Soils	EPCs - Pooled	Soils						
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)						
Aluminum	95% Student's-t UCL	18,746	95% Student's-t UCL	18,015	95% Adjusted Gamma UCL	18,011						
Arsenic	95% KM (t) UCL	9.33	95% KM (t) UCL	8.07	95% KM (t) UCL	8.28						
Chromium VI	Maximum Value	0.77	95% KM (t) UCL	0.88	95% KM (t) UCL	0.79						
Cobalt	KM H-UCL	9.42	95% Student's-t UCL	9.67	KM H-UCL	9.02						
Copper	95% Adjusted Gamma UCL	75.6	95% KM (t) UCL	17.0	KM H-UCL	49.4						
Iron	95% Chebyshev (Mean, Sd) UCL	153,756	95% Student's-t UCL	27,786	95% Chebyshev (Mean, Sd) UCL	109,025						
Manganese	95% Adjusted Gamma UCL	26,733	95% Chebyshev (Mean, Sd) UCL	989	97.5% Chebyshev (Mean, Sd) UCL	24,970						
Mercury	Gamma Adjusted KM- UCL	0.27	95% KM Bootstrap t UCL	10.9	95% KM (Chebyshev) UCL	0.48						
Vanadium	95% Chebyshev (Mean, Sd) UCL	1,938	95% Adjusted Gamma UCL	52.2	95% Chebyshev (Mean, Sd) UCL	1,284						
Aroclor 1254	Maximum Value	0.13	NA	NA	Maximum Value	0.13						
Benz[a]anthracene	95% KM (Chebyshev) UCL	0.60	95% KM (t) UCL	0.09	95% KM (Chebyshev) UCL	0.40						
Benzo[a]pyrene	95% KM (Chebyshev) UCL	0.49	Maximum Value	0.44	Gamma Adjusted KM- UCL	0.27						
Benzo[b]fluoranthene	95% KM (Chebyshev) UCL	0.83	95% KM (t) UCL	0.19	Gamma Adjusted KM- UCL	0.46						
Dibenz[a,h]anthracene	Gamma Adjusted KM- UCL	0.07	Maximum Value	0.09	Gamma Adjusted KM- UCL	0.05						

Bold indicates maximum value used as the EPC

NA = No Detections

**Table 9 - Sub-Parcel B7-1 Soil Exposure Point Concentrations** 

	EU2 & EU2-EXP (10.1 ac. & 10.2 ac.)										
	EPCs - Surfac	e Soils	EPCs - Sub-Sur	face Soils	EPCs - Pooled	Soils					
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)					
Aluminum	95% Student's-t UCL	17,511	95% Student's-t UCL	16,994	95% Student's-t UCL	16,526					
Arsenic	95% Adjusted Gamma UCL	8.44	95% KM (t) UCL	10.2	KM H-UCL	8.26					
Chromium VI	NA	NA	NA	NA	NA	NA					
Cobalt	95% H-UCL	11.1	95% Student's-t UCL	6.19	95% Chebyshev (Mean, Sd) UCL	13.7					
Copper	95% Chebyshev (Mean, Sd) UCL	227	95% Student's-t UCL	12.0	95% Chebyshev (Mean, Sd) UCL	155					
Iron	95% Chebyshev (Mean, Sd) UCL	133,518	95% Student's-t UCL	17,364	95% Chebyshev (Mean, Sd) UCL	94,448					
Manganese	95% Adjusted Gamma UCL	823	95% Student's-t UCL	112	95% Adjusted Gamma UCL	505					
Mercury	95% KM Bootstrap t UCL	0.35	Maximum Value	0.52	Gamma Adjusted KM- UCL	0.23					
Vanadium	95% Adjusted Gamma UCL	61.6	95% Student's-t UCL	28.8	95% Adjusted Gamma UCL	48.4					
Aroclor 1254	NA	NA	NA	NA	NA	NA					
Benz[a]anthracene	99% KM (Chebyshev) UCL	0.76	Maximum Value	0.02	95% KM (Chebyshev) UCL	0.28					
Benzo[a]pyrene	99% KM (Chebyshev) UCL	0.97	Maximum Value	0.02	95% KM (Chebyshev) UCL	0.36					
Benzo[b]fluoranthene	Gamma Adjusted KM- UCL	0.92	Maximum Value	0.03	95% KM (Chebyshev) UCL	0.62					
Dibenz[a,h]anthracene	Gamma Adjusted KM- UCL	0.12	Maximum Value	0.003	95% KM (Chebyshev) UCL	0.08					

Bold indicates maximum value used as the EPC

NA = No Detections

#### Table 10 - Sub-Parcel B7-1 Surface Soils Composite Worker Risk Ratios

			EU	U <b>1 (11</b> .	.8 ac.)			EU2 (10.1 ac.)			
				Compo	site Worker				Compo	site Worker	
			RSLs	(mg/kg)	Risk Ra	tios		RSLs	(mg/kg)	Risk Ra	tios
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,746		1,100,000		0.02	17,511		1,100,000		0.02
Arsenic	Cardiovascular; Dermal	9.33	3.00	480	3.1E-06	0.02	8.44	3.00	480	2.8E-06	0.02
Chromium VI	Respiratory	0.77	6.30	3,500	1.2E-07	0.0002	NA	6.30	3,500		
Cobalt	Thyroid	9.42	1,900	350	5.0E-09	0.03	11.1	1,900	350	5.8E-09	0.03
Copper	Gastrointestinal	75.6		47,000		0.002	227		47,000		0.005
Iron	Gastrointestinal	153,756		820,000		0.2	133,518		820,000		0.2
Manganese	Nervous	26,733		26,000		1	823		26,000		0.03
Mercury	Nervous	0.27		350		0.0008	0.35		350		0.001
Vanadium	Dermal	1,938		5,800		0.3	61.6		5,800		0.01
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.97	15.0	1.3E-07	0.009	NA	0.97	15.0		
Benz[a]anthracene		0.60	21.0		2.9E-08		0.76	21.0		3.6E-08	
Benzo[a]pyrene	Developmental	0.49	2.10	220	2.3E-07	0.002	0.97	2.10	220	4.6E-07	0.004
Benzo[b]fluoranthene		0.83	21.0		4.0E-08		0.92	21.0		4.4E-08	
Dibenz[a,h]anthracene		0.07	2.10		3.3E-08		0.12	2.10		5.7E-08	
		_			4E-06	4				3E-06	4

#### Bold indicates maximum value used as the EPC

NA = No Detections

RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
Total HI	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

#### Table 11 - Sub-Parcel B7-1 **Subsurface Soils Composite Worker Risk Ratios**

		EU1 (11						E	EU2 (10.1 ac.)			
				Compo	site Worker				Compo	site Worker		
			RSLs	(mg/kg)	Risk Ra	tios		RSLs	(mg/kg)	Risk Ra	ıtios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	
Aluminum	Nervous	18,015		1,100,000		0.02	16,994		1,100,000		0.02	
Arsenic	Cardiovascular; Dermal	8.07	3.00	480	2.7E-06	0.02	10.2	3.00	480	3.4E-06	0.02	
Chromium VI	Respiratory	0.88	6.30	3,500	1.4E-07	0.0003	NA	6.30	3,500			
Cobalt	Thyroid	9.67	1,900	350	5.1E-09	0.03	6.19	1,900	350	3.3E-09	0.02	
Copper	Gastrointestinal	17.0		47,000		0.0004	12.0		47,000		0.0003	
Iron	Gastrointestinal	27,786		820,000		0.03	17,364		820,000		0.02	
Manganese	Nervous	989		26,000		0.04	112		26,000		0.004	
Mercury	Nervous	10.9		350		0.03	0.52		350		0.001	
Vanadium	Dermal	52.2		5,800		0.009	28.8		5,800		0.005	
Aroclor 1254	Dermal; Immune; Ocular	NA	0.97	15.0			NA	0.97	15.0			
Benz[a]anthracene		0.09	21.0		4.3E-09		0.02	21.0		9.5E-10		
Benzo[a]pyrene	Developmental	0.44	2.10	220	2.1E-07	0.002	0.02	2.10	220	9.5E-09	0.00009	
Benzo[b]fluoranthene		0.19	21.0		9.0E-09		0.03	21.0		1.4E-09		
Dibenz[a,h]anthracene		0.09	2.10		4.3E-08		0.003	2.10		1.4E-09		
	-				3E-06	<b>\</b>				3E-06	<b>\</b>	

#### Bold indicates maximum value used as the EPC

NA = No Detections

RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
Total HI	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

### Table 12 - Sub-Parcel B7-1 Pooled Soils Composite Worker Risk Ratios

			EU	U <b>1 (11</b> .	8 ac.)			EU2 (10.1 ac.)			
				Compo	site Worker				Compo	site Worker	
			RSLs	(mg/kg)	Risk Ra	tios		RSLs	(mg/kg)	Risk Ra	tios
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,011		1,100,000		0.02	16,526		1,100,000		0.02
Arsenic	Cardiovascular; Dermal	8.28	3.00	480	2.8E-06	0.02	8.26	3.00	480	2.8E-06	0.02
Chromium VI	Respiratory	0.79	6.30	3,500	1.3E-07	0.0002	NA	6.30	3,500		
Cobalt	Thyroid	9.02	1,900	350	4.7E-09	0.03	13.7	1,900	350	7.2E-09	0.04
Copper	Gastrointestinal	49.4		47,000		0.001	155		47,000		0.003
Iron	Gastrointestinal	109,025		820,000		0.1	94,448		820,000		0.1
Manganese	Nervous	24,970		26,000		1	505		26,000		0.02
Mercury	Nervous	0.48		350		0.001	0.23		350		0.0007
Vanadium	Dermal	1,284		5,800		0.2	48.4		5,800		0.008
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.97	15.0	1.3E-07	0.009	NA	0.97	15.0		
Benz[a]anthracene		0.40	21.0		1.9E-08		0.28	21.0		1.3E-08	
Benzo[a]pyrene	Developmental	0.27	2.10	220	1.3E-07	0.001	0.36	2.10	220	1.7E-07	0.002
Benzo[b]fluoranthene		0.46	21.0		2.2E-08		0.62	21.0		3.0E-08	
Dibenz[a,h]anthracene		0.05	2.10		2.4E-08		0.08	2.10		3.8E-08	
	-	-			3E-06	1				3E-06	4

#### Bold indicates maximum value used as the EPC

NA = No Detections
RSI s were obtained from the

RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

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ardiovascular	0
Dermal	0
Thyroid	0
Respiratory	0
Gastrointestinal	0
Vervous	0
mmune	0
Occular	0
Developmental	0
	Chyroid Respiratory Gastrointestinal Nervous mmune Occular

#### Table 13 - Sub-Parcel B7-1 Surface Soils Adult Recreator Risk Ratios

			EU	U1 (11	.8 ac.)			E	U <b>2 (10</b>	.1 ac.)	
					or - High Frequ				- Moderate Fro		
			SSLs	(mg/kg)	Risk Rat	tios	==~	SSLs	(mg/kg)	Risk Ra	tios
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,746		1,120,000		0.02	17,511		1,540,000		0.01
Arsenic	Cardiovascular; Dermal	9.33	0.948	480	9.8E-06	0.02	8.44	1.30	659	6.5E-06	0.01
Chromium VI	Respiratory	0.77	0.426	3,480	1.8E-06	0.0002	NA	0.585	4,790		
Cobalt	Thyroid	9.42	1,780	347	5.3E-09	0.03	11.1	2,450	477	4.5E-09	0.02
Copper	Gastrointestinal	75.6		46,700		0.002	227		64,200		0.004
Iron	Gastrointestinal	153,756		818,000		0.2	133,518		1,120,000		0.1
Manganese	Nervous	26,733		25,600		1	823		35,200		0.02
Mercury	Nervous	0.27		350		0.0008	0.35		481		0.0007
Vanadium	Dermal	1,938		5,830		0.3	61.6		8,010		0.008
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.342	14.7	3.8E-07	0.009	NA	0.470	20.2		
Benz[a]anthracene		0.60	1.60		3.8E-07		0.76	2.20		3.5E-07	
Benzo[a]pyrene	Developmental	0.49	0.161	222	3.0E-06	0.002	0.97	0.221	305	4.4E-06	0.003
Benzo[b]fluoranthene		0.83	1.61		5.2E-07		0.92	2.21		4.2E-07	
Dibenz[a,h]anthracene		0.07	0.161		4.3E-07		0.12	0.221		5.4E-07	
			-		2E-05	<b>\</b>				1E-05	<b>\</b>

#### Bold indicates maximum value used as the EPC

NA = No Detections

High Frequency	Moderate Frequency
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

#### Table 14 - Sub-Parcel B7-1 Subsurface Soils Adult Recreator Risk Ratios

			El	U <b>1 (11</b> .	.8 ac.)			EU	U <b>2 (10</b> .	0.1 ac.)	
			Adı	ult Recreate	or - High Freq		Adult Recreator - Moderate Frequency				
			SSLs	(mg/kg)	Risk Ra	tios		SSLs	(mg/kg)	Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,015		1,120,000		0.02	16,994		1,540,000		0.01
Arsenic	Cardiovascular; Dermal	8.07	0.948	480	8.5E-06	0.02	10.2	1.30	659	7.8E-06	0.02
Chromium VI	Respiratory	0.88	0.426	3,480	2.1E-06	0.0003	NA	0.585	4,790		
Cobalt	Thyroid	9.67	1,780	347	5.4E-09	0.03	6.19	2,450	477	2.5E-09	0.01
Copper	Gastrointestinal	17.0		46,700		0.0004	12.0		64,200		0.0002
Iron	Gastrointestinal	27,786		818,000		0.03	17,364		1,120,000		0.02
Manganese	Nervous	989		25,600		0.04	112		35,200		0.003
Mercury	Nervous	10.9		350		0.03	0.52		481		0.001
Vanadium	Dermal	52.2		5,830		0.009	28.8		8,010		0.004
Aroclor 1254	Dermal; Immune; Ocular	NA	0.342	14.7			NA	0.470	20.2		
Benz[a]anthracene		0.09	1.60		5.6E-08		0.02	2.20		9.1E-09	
Benzo[a]pyrene	Developmental	0.44	0.161	222	2.7E-06	0.002	0.02	0.221	305	9.0E-08	0.00007
Benzo[b]fluoranthene		0.19	1.61		1.2E-07		0.03	2.21		1.4E-08	
Dibenz[a,h]anthracene		0.09	0.161		5.6E-07		0.003	0.221		1.4E-08	
					1E-05	<b>\</b>				8E-06	<b>1</b>

#### Bold indicates maximum value used as the EPC

NA = No Detections

High Frequency	Moderate Frequency
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Cardiovascular	0
Dermal	0
Thyroid	0
Respiratory	0
Gastrointestinal	0
Nervous	0
Immune	0
Occular	0
Developmental	0
	Dermal Thyroid Respiratory Gastrointestinal Nervous Immune Occular

#### Table 15 - Sub-Parcel B7-1 Pooled Soils Adult Recreator Risk Ratios

			EU	U <b>1 (11</b>	.8 ac.)			EU	U <b>2 (10</b>	.0.1 ac.)		
			Adı	ult Recreat	or - High Frequ		Adult	Recreator	- Moderate Fro	equency		
			SSLs	(mg/kg)	Risk Ra	tios		SSLs	(mg/kg)	Risk Ra	tios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	
Aluminum	Nervous	18,011		1,120,000		0.02	16,526		1,540,000		0.01	
Arsenic	Cardiovascular; Dermal	8.28	0.948	480	8.7E-06	0.02	8.26	1.30	659	6.4E-06	0.01	
Chromium VI	Respiratory	0.79	0.426	3,480	1.9E-06	0.0002	NA	0.585	4,790			
Cobalt	Thyroid	9.02	1,780	347	5.1E-09	0.03	13.7	2,450	477	5.6E-09	0.03	
Copper	Gastrointestinal	49.4		46,700		0.001	155		64,200		0.002	
Iron	Gastrointestinal	109,025		818,000		0.1	94,448		1,120,000		0.08	
Manganese	Nervous	24,970		25,600		1	505		35,200		0.01	
Mercury	Nervous	0.48		350		0.001	0.23		481		0.0005	
Vanadium	Dermal	1,284		5,830		0.2	48.4		8,010		0.006	
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.342	14.7	3.8E-07	0.009	NA	0.470	20.2			
Benz[a]anthracene		0.40	1.60		2.5E-07		0.28	2.20		1.3E-07		
Benzo[a]pyrene	Developmental	0.27	0.161	222	1.7E-06	0.001	0.36	0.221	305	1.6E-06	0.001	
Benzo[b]fluoranthene		0.46	1.61		2.9E-07		0.62	2.21		2.8E-07		
Dibenz[a,h]anthracene		0.05	0.161		3.1E-07		0.08	0.221		3.6E-07		
					1E-05	<b>\</b>				9E-06	<b>\</b>	

#### Bold indicates maximum value used as the EPC

NA = No Detections

High Frequency	Moderate Frequency
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Cardiovascular	0
Dermal	0
Thyroid	0
Respiratory	0
Gastrointestinal	0
Nervous	0
Immune	0
Occular	0
Developmental	0
	Dermal Thyroid Respiratory Gastrointestinal Nervous Immune Occular

