INTERIM MEASURES CONSTRUCTION REPORT
IN-SITU GROUNDWATER TREATMENT

Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland

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ACRONYMS LIST

ACO	Administrative Consent Order
bgs	Below Ground Surface
CY	Cubic Yards
EAG	Enviro-Analytics Group
ENRC	Enterprise Network Resolutions Contracting (Remedial Contractor)
EPA/USEPA	United States Environmental Protection Agency
FCL	FCL Builders (Developer of A-3 Parcel)
gpm	Gallons per Minute
GPS	Global Positioning System
IDW	Investigation Derived Waste
IM	Interim Measures
MD	Maryland
MDE	Maryland Department of Environment
MW	Monitoring Well
OSHA	Occupational Safety and Health Administration
PA	Pennsylvania
PDI	Pre-Design Investigation
PVC	Poly-vinyl Chloride (plastic pipe material)
PZ	Piezometer
QA	Quality Assurance
SA	Settlement Agreement and Covenant Not to Sue
SPLP	Synthetic Precipitation Leaching Procedure
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure

EXECUTIVE SUMMARY

This Interim Measures Construction Report (IM Construction Report) documents the work performed to implement the scope of work outlined in the *Interim Measures Work Plan, In-Situ Groundwater Treatment, Former Rod and Wire Mill Area (Advanced GeoServices, August 2016)* which was developed for the A-3 Parcel owned by Tradepoint Atlantic at the Sparrows Point Site in Maryland.

The Interim Measures (IM) Work Plan described the use of a blend of alkaline reagents (Terrabond^{MG} and crushed limestone) to be placed into trenches corresponding with elevated concentrations of cadmium and zinc within the intermediate zone groundwater. Prior to the start of the IM construction two pumping wells were used in this area to capture impacted groundwater. Groundwater modeling performed by the ARM Group indicated that the pumping wells were responsible for creating the hydraulic gradient within this portion of the Site; and that with the pumping wells turned off the hydraulic gradient and resulting groundwater seepage velocity would be very low (less than 10 feet per year).

The intention of the IM Work Plan was to place alkaline reagent into contact with impacted groundwater in the intermediate zone. The alkaline reagent would then react with the low pH groundwater to increase the pH sufficiently to precipitate dissolved cadmium and zinc as well as form chemical bonds that would further limit the mobility of cadmium and zinc in the groundwater.

The construction of the groundwater treatment trenches occurred from October 2017 through December 2017. The pumping wells were turned off prior to the start of construction. The six month progress report being developed by EAG and ARM Group will present a detailed assessment of the overall remedy effectiveness.

Advanced GeoServices provided direct oversight of the treatment trench construction (excavation, reagent placement, and overburden backfill), installation of new monitoring wells, and remediation of lead and cadmium hot-spots. This IM Construction Report focuses solely on the observations made during the construction of the treatment trenches and limited post-construction observations. Discussion of the lead and cadmium hot-spot remediation within the A-3 parcel is also presented.

1.0 INTRODUCTION

Advanced GeoServices Corp. (Advanced GeoServices) has prepared this Interim Measures (IM) Construction Report to summarize the implementation of an upgraded interim measure designed to remediate elevated concentrations of cadmium and zinc (dissolved metals) within groundwater at the A-3 parcel of property owned by Tradepoint Atlantic. Tradepoint Atlantic is currently redeveloping the 3,100 acre property at Sparrows Point Maryland formerly occupied by an integrated steel mill complex that was operated chiefly by Bethlehem Steel Corporation since 1916. The A-3 parcel was the site of a rod and wire mill manufacturing complex located as shown on Figure 1 and is more commonly known as the Rod and Wire Mill Area. Groundwater from a portion of the Rod and Wire Mill Area has been undergoing pump and treat interim measure actions since the mid-1980s.

Environmental cleanup and associated interim measures were conducted at the Tradepoint Atlantic property in compliance with requirements pursuant to the following:

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

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

Parcel A-3 is also part of the acreage that remains subject to the requirements of the *Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency (EPA), and the Maryland Department of the Environment (MDE) (effective October 8, 1997)* as documented in correspondence received from EPA on September 12, 2014.

A development plan for Parcel A-3 is underway that consists of a proposed structure spanning approximately 1,000,000 SF. Construction of the proposed 1,000,000 SF structure is expected to

be completed in the first half of 2018. The northern limit of the proposed building is proximal to the IM remedy and other associated monitoring wells. A 5 acre parking area is proposed for the remainder of the parcel to the north of the proposed building.

The executed interim measure for the A-3 Parcel consisted of the treatment of groundwater by in-situ neutralization and attenuation of dissolved metals by mineral precipitation. Selection of this remedy was supported by several pre-design investigation programs which are more fully described in the *"Interim Measure Work Plan, In-Situ Groundwater Treatment" (Advanced GeoServices, revised August 22, 2016)* herein referred to as the *IM Work Plan.*

1.1 SITE DESCRIPTION

Based on the historical information presented in "*Phase II and Pre-Design Investigation Workplan, Parcel A-3, Former Rod and Wire Mill Area" (EnviroAnalytics Group, Sept 17, 2015),* Sparrows Point housed large scale iron and steel production operations from the 1800's until 2012. This included raw material handling, coke production, sinter production, iron production, steel production, and semi-finished and finished product separation. In 1970, Sparrows Point was the largest steel facility in the United States. Steelmaking operations at the Facility ceased completely in fall 2012.

The Rod and Wire Mill Area encompasses approximately 67 acres on the northwestern portion of the property (Figure 1). The mills that were formerly located in this area produced rods and wire products from the 1940's into the early 1980's. The area is bounded to the west by Riverside Drive and Bear Creek, to the north by Bethlehem Boulevard and Interstate 695, and to the east by the former Pipe Mill Area. After the operations activities ceased in the early 1980's, the demolition of the remnant structures occurred between 1994 and 2000.

Manufacturing operations at the Wire Mill included leaching of zinc ore along with additional treatment processes to remove cadmium impurities. These activities resulted in elevated levels of zinc and cadmium in the soil and groundwater. The leaching process was implemented in large tanks located inside the north end of the former Rod and Wire Mill building. In 1959 filters were

installed to dewater the residues. Filtrate from the dewatering process was typically recycled to the wire plating process. The dewatered sludge was temporarily stored on the ground north of the mill buildings in the Former Sludge Bin Storage Area (see Figure 5). Excess filtrate is assumed to have been discharged to an adjacent pond (East Pond) until 1971; after which it was sent to the onsite waste water treatment plant. The Rod and Wire Mill operation terminated in the early 1980s.

During a period in the mid-1980s to early 1990s, eight (8) Solid Waste Management Units (SWMUs) were identified in the vicinity of the Rod and Wire Mill during a series of investigations and interim measures to address conditions. These investigations and interim measures were performed by the then owner, Bethlehem Steel. Three (3) of these SWMUs were the focus of the Rod and Wire Mill Interim Measures conducted from October 18, 2016 through present day. IM treatment trench construction was completed during fall 2016 and early winter 2017.

The SWMUs (shown on Figure 5) include:

- SWMU 27: Sludge Bin Storage Area;
- SWMU 28: Northwest Pond; and
- SWMU 29: East Pond.

1.2 OVERVIEW OF PREVIOUS ACTIVITIES

The historical operations at the Rod and Wire Mill Area resulted in releases of acidic liquids, cadmium and zinc to the soil and groundwater. In 1986 a soil and groundwater remediation program was initiated to address elevated levels of cadmium and zinc in the groundwater and residual soil contamination in the Sludge Bin Storage Area. Remediation included a soil-flushing program and associated pumping and treatment of groundwater from shallow and intermediate wells. Groundwater pumping was discontinued in 1999 as part of the Rod and Wire Mill demolition.

Following a reassessment, pumping and treatment of groundwater resumed in September 2001 and continued until late 2016, when construction activities at the Rod and Wire Mill Area required the pumping wells be shut off. A plume of dissolved cadmium and zinc was documented in the sandy subsurface. The average depth of water has been observed as shallow as approximately 3 to 5 feet below ground surface (bgs). Sandy and clayey subsoils exist down to approximately 50-60 feet bgs. There is currently no indication that there is a significant plume of dissolved cadmium and zinc at depths greater than 30-ft bgs.

The previous IM remedial operations are summarized as follows:

- Institutional controls for soils to limit worker exposure provided a "Restricted Work Area" at the Former Sludge Bin Storage Area.

- A groundwater monitoring network that included 31 wells to collect water level and groundwater quality data.

- A groundwater pump and treat system.

The groundwater pump and treat system historically utilized two intermediate depth zone recovery wells (RW10-PZM020 and RW15-PZM020) that typically operated at a combined pumping rate of 5.0-12.0 gallons per minute (gpm). A total of 4,487,659 gallons of water were extracted from the Former Rod and Wire Mill Area pumping wells and treated during 2015. The average pumping rate for the system was 12,295 gpd, or 8.5 gpm. A total of 210 pounds (lbs) of cadmium and 10,630 pounds (lbs) of zinc were removed and treated during 2015.

1.3 RECENT INVESTIGATIVE FINDINGS

In late April 2016 field work associated with the "*Interim Remedial Measures Workplan, Pre-Design Investigation Supplement, Parcel A-3" (Advanced GeoServices, April 1, 2016)* was performed. Subsequently, data was received and evaluated in early May 2016. Concurrently the *"Pre-Design Investigation, Rod and Wire Mill Area, Characterization Report," ARM Group;*

April 29, 2016 (ARM PDI Report) was developed. The final version of the *ARM PDI Report* was received June 6, 2016. The key findings from these investigations are presented in this section.