#### Table 16 - Sub-Parcel B7-1 Surface Soils Child Recreator Risk Ratios

			EU	J <b>1 (11</b>	.8 ac.)			EU2 (10.1 ac.)				
					or - High Freq				- Moderate Fr			
		ED.C	SSLs (	mg/kg)	Risk Rat	tios	TD G	SSLs (	mg/kg)	Risk Ra	tios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	
Aluminum	Nervous	18,746		109,000		0.2	17,511		150,000		0.1	
Arsenic	Cardiovascular; Dermal	9.33	0.948	48.9	9.8E-06	0.2	8.44	1.30	67.2	6.5E-06	0.1	
Chromium VI	Respiratory	0.77	0.426	328	1.8E-06	0.002	NA	0.585	451			
Cobalt	Thyroid	9.42	1,780	32.8	5.3E-09	0.3	11.1	2,450	45.1	4.5E-09	0.2	
Copper	Gastrointestinal	75.6		4,380		0.02	227		6,020		0.04	
Iron	Gastrointestinal	153,756		76,700		2	133,518		105,000		1	
Manganese	Nervous	26,733		2,610		10	823		3,580		0.2	
Mercury	Nervous	0.27		32.8		0.008	0.35		45.1		0.008	
Vanadium	Dermal	1,938		551		4	61.6		757		0.08	
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.342	1.64	3.8E-07	0.08	NA	0.470	2.26			
Benz[a]anthracene		0.60	1.60		3.8E-07		0.76	2.20		3.5E-07		
Benzo[a]pyrene	Developmental	0.49	0.161	25.1	3.0E-06	0.02	0.97	0.221	34.4	4.4E-06	0.03	
Benzo[b]fluoranthene		0.83	1.61		5.2E-07		0.92	2.21		4.2E-07		
Dibenz[a,h]anthracene		0.07	0.161		4.3E-07		0.12	0.221		5.4E-07		
					2E-05	<b>\</b>				1E-05	<b>\</b>	

#### Bold indicates maximum value used as the EPC

NA = No Detections

High Frequency	Moderate Frequency
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

	Cardiovascular	0
Total HI	Dermal	4
	Thyroid	0
	Respiratory	0
	Gastrointestinal	2
	Nervous	10
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
Total HI	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0
•		

#### Table 17 - Sub-Parcel B7-1 Subsurface Soils Child Recreator Risk Ratios

		EU1 (11.8 ac.)					EU2 (10.1 ac.)				
			Child Recreator - High Frequency					- Moderate Fr			
			SSLs (	(mg/kg)	Risk Ra	tios		SSLs (	mg/kg)	Risk Ra	tios
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,015		109,000		0.2	16,994		150,000		0.1
Arsenic	Cardiovascular; Dermal	8.07	0.948	48.9	8.5E-06	0.2	10.2	1.30	67.2	7.8E-06	0.2
Chromium VI	Respiratory	0.88	0.426	328	2.1E-06	0.003	NA	0.585	451		
Cobalt	Thyroid	9.67	1,780	32.8	5.4E-09	0.3	6.19	2,450	45.1	2.5E-09	0.1
Copper	Gastrointestinal	17.0		4,380		0.004	12.0		6,020		0.002
Iron	Gastrointestinal	27,786		76,700		0.4	17,364		105,000		0.2
Manganese	Nervous	989		2,610		0.4	112		3,580		0.03
Mercury	Nervous	10.9		32.8		0.3	0.52		45.1		0.01
Vanadium	Dermal	52.2		551		0.09	28.8		757		0.04
Aroclor 1254	Dermal; Immune; Ocular	NA	0.342	1.64			NA	0.470	2.26		
Benz[a]anthracene		0.09	1.60		5.6E-08		0.02	2.20		9.1E-09	
Benzo[a]pyrene	Developmental	0.44	0.161	25.1	2.7E-06	0.02	0.02	0.221	34.4	9.0E-08	0.0006
Benzo[b]fluoranthene		0.19	1.61		1.2E-07		0.03	2.21		1.4E-08	
Dibenz[a,h]anthracene		0.09	0.161		5.6E-07		0.003	0.221		1.4E-08	
					1E-05	<b>\</b>				8E-06	<b>\</b>

#### Bold indicates maximum value used as the EPC

NA = No Detections

SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High FrequencyModerate FrequencyChronic exposureChronic exposureEF (day/yr) = 250EF (day/yr) = 182ET (hr/day) = 8ET (hr/day) = 8

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

#### Table 18 - Sub-Parcel B7-1 Pooled Soils Child Recreator Risk Ratios

		EU1 (11.8 ac.)				EU2 (10.1 ac.)					
					tor - High Freq					- Moderate Fr	
		~	SSLs (	mg/kg)	Risk Ra	tios		SSLs (	mg/kg)	Risk Ra	tios
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,011		109,000		0.2	16,526		150,000		0.1
Arsenic	Cardiovascular; Dermal	8.28	0.948	48.9	8.7E-06	0.2	8.26	1.30	67.2	6.4E-06	0.1
Chromium VI	Respiratory	0.79	0.426	328	1.9E-06	0.002	NA	0.585	451		
Cobalt	Thyroid	9.02	1,780	32.8	5.1E-09	0.3	13.7	2,450	45.1	5.6E-09	0.3
Copper	Gastrointestinal	49.4		4,380		0.01	155		6,020		0.03
Iron	Gastrointestinal	109,025		76,700		1	94,448		105,000		0.9
Manganese	Nervous	24,970		2,610		10	505		3,580		0.1
Mercury	Nervous	0.48		32.8		0.01	0.23		45.1		0.005
Vanadium	Dermal	1,284		551		2	48.4		757		0.06
Aroclor 1254	Dermal; Immune; Ocular	0.13	0.342	1.64	3.8E-07	0.08	NA	0.470	2.26		
Benz[a]anthracene		0.40	1.60		2.5E-07		0.28	2.20		1.3E-07	
Benzo[a]pyrene	Developmental	0.27	0.161	25.1	1.7E-06	0.01	0.36	0.221	34.4	1.6E-06	0.01
Benzo[b]fluoranthene		0.46	1.61		2.9E-07		0.62	2.21		2.8E-07	
Dibenz[a,h]anthracene		0.05	0.161		3.1E-07		0.08	0.221		3.6E-07	
					1E-05	<b>\</b>				9E-06	<b>\</b>

#### Bold indicates maximum value used as the EPC

NA = No Detections

High Frequency	Moderate Frequency
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

	Cardiovascular	0
	Dermal	3
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	1
	Nervous	10
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
	Thyroid	0
Total HI	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

#### Table 19 - Sub-Parcel B7-1 Surface Soils Construction Worker Risk Ratios

		50 Day - EU1-EXP (12.1 ac.)				250 Day - EU2-EXP (10.2 ac.)					
				Constru	ction Worker				Constru	ction Worker	
			SSLs	(mg/kg)	Risk Rat	tios		SSLs	(mg/kg)	Risk Ratios	
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ
Aluminum	Nervous	18,746		1,452,322		0.01	17,511		287,263		0.06
Arsenic	Cardiovascular; Dermal	9.33	75.6	479	1.2E-07	0.02	8.44	15.1	95.6	5.6E-07	0.09
Chromium VI	Respiratory	0.77	105	3,994	7.3E-09	0.0002	NA	20.9	798		
Cobalt	Thyroid	9.42	14,602	4,532	6.5E-10	0.002	11.1	2,724	899	4.1E-09	0.01
Copper	Gastrointestinal	75.6		17,182		0.004	227		3,436		0.07
Iron	Gastrointestinal	153,756		1,202,707		0.1	133,518		240,541		0.6
Manganese	Nervous	26,733		19,284		1	823		3,801		0.2
Mercury	Nervous	0.27		2,467		0.0001	0.35		493		0.0007
Vanadium	Dermal	1,938		7,872		0.2	61.6		1,570		0.04
Aroclor 1254	Dermal; Immune; Ocular	0.13	25.4	37.4	5.1E-09	0.003	NA	6.65	7.48		
Benz[a]anthracene		0.60	691		8.7E-10		0.76	158		4.8E-09	
Benzo[a]pyrene	Developmental	0.49	84.5	26.0	5.8E-09	0.02	0.97	17.4	10.9	5.6E-08	0.09
Benzo[b]fluoranthene		0.83	840		9.9E-10		0.92	174		5.3E-09	
Dibenz[a,h]anthracene		0.07	87.1		8.0E-10		0.12	17.6		6.8E-09	
					1E-07	<b>\</b>				6E-07	<b>↓</b>

#### Bold indicates maximum value used as the EPC

NA = No Detections

SSLs calculated using equations in 2002 EPA Supplemental Guidance <u>Guidance Equation Input Assumptions:</u>

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

	Cardiovascular	0
	Dermal	0
Total HI	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
Total HI	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

#### Table 20 - Sub-Parcel B7-1 Subsurface Soils Construction Worker Risk Ratios

		50 1	Day -	EU1-E	XP (12.1	ac.)	250	Day -	EU2-I	EXP (10.2	ac.)		
				Constru	ction Worker			Construction Worker					
			SSLs	(mg/kg)	Risk Rat		SSLs (mg/kg)		Risk Ratios				
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ		
Aluminum	Nervous	18,015		1,452,322		0.01	16,994		287,263		0.06		
Arsenic	Cardiovascular; Dermal	8.07	75.6	479	1.1E-07	0.02	10.2	15.1	95.6	6.8E-07	0.1		
Chromium VI	Respiratory	0.88	105	3,994	8.4E-09	0.0002	NA	20.9	798				
Cobalt	Thyroid	9.67	14,602	4,532	6.6E-10	0.002	6.19	2,724	899	2.3E-09	0.007		
Copper	Gastrointestinal	17.0		17,182		0.001	12.0		3,436		0.003		
Iron	Gastrointestinal	27,786		1,202,707		0.02	17,364		240,541		0.07		
Manganese	Nervous	989		19,284		0.05	112		3,801		0.03		
Mercury	Nervous	10.9		2,467		0.004	0.52		493		0.001		
Vanadium	Dermal	52.2		7,872		0.007	28.8		1,570		0.02		
Aroclor 1254	Dermal; Immune; Ocular	NA	25.4	37.4			NA	6.65	7.48				
Benz[a]anthracene		0.09	691		1.3E-10		0.02	158		1.3E-10			
Benzo[a]pyrene	Developmental	0.44	84.5	26.0	5.2E-09	0.02	0.02	17.4	10.9	1.1E-09	0.002		
Benzo[b]fluoranthene		0.19	840		2.3E-10		0.03	174		1.7E-10			
Dibenz[a,h]anthracene		0.09	87.1		1.0E-09		0.003	17.6		1.7E-10			
		1E-07				7E-07 ↓							

#### Bold indicates maximum value used as the EPC

NA = No Detections

SSLs calculated using equations in 2002 EPA Supplemental Guidance <u>Guidance Equation Input Assumptions:</u>

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

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

# Table 21 - Sub-Parcel B7-1 Pooled Soils Construction Worker Risk Ratios

		50 1	Day -	EU1-E	XP (12.1	ac.)	250	Day -	EU2-I	EXP (10.2	ac.)		
				Constru	ction Worker			Construction Worker					
			SSLs	(mg/kg)	Risk Rat		SSLs (mg/kg)		Risk Ra	tios			
Parameter	Target Organs	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non- Cancer	Risk	HQ		
Aluminum	Nervous	18,011		1,452,322		0.01	16,526		287,263		0.06		
Arsenic	Cardiovascular; Dermal	8.28	75.6	479	1.1E-07	0.02	8.26	15.1	95.6	5.5E-07	0.09		
Chromium VI	Respiratory	0.79	105	3,994	7.5E-09	0.0002	NA	20.9	798				
Cobalt	Thyroid	9.02	14,602	4,532	6.2E-10	0.002	13.7	2,724	899	5.0E-09	0.02		
Copper	Gastrointestinal	49.4		17,182		0.003	155		3,436		0.05		
Iron	Gastrointestinal	109,025		1,202,707		0.09	94,448		240,541		0.4		
Manganese	Nervous	24,970		19,284		1	505		3,801		0.1		
Mercury	Nervous	0.48		2,467		0.0002	0.23		493		0.0005		
Vanadium	Dermal	1,284		7,872		0.2	48.4		1,570		0.03		
Aroclor 1254	Dermal; Immune; Ocular	0.13	25.4	37.4	5.1E-09	0.003	NA	6.65	7.48				
Benz[a]anthracene		0.40	691		5.8E-10		0.28	158		1.8E-09			
Benzo[a]pyrene	Developmental	0.27	84.5	26.0	3.2E-09	0.01	0.36	17.4	10.9	2.1E-08	0.03		
Benzo[b]fluoranthene		0.46	840		5.5E-10		0.62	174		3.6E-09			
Dibenz[a,h]anthracene		0.05	87.1		5.7E-10		0.08	17.6		4.5E-09			
					1E-07	<b>\</b>				6E-07	<b>1</b>		

#### Bold indicates maximum value used as the EPC

NA = No Detections

SSLs calculated using equations in 2002 EPA Supplemental Guidance <u>Guidance Equation Input Assumptions:</u>

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

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
Total HI	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

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## APPENDIX A

11



March 29, 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 B7-1; County Parcel

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 B7-1 and complement the statutory requirements of the Voluntary Cleanup Program (Section 7-501 of the Environment Article). Upon submission of a Site Response and Development Work Plan and completion of the remedial activities for the sub-parcel, the Department shall issue a "No Further Action" letter upon a recordation of an environmental covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the Department a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the



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

Alternatively, Tradepoint Atlantic, or other entity may elect to submit an application for a specific subparcel 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 Baltimore, Maryland 21219 T 443.649.5055 C 732.841.7935 phaid@tradepointatlantic.com

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APPENDIX B

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### Construction Worker Soil Screening Levels Maximum Allowable Work Day Exposure Calculation Spreadsheet - Sub-Parcel B7-1

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	Р	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 B7-1

Area of site (ac)	Ac	12.1
Overall duration of construction (wk/yr)	EW	10
Exposure frequency (day/yr)	EF	50
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	15.0
Overall duration of traffic (s)	Tt	1,440,000
Surface area (m2)	AR	48,967
Length (m)	LR	221
Distance traveled (km)	ΣVΚΤ	111
Particulate emission factor (m3/kg)	PEFsc	85,724,699
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	8.16
Total time of construction (s)	Tcv	1,440,000



(EU1-EXP)

Chemical	Toxicity Criteria Source	^Ingestion SF (mg/kg-day) <sup>-1</sup>	^Inhalation Unit Risk (ug/m³) <sup>-1</sup>	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m³)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m³/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)
Aluminum	A/P	-	-	1.00E+00	5.00E-03	1	1.00E+00	0.01	1			-	1.50E+03							1,718,152	9,386,854	1,452,322
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				75.8	30,562	75.6	487	28,161	479
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				113	1,564	105	4,022	563,211	3,994
Cobalt	Р	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					14,602	14,602	5,154	37,547	4,532
Copper	Α	-	-	1.00E-02	-	1	1.00E-02	0.01	1			-	3.50E+01							17,182		17,182
Iron	Р	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							1,202,707		1,202,707
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							24,270	93,869	19,284
Mercuric Chloride (and other salts)	I	-	-	2.00E-03	3.00E-04	0.07	1.40E-04	0.01	1			-								2,478	563,211	2,467
Vanadium and Compounds	Α	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							8,216	187,737	7,872
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	2.26E+4	43.6	60.7	25.4	37.4		37.4
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	1.21E+5	891	3,079	691			
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	6.43E+5	89.1	1,630	84.5	382	27.9	26.0
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	5.79E+5	891	14,704	840			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	1.54E+6	89.1	3,861	87.1			

 $<sup>^{\</sup>star} \text{chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls}$ 

<sup>^</sup>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

Construction Worker Soil Screening Levels Maximum Allowable Work Day Exposure Calculation Spreadsheet - Sub-Parcel B7-1

Area of site (ac)	Ac	10.2
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	250
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	15.2
Overall duration of traffic (s)	Tt	7,200,000
Surface area (m2)	AR	41,278
Length (m)	LR	203
Distance traveled (km)	ΣVΚΤ	508
Particulate emission factor (m3/kg)	PEFsc	79,964,721
Derivation of dispersion factor - volatilization (g/m2 s per kg/m3)	Q/Csa	8.39
Total time of construction (s)	Tcv	7,200,000



(EU2-EXP)

Chemical	Toxicity Criteria Source	^Ingestion SF (mg/kg-day) <sup>-1</sup>	^Inhalation Unit Risk (ug/m³) <sup>-1</sup>	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m³)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m³/kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)		Non- Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non- Carcinogenic Inhalation SL (SLinh)	Non- Carcinogenic SL (mg/kg)
Aluminum	A/P	-	-	1.00E+00	5.00E-03	1	1.00E+00	0.01	1			-	1.50E+03							343,630	1,751,227	287,263
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.2	5,702	15.1	97.4	5,254	95.6
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				22.5	292	20.9	804	105,074	798
Cobalt	Р	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					2,724	2,724	1,031	7,005	899
Copper	Α	-	-	1.00E-02	-	1	1.00E-02	0.01	1			-	3.50E+01							3,436		3,436
Iron	Р	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							4,854	17,512	3,801
Mercuric Chloride (and other salts)	I	-	-	2.00E-03	3.00E-04	0.07	1.40E-04	0.01	1			-								496	105,074	493
Vanadium and Compounds	Α	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							1,643	35,025	1,570
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	5.20E+4	8.72	27.9	6.65	7.48		7.48
Benz[a]anthracene	Į.	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.77E+5	178	1,412	158			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.48E+6	17.8	741	17.4	76.4	12.7	10.9
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.33E+6	178	6,693	174			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	3.54E+6	17.8	1,730	17.6			

 $<sup>{}^{\</sup>star}\text{chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls}$ 

<sup>^</sup>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

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P: chemical specific parameters found in the Database of EPA PPRTVs at https://hhpprtv.ornl.gov/quickview/pprtv.php

## Site-specific Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - mass limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - mass limit)	18.4385	18.4385
City (PEF Climate Zone) Selection	Default	Default
City (VF Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - mass limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
$F(x)$ (function dependent on U _,/U,) unitless	0.194	0.194
n (total soil porosity) L/L/L/L/L	0.43396	0.43396
p, (dry soil bulk density) g/cm <sup>3</sup>	1.5	1.5
p, (dry soil bulk density - mass limit) g/cm <sup>3</sup>	1.5	1.5
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438	1359344438
p <sub>e</sub> (soil particle density) g/cm <sup>-3</sup>	2.65	2.65
Q/C <sub>wind</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	93.77	93.77
$Q/C_{_{\text{vol}}}$ (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18	68.18
Q/C <sub>vol</sub> (g/m²-s per kg/m³ - mass limit)	68.18	68.18
A <sub>c</sub> (PEF acres)	0.5	0.5
A <sub>c</sub> (VF acres)	0.5	0.5
A <sub>c</sub> (VF mass-limit acres)	0.5	0.5
AF <sub>0.2</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.2	0.2
AF <sub>2.6</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.2	0.2
AF <sub>6.16</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.07	0.07
AF <sub>16,30</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.07	0.07
AF <sub>roc.a</sub> (skin adherence factor - adult) mg/cm <sup>2</sup>	0.07	0.07
AF <sub>rec.c.</sub> (skin adherence factor - child) mg/cm <sup>-2</sup>	0.2	0.2
AT <sub>rec</sub> (averaging time)	365	365

# Site-specific Recreator Soil Inputs

	Recreator Soil	
	Default	Form-input
Variable	Value	Value
BW <sub>0.2</sub> (body weight) kg	15	15
BW <sub>2.6</sub> (body weight) kg	15	15
BW <sub>6-16</sub> (body weight) kg	80	80
BW <sub>16.30</sub> (body weight) kg	80	80
BW (body weight - adult) kg	80	80
BW <sub>rec</sub> (body weight - child) kg	15	15
DFS <sub>recard</sub> (age-adjusted soil dermal factor) mg/kg		73850
DFSM <sub>rec.adj</sub> (mutagenic age-adjusted soil dermal factor) mg/kg		305900
ED (exposure duration - recreator) years	26	26
ED <sub>0.2</sub> (exposure duration) year	2	2
ED <sub>2.6</sub> (exposure duration) year	4	4
ED <sub>6.16</sub> (exposure duration) year	10	10
ED <sub>16.30</sub> (exposure duration) year	10	10
ED <sub>rec.</sub> (exposure duration - child) years	6	6
EF <sub>rec</sub> (exposure frequency) days/year		250
EF <sub>a.2</sub> (exposure frequency) days/year		250
EF <sub>2.6</sub> (exposure frequency) days/year		250
EF <sub>6.16</sub> (exposure frequency) days/year		250
EF <sub>16,30</sub> (exposure frequency) days/year		250
EF <sub>rec.a</sub> (exposure frequency - adult) days/year		250
EF <sub>rec.</sub> (exposure frequency - child) days/year		250
ET <sub>rec</sub> (exposure time - recreator) hours/day		8
ET <sub>0.2</sub> (exposure time) hours/day		8
ET <sub>2.6</sub> (exposure time) hours/day		8
ET <sub>6.16</sub> (exposure time) hours/day		8
ET <sub>16,30</sub> (exposure time) hours/day		8
ET <sub>rec.a</sub> (adult exposure time) hours/day		8
ET (child exposure time) hours/day		8
THQ (target hazard quotient) unitless	0.1	0.1
IFS <sub>rec-arti</sub> (age-adjusted soil ingestion factor) mg/kg		26250
IFSM rec-adj (mutagenic age-adjusted soil ingestion factor) mg/kg		119166.667

## Site-specific Recreator Soil Inputs

M. C.M.	Recreator Soil Default	Form-input
Variable	Value	Value
IRS (soil intake rate) mg/day	200	200
IRS <sub>2.6</sub> (soil intake rate) mg/day	200	200
IRS <sub>6.16</sub> (soil intake rate) mg/day	100	100
IRS <sub>16.30</sub> (soil intake rate) mg/day	100	100
IRS <sub>rec.a</sub> (soil intake rate - adult) mg/day	100	100
IRS (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA <sub>n.2</sub> (skin surface area) cm <sup>-2</sup> /day	2373	2373
SA <sub></sub> (skin surface area) cm <sup>2</sup> /day	2373	2373
SA <sub>s.16</sub> (skin surface area) cm <sup>2</sup> /day	6032	6032
SA <sub>16.30</sub> (skin surface area) cm <sup>2</sup> /day	6032	6032
SA <sub>reca</sub> (skin surface area - adult) cm <sup>2</sup> /day	6032	6032
SA <sub>rec.</sub> (skin surface area - child) cm <sup>2</sup> /day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T <sub></sub> (groundwater temperature) Celsius	25	25
Theta (air-filled soil porosity) L (air-filled soil porosity) L (air-filled soil porosity)	0.28396	0.28396
Theta <sub>w</sub> (water-filled soil porosity) L water /L coil	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U <sub>m</sub> (mean annual wind speed) m/s	4.69	4.69
U, (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

## Site-specific

Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF <sub>o</sub> (mg/kg-day) <sup>-1</sup>	SF <sub>.</sub> Ref	IUR (ug/m³)-1	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m <sup>3</sup> )	RfC Ref
Aluminum	7429-90-5	No	No	Inorganics	-		-		1.00E+00	Р	5.00E-03	Р
Aroclor 1254	11097-69-1	No	Yes	Organics	2.00E+00	G	5.71E-04	G	2.00E-05	- 1	-	
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	1	4.30E-03	1	3.00E-04	1	1.50E-05	С
Benz[a]anthracene	56-55-3	Yes	Yes	Organics	1.00E-01	Е	6.00E-05	Ε	-		-	
Benzo[a]pyrene	50-32-8	Yes	No	Organics	1.00E+00	ı	6.00E-04	I	3.00E-04	1	2.00E-06	1
Benzo[b]fluoranthene	205-99-2	Yes	No	Organics	1.00E-01	Е	6.00E-05	Ε	-		-	
Chromium(VI)	18540-29-9	Yes	No	Inorganics	5.00E-01	С	8.40E-02	G	3.00E-03	1	1.00E-04	1
Cobalt	7440-48-4	No	No	Inorganics	_		9.00E-03	Р	3.00E-04	Р	6.00E-06	Р
Copper	7440-50-8	No	No	Inorganics	-		-		4.00E-02	Н	-	
Dibenz[a,h]anthracene	53-70-3	Yes	No	Organics	1.00E+00	Е	6.00E-04	Ε	-		-	
Iron	7439-89-6	No	No	Inorganics	_		-		7.00E-01	Р	-	
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	G	5.00E-05	1
Mercuric Chloride	7487-94-7	No	No	Inorganics	-		-		3.00E-04	1	3.00E-04	G
Vanadium and Compounds	7440-62-2	No	No	Inorganics	-		-		5.04E-03	G	1.00E-04	Α

## Site-specific

Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; \* = where: nc SL < 100X ca SL; \*\* = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	Kू\ (cm³/g)	K <sub>d</sub> \ (cm³/g)	HLC (atm-m³/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref
1	-	1	-	-	-	1.50E+03	-	-		2792.15	CRC89
1	0.14	1	-	4.30E-02	1.31E+05	7.83E+02	2.83E-04	1.16E-02	PHYSPROP	651.36	EPI
1	0.03	0.6	-	-	-	2.90E+01	-	-		888.15	PHYSPROP
1	0.13	1	-	9.40E-03	1.77E+05	1.06E+03	1.20E-05	4.91E-04	PHYSPROP	710.75	PHYSPROP
1	0.13	1	-	1.62E-03	5.87E+05	-	4.57E-07	1.87E-05	PHYSPROP	768.15	PHYSPROP
1	0.13	1	-	1.50E-03	5.99E+05	-	6.57E-07	2.69E-05	PHYSPROP	715.9	EPI
0.025	-	1	-	1.69E+06	-	1.90E+01	-	-		-	
1	-	1	-	-	-	4.50E+01	-	-		3200.15	CRC89
1	-	1	-	-	-	3.50E+01	-	-		2868.15	PHYSPROP
1	0.13	1	-	2.49E-03	1.91E+06	-	1.41E-07	5.76E-06	EPI	797.15	PHYSPROP
1	-	1	-	-	-	2.50E+01	-	-		3273.15	PERRY
0.04	-	1	-	-	-	6.50E+01	_	-		2368.15	PHYSPROP
0.07	-	1	-	6.90E+04	-	-	-	-		577.15	CRC89
0.026	-	1	-	-	-	1.00E+03	-	-		3680.15	CRC89

Critical Temperature TC (K)	TC Ref	Chemical Type	D <sub>ia</sub> \ (cm²/s)	D <sub>iw</sub> \ (cm²/s)	D <sub>A</sub> \ (cm²/s)	Particulate Emission Factor (m³/kg)	Volatilization Factor (m³/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)
6700	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
957.225	Approx. from Tcrit=1.5xTBoil	PCB	2.37E-02	6.10E-06	1.87E-08	1.36E+09	8.43E+05	4.87E-01	1.24E+00	1.74E+01
1673	CRC89	INORGANIC	-	-	-	1.36E+09	-	1.08E+00	7.69E+00	3.73E+03
979	YAWS	PAH	2.61E-02	6.75E-06	6.83E-10	1.36E+09	4.41E+06	2.14E+00	6.42E+00	3.12E+02
969.27	EPA 2001 Fact Sheet	PAH	2.55E-02	6.58E-06	-	1.36E+09	-	2.14E-01	6.42E-01	9.65E+03
969.27	EPA 2001 Fact Sheet	PAH	2.50E-02	6.43E-06	-	1.36E+09	-	2.14E+00	6.42E+00	9.65E+04
-		INORGANIC	-	-	-	1.36E+09	-	4.29E-01	-	6.89E+01
7398.48	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	1.78E+03
5123	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	-
990.41	EPA 2001 Fact Sheet	PAH	2.36E-02	6.02E-06	-	1.36E+09	-	2.14E-01	6.42E-01	9.65E+03
9340	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
4325	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
973	CRC89	INORGANIC	-	-	-	1.36E+09	-	_	-	-
11325	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	-

Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
-	1.10E+04	-	2.98E+06	1.09E+04	1.17E+05	-	2.98E+06	1.12E+05	1.09E+04 nc
3.42E-01	2.19E-01	6.59E-01	-	1.64E-01	2.34E+00	3.95E+00	-	1.47E+00	1.64E-01 nc
9.48E-01	5.48E+00	4.61E+01	8.93E+03	4.89E+00	5.84E+01	2.77E+02	8.93E+03	4.80E+01	9.48E-01 ca
1.60E+00	-	-	-	-	-	-	-	-	1.60E+00 ca
1.61E-01	3.29E+00	1.06E+01	1.19E+03	2.51E+00	3.50E+01	6.38E+01	1.19E+03	2.22E+01	1.61E-01 ca
1.61E+00	-	-	-	-	-	_	-	-	1.61E+00 ca
4.26E-01	3.29E+01	-	5.95E+04	3.28E+01	3.50E+02	-	5.95E+04	3.48E+02	4.26E-01 ca
1.78E+03	3.29E+00	-	3.57E+03	3.28E+00	3.50E+01	-	3.57E+03	3.47E+01	3.28E+00 nc
-	4.38E+02	-	-	4.38E+02	4.67E+03	-	-	4.67E+03	4.38E+02 nc
1.61E-01	-	-	-	-	-	-	-	-	1.61E-01 ca
-	7.67E+03	-	-	7.67E+03	8.18E+04	-	-	8.18E+04	7.67E+03 nc
-	2.63E+02	-	2.98E+04	2.61E+02	2.80E+03	-	2.98E+04	2.56E+03	2.61E+02 nc
-	3.29E+00	-	1.79E+05	3.28E+00	3.50E+01	_	1.79E+05	3.50E+01	3.28E+00 nc
-	5.52E+01	-	5.95E+04	5.51E+01	5.89E+02	-	5.95E+04	5.83E+02	5.51E+01 nc

# Site-specific Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - mass limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - mass limit)	18.4385	18.4385
City (PEF Climate Zone) Selection	Default	Default
City (VF Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - mass limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U/U,) unitless	0.194	0.194
n (total soil porosity) L/L/L/L/L	0.43396	0.43396
p, (dry soil bulk density) g/cm <sup>3</sup>	1.5	1.5
p, (dry soil bulk density - mass limit) g/cm <sup>3</sup>	1.5	1.5
PEF (particulate emission factor) m <sup>3</sup> /kg	1359344438	1359344438
p <sub>e</sub> (soil particle density) g/cm <sup>-3</sup>	2.65	2.65
Q/C <sub>wind</sub> (g/m²-s per kg/m³)	93.77	93.77
$Q/C_{_{VA}}$ (g/m <sup>2</sup> -s per kg/m <sup>3</sup> )	68.18	68.18
Q/C <sub>vol</sub> (g/m <sup>2</sup> -s per kg/m <sup>3</sup> - mass limit)	68.18	68.18
A <sub>c</sub> (PEF acres)	0.5	0.5
A <sub>c</sub> (VF acres)	0.5	0.5
A <sub>c</sub> (VF mass-limit acres)	0.5	0.5
AF <sub>0.2</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.2	0.2
AF <sub>3.6</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.2	0.2
AF <sub>6.16</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.07	0.07
AF <sub>16-30</sub> (skin adherence factor) mg/cm <sup>-2</sup>	0.07	0.07
AF <sub>rac-a</sub> (skin adherence factor - adult) mg/cm <sup>-2</sup>	0.07	0.07
AF <sub>recc</sub> (skin adherence factor - child) mg/cm <sup>-2</sup>	0.2	0.2
AT <sub>rec</sub> (averaging time)	365	365

# Site-specific Recreator Soil Inputs

	Recreator Soil	
W. CHI.	Default	Form-input
Variable	Value	Value
BW <sub>0.2</sub> (body weight) kg	15	15
BW <sub>2.6</sub> (body weight) kg	15	15
BW <sub>6.16</sub> (body weight) kg	80	80
BW <sub>16,20</sub> (body weight) kg	80	80
BW (body weight - adult) kg	80	80
BW (body weight - child) kg	15	15
DFS (age-adjusted soil dermal factor) mg/kg		53762.8
DFSM <sub>roc.adj</sub> (mutagenic age-adjusted soil dermal factor) mg/kg		222695.2
ED <sub>rac</sub> (exposure duration - recreator) years	26	26
ED <sub>0.2</sub> (exposure duration) year	2	2
ED <sub>2.6</sub> (exposure duration) year	4	4
ED <sub>6.16</sub> (exposure duration) year	10	10
ED <sub>16,30</sub> (exposure duration) year	10	10
ED <sub>rec.c.</sub> (exposure duration - child) years	6	6
EF <sub>roc</sub> (exposure frequency) days/year		182
EF <sub>a.2</sub> (exposure frequency) days/year		182
EF <sub>2.6</sub> (exposure frequency) days/year		182
EF <sub>6.16</sub> (exposure frequency) days/year		182
EF <sub>16.30</sub> (exposure frequency) days/year		182
EF <sub>rec.a</sub> (exposure frequency - adult) days/year		182
EF (exposure frequency - child) days/year		182
ET <sub>rec</sub> (exposure time - recreator) hours/day		8
ET <sub>0.2</sub> (exposure time) hours/day		8
ET <sub>2.6</sub> (exposure time) hours/day		8
ET <sub>6.16</sub> (exposure time) hours/day		8
ET <sub>16,30</sub> (exposure time) hours/day		8
ET <sub>reca</sub> (adult exposure time) hours/day		8
ET_recc (child exposure time) hours/day		8
THQ (target hazard quotient) unitless	0.1	0.1
IFS <sub>recadi</sub> (age-adjusted soil ingestion factor) mg/kg		19110
IFSM <sub>rec-adj</sub> (mutagenic age-adjusted soil ingestion factor) mg/kg		86753.333

# Site-specific Recreator Soil Inputs

	Recreator Soil Default	Form-input
Variable	Value	Value
IRS <sub>0.2</sub> (soil intake rate) mg/day	200	200
IRS <sub>2.6</sub> (soil intake rate) mg/day	200	200
IRS <sub>6.16</sub> (soil intake rate) mg/day	100	100
IRS <sub>16.20</sub> (soil intake rate) mg/day	100	100
IRS <sub>rec.a</sub> (soil intake rate - adult) mg/day	100	100
IRS <sub>rec.c</sub> (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA <sub>n.2</sub> (skin surface area) cm <sup>-2</sup> /day	2373	2373
SA <sub>2.6</sub> (skin surface area) cm <sup>-2</sup> /day	2373	2373
SA <sub>6.16</sub> (skin surface area) cm <sup>-2</sup> /day	6032	6032
SA <sub>16,30</sub> (skin surface area) cm <sup>2</sup> /day	6032	6032
SA <sub>mer-a</sub> (skin surface area - adult) cm <sup>2</sup> /day	6032	6032
SA <sub>rec.</sub> (skin surface area - child) cm <sup>2</sup> /day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T <sub>w</sub> (groundwater temperature) Celsius	25	25
Theta (air-filled soil porosity) L / L / L / C / L / C / L / L / C / L / C / L / C / L / C / C	0.28396	0.28396
Theta (water-filled soil porosity) L (water-filled soil porosity) L	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U <sub>m</sub> (mean annual wind speed) m/s	4.69	4.69
U, (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