1.3.1 ARM PDI Report

The *ARM PDI Report* characterized the soils and groundwater beneath the former Rod and Wire Mill area and represents many of the pre-construction conditions in the area. Key information and understandings presented in the report included the 3D contours of cadmium and zinc in soil and intermediate groundwater isocontours for cadmium and zinc (See Appendix A, Figures 6, 7, 9 and 10). These figures indicated

- The primary source of zinc is the western portion of the northwest pond (just west of the existing transformer pad)[1].
- A secondary zinc source is located further west near the former sludge bin location.
- The former sludge bin location also appears to be the primary cadmium source.

These areas were the target of the Rod and Wire Mill Interim Measures activities.

An extensive groundwater model of Site conditions was also completed by ARM Group for EAG. The following information was developed as part of this model.

- The groundwater modeling completed and presented on Figure 11 of the *ARM PDI Report* (Appendix A), along with the subsurface characterizations confirms the presence of a higher permeability sand zone within which the relatively higher concentrations of dissolved cadmium and zinc in groundwater have been identified.

- Figure 12 of the *ARM PDI Report* (Appendix A) depicts the groundwater elevations in this area with the existing pumping system in operation at RW10-PZM020 and RW15-PZM020 (RW-10 and RW-15).

[1] Note that a significant portion of the former East Pond is inaccessible due to the new electrical transformer station.

- A seepage velocity of 10 feet per year, or less is anticipated when the pumping system is turned off based on the information presented in the *ARM PDI Report* on Figure 11 (permeability) and Figure 17 (hydraulic gradient) provided in Appendix A.

- When the pumping system was in operation the combination of a larger hydraulic gradient and the presence of a zone of elevated hydraulic conductivity outside of the source zone (green zone on *ARM PDI Report* Figure 11 in Appendix A) resulted in higher seepage velocities for groundwater entering the source zone during pumping.

1.3.2 Advanced GeoServices Field Investigation

Advanced GeoServices developed the *"Interim Remedial Measures Work Plan, Pre-Design Investigation Supplement, Parcel A-3" (Advanced GeoServices, April 1, 2016)* and performed the associated field work. The field work consisted of several test pit excavations, soil sample analysis, groundwater sample analysis, soil-reagent treatability study, and a groundwater pH adjustment titration study. The observations and results of the treatability study in conjunction with updated findings from the *ARM PDI Report* were used to modify the conceptual site model (CSM) and support the selection of an appropriate Interim Measure to address the identified dissolved zinc and cadmium in the intermediate zone groundwater at the Site. The findings of Advanced GeoServices' pre-design investigation activities were presented in the *"Interim Measure Work Plan, In-situ Groundwater Treatment" (Advanced GeoServices, rev. August 22, 2016).* Relevant figures and data from this Advanced GeoServices *IM Work Plan* are provided for reference in Appendix B.

1.3.2.1 **Pre-IM Up-Gradient Groundwater Findings**

The field work to assess the pre-IM groundwater conditions consisted of the installation of two (2) up-gradient wells to assess the background aquifer conditions. The shallow well is identified as CW-MW-1(S). The intermediate depth well is identified as CW-MW-2(I).

Both wells had acidic pH values of 4.09 (CW-MW-1, shallow) and 4.23 (CW-MW-2, intermediate). The shallow well had a dissolved iron concentration of 49.9 mg/L. The intermediate well had a dissolved iron concentration of 126 mg/L. Cadmium total and dissolved concentrations were non-detect and zinc total and dissolved concentrations were less than 100 µg/L. The analytical groundwater data for these wells (as well as "in plume wells" RW18-MW(I) and RW10-PZM020 and titration study) are presented on Table 1 of the *Interim Measure Work Plan*, located in Appendix B. The acidity in the up-gradient wells was also much less than the wells in the plume. These wells suggest the source of acidity may be up-gradient groundwater. This was further supported by the test pit study performed (see Section 1.3.2.4). Local shallow and intermediate pH conditions prior to the start of the interim remedy are presented on Figures 3 and 4 of Appendix B, respectively.

1.3.2.2 **Pre-IM In-Plume Well Findings**

Pre-IM groundwater samples were collected from the intermediate zone well at RW18-MW(I) (formerly RW02-PZM020) and pumping well RW10-PZM020 (abandoned) to represent the down-gradient aquifer conditions. The analytical data gathered from these wells generally corroborates existing data for the aquifer in this area. Notable observations included:

- RW10-PZM020 had elevated dissolved cadmium, nickel, and zinc, whereas RW18-MW(I) had only elevated zinc. The level of dissolved zinc in RW10-PZM020 (447 mg/L) was less than that in RW18-MW(I) (653 mg/L); and

- Both RW10-PZM020 and RW18-MW(I) had high levels of dissolved iron and manganese with the levels in RW18-MW(I) (Iron: 690 mg/L; Manganese: 24.9 mg/L) higher than those in RW10-PZM020 (Iron: 217 mg/L; Manganese: 18.7 mg/L).

1.3.2.3 **Groundwater Reagent/Titration Study**

Select pre-IM groundwater samples from wells RW18-MW(I) (formerly RW02-PZM020), RW10-PZM020 (subsequently abandoned), and up-gradient wells CW-MW-1(S) and CW-MW-2(S) were delivered to ALS Analytical Laboratory in Middletown, Pennsylvania in unpreserved containers. Three aliquots from each well were then separated and sodium hydroxide was used to raise the pH to 7.5, 9, and 10.5. At each pH point dissolved metals analysis was performed. The pH-adjusted samples are indicated as such. For example the aliquot from RW10-PZM020 that was adjusted to pH 10.5 is identified as "RW-10 pH 10.5".

As expected, as pH increased the dissolved concentrations of iron, cadmium, and zinc decreased. The decrease was moderate at pH 7.5 and became more effective and pronounced at pH 9 and 10.5.

Jar testing was also performed with up-gradient groundwater mixed with a variety of alkaline reagents. The following observations were made:

- Agricultural Lime remained relatively insoluble and was slow to react. A table spoon (approximately) of agricultural lime added to a cup of up-gradient groundwater produced an initial pH increase to 5.9. After a few days, the lime addition increased the pH to 7. Over a period of three weeks the pH increased as high as 8.7. No additional increase was observed after several days.

- Enviroblend, a proprietary Magnesium Oxide reagent, was also relatively insoluble, but was quick to react. A teaspoon of Enviroblend added to a cup of up-gradient groundwater produced an initial pH increase to 10.7. Within 24 hours the pH had increased to 11.17.

- Terrabond^{MG}, a proprietary Magnesium Carbonate product, was more soluble and quick to react and raised the pH to between 9.5 and 10 within a few minutes.

The removal of dissolved cadmium and zinc from solution can occur by precipitation of hydroxide minerals, carbonate minerals, or adsorption onto iron and manganese hydroxides or a combination of processes. The dissolved iron concentrations were reduced as pH increases in a manner similar to dissolved cadmium and zinc. In-situ reactions may be greater than those observed in bench scale tests due to the longer residence time and adsorption reactions with the soil. The available data indicated no additional contaminants appear to be mobilized at the evaluated pH values in the testing completed.

1.3.2.4 **Source Area Soil Study**

The investigation plan proposed that five (5) test pits would be excavated in and around the three source areas. However, the test pit excavation went much better than expected. A total of 5 test pits were excavated in the accessible portion of the Former East Pond; 2 test pits were excavated near the former Sludge Bin Area, and 2 test pits were excavated near the former Northwest Pond Area and shown on Figure 5.

In addition to the test pits, four (4) Geoprobe soil borings were performed and soil samples were collected during the up-gradient well installation.

The general observations of the soils study are:

- Subsurface was a mixture of clay lenses and sand layers (as indicated on *ARM PDI Report* cross sections Figure 8 in Appendix A).
- Test pit excavation sidewalls were very stable to depths of 20-22 feet bgs.
- Water infiltration was not significant and primarily occurred within the upper 10 feet bgs (perched water zone).

- The clay encountered was relatively stiff. Excavated soils when mixed were not highly plastic based on the Atterberg test results.

- Depending on location, high concentrations of total iron, cadmium, zinc, magnesium, and manganese were measured (as expected).

- Zinc and cadmium leaching was observed in SPLP samples collected at intermediate depth in boring locations B2 (20-30 feet bgs) and B3 (15-25 feet bgs).

- Arsenic was not detected in any SPLP sample.

- Acidity from soils was not as high as expected with measured pH values of 6 to 7.

1.4 CONCEPTUAL SITE MODEL

As a result of the findings from the field investigation performed by Advanced GeoServices, the Conceptual Site Model (CSM) was updated to reflect the following unexpected positions:

- The up-gradient wells (CW-MW-1(S) and CW-MW-2(S)) had a very low pH (both less than 4.23) and very high iron (greater than 50 mg/L) concentrations.

- pH in the shallow groundwater was approximately 4 - 4.2 in the up-gradient well locations and remained approximately 5.52 at RW006-PZ and 5.1 at SWM-2; both immediately south of the substation. As previously described, the pH of the shallow groundwater increased in wells within the source area and west towards the shoreline (approximately pH 11.5). Figure 3 in the *IM Work Plan* (Appendix B) depicts the pH in shallow groundwater aquifer in and around the IM treatment area.