	CAS			Chemical	SF <sub>。</sub>	SF。		IUR	RfD	RfD	RfC	RfC		
Chemical	Number	Mutagen?	Volatile?	Type	(mg/kg-day) -1	Ref	(ug/m <sup>3</sup> ) <sup>-1</sup>	Ref	(mg/kg-day)	Ref	(mg/m <sup>3</sup> )	Ref	<b>GIABS</b>	ABS
Aluminum	7429-90-5	No	No	Inorganics	_		-		1.00E+00	U	5.00E-03	U	1	-
Aroclor 1254	11097-69-1	No	Yes	Organics	2.00E+00	U	5.71E-04	U	2.00E-05	U	-		1	0.14
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	U	4.30E-03	U	3.00E-04	U	1.50E-05	U	1	0.03
Benz[a]anthracene	56-55-3	Yes	Yes	Organics	1.00E-01	U	6.00E-05	U	-		-		1	0.13
Benzo[a]pyrene	50-32-8	Yes	No	Organics	1.00E+00	U	6.00E-04	U	3.00E-04	U	2.00E-06	U	1	0.13
Benzo[b]fluoranthene	205-99-2	Yes	No	Organics	1.00E-01	U	6.00E-05	U	-		-		1	0.13
Chromium(VI)	18540-29-9	Yes	No	Inorganics	5.00E-01	U	8.40E-02	U	3.00E-03	U	1.00E-04	U	0.025	-
Cobalt	7440-48-4	No	No	Inorganics	-		9.00E-03	U	3.00E-04	U	6.00E-06	U	1	-
Copper	7440-50-8	No	No	Inorganics	-		-		4.00E-02	U	-		1	-
Dibenz[a,h]anthracene	53-70-3	Yes	No	Organics	1.00E+00	U	6.00E-04	U	-		-		1	0.13
Iron	7439-89-6	No	No	Inorganics	-		-		7.00E-01	U	-		1	-
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	U	5.00E-05	U	0.04	-
Mercuric Chloride	7487-94-7	No	No	Inorganics	-		-		3.00E-04	U	3.00E-04	U	0.07	-
Vanadium and Compounds	7440-62-2	No	No	Inorganics	-		-		5.04E-03	U	1.00E-04	U	0.026	-

RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K <sub>∞</sub> \ (cm³/g)	K <sub>d</sub> \ (cm³/g)	HLC (atm-m³/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D <sub>ia</sub> \ (cm²/s)
1	-	-	-	1.50E+03	-	-		2793.15	U	6700	U	INORGANIC	-
1	-	4.30E-02	1.30E+05	7.80E+02	2.83E-04	1.16E-02	U	651.15	U	957	U	PCB	2.37E-02
0.6	-	-	-	2.90E+01	-	-		888.15	U	1670	U	INORGANIC	-
1	-	9.40E-03	1.77E+05	1.06E+03	1.20E-05	4.91E-04	U	711.15	U	979	U	PAH	2.61E-02
1	-	1.62E-03	5.87E+05	-	4.57E-07	1.87E-05	U	768.15	U	969	U	PAH	2.55E-02
1	-	1.50E-03	5.99E+05	-	6.57E-07	2.69E-05	U	716.15	U	969	U	PAH	2.50E-02
1	-	1.69E+06	-	1.90E+01	-	-		-		-		<b>INORGANIC</b>	-
1	-	-	-	4.50E+01	-	-		3203.15	U	7400	U	<b>INORGANIC</b>	-
1	-	_	_	3.50E+01	-	_		2873.15	U	5120	U	<b>INORGANIC</b>	-
1	-	2.49E-03	1.91E+06	-	1.41E-07	5.76E-06	U	797.15	U	990	U	PAH	2.36E-02
1	-	_	_	2.50E+01	-	_		3273.15	U	9340	U	<b>INORGANIC</b>	-
1	-	-	_	6.50E+01	-	-		2373.15	U	4320	U	INORGANIC	-
1	-	6.90E+04	-	-	-	-		577.15	U	973	U	INORGANIC	-
1	-	-	-	1.00E+03	-	-		3683.15	U	11300	U	INORGANIC	-

D <sub>iw</sub> \ (cm²/s)	D <sub>A</sub> \ (cm²/s)	Particulate Emission Factor (m³/kg)	Volatilization Factor (m³/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	SL	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)
-	-	1.36E+09	-	-	-	-	-	1.50E+04	-	4.09E+06	1.50E+04
6.10E-06	1.88E-08	1.36E+09	8.42E+05	6.68E-01	1.70E+00	2.39E+01	4.70E-01	3.01E-01	9.05E-01	-	2.26E-01
-	-	1.36E+09	-	1.49E+00	1.06E+01	5.12E+03	1.30E+00	7.52E+00	6.34E+01	1.23E+04	6.72E+00
6.75E-06	6.83E-10	1.36E+09	4.41E+06	2.95E+00	8.83E+00	4.29E+02	2.20E+00	-	-	-	-
6.58E-06	-	1.36E+09	-	2.95E-01	8.83E-01	1.33E+04	2.21E-01	4.51E+00	1.46E+01	1.64E+03	3.44E+00
6.43E-06	-	1.36E+09	-	2.95E+00	8.83E+00	1.33E+05	2.21E+00	-	-	-	-
-	-	1.36E+09	-	5.89E-01	-	9.47E+01	5.85E-01	4.51E+01	-	8.18E+04	4.51E+01
-	-	1.36E+09	-	-	-	2.45E+03	2.45E+03	4.51E+00	-	4.91E+03	4.51E+00
-	-	1.36E+09	-	-	-	-	-	6.02E+02	-	-	6.02E+02
6.02E-06	-	1.36E+09	-	2.95E-01	8.83E-01	1.33E+04	2.21E-01	-	-	-	-
-	-	1.36E+09	-	-	-	-	-	1.05E+04	-	-	1.05E+04
-	-	1.36E+09	-	-	-	-	-	3.61E+02	-	4.09E+04	3.58E+02
-	-	1.36E+09	-	-	-	-	-	4.51E+00	-	2.45E+05	4.51E+00
-	-	1.36E+09	-	=	-	-	-	7.58E+01	-	8.18E+04	7.57E+01

Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	SL Adult	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
1.60E+05	-	4.09E+06	1.54E+05	1.50E+04 nc
3.21E+00	5.43E+00	-	2.02E+00	2.26E-01 nc
8.02E+01	3.80E+02	1.23E+04	6.59E+01	1.30E+00 ca
-	-	-	-	2.20E+00 ca
4.81E+01	8.77E+01	1.64E+03	3.05E+01	2.21E-01 ca
-	-	-	-	2.21E+00 ca
4.81E+02	-	8.18E+04	4.79E+02	5.85E-01 ca
4.81E+01	-	4.91E+03	4.77E+01	4.51E+00 nc
6.42E+03	-	-	6.42E+03	6.02E+02 nc
-	-	-	-	2.21E-01 ca
1.12E+05	-	-	1.12E+05	1.05E+04 nc
3.85E+03	-	4.09E+04	3.52E+03	3.58E+02 nc
4.81E+01	-	2.45E+05	4.81E+01	4.51E+00 nc
8.09E+02	-	8.18E+04	8.01E+02	7.57E+01 nc

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Model Version: 1.1 Build11

User Name: Date: Site Name: Operable Unit: Run Mode: Research

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\*\*\*\*\* Air \*\*\*\*\*

Indoor Air Pb Concentration: 30.000 percent of outdoor.

**Other Air Parameters:** 

Age	Time Ventilati Outdoors Rate		Lung Absorption	Outdoor Air n Pb Conc
	(hours)	(m³/day)		(μg Pb/m³)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

\*\*\*\*\* Diet \*\*\*\*\*

Age	Diet Intake(μg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

\*\*\*\*\*\* Drinking Water \*\*\*\*\*\*

### **Water Consumption:**

Age	Water (L/day)	
.5-1	0.200	
1-2	0.500	
2-3	0.520	
3-4	0.530	
4-5	0.550	
5-6	0.580	
6-7	0.590	

Drinking Water Concentration: 4.000 µg Pb/L

\*\*\*\*\* Soil & Dust \*\*\*\*\*

**Multiple Source Analysis Used** 

Average multiple source concentration: 50.460 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700 Outdoor airborne lead to indoor household dust lead concentration: 100.000 Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (μg Pb/g)
.5-1	57.800	50.460
1-2	57.800	50.460
2-3	57.800	50.460
3-4	57.800	50.460
4-5	57.800	50.460
5-6	57.800	50.460
6-7	57.800	50.460

\*\*\*\*\* Alternate Intake \*\*\*\*\*

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

\*\*\*\*\* Maternal Contribution: Infant Model \*\*\*\*\*\*

Maternal Blood Concentration: 1.000 µg Pb/dL

\*\*\*\*\*\*\*\*\*\*\*

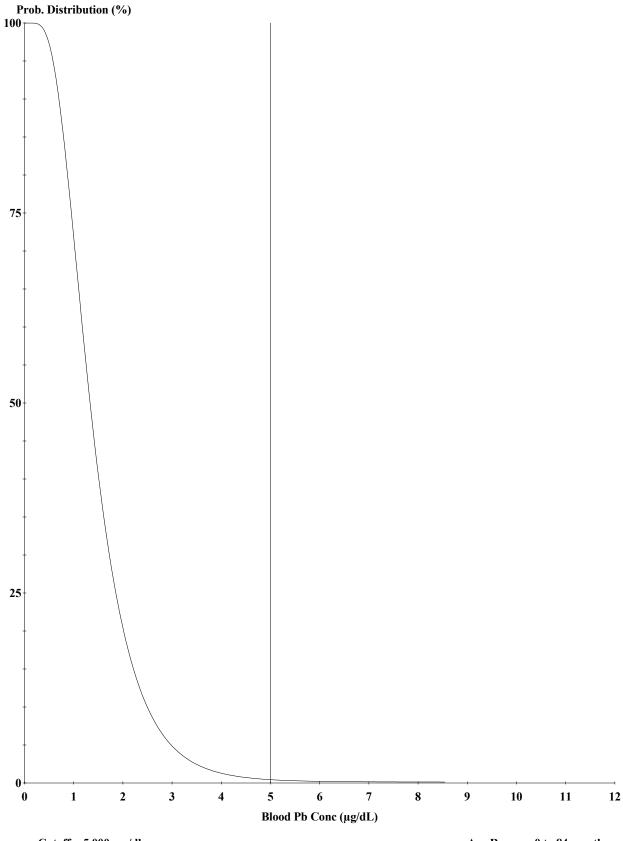
## CALCULATED BLOOD LEAD AND LEAD UPTAKES:

\*\*\*\*\*\*\*\*\*\*\*\*\*

Year	Air (μg/day)	Diet (µg/day)	Alternate (μg/day)	Water (μg/day)
.5-1	0.021	1.095	0.000	0.387
1-2	0.034	0.946	0.000	0.966
2-3	0.062	1.033	0.000	1.009
3-4	0.067	0.994	0.000	1.033
4-5	0.067	0.956	0.000	1.079
5-6	0.093	1.007	0.000	1.140
6-7	0.093	1.092	0.000	1.161

Year	Soil+Dust (µg/day)	Total (μg/day)	Blood (μg/dL)
.5-1	1.328	2.831	1.6
1-2	2.103	4.049	1.7
2-3	2.112	4.215	1.6
3-4	2.121	4.214	1.5
4-5	1.581	3.683	1.3
5-6	1.427	3.668	1.1
6-7	1.349	3.696	1.1





Cutoff = 5.000 µg/dl Geo Mean = 1.398 GSD = 1.600 % Above = 0.335 Age Range = 0 to 84 months

Run Mode = Research

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Model Version: 1.1 Build11

User Name: Date: Site Name: Operable Unit: Run Mode: Research

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\*\*\*\*\* Air \*\*\*\*\*

Indoor Air Pb Concentration: 30.000 percent of outdoor.

**Other Air Parameters:** 

Age	Time Outdoors	Ventilation Rate	Lung Absorption	Outdoor Air n Pb Conc
	(hours)	(m³/day)		(μg Pb/m³)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

\*\*\*\*\* Diet \*\*\*\*\*

Age	Diet Intake(μg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

\*\*\*\*\*\* Drinking Water \*\*\*\*\*\*

### **Water Consumption:**

Age	Water (L/day)		
.5-1	0.200		
1-2	0.500		
2-3	0.520		
3-4	0.530		
4-5	0.550		
5-6	0.580		
6-7	0.590		

Drinking Water Concentration: 4.000 µg Pb/L

\*\*\*\*\* Soil & Dust \*\*\*\*\*

**Multiple Source Analysis Used** 

Average multiple source concentration: 36.810 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700 Outdoor airborne lead to indoor household dust lead concentration: 100.000 Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	38.300	36.810
1-2	38.300	36.810
2-3	38.300	36.810
3-4	38.300	36.810
4-5	38.300	36.810
5-6	38.300	36.810
6-7	38.300	36.810

\*\*\*\*\* Alternate Intake \*\*\*\*\*

Age	Alternate (μg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

\*\*\*\*\*\* Maternal Contribution: Infant Model \*\*\*\*\*\*

Maternal Blood Concentration: 1.000 µg Pb/dL

\*\*\*\*\*\*\*\*\*\*\*

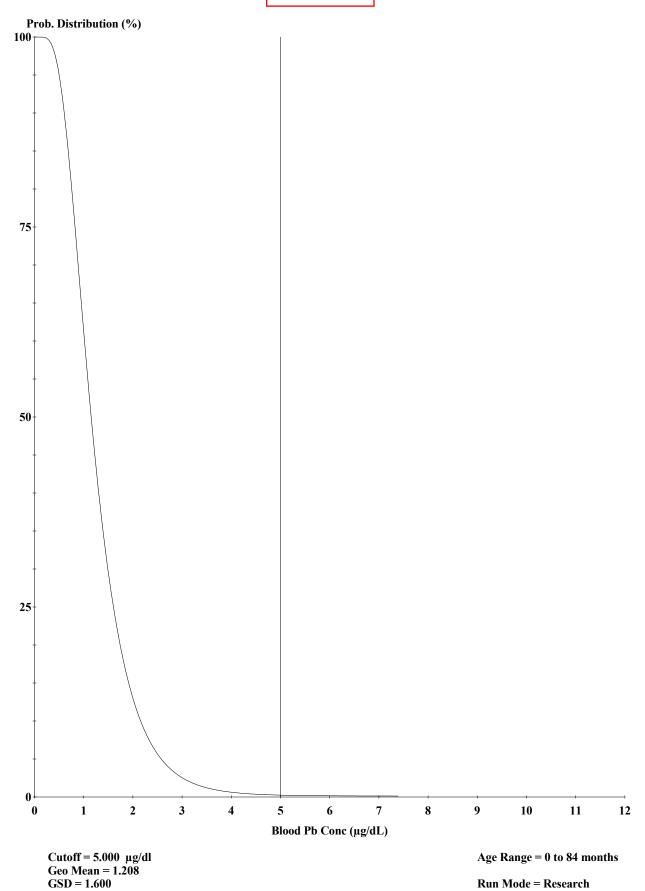
## CALCULATED BLOOD LEAD AND LEAD UPTAKES:

\*\*\*\*\*\*\*\*\*\*\*

Year	Air (μg/day)	Diet (μg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.100	0.000	0.389
1-2	0.034	0.951	0.000	0.971
2-3	0.062	1.038	0.000	1.013
3-4	0.067	0.998	0.000	1.037
4-5	0.067	0.958	0.000	1.081
5-6	0.093	1.010	0.000	1.143
6-7	0.093	1.094	0.000	1.163

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.930	2.440	1.3
1-2	1.474	3.431	1.4
2-3	1.479	3.592	1.3
3-4	1.485	3.586	1.3
4-5	1.105	3.212	1.1
5-6	0.997	3.242	1.0
6-7	0.942	3.293	0.9

EUG-Surface



% Above = 0.126

Run Mode = Research

# **APPENDIX C**

# <u>Sparrows Point Development - PPE Standard</u> <u>Operational Procedure, Revision 3</u>

# Planning, Tracking/Supervision, Enforcement, and Documentation

### **Planning**

- Response and Development Work Plan (RDWP) for each individual redevelopment subparcel 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:
  - o 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.