- pH in the intermediate groundwater was approximately 4 - 4.2 in the up-gradient well locations and remained approximately 4 – 5 in the area immediately west of the substation (RW-063, RW-067, RW18-MW(I) (formerly RW02-PZM020)). It

increased to slightly over 6 in the former pumping well (RW10-PZM020) and ranged from 5 to 7 approaching the shoreline at wells RW05-MW(I) (formerly TS04-PZM023), RW20-PZM020 (abandoned) and RW06-MW(I) (formerly RW19-PZM020). Figure 4 in the *IM Work Plan* (Appendix B) depicts the pH in the intermediate groundwater aquifer in and around the IM treatment area.

- The source of the acidity in the up-gradient groundwater does not appear to be related to previous acid washing or other known operations on the A-3 parcel. The up-gradient wells are approximately 1,400 feet east of the past acid washing operations. The specific cause of the low pH is unknown at this time.

- The test pit soils collected from the source areas and in particular from the east pond were not nearly as acidic as expected.

- Based on the testing completed, the zinc and cadmium in those soils did not appear to be a significant source of the dissolved cadmium, zinc, or the low pH found in the groundwater.

- The clay encountered in the test pits was stiff enough to allow the excavations (20 feet or more) to remain stable and open for several hours until they were backfilled.

2.0 INTERIM MEASURE CONSTRUCTION

2.1 INTERIM MEASURES DESCRIPTION

The plan for addressing the elevated dissolved cadmium and zinc in the intermediate groundwater zone called for precipitating the dissolved metals in-situ by raising the groundwater pH. This would be accomplished by adding alkaline reagents into the intermediate groundwater zone at select high concentration areas. Excavated soils were replaced with alkaline "charges" that were expected to react with acidic groundwater to create slightly alkaline conditions within the aquifer and remove the dissolved cadmium and zinc from solution. The alkaline charges were comprised of a combination of fast acting Terrabond^{MG} (target 40% by weight) and #57 limestone aggregate (target 60% by weight). The reagents were placed in trenches in a staggered/offset alignment that is perpendicular to the current groundwater flow under non-pumping conditions.

As noted below, the reagent mix included both fast acting and long acting alkaline materials. The fast acting reagent, Terrabond^{MG}, is intended to react quickly within the aquifer to create alkaline conditions (as well as chemical bonds) which reduce the mobility of the metals in groundwater. The long acting reagent, limestone aggregate (#57 stone gradation), is intended to react much more slowly within in the aquifer and was used to address the long term need due to the high pH of the up-gradient groundwater. The limestone aggregate also provided a structurally stable frame for the Terrabond^{MG} reagent. The Terrabond^{MG} accounted for 40% (by weight) of the reagent mix with the limestone aggregate making up the remaining 60% of the reagent mix. The allowable tolerance on the reagent blend was ±10%. The Terrabond^{MG} and limestone were stockpiled separately on-site and mixed as needed using a large rubber tired loader.

Groundwater modeling within the *ARM PDI Report* (figures in Appendix A) showed that once the groundwater extraction system was shut down the groundwater seepage velocity in the impacted areas was significantly reduced and thus greatly increased the residence time of the reagent mix with any impacted groundwater. The remedy as proposed in the *IM Work Plan* assumed that the groundwater pumping system would resume operation and would recreate the gradient to bring low pH groundwater in contact with the reagent and to disperse affected groundwater down gradient.

A general chronology of IM construction activities is provided in Section 3.0.

2.2 INVOLVED PARTIES

2.2.1 USEPA

The United States Environmental Protection Agency (USEPA) was involved with review and approval of the IM Workplan. During the IM construction, USEPA was provided with updates on work progress by EAG at regularly scheduled project meetings.

2.2.2 MDE

The Maryland Department of the Environment (MDE) was involved with review and approval of the IM Work Plan. During the IM construction, MDE was provided with updates on work progress by EAG at regularly scheduled project meetings.

2.2.3 Tradepoint Atlantic

Tradepoint Atlantic (Tradepoint) is the Owner of the Sparrow's Point Site.

2.2.4 EAG

EnviroAnalytics Group (EAG) is retained by Tradepoint to address environmental issues and liabilities related to the Sparrow's Point Site. This includes the IM for the A-3 Rod and Wire Mill Parcel. EAG is based in St. Louis, Missouri but maintains a full time office at the Sparrows Point Site.

2.2.5 Advanced GeoServices Corp.

Advanced GeoServices Corp. is a multidisciplinary civil and environmental engineering consultant firm located in West Chester, Pennsylvania. Advanced GeoServices assisted EAG with the development and implementation of the *IM Work Plan*. Advanced GeoServices provided

oversight of IM construction activities including trench excavation, reagent charge backfill, trench fill placement and restoration, geotechnical testing, and monitoring well installation. Advanced GeoServices is also the primary author of this report.

2.2.6 ENRC

Enterprise Network Resolutions Contracting (ENRC) is a remedial contractor based in Winslow Township, New Jersey. ENRC was retained by EAG to perform the IM construction activities.

2.3 MOBILIZATION AND SITE PREPARATION

2.3.1 Erosion and Sediment Permit

On October 18, 2016 an inspector from the Baltimore County Office of Permits, Approvals and Inspections was on-site to inspect the erosion and sediment control measures in place. The erosion and sediment controls employed at the Rod and Wire Mill area were a site silt fence and a stabilized construction entrance. After inspecting the silt fence and stabilized construction entrance, the Baltimore County inspector issued Erosion and Sediment Control permit #B925553 to EAG and granted them the right to proceed with soil disturbing construction activities. No soil disturbing activities were conducted before issuance of the Erosion and Sediment Control permit and the right to proceed. The inspector from the Baltimore County Office of Permits, Approvals and Inspections returned to the site to conduct follow up inspections roughly every two weeks to ensure that all erosion and sediment control measures were being properly maintained.

2.3.2 Well Abandonment

As a result of the proposed development and future usage of the property, as well as the locations of the alkaline charges, the existing groundwater monitoring well network had to be modified. Figure 11A and 11B in the *IM Work Plan* (Appendix B) depicts the modifications made to the groundwater monitoring well network. Seven (7) shallow wells were abandoned because they were inside of or extremely close to the proposed building footprint. An additional three (3) shallow wells were abandoned due to their location relative to a proposed stormwater basin located

along Riverside Drive. Ten (10) additional wells in the intermediate zone were abandoned. The well abandonment is summarized on Table 5 of the *IM Work Plan* (Appendix B) and Table 5 of this Construction Report.

Additional discussion regarding the abandonment and replacement of intermediate zone wells is provided in Section 2.10.

2.4 TRENCH OVERBURDEN TCLP INVESTIGATION

Prior to the start of excavation, a soil characterization study was performed along the proposed trench alignment. Geoprobe borings were performed at approximately 100 foot intervals along the alignment of the treatment trenches resulting in 19 sample locations. Each boring was performed for the zero to 15 foot depth interval to represent materials that would potentially be reused as backfill above the reagent. The entire 15 foot interval was used to create a composite sample (TT-1 Comp through TT-19 Comp) to represent that portion of the treatment trench. The composite samples were analyzed for TCLP metals to determine if the soils in the zero to 15 foot depth interval may be used as backfill within the treatment trench excavations. In addition, at each boring location discreet split samples were collected from the 0-1 ft., 4-5 ft., 9-10 ft., and 14-15 ft. intervals. These split samples were only analyzed if the composite sample for that location exceeded a TCLP limit for hazardous materials.

The only exceedances of hazardous TCLP limits were for Cadmium (1 mg/L) in the TT-13 Comp sample (26 mg/L) and in the TT-14 Comp sample (1.6 mg/L). Additional analysis of the discreet samples in those locations noted exceedances of the hazardous TCLP limits for Cadmium in the TT-14 14-15 ft. sample (6.6 mg/L) and in the TT-13 0-1 ft. (200 mg/L), 9-10 ft. (2.7 mg/L), and 14-15 ft. (1.4 mg/L) samples. Soils from these locations and intervals were segregated for hazardous disposal. Data from the TCLP study is summarized on Table 1 (laboratory reports are attached in Appendix C) and sample locations are provided on Figure 2.

After it was determined that overburden soil from the trench excavation would not be used as backfill, excavated soils that passed TCLP metals analysis were disposed of in the on-site landfill.

Soils from locations and intervals that did not pass TCLP metals analysis were stockpiled separately in a temporary containment cell, sampled for characterization and transported to US Ecology for disposal. Waste disposal sample data for the treatment trench excavations are summarized on Table 2. Disposal characterization sampling data for hazardous soils are summarized on Table 3.

2.5 DUST CONTROL

The Terrabond^{MG} stockpile within the Materials Management area remained covered whenever the stockpile did not need to be accessed in order to minimize the migration of dust. Given the silty gradation of the Terrabond^{MG}, only the working face of the stockpile was uncovered when accessing the material.

All hazardous soils stockpiles were also covered at the end of each day. A weighted cover system consisting of polyethylene sheeting, tarps (for the hazardous soils stockpiles) and sand bags was used to keep the covers in-place. Photographs of stockpile management are provided in Appendix D.

The migration of dust was also controlled by wetting on-site roads and working surfaces at least daily. Using a water truck, ENRC wet down all paved working areas on-site and all roads traveled on by ENRC trucks and equipment, as needed. This included the portion of Riverside Drive that ENRC used in order to access the on-site landfill.

2.6 STORMWATER MANAGEMENT

The work area was generally flat. Stormwater was managed on-site through the use of a perimeter silt fence around the work area(s). Due to the flat topography, the silt fence functioned as a diversion and prevented stormwater run-on from entering the site and generally kept stormwater run-off contained on-site until it could infiltrate into the ground.

The site silt fence was installed prior to any soil disturbing activities began. The silt fence was installed in accordance with all Baltimore County regulations and inspected and approved by an

inspector from the Baltimore County Office of Permits, Approvals and Inspections. A general layout of the work areas, erosion and sediment controls, and stormwater management features used during construction is provided on Figure 3.

2.7 PUMPING WELL SHUT-OFF

In order to access all areas of the site and install the primary cadmium treatment trench, the pumping wells and associated pumps, piping, and pipe racks had to be shut down and removed.

2.8 TREATMENT TRENCH EXCAVATION

2.8.1 Trench Configuration

The location of the primary treatment trenches were selected based on the *ARM PDI Report* which showed the highest zinc intermediate groundwater concentrations at RW-067-PZ and RW-57-PZ and highest total cadmium intermediate groundwater concentration at RW-057-PZ. These locations also correlate with the highest soil concentrations and the location of the Former East Pond and Former Sludge Bin Storage areas.

Two additional shorter (approximately 215 - 240 feet long) secondary treatment trenches were also installed. One of the secondary treatment trenches was up-gradient of the primary zinc trench. The second secondary treatment trench was installed between the primary zinc and primary cadmium treatment trenches. Proposed locations of the trenches relative to contaminant isopleths are shown on Figures 6A and 6B of the *IM Work Plan* (Appendix B).

The primary zinc treatment trench is approximately 480 feet long, the secondary zinc treatment trench is approximately 290 feet long, the primary cadmium treatment trench is approximately 530 feet long and the secondary cadmium treatment trench is approximately 210 feet long. The treatment trenches were not installed as a linear "wall". The trench installations were performed in off-set sections with lengths of 40 - 100 feet depending on field conditions. The lengths of excavation that make up each trench were offset in two staggered rows approximately 5 feet apart (edge to edge). The staggered lengths of trench overlap each other by approximately 5 feet at each

offset point. Typical profile and section views of the trenches are shown on Figures 4A and 4B, respectively. Photographs of the trench construction are provided in Appendix D. As-built locations of the treatment trenches are shown on Drawing 1.

2.8.2 Trench Excavation Methodology

The treatment trenches were able to be excavated to their target depth of 35 feet bgs through a combination of sloping the upper portion of the trench and shoring the sidewalls in the lower portion of the trench with a trench box and steel plates. The upper, sloped portion of the trench excavations were excavated to a depth of approximately 10 feet bgs where a working platform was established for the excavator. From that elevation, the lower portion of the trench was excavated using a long-reach excavator. The trench box and steel plates were moved and lowered, respectively, into position in the lower portion of the trench using the excavator. Using a 3 foot wide excavator bucket, the remaining depth of the trench was excavated through the top of the trench box. As the excavation progressed, the trench box and steel plates were pushed deeper into the excavation with the excavator bucket to prevent the sidewalls from collapsing.

Prior to removing the trench box and steel plates, the excavations were backfilled with the Terrabond^{MG}/limestone reagent mix by placing the reagent mix through the open top of the trench box using either a rubber tired loader, excavator, or dump truck. The method used for backfilling depended on the accessibility at each section of the trench. The excavator bucket was used to tamp/settle the reagent mix into place. As the excavations were backfilled with the reagent mix, the steel plates and trench box were periodically pulled up a few feet at a time with the excavator.

2.8.3 Increased Excavation Footprint

The treatment trenches were initially intended to be approximately 35 feet deep and 3 feet wide. Although test pit side walls stayed open up to 22 feet for a short period of time before the influx of perched groundwater started to occur, initial attempts to excavate down to the desired depth of 35 feet were unsuccessful due to significant infiltration of groundwater and the eventual collapse of the trench sidewalls. The initially attempted modification was using sloping of the trench excavations to a depth of 15 feet bgs to relieve the pressure on the excavation sidewalls. This

technique proved to be insufficient to keep the excavation sidewalls from collapsing prior to reaching the desired depth of 35 feet bgs. The issue was addressed by using a 4 foot wide by 20 foot long steel trench box and 4 foot by 8 foot steel plates placed at either end of the trench box to hold the sidewalls in place and prevent sandy soils from sloughing into the excavations. Using this method, the desired depth of 35 feet bgs was able to be achieved, however, due to the trench box, the final width of the treatment trenches was increased to roughly 5 feet. Representative profile and section views of the trench segments are presented on Figures 4A and 4B respectively.

2.8.4 Excavation Dewatering

A 20,000 gallon frac tank, 18,000 gallon weir tank and associated pumps and hoses were setup next to the Materials Management Area (Figure 3) on-site prior to the start of the treatment trench installation as a contingency measure in case large amounts of groundwater in the trenches or excessive amounts of pore water from excavated soils were encountered. As excessive amounts of groundwater during excavation and substantial amounts of pore water from excavated soils were not encountered, these tanks were only used to dewater the trenches prior to the placement of non-reagent mix backfill. The groundwater was pumped to the 20,000 gallon frac tank and 18,000 gallon weir tank to settle out any solids prior to pumping to the on-site wastewater treatment plant.

During treatment trench installation, groundwater dewatering was minimized by excavating the trenches in 20-foot sections. The 20-foot sections of trench could be excavated and backfilled with the reagent mixture quickly enough to prevent large amounts of groundwater from infiltrating into the excavation and collapsing the sidewalls. Excavating the trenches in this manner eliminated the need to remove and manage water during trench installation.

Prior to the placement of the steel mill slag backfill, large amounts of groundwater infiltrated into the trenches above the level of reagent blend backfill. This water had to be removed from the trenches in order to finish backfilling the trenches. To accomplish this, ENRC backfilled the trenches sequentially from east to west. The infiltrated groundwater was pumped out of each trench into the trench immediately to the west. Once a trench was pumped dry, ENRC removed any saturated soils, widened the trench, and placed the base layer of large steel mill slag backfill

on top of the reagent blend backfill. Once this was completed ENRC would move on to the next trench, pumping any infiltrated groundwater into the next trench to the west.

The water from the final trench was transferred to the on-site wastewater treatment plant. The quantity of water was not metered.

2.9 TRENCH BACKFILL

2.9.1 Reagent Placement

The AASHTO #57 crushed limestone aggregate used in the reagent blend was stored on-site in an uncovered pile located within the Materials Management Area in the northwest corner of the site. The location of the Materials Management Area is shown on Figure 3. Approximately 5,500 CY of limestone was used based on volumetric calculations.

The Terrabond^{MG} powder used in the reagent blend was stored in covered stockpiles within the Materials Management Area. The Terrabond^{MG} powder stockpile was kept covered with tarps and polyethylene sheeting to keep the material dry and prevent the generation and off-site migration of dust. Based on volumetric calculations, approximately 3,150 CY of TerrabondMG was used for reagent trench backfill. An additional 625 CY (estimated) was used for restoration of hot spot excavations.

The reagent blend consisted of ASHTO #57 crushed limestone aggregate (60% by weight) and Terrabond^{MG} powder (40% by weight). The reagent materials were mixed on-site within the Materials Management Area on an as-needed basis to avoid the need for full-time management of a stockpile of the reagent blend.

The *IM Work Plan* proposed backfilling only the lower 20 feet (15 to 35 foot depth interval) of each section of trench with the Terrabond^{MG}/limestone reagent mix, followed by soil spoils from the trench from 20 feet bgs to 2 feet bgs, and finally clean fill in the final 2 feet. However, after the lower 20 feet of the trenches were backfilled with the reagent mix, groundwater was observed infiltrating into the trenches above the top of the reagent mix backfill. At the request of EAG, the

trenches were backfilled with additional reagent mix up to a depth approximately 12 feet bgs. Any additional groundwater that infiltrated above the height of reagent mix backfill was pumped out of the trenches prior to the placement of the next layer of backfill.

2.9.2 Overburden Backfill

Tradepoint Atlantic raised concerns over the structural integrity of the proposed backfilling method that proposed reusing the excavated overburden soil. After discussions EAG and Tradepoint Atlantic, it was agreed that blast furnace slag that was available on-site would be used as backfill above the reagent mix in lieu of the excavated soil spoils. As a result, approximately 13,282 CY of overburden soils were sent to the onsite landfill. An additional 1,140 CY of overburden soils were sent to an offsite facility for disposal as a hazardous waste. An equivalent volume (approximately 14,422 CY) of blast furnace slag was used as backfill above the reagent.

A roughly 2 foot thick base of larger (≥ 2") blast furnace slag was placed on top of the reagent mix backfill. A finer gradation of blast furnace slag, with particle sizes ranging from ¾" to fine powder, was placed above the base of larger blast furnace slag in 12" lifts and compacted with a large, vibratory, smooth drum roller. A 12 inch lift of clean #57 crushed limestone aggregate was placed in between the top of the larger blast furnace slag and the first lift of finer blast furnace slag to prevent the finer slag material from falling into the void spaces in the base layer of larger slag. See Figures 4A and 4B for a profile and cross-section of the backfilled treatment trenches.