SP Development PPE Procedure 4-3-19

# **APPENDIX D**

#### L.8808 F.116 GENERAL NOTES PR. 12"x8" TAPPING SLEEVE WAREHOUSE RD AND VALVE I. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" (I-800-257-7777) AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK. 2. EXISTING UTILITY INFORMATION SHOWN HEREON IS BASED ON THE BEST AVAILABLE INFORMATION, WHICH INCLUDES A FIELD SURVEY CONDUCTED BY PRECISION MAPPING AND SURVEYING, DURING JUNE, 2019. AS-BUILT WATER, WASTEWATER AND STORM DRAIN PLANS FROM BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS AND BALTIMORE GAS AND ELECTRIC COMPANY PLANS. 3. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. MK CONSULTING ENGINEERS, LLC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR LEWIS D. ANNA HOLDINGS L L.39894 F.121 THE COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY ALL SUCH INFORMATION TO HIS OWN SATISFACTION. IN THE EVENT THAT INFORMATION IS IN CONFLICT WITH INFORMATION OUTLINED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT PRIOR TO STARTING ANY WORK. 4. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AVAILABLE AS-BUILT PLANS PROVIDED BY TRADE POINT ATLANTIC LLC AND BALTIMORE COUNTY DPW, A SUPPLEMENTAL SURVEY CONDUCTED BY PRECISION MAPPING MARGARET RICKINSON AND SURVEYING DURING JUNE, 2019, AND A BATHYMETRIC SURVEY DURING JULY 2020. JONES CREEK 5. REMOVAL OF ANY SIDEWALK AND/OR CURB AND GUTTER SHALL BE TO THE NEAREST JOINT. NO PATCHING SHALL BE PERMITTED. 6. ADJUST TOP OF CURB GRADES TO PROVIDE SMOOTH TRANSITION. 7. SAWCUT EXISTING PAVING AS NEEDED TO INSTALL NEW CONSTRUCTION. LOTS 14 &15 RONALD D. BASS VICINITY MAP 8. STRIP & RESURFACE EXISTING PAVING AS NEEDED TO PROVIDE SMOOTH TRANSITION TO EX. SURFACE. L.31358 F.27 ANNA EDWARDS L.25862 F.236 SCALE: I"= 1000' 9. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THIS PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK. 10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION FROM THIS PLAN PRIOR TO ANY CHANGE BEING MADE. ANY DEVIATION FROM THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. II. SHOULD THE CONTRACTOR DISCOVER DISCREPENCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING LOTS 16 & 17, PT THE ENGINEER, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES OF LOTS 18,19, & IOZI TRADEPOINT AVENUE 12. THE CONTRACTOR SHALL NOTE THAT IN CASE OF ANY DISCREPANCY BETWEEN THE SCALED RAYMOND H. AND FIGURED DIMENSIONS SHOWN ON THESE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN. WEINREICH JR. L.14938 F.155 13. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL TIE-IN ELEVATIONS. 14. STRUCTURAL FILL IN BUILDING AREAS SHALL BE PLACED IN HORIZONTAL, EIGHT-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO AT LEAST 92 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T-180, STANDARD PROCTOR. STRUCTURAL FILL PLACED IN PAVEMENT AREAS SHALL BE PLACED IN HORIZONTAL, EIGHT-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T-180, STANDARD PROCTOR. SEE THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION. 15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF THE SUB-GRADE UNTIL IT RECEIVES FINAL SURFACE TREATMENT AND SHALL MAINTAIN THE SUB-GRADE AS SUITABLE AND ATLANTICILLO 7021 ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE AT ALL TIMES. HE SHALL BE TRADEPOINT COMPLETELY RESPONSIBLE FOR THE RESTORATION OR REPLACEMENT OF THE SUB-GRADE DUE TO AVENUE MOISTURE DAMAGE, CONSTRUCTION TRAFFIC, OR ANY OTHER CAUSE. REPAIR OR REPLACEMENT OF THE SUB-GRADE SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER 18,19, 26-29 \$ 16. ALL CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST BALTIMORE COUNTY ADJ LAND STANDARD DETAILS AND SPECIFICATIONS AND ALL REVISIONS THERETO, UNLESS OTHERWISE NOTED. RAYMOND H. WEINREICH JR. 17. CONTRACTOR SHALL ADJUST ALL FRAMES, GRATES AND COVERS OF ALL EXISTING L.14938 F.155 UTILITIES WITHIN THE LIMITS OF THE CONTRACT TO THE PROPOSED GRADES, AS REQUIRED. 18. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE TO SWALES AND/ OR STORM DRAIN SYSTEMS AT ALL TIMES. 19. PAVING REPAIR SHALL BE IN ACCORDANCE WITH BALTIMORE COUNTY STANDARD DETAIL R-38. 20. ALL NEW CONCRETE SHALL BE SHA MIX NO. 3, 3,500 PSI (MIN.) AT 28 DAYS. L.*2630*7 21. CONSTRUCTION OF THE PROPOSED ON-SITE UTILITIES WILL BE IN ACCORDANCE WITH THE BALTIMORE F. 640 COUNTY PLUMBING CODE AND BY A CONTRACTOR PRE-QUALIFIED BY BALTIMORE COUNTY. 22. CONTRACTOR SHALL COORDINATE THE LOCATION OF THE UNDERGROUND ELECTRIC SERVICE WITH THE BALTIMORE GAS & ELECTRIC COMPANY. SEE ELECTRICAL PLANS FOR DETAILS. AREA 23. SANITARY SEWER LINES OUTSIDE OF THE BUILDING WILL BE PVC CLASS SDR 26. 24. ALL WATER PIPING, TUBING, FITTINGS AND JOINING METHODS SHALL BE ACCORDING TO THE FOLLOWING APPLICATIONS: 4 INCHES (DN 100) TO 8 INCHES (DN 200): CLASS 'D' OR CLASS 250, DUCTILE IRON PIPE, DUCTILE IRON COMPACT FITTINGS, AND MECHANICAL JOINTS WITH RETAINER GLANDS 25. ALL ON SITE FIRE HYDRANTS ARE TO BE PAINTED RED AND FIRE HYDRANTS STREAMER NOZZLE TO FACE DRIVE AISLES. 26. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL WORK SHOWN ON THESE DRAWINGS JONES CREEK UNLESS OTHERWISE NOTED. 27. PRIOR TO BEGINNING ANY UTILITY CONSTRUCTION THE CONTRACTOR SHALL VERIFY THAT ALL EXISTING UTILITIES WILL TIE IN WITH PROPOSED UTILITIES AS SHOWN. 28. ALL VALVES SHALL BE IN STANDARD CONCRETE VAULTS IN ACCORDANCE WITH BALTIMORE COUNTY STANDARD DETAILS. MATCH LINE SEE SHEET C2.0 FOREST CONSERVATION/ FOREST BUFFER PROTECTIONS PLANS NOTE: 29. SEE STRUCTURAL AND ARCHITECTURAL PLANS FOR SIZE AND LOCATIONS OF TURNED DOWN SLABS OWNER AT EXTERIOR DOORS. REFER TO THE APPROVED FINAL FCP AND FBPP FOR THIS PROJECT IN REGARDS TO ALL FOREST PROTECTION AND PRESERVATION MEASURES, OVERALL SITE AND GRADING PLAN TRADEPOINT ATLANTIC LLC 30. ALL PUBLIC WORK IDENTIFIED ON THESE PLANS IS SUBJECT TO A BALTIMORE COUNTY UTILITY INCLUDING THE LOCATION OF ALL CONSERVATION AREAS. 1600 SPARROWS POINT BLVD AGREEMENT AND SHALL BE PERFORMED BY A BALTIMORE COUNTY PREQUALIFIED CONTRACTOR BALTIMORE, MD 21219 HAVING PREQUALIFICATIONS AI, A2, B, FI, F2, F3 AND E. PHONE: 410-709-1286 1" inch = 50' 31. ALL WORK IDENTIFIED AS PUBLIC AND PRIVATE ON THESE PLANS SHALL BE COMPLETED BY THE CONTRACTOR. BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL 32. THE AREAS BETWEEN THE SIGHT LINE AND THE CURB LINE MUST BE CLEARED, GRADED AND KEPT FREE BENCHMARK DATA PROTECTION AND SUSTAINABILITY OWNER'S/DEVELOPER'S CERTIFICATION-GRADING: 33. SEE SHEET C2.02 FOR LEGEND. I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ALL SURVEY DATA CONTAINED HEREON ARE REFERENCED TO THE REFERENCED ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET TO THE MARYLAND COORDINATE SYSTEM (NAV83/2011) EPOCH 2010 & NAVD88 APPROVED FOR GRADING 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. FOR VERTICAL. AS DERIVED FROM THE FOLLOWING CONTROL STATIONS: DESCRIPTION IRON REBAR & CAP 569,397.29284 1,464,515.29075 12.03' SIGNATURE OWNER/DEVELOPER DATE 569,877.84075 1,464,126.63364 STORMWATER MANAGEMENT REQUIRED 570,264.86984 1,464,567.71304 17.03' IRON REBAR & CAP 569,300.45813 1,465,115.31775 IRON REBAR & CAP PRINT NAME PSM-48 SHEET DESIGNATION CONTRACT NUMBER CIVIL ENGINEER 21004PO0 PROFESSIONAL CERTIFICATION BY DATE P.W.A. NO. KEY SHEET POSITION SH DRAWING SCALE HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OF BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT 100% DD (60% CD) JOB ORDER NUMBER LAN SCALI APPROVED BY ME, AND THAT I AM A DULY LICENSED R.O.W NO. PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF 241-212-0307-0809 SPARROWS POINT PARK LICENSE NO. SHEET 6 of 150 IVIL ENGINEER OVERALL SITE AND GRADING PLAN HIGHWAYS STRUCTURES STORM DRAINS WATER PROPERTY MANAGEMENT $\star\star\star\star\star$ AND CONSTRUCTION DRAWING NUMBER 1900 WHARF ROAD DWN BY: SG REVIEWED BY: V2-C2.00

SUBDIVISION:

ALTIMORE, MD 21211

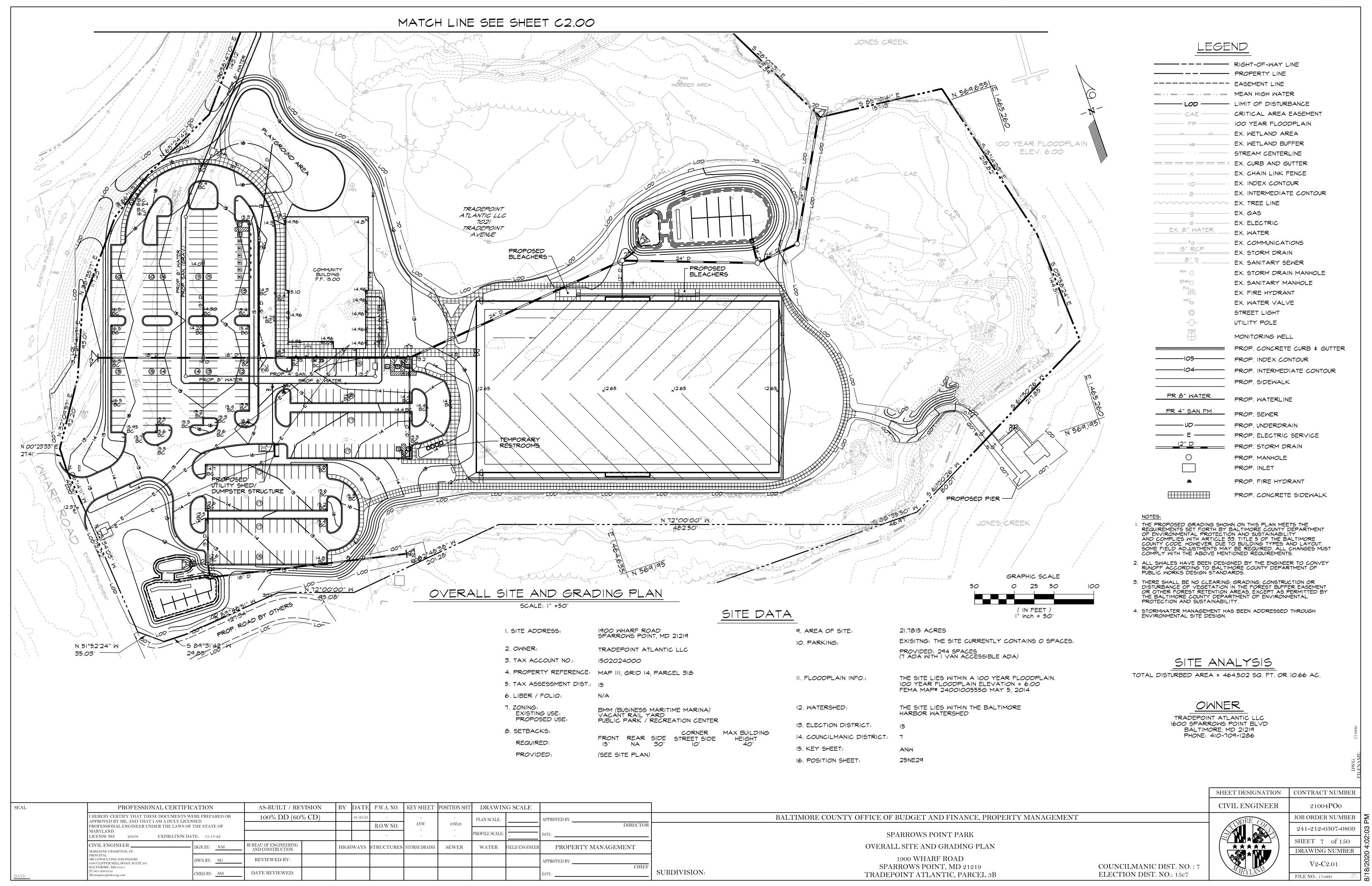
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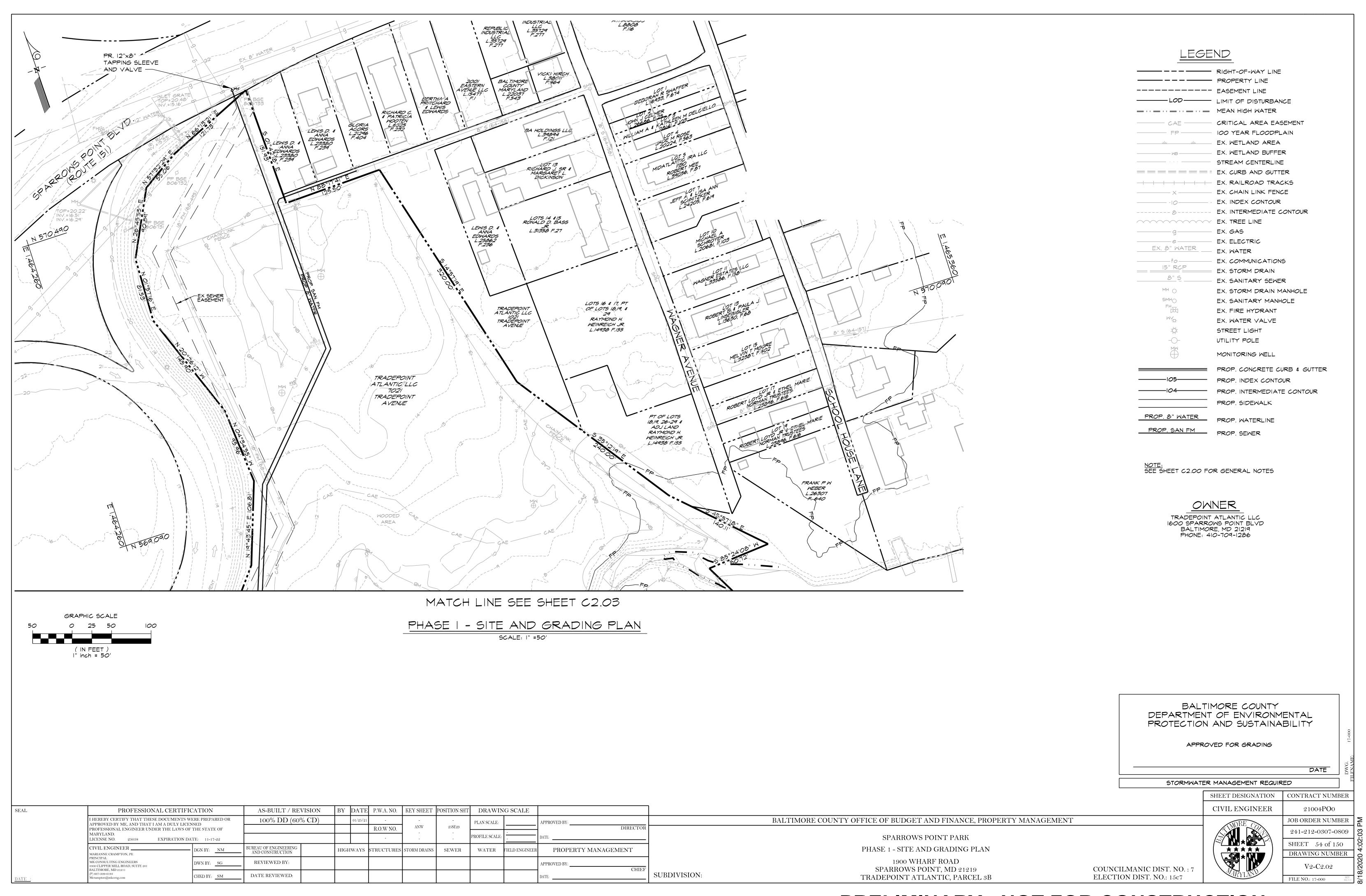
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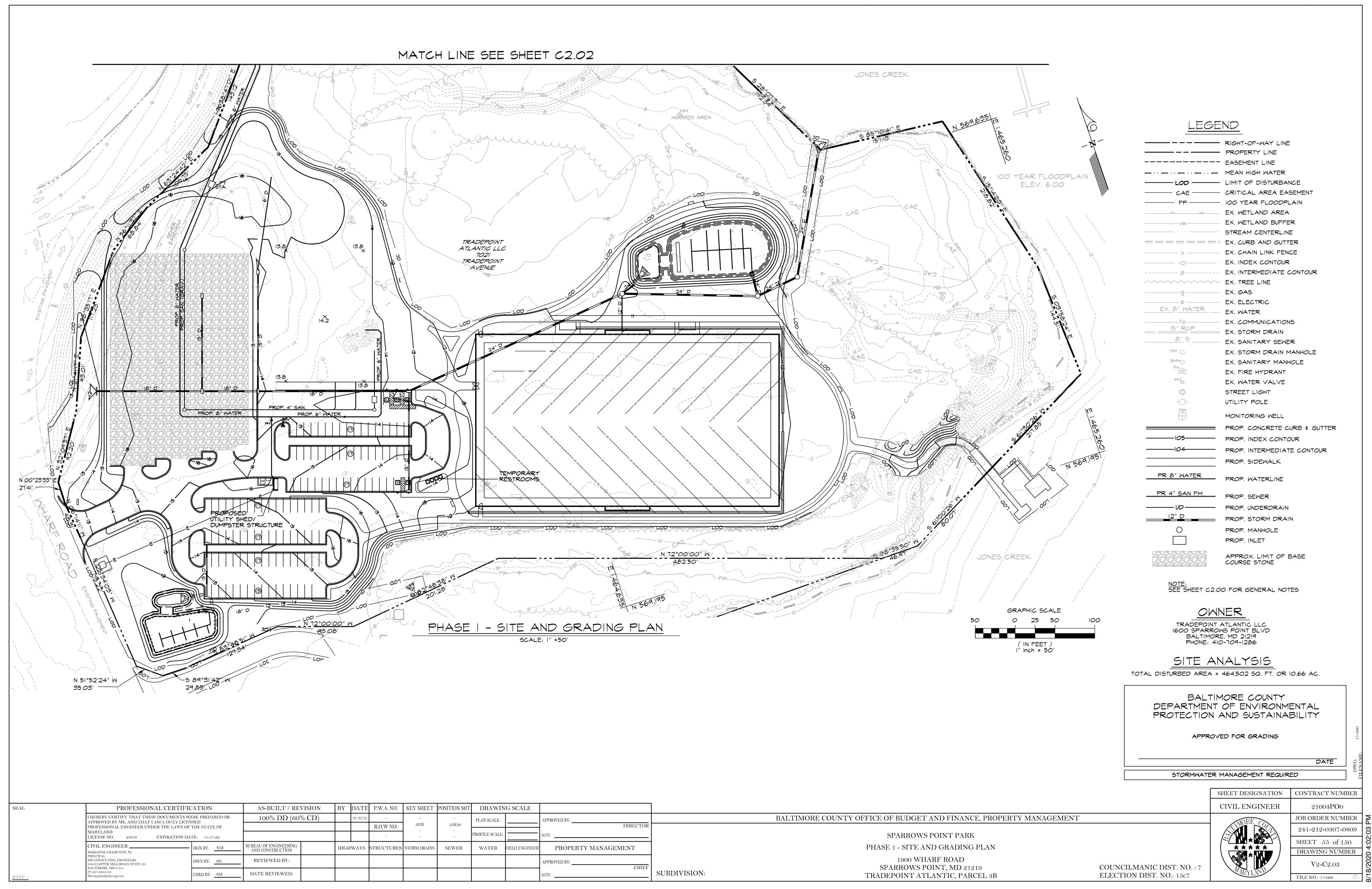
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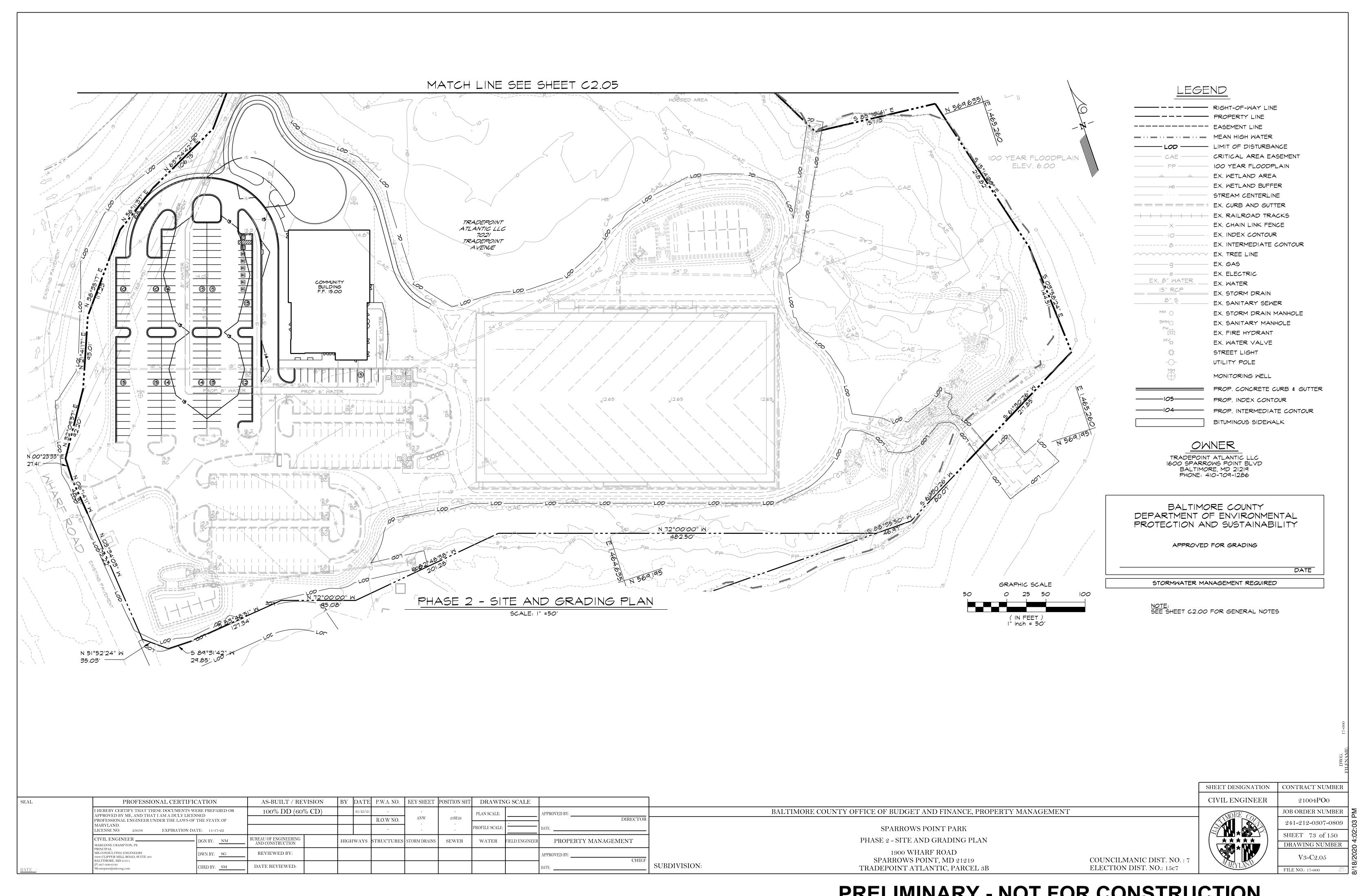
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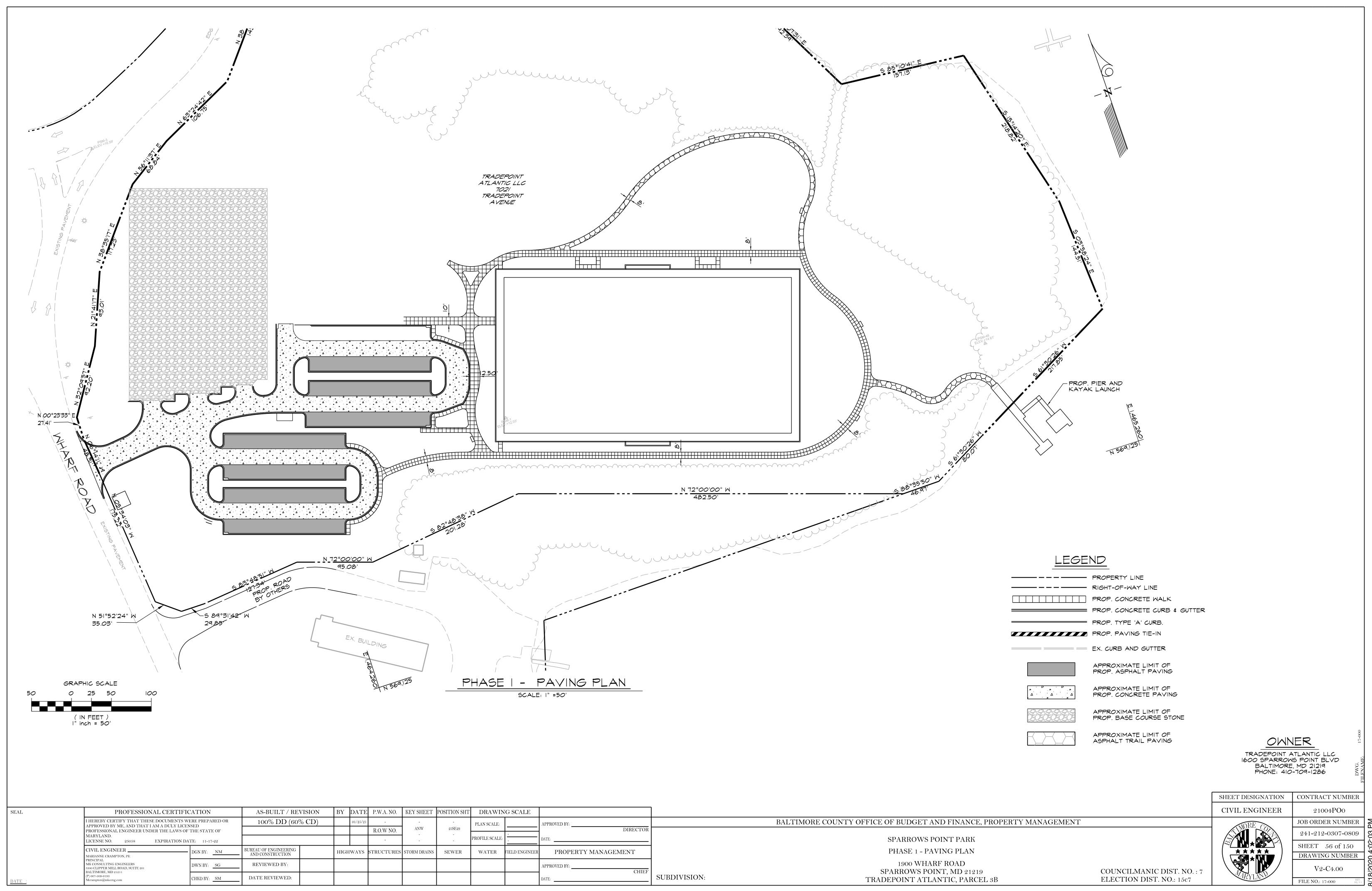