2.9.3 Post-IM Fill Placement

Following the completion of the trench backfill placement to existing/surrounding grades, the entire area will have at least 2-feet of clean fill soils and/or parking lot subgrade placed above the top of the slag fill. This is necessary to satisfy the design grades for the future parking lot and building construction that is proposed for this area. It will also satisfy the MDE requirement to place a 2-foot thick clean soil cap above the reagent trenches.

2.10 HOT SPOT REMEDIATION

The soils and groundwater beneath the Former Sludge Bin Storage area contain the highest concentrations of cadmium in the Rod and Wire Mill Area. A 130 foot by 130 foot section of this area was designated as the cadmium hot spot (see Drawing 1). The smaller, secondary cadmium treatment trench was installed through the center of this area. Prior to the installation of the secondary cadmium treatment trench, the top 2 feet of soil from the cadmium hot spot were removed and stockpiled separately on-site, and sampled for characterization pending disposal. The stockpile was placed in a temporary containment cell consisting of polyethylene sheeting and covered with tarps held in place with sand bags to prevent the stockpile from coming into contact with the ground, getting wet or generating dust. Approximately 1,252 CY of soils were excavated from the cadmium hot spot.

After the secondary cadmium treatment trench was installed and backfilled, the soils in the cadmium hot spot were mixed in situ with 100% Terrabond^{MG} powder. The Terrabond^{MG} powder was mixed into the hot spot soils in the 2 to 7 foot depth interval. After the soils were mixed with the Terrabond^{MG}, the cadmium hot spot was capped with a 12" layer of the smaller gradation of steel mill slag. The steel mill slag was then sealed with repeated passes of a large, smooth drum, vibratory roller. Table 4 summarizes the results of TCLP analysis on soil samples collected from the cadmium hot spot prior to remediation.

2.11 WELL CONSTRUCTION

Figures 11A and 11B in the *IM Work Plan* (Appendix B) depict the modifications made to the shallow and intermediate groundwater monitoring well networks, respectively, that will be used to monitor the effectiveness of the IM. Five (5) shallow wells and five (5) intermediate wells were abandoned because they are inside of the proposed building footprint. An additional five (5) shallow wells and five (5) intermediate wells were abandoned due to their location relative to a proposed stormwater basin located along Riverside Drive. Six (6) new shallow wells and six (6) new intermediate wells were installed north of the proposed building footprint. Four (4) new shallow wells and four (4) new intermediate wells were installed west of the proposed stormwater

basin along Riverside Drive. In addition, RW10-PZM020 was relocated (replacement well ID RW10-MW(I)). Table 5 presents a summary of the modifications made to the groundwater monitoring network.

The locations of the existing and new wells relative to the treatment trenches are shown on the Interim Measures construction as-built drawing, provided as Drawing 1. The final locations of the new wells were field located and may have been shifted slightly to accommodate redevelopment considerations and site conditions. The new wells are 2-inch diameter PVC wells with 2 inch Schedule 40 slotted screens with a sand pack.

Installation of the ten (10) new shallow wells and eleven (11) new intermediate wells overseen by AGC occurred from December 7, 2016 through December 23, 2016. The wells were installed using a hollow stem auger drill rig. Soil cuttings were placed in 55-gal steel drums which were collected by ENRC and transported along with other hazardous soils to US Ecology for disposal. Boring logs for the monitoring wells installed under AGC oversight are provided as Appendix G-1 of this report.

Additional well abandonment and installation of new wells was performed by the ARM Group between June 7, 2017 and August 25, 2017. Advanced GeoServices was not present for the well abandonment and new well installation during this time. ARM Group abandoned three (3) shallow wells and four (4) intermediate wells and installed an additional nine (9) new shallow wells and five (5) new intermediate wells. Boring logs for wells installed by the ARM Group are included in Appendix G-2.

Well development occurred from August 2, 2017 to August 31, 2017. Advanced GeoServices was not present for the well development. Well development logs, provided by the ARM Group, are included as Appendix G-3.

2.12 WASTE HANDLING

2.12.1 Overburden Soils – Non-Hazardous

During the installation of the treatment trenches, overburden soils were excavated, stockpiled in an area along the southern boundary of the site, and sampled for TCLP metals analysis. The stockpiles that did not exceed the TCLP metals limits were then disposed of in the on-site landfill. The locations of the non-hazardous soil stockpiles are shown on Figure 3. Approximately 13,282 CY of overburden soils were disposed of in the onsite non-hazardous landfill.

2.12.2 Overburden Soils – Hazardous

Overburden soils that exceeded the limits of TCLP metals analysis (primarily overburden soils from the trench excavation presented on Figure 2 and in Tables 1 and 2) were transferred to a temporary containment cell located south of the secondary cadmium treatment trench (Figure 3). The temporary containment cell consisted of polyethylene sheeting laid on the ground surface with a minimum of 12 inches of overlap between adjacent sheets. The hazardous soils stockpiles in the temporary containment cell were covered with tarps held in place with sand bags whenever the stockpiles did not need to be accessed. The hazardous soil stockpiles were sampled for characterization and transported to US Ecology, located in York, Pennsylvania for disposal. Approximately 1,140 CY of hazardous overburden soils were disposed of at US Ecology.

2.12.3 Hot Spot Soils

Prior to the installation of the secondary zinc treatment trench, the top two feet of soil from the entire footprint of the cadmium hot spot were removed. The hot spot soils were stockpiled in the temporary containment cell on-site, sampled for characterization and transported to US Ecology for disposal. Approximately 1,252 CY of hot spot soils were disposed of at US Ecology.

2.12.4 IDW – Drill Cuttings

Drill cuttings generated during the installation of new groundwater monitoring wells were placed into 55-gal steel drums by the drillers (Allied Drilling) as the cuttings were generated. At the direction of EAG, each filled drum was left at the well site until all the new groundwater monitoring wells were installed. After all of the new groundwater monitoring wells were installed, ENRC collected the resulting drums and had them transported to US Ecology for disposal.

2.13 QUALITY ASSURANCE

2.13.1 Vertical Depth Measurements

The depth of the treatment trenches was initially measured using a weighted string line dangled into the excavations from the excavator boom as personnel were prohibited from entering the excavation or approaching the excavation sidewalls. This measurement method proved to be very time consuming. Over time, field personnel switched to using visual markings on the excavator arm to determine the depth of the excavations.

2.13.2 Horizontal Measurement/Location

On December 2, 2016, the locations and alignment of the four treatment trenches were recorded using a hand held Trimble GPS unit. The positioning and alignment of the treatment trenches are shown on Drawing 1. The coordinates for the trench segment corners are also listed on Drawing 1.

2.13.3 Reagent Blend

The final reagent blend consisted of 40% Terrabond^{MG} by weight and 60% AASHTO #57 crushed limestone. The two ingredients in the reagent blend have very similar densities (determined based on comparing the net weight of comparably loaded truck volumes) so the proper mix ratio was achieved by mixing the reagent materials in small batches consisting of six rubber tired loader bucket loads of #57 limestone and 4 bucket loads of Terrabond^{MG}.

2.13.4 Compaction Testing, Geotechnical Testing

In-place density testing was conducted on the non-reagent mix trench backfill to ensure proper compaction was achieved. In-place density tests were performed on each lift of the finer steel mill slag backfill at approximately 100 foot horizontal intervals. The in-place density tests were conducted by an Advanced GeoServices QA representative using a Troxler Model 4590 density gauge in conjunction with a Troxler Model 6760 moisture probe.

Additional information concerning the backfill of the treatment trenches, including the results of in-place density testing, can be found in the Trench Backfill Geotechnical Report (Advanced GeoServices, December 20, 2017), located in Appendix E. Hillis-Carnes also performed independent geotechnical testing of slag materials placed as fill. Hillis-Carnes geotechnical reports are provided in Appendix F.

2.13.5 Groundwater Monitoring During Construction

During construction, Advanced GeoServices field personnel utilized a hand held pH probe to measure the field pH of water in existing monitoring wells within the area around the reagent trenches. In many wells, a modest pH increase was observed in early November when compared to the "baseline" established in the *ARM PDI Report* data collected in July. However, fluctuations in pH were observed in many wells during the measurement period from November 10, 2016 through January 11, 2017. Tables 6A, 6B, and 6C; and 7A, 7B, 7C, and 7D present a summary of depth to water and pH measurements collected during IM construction, respectively.