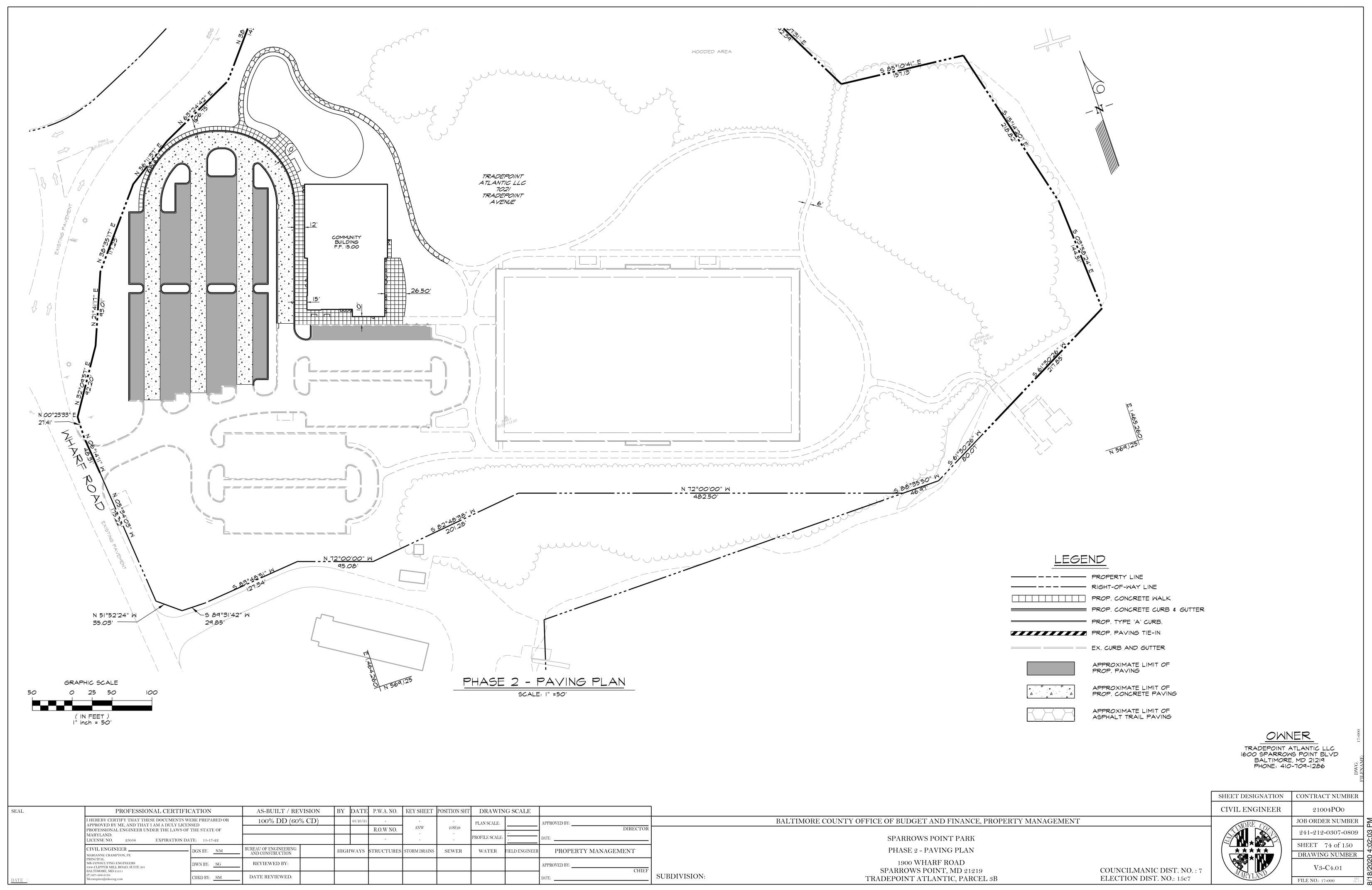




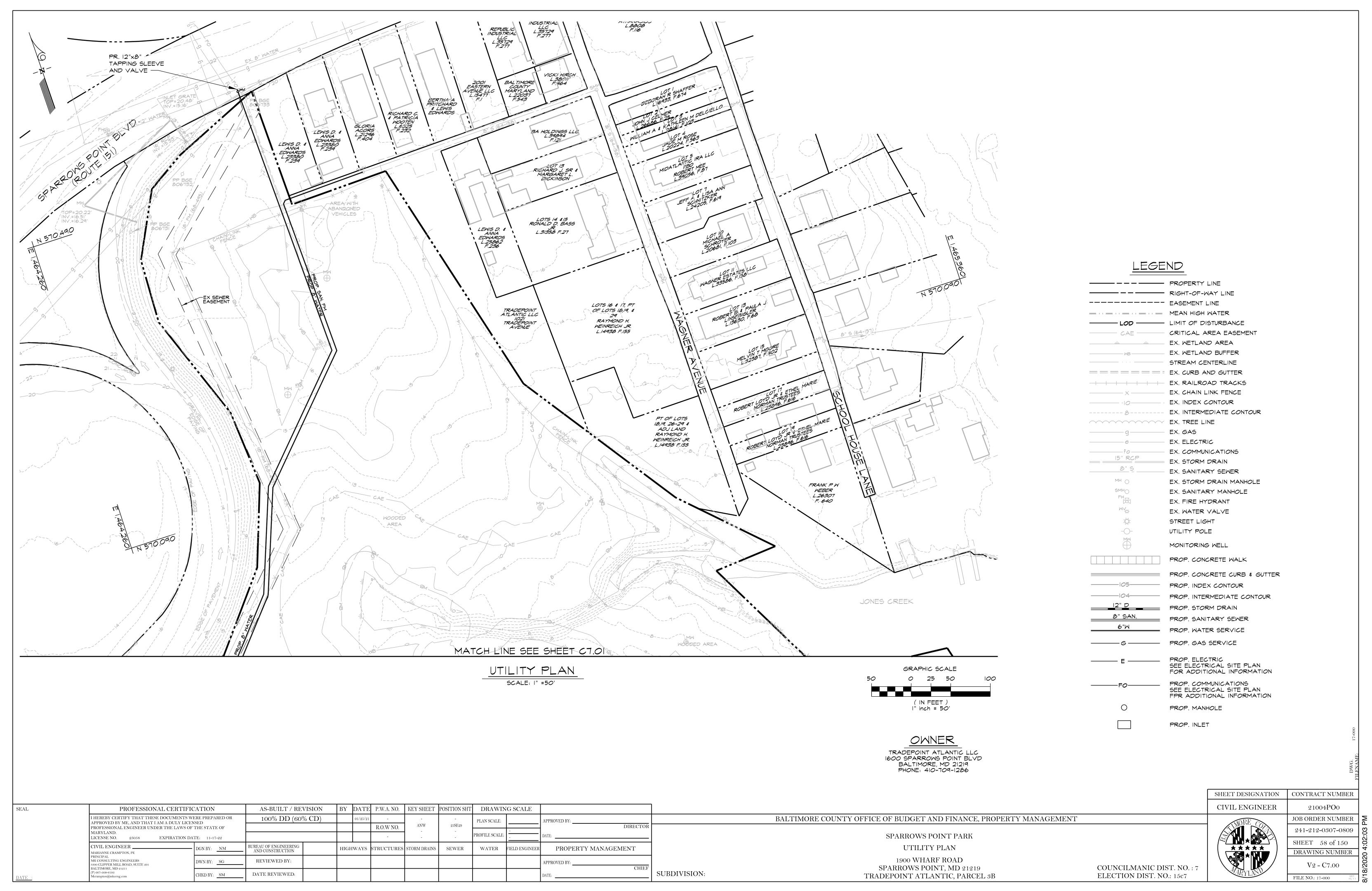


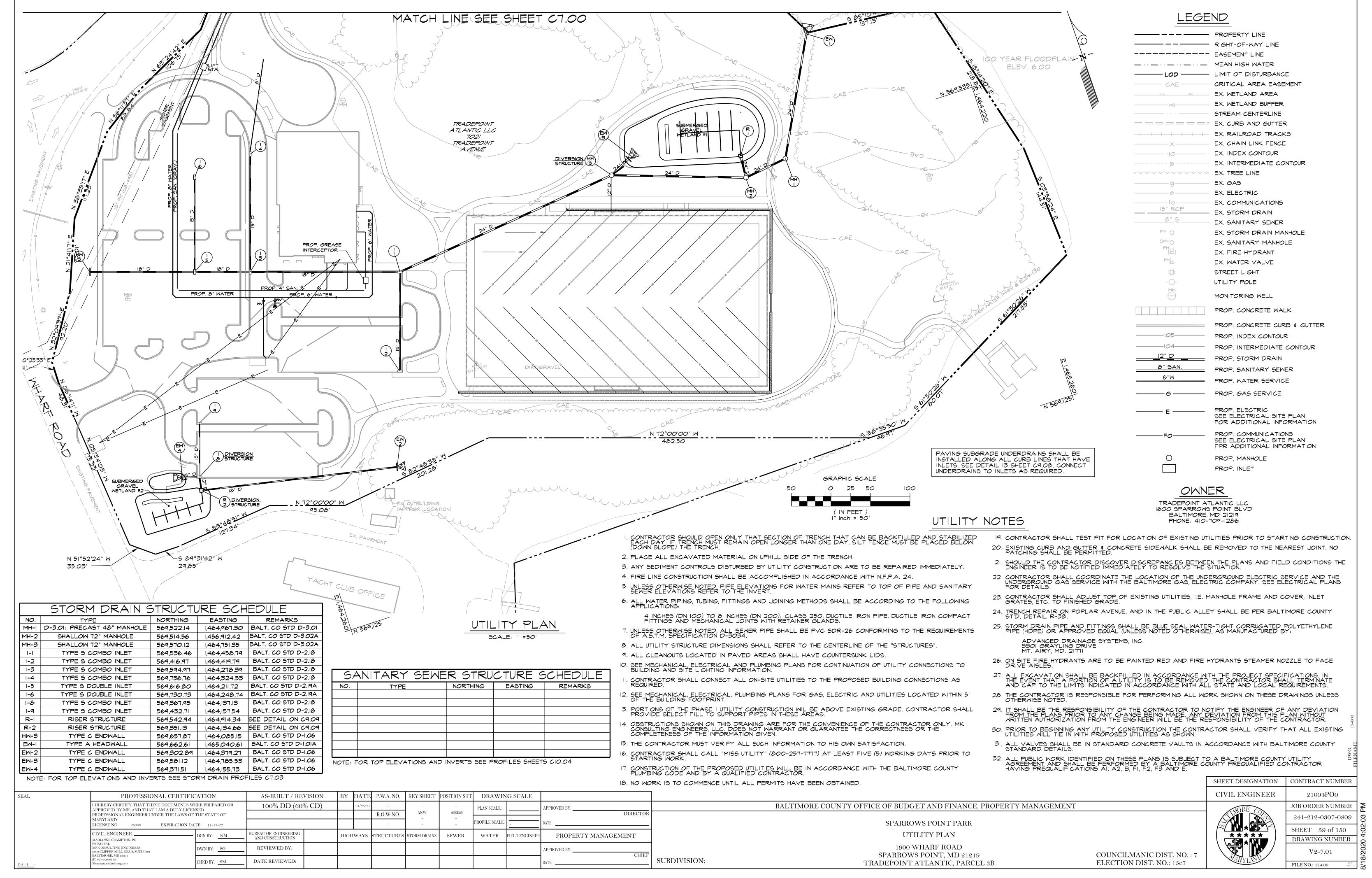


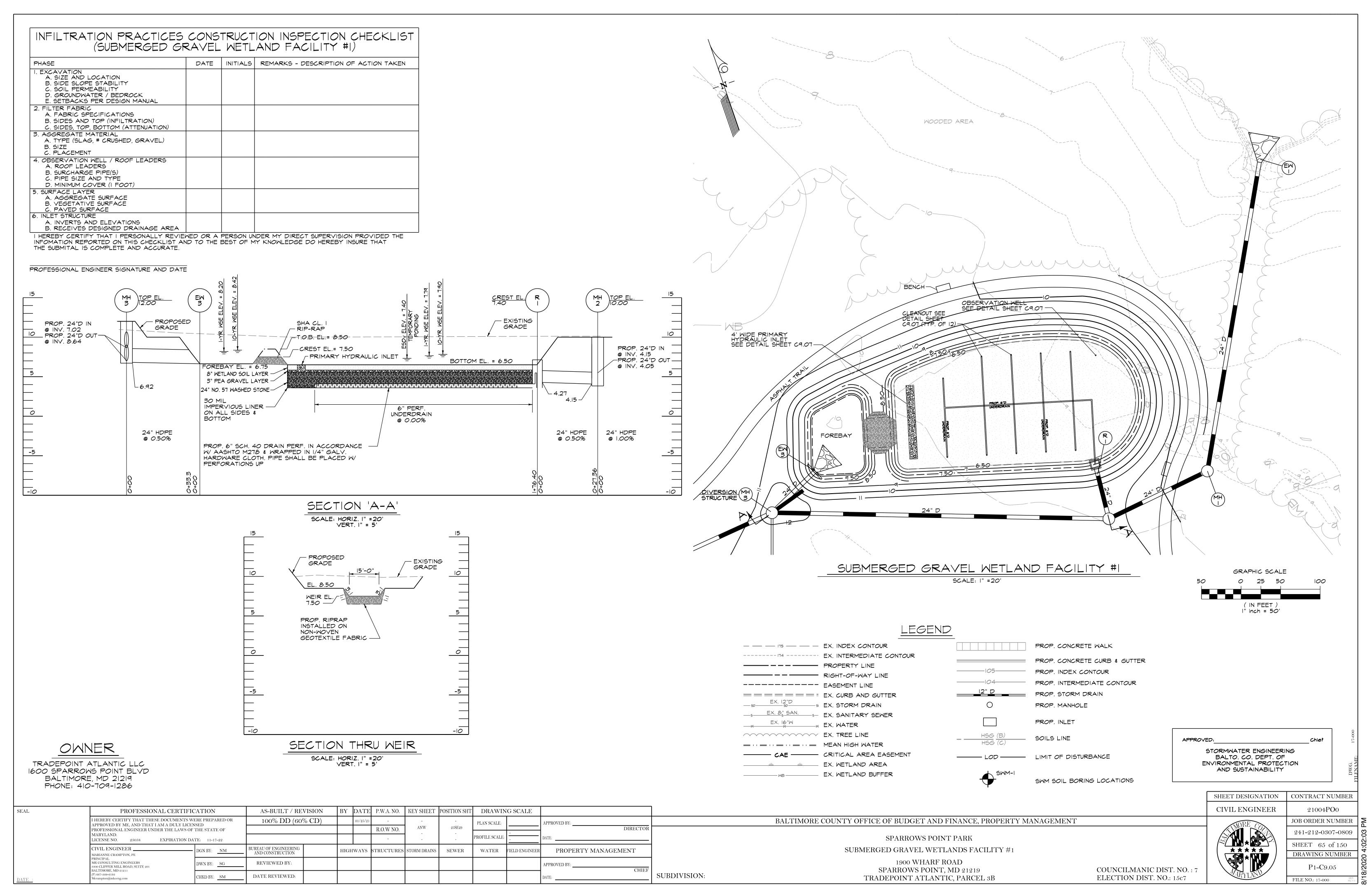
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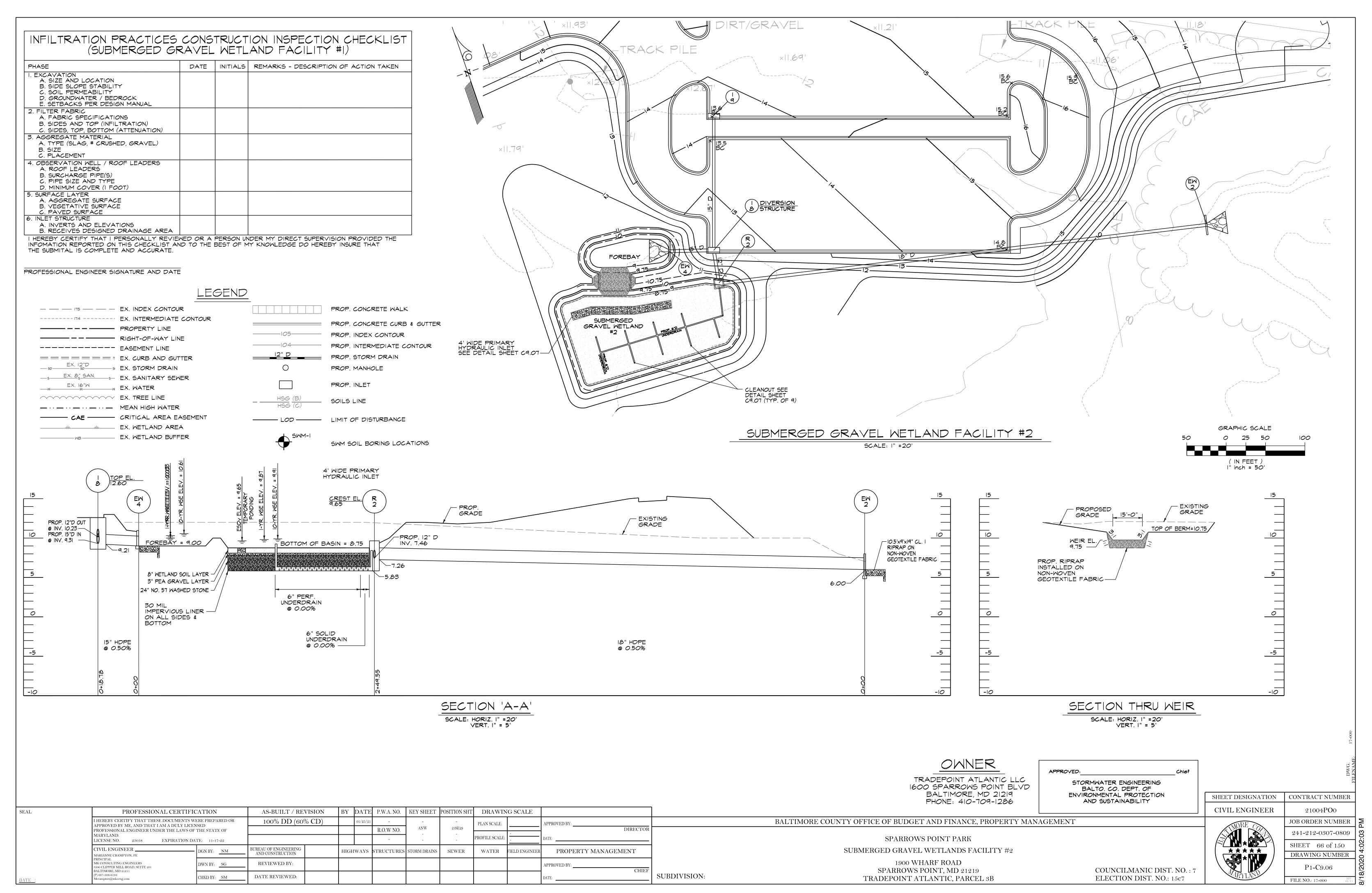
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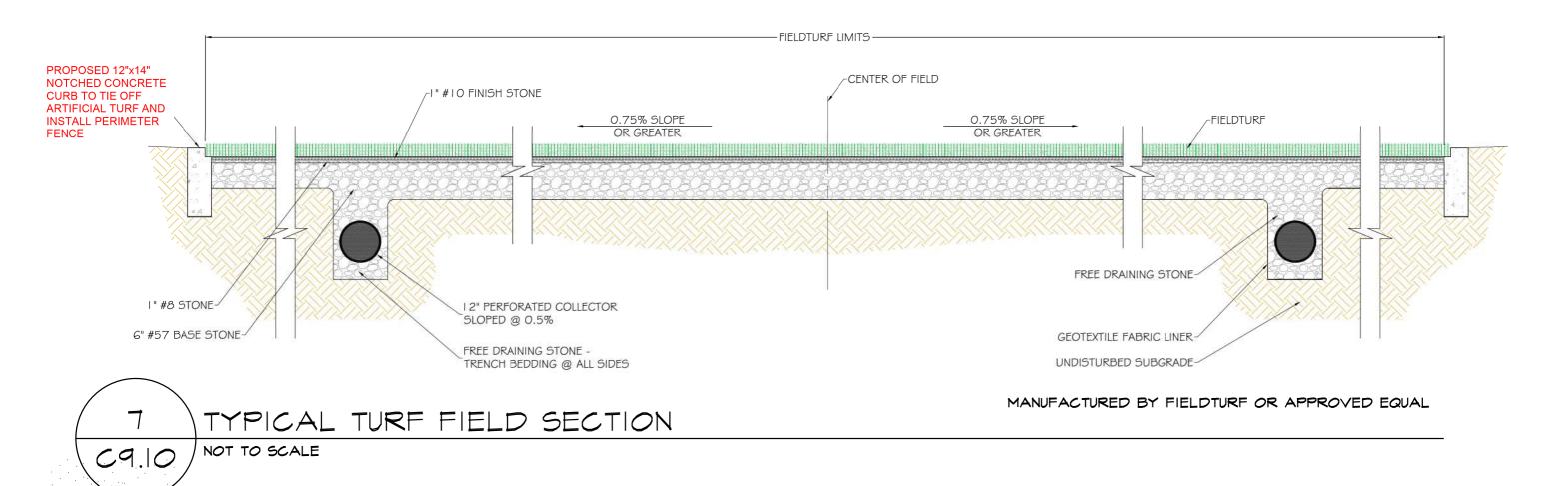


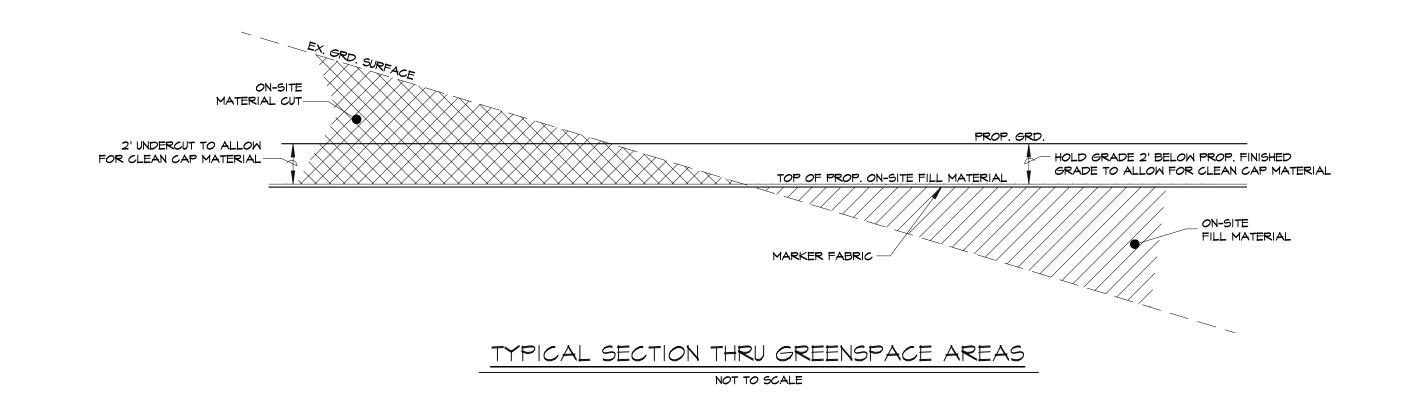




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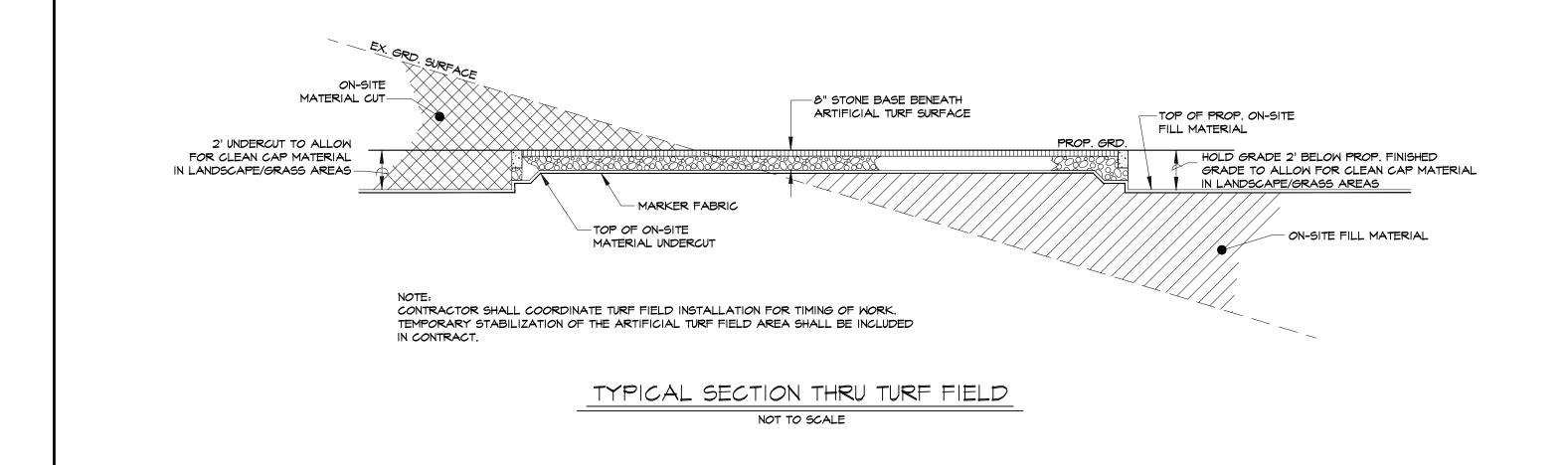






# TYPICAL SECTION THRU GREENSPACE AREAS SPARROWS POINT PARK

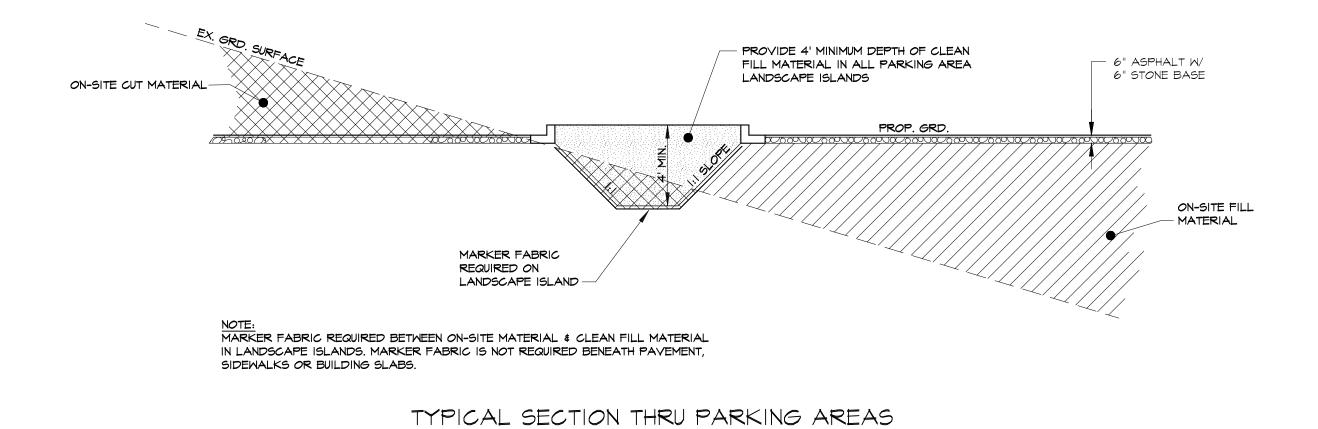




TYPICAL SECTION THRU TURF FIELD

SPARROWS POINT PARK



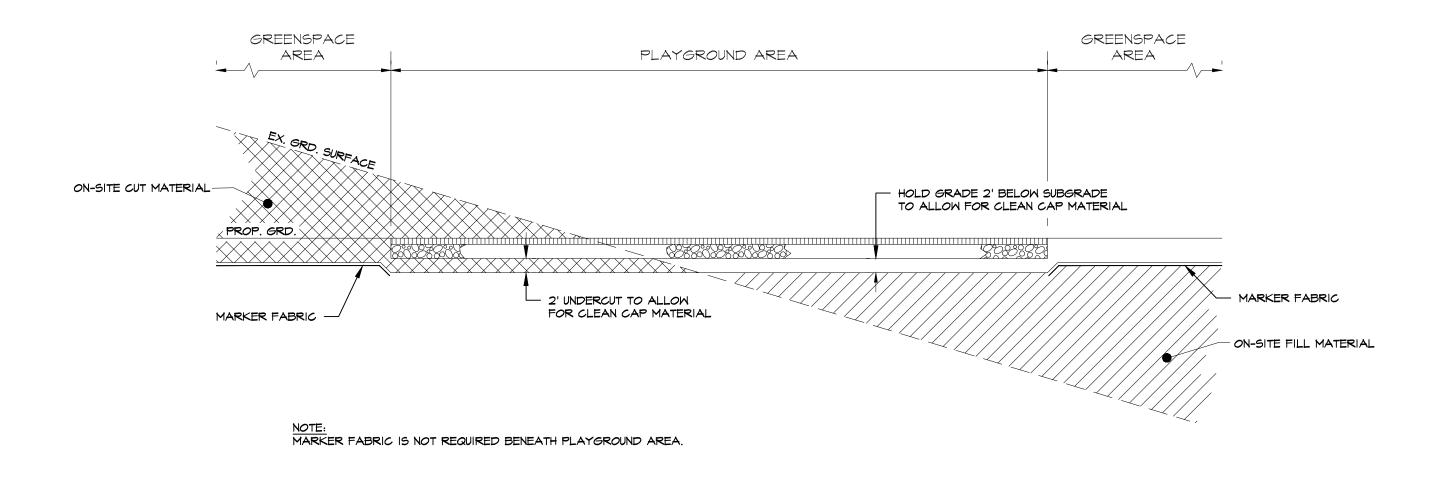


NOT TO SCALE

TYPICAL SECTION THRU PARKING AREAS

SPARROWS POINT PARK





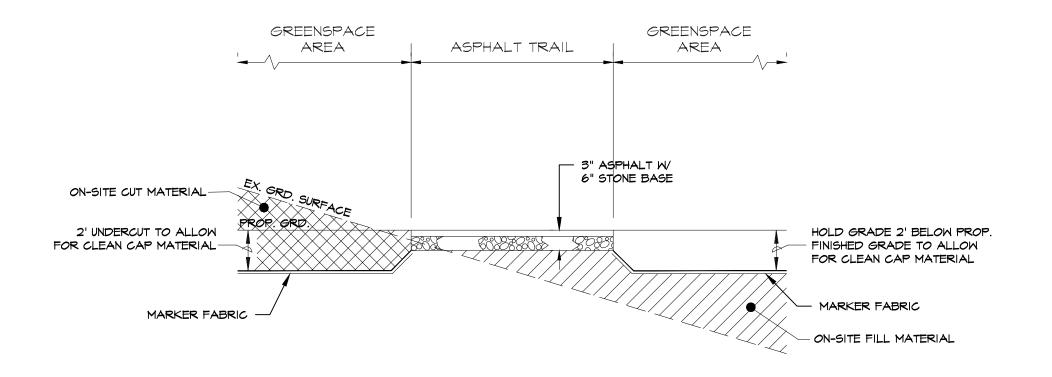
TYPICAL SECTION THRU PLAYGROUND AREAS

NOT TO SCALE

TYPICAL SECTION THRU PLAYGROUND AREAS

SPARROWS POINT PARK





NOTE: MARKER FABRIC IS NOT REQUIRED BENEATH TRAIL AREA.

TYPICAL SECTION THRU ASPHALT TRAIL

NOT TO SCALE

TYPICAL SECTION THRU ASPHALT TRAIL
SPARROWS POINT PARK



### **APPENDIX E**

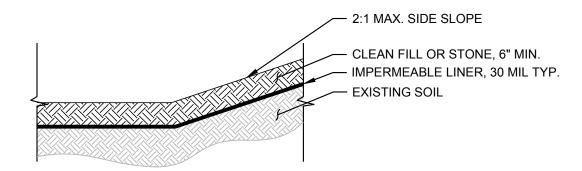
proje

2:1 MAX. SIDE SLOPE

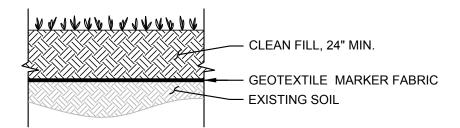
— CLEAN FILL OR STONE, 12" MIN.

— CLAY LAYER, 12" MIN.

— EXISTING SOIL



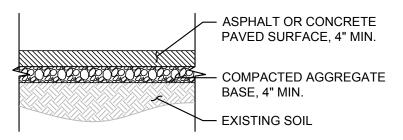
## TYPICAL POND SECTIONS



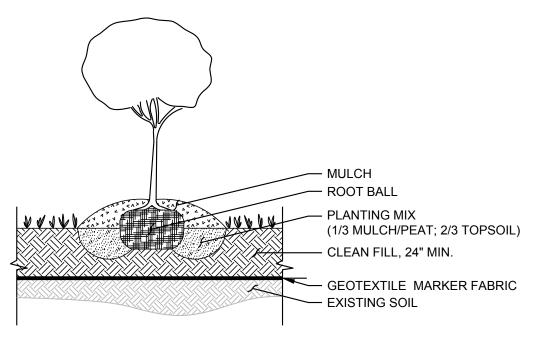
# TYPICAL LANDSCAPE SECTION

### 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



# TYPICAL PAVING SECTION



### TYPICAL PLANTING SECTION

### TCDNG'3"

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 <sup>-1</sup>	1.7	
Flow Rate	ASTM D4491	gal/min/ft2 (l/min/m2)	135 (5500)	
-			Minimum Test Value	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

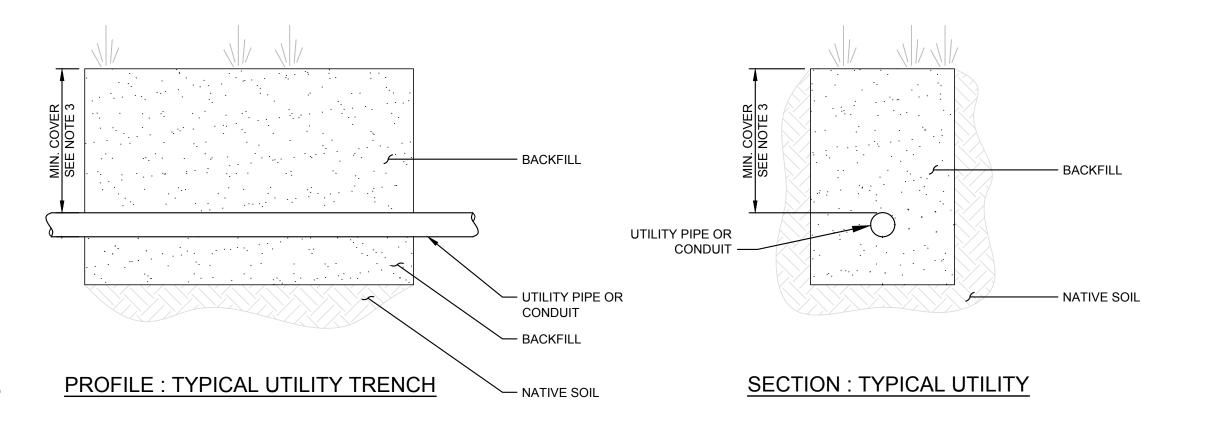
### **APPENDIX F**

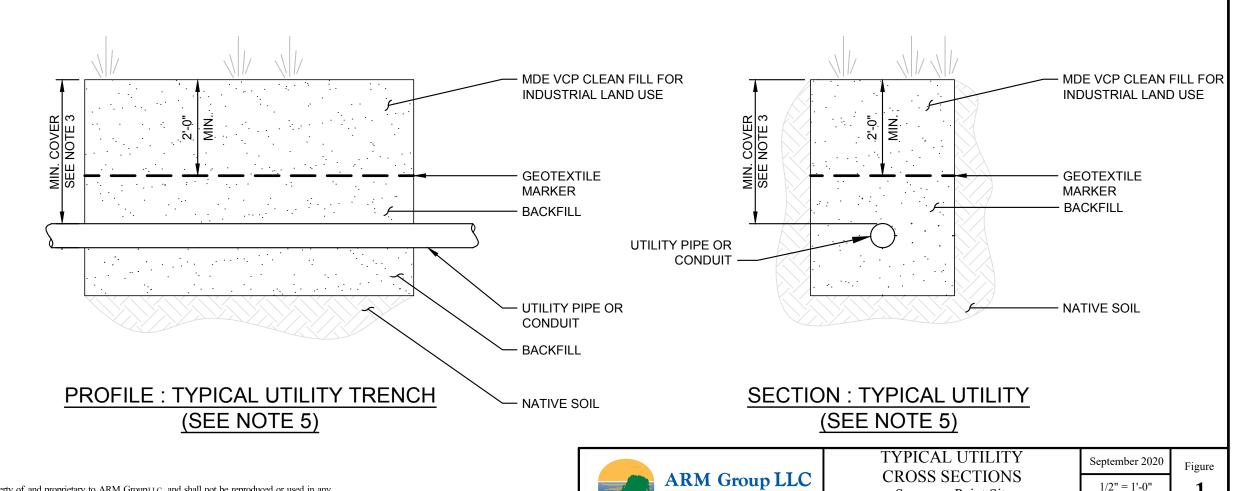
- 2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.
- 3. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.
- 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.

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**Engineers and Scientists** 

Sparrows Point Site

Tradepoint Atlantic

160443M

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#### **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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> samples should be biased to target elevated PID readings, if any. The agencies have requested that all soil samples prepared for the Oil Sticks<sup>TM</sup> 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<sup>TM</sup> test kit or other field screening methods, disposal requirements will be determined using the quantitative PetroFLAG<sup>TM</sup> hydrocarbon analysis system or fixed laboratory analysis (see following section). The PetroFLAG<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> test kit to characterize the material for appropriate disposal. If a PetroFLAG<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> test kit, but soil disposal requirements will be determined with the PetroFLAG<sup>TM</sup> test kit (since the Oil Sticks<sup>TM</sup> method is not quantitative) or via fixed laboratory analysis for TPH/Oil & Grease (if preferred by the contractor or if the PetroFLAG<sup>TM</sup> 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<sup>TM</sup> Procedure**

PetroFLAG<sup>TM</sup> 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<sup>TM</sup>. 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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<sup>TM</sup> 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).

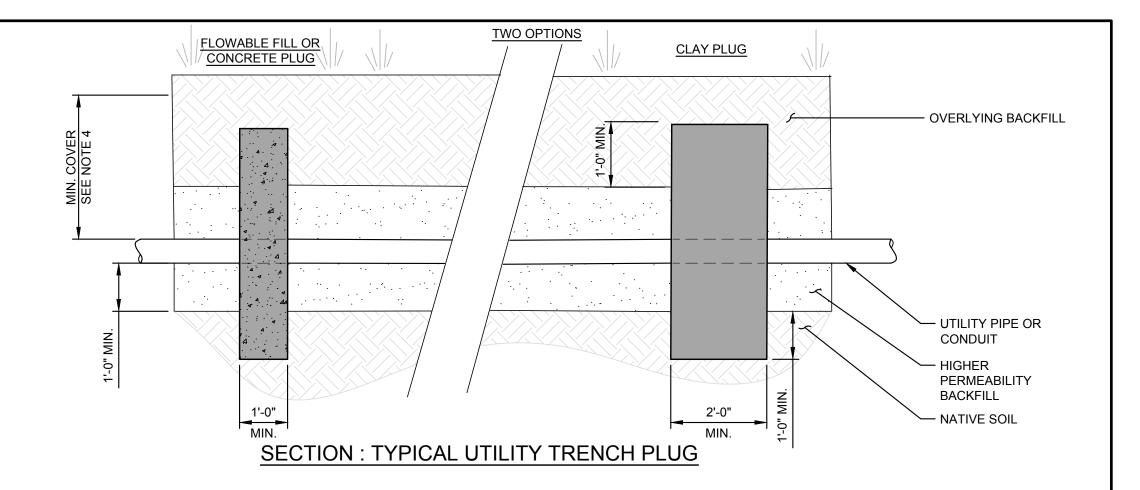
#### References:

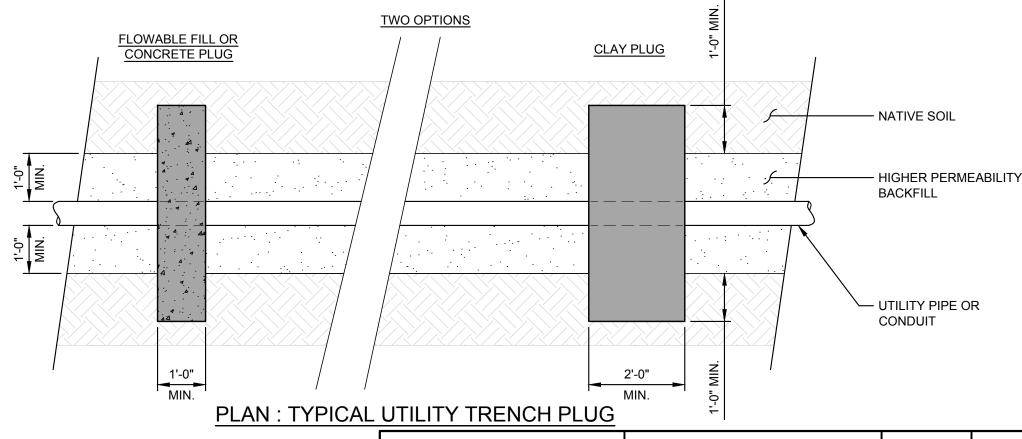
U.S. Environmental Protection Agency (EPA). Contaminated Site Clean-up Information (Clu-IN): Test Kits. Office of Superfund Remediation and Technology Innovation. <a href="http://www.clu-in.net/characterization/technologies/color.cfm">http://www.clu-in.net/characterization/technologies/color.cfm</a>

Dexsil Corporation. 2016. PetroFLAG Analyzer System (PF-MTR-01). <a href="http://www.dexsil.com/products/detail.php?product\_id=23">http://www.dexsil.com/products/detail.php?product\_id=23</a>

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

- 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.
- 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.
  - 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).





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ARM Group LLC Engineers and Scientists Tradepoint Atlantic

UTILITY TRENCH PLUG Sparrows Point Site

September 2020 Not to Scale

160443M

Figure