3.0 CHRONOLOGY OF CONSTRUCTION EVENTS

Event	Start Date
ARM Pre-Design Investigation	10/1/2015
Advanced GeoServices Pre-Design Investigation Test Pit Excavations	4/20/2016
Up-Gradient Monitoring Well Installations	4/25/2016
Advanced GeoServices Pre-Design Investigation Soil Sampling	4/26/2016
Advanced GeoServices Pre-Design Investigation Groundwater Sampling	4/27/2016
Advanced GeoServices Trench Overburden TCLP Investigation	8/18/2016
Interim Measure Construction	10/18/2016
Primary Zinc Trench Excavation and Reagent Blend Backfill	10/21/2016
Removal of Top 2 Feet of Soil from Cadmium Hot Spot	10/26/2016
Primary Cadmium Trench Excavation and Reagent Blend Backfill	11/8/2016
Secondary Cadmium Trench Excavation and Reagent Blend Backfill	11/18/2016
Secondary Zinc Trench Excavation and Reagent Blend Backfill	11/28/2016
Secondary Zinc Trench Large Slag Structural Backfill	12/5/2016
Primary Zinc Trench Large Slag Structural Backfill	12/7/2016
New Monitoring Well Installations	12/7/2016
Primary Cadmium Trench Large Slag Structural Backfill	12/13/2016
Hazardous Soil Stockpile Transported Off-Site for Disposal	12/14/2016
Secondary Cadmium Trench Large Slag Structural Backfill	12/15/2016
Primary Cadmium Trench “Choke Layer” Backfill	12/15/2016
Primary Cadmium Trench Fine Slag Structural Backfill	12/16/2016
Secondary Cadmium Trench “Choke Layer” Backfill	12/19/2016
Secondary Cadmium Trench Fine Slag Structural Backfill	12/19/2016
Primary Zinc Trench “Choke Layer” Backfill	12/20/2016
Secondary Zinc Trench “Choke Layer” Backfill	12/20/2016
Primary Zinc Trench Fine Slag Structural Backfill	12/21/2016
Secondary Zinc Trench Fine Slag Structural Backfill	1/5/2017
Mixing Terrabond^{MG} into Cadmium Hot Spot Soils	1/12/2017
Cap Placement over Cadmium Hot Spot	1/13/2017
A-3 Well Development Start	8/2/2017
A-3 Well Development Finish	8/31/2017

4.0 HEALTH AND SAFETY

The reagent trench construction and hot spot remediation was performed with no lost time accidents or OSHA reportable incidents.

TABLE

TABLE 1
Trench Overburden TCLP Results
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
TCLP Limit (mg/L)	**5**	**100**	**1**	**5**	**5**	**0.2**	**1**	**5**
Sample ID								
TT-01-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-01-COMP2 (mg/L)	<0.5	<10	**0.73**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP (mg/L)	<0.5	<10	**0.36**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-03-COMP (mg/L)	<0.5	<10	**0.36**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP (mg/L)	<0.5	<10	**0.69**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-05-COMP (mg/L)	<0.5	<10	**0.71**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-06-COMP (mg/L)	<0.5	<10	**0.34**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-07-COMP (mg/L)	<0.5	<10	**0.11**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-08-COMP (mg/L)	<0.5	<10	**0.16**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-09-COMP (mg/L)	<0.5	<10	**0.38**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-10-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-11-COMP (mg/L)	<0.5	<10	**0.82**	<0.5	**4.8**	<0.02	<0.1	<0.5
TT-12-COMP (mg/L)	<0.5	<10	**0.92**	<0.5	**2.1**	<0.02	<0.1	<0.5
TT-13-COMP (mg/L)	<0.5	<10	**26**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-13-0-1 (mg/L)	<0.5	<10	**200**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-13-4-5 (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-13-9-10 (mg/L)	<0.5	<10	**2.7**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-13-14-15 (mg/L)	<0.5	<10	**1.4**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-14-COMP (mg/L)	<0.5	<10	**1.60**	<0.5	**0.7**	<0.02	<0.1	<0.5
TT-14-COMP2 (mg/L)	<0.5	<10	**0.99**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-14-0-1 (mg/L)	<0.5	<10	**0.10**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-14-4-5 (mg/L)	<0.5	<10	**0.45**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-14-9-10 (mg/L)	<0.5	<10	**0.72**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-14-14-15 (mg/L)	<0.5	<10	**6.6**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-15-COMP (mg/L)	<0.5	<10	**0.23**	<0.5	**1.2**	<0.02	<0.1	<0.5
TT-16-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-17-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-18-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-19-COMP (mg/L)	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5

Exceeds TCLP Limit

TABLE 2
Trench Excavation Sampling for Disposal
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
TCLP Limit (mg/L)	**5**	**100**	**1**	**5**	**5**	**0.2**	**1**	**5**
Sample ID								
TT-01-COMP-01	<0.5	<10	**1.9**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-01-COMP-02	<0.5	<10	**1.9**	<0.5	**0.51**	<0.02	<0.1	<0.5
TT-01-COMP-03	<0.5	<10	**0.90**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-01	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-02	<0.5	<10	**0.36**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-03	<0.5	<10	**0.14**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-04	<0.5	<10	**0.16**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-05	<0.5	<10	**0.76**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-06	<0.5	<10	**0.50**	<0.5	**0.51**	<0.02	<0.1	<0.5
TT-02-COMP-07	<0.5	<10	**0.16**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-08	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-09	<0.5	<10	**0.17**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-10	<0.5	<10	**0.45**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-02-COMP-11	<0.5	<10	**0.25**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-03-COMP-01	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-03-COMP-02	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-03-COMP-03	<0.5	<10	**5.6**	<0.5	**0.68**	<0.02	<0.1	<0.5
TT-03-COMP-04	<0.5	<10	**4.0**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-03-COMP-05	<0.5	<10	**3.7**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-01	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-02	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-03	<0.5	<10	**0.23**	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-04	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-05	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
TT-04-COMP-06	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5

Notes:
Exceeds TCLP Limit

TABLE 3
Hazardous Waste Disposal Characterization Sampling Data
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Parameter	Units	HAZ-COMP-01	HAZ-COMP-02	HAZ-COMP-03	HAZ-COMP-04
pH	pH units	9.07	8.95	8.76	8.52
Percent Solids	%	89	88	87	92
Polychlorinated Biphenyls					
Aroclor 1016	mg/kg	<0.058	<0.06	<0.063	<0.053
Aroclor 1221	mg/kg	<0.058	<0.06	<0.063	<0.053
Aroclor 1232	mg/kg	<0.058	<0.06	<0.063	<0.053
Aroclor 1242	mg/kg	<0.058	<0.06	<0.063	<0.053
Aroclor 1248	mg/kg	**0.23**	<0.06	<0.063	<0.053
Aroclor 1254	mg/kg	<0.058	<0.06	<0.063	<0.053
Aroclor 1260	mg/kg	<0.058	<0.06	<0.063	<0.053
Semi-Volatiles					
Phenol	µg/kg	<100	<110	<110	<100
Bis (2-chloroethyl) ether	µg/kg	<100	<110	<110	<100
2-Chlorophenol	µg/kg	<100	<110	<110	<100
2-Methylphenol	µg/kg	<100	<110	<110	<100
Bis (2-chloroisopropyl) ether	µg/kg	<100	<110	<110	<100
Acetophenone	µg/kg	<100	<110	<110	<100
4-Methylphenol	µg/kg	<100	<110	<110	<100
N-Nitroso-di-n-propylamine	µg/kg	<100	<110	<110	<100
Hexachloroethane	µg/kg	<100	<110	<110	<100
Nitrobenzene	µg/kg	<100	<110	<110	<100
Isophorone	µg/kg	<100	<110	<110	<100
2-Nitrophenol	µg/kg	<100	<110	<110	<100
2,4-Dimethylphenol	µg/kg	<100	<110	<110	<100
Bis (2-chloroethoxy) methane	µg/kg	<100	<110	<110	<100
2,4-Dichlorophenol	µg/kg	<100	<110	<110	<100
Naphthalene	µg/kg	<100	<110	<110	<100
4-Chloroaniline	µg/kg	<100	<110	<110	<100
Hexachlorobutadiene	µg/kg	<100	<110	<110	<100
Caprolactam	µg/kg	<100	<110	<110	<100
4-Chloro-3-methylphenol	µg/kg	<100	<110	<110	<100
2-Methylnapthalene	µg/kg	<100	<110	<110	<100
Hexachlorocyclopentadiene	µg/kg	<100	<110	<110	<100
2,4,6-Trichlorophenol	µg/kg	<100	<110	<110	<100
2,4,5-Trichlorophenol	µg/kg	<260	<270	<280	<260
1,1-Biphenyl	µg/kg	<100	<110	<110	<100
2-Chloronaphthalene	µg/kg	<100	<110	<110	<100
2-Nitroaniline	µg/kg	<260	<270	<280	<260
Dimethyl phthalate	µg/kg	<100	<110	<110	<100
2,6-Dinitrotoluene	µg/kg	<100	<110	<110	<100
Acenaphthylene	µg/kg	<100	<110	<110	<100
3-Nitroaniline	µg/kg	<260	<270	<280	<260
Acenaphthene	µg/kg	<100	<110	<110	<100
2,4-Dinitrophenol	µg/kg	<260	<270	<280	<260
4-Nitrophenol	µg/kg	<260	<270	<280	<260

TABLE 3
Hazardous Waste Disposal Characterization Sampling Data
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Parameter	Units	HAZ-COMP-01	HAZ-COMP-02	HAZ-COMP-03	HAZ-COMP-04
Dibenzofuran	µg/kg	<100	<110	<110	<100
2,4-Dinitrotoluene	µg/kg	<100	<110	<110	<100
Diethyl phthalate	µg/kg	<100	<110	<110	<100
Fluorene	µg/kg	<100	<110	<110	<100
4-Chlorophenyl phenyl ether	µg/kg	<100	<110	<110	<100
4-Nitroaniline	µg/kg	<260	<270	<280	<260
4,6-Dinitro-2-methylphenol	µg/kg	<240	<250	<260	<240
N-Nitrosodiphenylamine	µg/kg	<100	<110	<110	<100
4-Bromophenyl phenyl ether	µg/kg	<100	<110	<110	<100
Hexachlorobenzene	µg/kg	<100	<110	<110	<100
Atrazine	µg/kg	<100	<110	<110	<100
Pentachlorophenol	µg/kg	<260	<270	<280	<260
Phenanthrene	µg/kg	**500**	**1,400**	**340**	**340**
Anthracene	µg/kg	<100	**390**	<110	<100
Carbazole	µg/kg	<100	<110	<110	<100
Di-n-butyl phthalate	µg/kg	<100	<110	<110	<100
Fluoranthene	µg/kg	**930**	**3,900**	**650**	**500**
Pyrene	µg/kg	**840**	**2,700**	**770**	**450**
Butyl benzyl phthalate	µg/kg	<100	<110	<110	<100
3,3-Dichlorobenzidine	µg/kg	<100	<110	<110	<100
Benzo[a]anthracene	µg/kg	**460**	**1,800**	**310**	**220**
Chrysene	µg/kg	**590**	**1,800**	**410**	**290**
Bis (2-ethylhexyl) phthalate	µg/kg	<100	<110	<110	<100
Di-n-octyl phthalate	µg/kg	<100	<110	<110	<100
Benzo[b]fluoranthene	µg/kg	**930**	**2,300**	**540**	**410**
Benzo[k]fluoranthene	µg/kg	**410**	**1,000**	**240**	<100
Benzo[a]pyrene	µg/kg	**500**	**1,500**	**310**	**210**
Indeno[1,2,3-cd]pyrene	µg/kg	<100	**490**	<110	<100
Dibenz[a,h]anthracene	µg/kg	<100	<110	<110	<100
Benzo[g,h,i]perylene	µg/kg	<100	**470**	<110	<100
Volatiles					
Dichlorodifluoromethane	µg/kg	<100	<5	<6	<5
Chloromethane	µg/kg	<6	<5	<6	<5
Vinyl Chloride	µg/kg	<6	<5	<6	<5
Bromomethane	µg/kg	<6	<5	<6	<5
Chloroethane	µg/kg	<6	<5	<6	<5
Trichlorofluoromethane	µg/kg	<6	<5	<6	<5
1,1-Dichloroethene	µg/kg	<6	<5	<6	<5
1,1,2-Trichlorotrifluoroethane	µg/kg	<6	<5	<6	<5
Acetone	µg/kg	<58	<53	<59	<53
Carbon disulfide	µg/kg	<12	<11	<12	<11
Methyl acetate	µg/kg	<29	<27	<29	<26
Methylene chloride	µg/kg	<29	<27	<29	<26
trans-1,2-Dichloroethene	µg/kg	<6	<5	<6	<5
Methyl t-butyl ether (MTBE)	µg/kg	<6	<5	<6	<5

TABLE 3
Hazardous Waste Disposal Characterization Sampling Data
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Parameter	Units	HAZ-COMP-01	HAZ-COMP-02	HAZ-COMP-03	HAZ-COMP-04
1,1-Dichloroethane	µg/kg	<6	<5	<6	<5
cis-1,2-Dichloroehtene	µg/kg	<6	<5	<6	<5
2-Butanone (MEK)	µg/kg	<58	<53	<59	<53
Chloroform	µg/kg	<6	<5	<6	<5
1,1,1-Trichloroethane	µg/kg	<6	<5	<6	<5
Cyclohexane	µg/kg	<6	<5	<6	<5
Carbon tetrachloride	µg/kg	<6	<5	<6	<5
Benzene	µg/kg	<6	<5	<6	<5
1,2-Dichloroethane	µg/kg	<6	<5	<6	<5
Trichloroethene	µg/kg	<6	<5	<6	<5
Methylcyclohexane	µg/kg	<6	<5	<6	<5
1,2-Dichloropropane	µg/kg	<6	<5	<6	<5
Bromodichloroethane	µg/kg	<6	<5	<6	<5
cis-1,3-Dichloropropene	µg/kg	<6	<5	<6	<5
4-Methyl-2-pentanone (MIBK	µg/kg	<12	<11	<12	<11
Toluene	µg/kg	<6	<5	<6	<5
trans-1,3-Dichloropropene	µg/kg	<6	<5	<6	<5
1,1,2-Trichloroethane	µg/kg	<6	<5	<6	<5
Tetrachloroethene	µg/kg	<6	<5	<6	<5
2-Hexanone (MBK)	µg/kg	<12	<11	<12	<11
Dibromochloromethane	µg/kg	<6	<5	<6	<5
1,2-Dibromoethane	µg/kg	<6	<5	<6	<5
Chlorobenzene	µg/kg	<6	<5	<6	<5
Ethylbenzene	µg/kg	<6	<5	<6	<5
m&p-Xylene	µg/kg	<12	<11	<12	<11
o-Xylene	µg/kg	<6	<5	<6	<5
Styrene	µg/kg	<6	<5	<6	<5
Bromoform	µg/kg	<6	<5	<6	<5
Isopropylbenzene	µg/kg	<6	<5	<6	<5
1,1,2,2-Tetrachloroethane	µg/kg	<6	<5	<6	<5
1,3-Dichlorobenzene	µg/kg	<6	<5	<6	<5
1,4-Dichlorobenzene	µg/kg	<6	<5	<6	<5
1,2-Dichlorobenzene	µg/kg	<6	<5	<6	<5
1,2-Dibromo-3-chloropropan	µg/kg	<6	<5	<6	<5
1,2,4-Trichlorobenzene	µg/kg	<6	<5	<6	<5
Naphthalene	µg/kg	<12	<11	<12	<11
Ethyl-t-butyl ether (ETBE)	µg/kg	<6	<5	<6	<5
tert-Butanol (TBA)	µg/kg	<29	<27	<29	<26
Diisopropyl ether (DIPE)	µg/kg	<6	<5	<6	<5
tert-Amyl methyl ether (TAM	µg/kg	<6	<5	<6	<5
tert-Amyl alcohol (TAA)	µg/kg	<29	<27	<29	<26
tert-Amyl ethyl ether (TAEE)	µg/kg	<6	<5	<6	<5
TCLP Polychlorinated Biphenyls					
Aroclor 1016	mg/L	<5	<5	<5	<5
Aroclor 1221	mg/L	<5	<5	<5	<5

TABLE 3
Hazardous Waste Disposal Characterization Sampling Data
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Parameter	Units	HAZ-COMP-01	HAZ-COMP-02	HAZ-COMP-03	HAZ-COMP-04
Aroclor 1232	mg/L	<5	<5	<5	<5
Aroclor 1242	mg/L	<5	<5	<5	<5
Aroclor 1248	mg/L	<5	<5	<5	<5
Aroclor 1254	mg/L	<5	<5	<5	<5
Aroclor 1260	mg/L	<5	<5	<5	<5
TCLP Semi-Volatiles					
2-Methylphenol	µg/L	<100	<100	<100	<100
3+4-Methylphenol	µg/L	<200	<200	<200	<200
2,4-Dinitrotoluene	µg/L	<100	<100	<100	<100
Hexachloroethane	µg/L	<100	<100	<100	<100
Hexachlorobenzene	µg/L	<100	<100	<100	<100
Nitrobenzene	µg/L	<100	<100	<100	<100
Pentachlorophenol	µg/L	<500	<500	<500	<500
Pyridine	µg/L	<100	<100	<100	<100
2,4,5-Trichlorophenol	µg/L	<100	<100	<100	<100
2,4,6-Trichlorophenol	µg/L	<100	<100	<100	<100
Hexachlorobutadiene	µg/L	<100	<100	<100	<100
TCLP Volatiles					
Benzene	µg/L	<20	<17	<21	<22
Carbon Tetrachloride	µg/L	<20	<17	<21	<22
Chloroform	µg/L	<20	<17	<21	<22
1,2-Dichlorlethane	µg/L	<20	<17	<21	<22
Tetrachloroethene	µg/L	<20	<17	<21	<22
Vinyl Chloride	µg/L	<20	<17	<21	<22
2-Butanone (MEK)	µg/L	<40	<35	<42	<43
Chlorobenzene	µg/L	<20	<17	<21	<22
1,4-Dichlorobenzene	µg/L	<20	<17	<21	<22
1,1-Dichloroethene	µg/L	<20	<17	<21	<22
Trichloroethene	µg/L	<20	<17	<21	<22

TABLE 4
Cadmium Hot Spot Sample Data
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
TCLP Limit (mg/L)	**5**	**100**	**1**	**5**	**5**	**0.2**	**1**	**5**
Sample ID								
HS-COMP-01	<0.5	<10	**9.5**	<0.5	**1.6**	<0.02	<0.1	<0.5
HS-COMP-02	<0.5	<10	**21**	<0.5	**1.5**	<0.02	<0.1	<0.5
HS-COMP-03	<0.5	<10	**12**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-04	<0.5	<10	**34**	<0.5	**0.75**	<0.02	<0.1	<0.5
HS-COMP-05	<0.5	<10	**5.2**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-06	<0.5	<10	**7.2**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-07	<0.5	<10	**7.7**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-08	<0.5	<10	**11**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-09	<0.5	<10	**24**	<0.5	**0.78**	<0.02	<0.1	<0.5
HS-COMP-10	<0.5	<10	**8.7**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-11	<0.5	<11	**8.8**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-12	<0.5	<11	**17**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-COMP-13	<0.5	<11	**13**	<0.5	**6.8**	<0.02	<0.1	<0.5
HS-COMP-14	<0.5	<11	**26**	<0.5	**5.2**	<0.02	<0.1	<0.5
HS-COMP-15	<0.5	<10	**20**	<0.5	**59**	<0.02	<0.1	<0.5
HS-COMP-16	<0.5	<10	**19**	<0.5	**3.1**	<0.02	<0.1	<0.5
HS-COMP-17	<0.5	<10	**8.6**	<0.5	**6.2**	<0.02	<0.1	<0.5
HS-COMP-18	<0.5	<10	**12**	<0.5	**0.91**	<0.02	<0.1	<0.5
HS-COMP-19	<0.5	<10	**2.6**	<0.5	**1.6**	<0.02	<0.1	<0.5
HS-COMP-20	<0.5	<10	**6.2**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-01	<0.5	<10	**11**	<0.5	**95**	<0.02	<0.1	<0.5
HS-DISC-02	<0.5	<10	**21**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-03	<0.5	<10	**4.9**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-04	<0.5	<10	**13**	<0.5	**0.85**	<0.02	<0.1	<0.5
HS-DISC-05	<0.5	<10	**1.8**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-06	<0.5	<10	**12**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-07	<0.5	<10	**26**	<0.5	**29**	<0.02	<0.1	<0.5
HS-DISC-08	<0.5	<10	**29**	<0.5	<0.5	<0.02	<0.1	<0.5
HS-DISC-09	<0.5	<10	**14**	<0.5	<0.5	<0.02	<0.1	<0.5

Notes:
Exceeds TCLP Limit

TABLE 5
Groundwater Monitoring Network Modifications
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Monitoring Well ID	Previous Monitoring Well ID	Well Status	Groundwater Zone
RW01-MW(S)	RW-TEMP-1-S	New Well	Shallow
RW01-MW(I)	RW-TEMP-1-I	New Well	Intermediate
RW02-MW(S)	RW-TEMP-2-S	New Well	Shallow
RW02-MW(I)	RW-TEMP-1-I	New Well	Intermediate
RW03-MW(S)	RW-TEMP-3-S	New Well	Shallow
RW03-MW(I)	RW-TEMP-3-I	New Well	Intermediate
RW04-MW(S)	TS04-PDM004	Existing Well	Shallow
RW05-MW(S)	RW22-MW(S), TS04-PPM007	New Well	Shallow
RW05-MW(I)	TS04-PDM023, RW22-MW(I)	Existing Well	Intermediate
RW06-MW(S)	RW19-PZP003, RW-RWBW-11	Existing Well	Shallow
RW06-MW(I)	RW19-PZM020, RW-RWBW-12	Existing Well	Intermediate
RW06-MW(D)	RW19-PZM050, RW-RWBW-13	Existing Well	Deep
RW07-MW(S)	RW-TEMP-5-S	New Well	Shallow
RW07-MW(I)	RW-TEMP-5-I	New Well	Intermediate
RW08-MW(S)	RW-TEMP-4-S	New Well	Shallow
RW08-MW(I)	RW-TEMP-4-I	New Well	Intermediate
RW09-MW(S)	RW-TEMP-7-S	New Well	Shallow
RW09-MW(I)	RW-TEMP-7-I	New Well	Intermediate
RW10-MW(I)	PUMP-TEMP-1-I	New Well	Intermediate
RW11-MW(S)	RW-TEMP-6-S	New Well	Shallow
RW11-MW(I)	RW14-PZM020	Existing Well	Intermediate
RW12-MW(S)	RW07-PZM004, RW-RWBW-7	Existing Well	Shallow
RW12-MW(I)	RW07-PZM017, RW-RWBW-6	Existing Well	Intermediate
RW13-MW(I)	PUMP-TEMP-2-I	New Well	Intermediate
RW14-MW(S)	RW06-PZM001	New Well	Shallow
RW15-MW(S)	RW20-MW(S)	New Well	Shallow
RW15-MW(I)	RW20-MW(I)	New Well	Intermediate
RW16-MW(S)	RW-TEMP-9-S	New Well	Shallow
RW16-MW(I)	RW-TEMP-9-I	New Well	Intermediate
RW17-MW(S)	RW24-MW(S)	New Well	Shallow

TABLE 5
Groundwater Monitoring Network Modifications
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Monitoring Well ID	Previous Monitoring Well ID	Well Status	Groundwater Zone
RW18-MW(S)	RW02-PZM000, RW-RWMW-3	Existing Well	Shallow
RW18-MW(I)	RW02-PZM020, RW-RWBW-2	Existing Well	Intermediate
RW19-MW(S)	RW-TEMP-8-S	New Well	Shallow
RW19-MW(I)	RW-TEMP-8-I	New Well	Intermediate
RW20-MW(S)	RW23-MW(S)	New Well	Shallow
RW21-MW(S)	RW25-MW(S)	New Well	Shallow
RW22-MW(I)	RW21-MW(D), RW21-MW(I), RW-RWBW-21	Existing Well	Intermediate
	RW01-PZM020	Abandoned	Intermediate
	RW-03-PZM003	Abandoned	Shallow
	RW04-PZM003	Abandoned	Shallow
	RW05-PZP001	Abandoned	Shallow
	RW08-PZM003	Abandoned	Shallow
	RW09-PZM004	Abandoned	Shallow
	RW10-PZM004	Abandoned	Shallow
	RW10-PZM020	Abandoned	Intermediate
	RW10-PZM065	Abandoned	Deep
	RW11-PZM004	Abandoned	Shallow
	RW12-PZM004	Abandoned	Shallow
	RW13-PZM020	Abandoned	Intermediate
	RW15-PZM020	Abandoned	Intermediate
	RW16-PZM020	Abandoned	Intermediate
	RW17-PZM019	Abandoned	Intermediate
	RW18-PZM047	Abandoned	Intermediate
	RW20-PZP000	Abandoned	Shallow
	RW20-PZM020	Abandoned	Intermediate
	RW20-PZM050	Abandoned	Deep
	RW21-PZM023	Abandoned	Intermediate

TABLE 6-A
Depth to Groundwater Measurements During Construction - Shallow Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	Depth to Water (feet)				
		11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
CM-MW1(S)	CM-MW1(S)	N/A	N/A	7.43	7.22	7.29
RW03-PZM003	RW03-PZM003 (abandoned)	7.23	7.51	7.46	N/A	N/A
RW04-MW(S)	TS04-PDM004	13.30	12.50	12.75	12.03	11.11
RW04-PZM003	RW04-PZM003 (abandoned)	7.62	7.88	7.62	6.79	6.56
RW06-MW(S)	RW-19-PZP003, RW-RWBW-11	10.11	10.13	9.38	9.02	9.03
RW09-PZM004	RW09-PZM004 (abandoned)	10.35	10.55	10.46	10.01	9.60
RW10-PZM004	RW10-PZM004 (abandoned)	11.00	10.36	9.17	9.20	8.98
RW11-PZM004	RW11-PZM004 (abandoned)	10.62	10.87	10.51	10.91	10.55
RW12-MW(S)	RW-07-PZM004, RW-RWBW-7	11.12	10.96	10.18	9.61	9.20
RW12-PZM004	RW12-PZM004 (abandoned)	12.48	12.11	11.46	11.12	10.31
RW14-MW(S)	RW06-PZM001	8.61	8.97	9.52	7.79	7.75
RW18-MW(S)	RW-02-PZM000, RW-RWBW-3	7.84	7.52	7.42	7.11	6.86
RW20-PZP000	RW20-PZP000 (abandoned)	5.43	5.77	4.23	4.05	4.17

TABLE 6-B
Depth to Groundwater Measurements During Construction - Intermediate Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	Depth to Water (feet)				
		11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
CM-MW2(I)	CM-MW2(I)	N/A	14.59	14.66	14.65	14.70
RW01-PZM020	RW01-PZM020 (abandoned)	11.37	10.85	10.79	10.26	10.12
RW06-MW(I)	RW-19-PZM020, RW-RWBW-21	13.11	12.47	11.77	12.19	11.35
RW10-PZM020	RW10-PZM020 (abandoned)	11.00	10.36	8.52	9.20	8.98
RW11-MW(I)	RW14-PZM020	13.00	12.27	12.11	11.87	11.57
RW12-MW(I)	RW-07-PZM017, RW-RWBW-6	8.61	11.48	10.97	11.07	10.77
RW13-PZM020	RW13-PZM020 (abandoned)	12.06	11.42	10.92	10.89	10.71
RW16-PZM020	RW16-PZM020 (abandoned)	13.59	12.72	11.98	12.46	12.02
RW17-PZM019	RW17-PZM019 (abandoned)	13.24	12.38	N/A	12.10	11.64
RW18-PZM047	RW18-PZM047 (abandoned)	16.62	15.33	14.89	14.97	14.56
RW18-MW(I)	RW-02-PZM020, RW-RWBW-2	11.81	11.18	10.95	10.63	10.45
RW20-PZM020	RW20-PZM020 (abandoned)	13.25	12.58	11.82	12.36	11.87
RW21-PZM023	RW21-PZM023 (abandoned)	12.71	12.03	11.57	11.78	11.28

TABLE 6-C
Depth to Groundwater Measurements During Construction - Deep Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	Depth to Water (feet)				
		11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
RW06-MW(D)	RW-19-PZM050, RW-RWBW-13	13.87	12.72	12.91	12.23	12.05
RW10-PZM065	RW10-PZM065 (abandoned)	11.00	10.36	10.53	9.20	8.98
RW20-PZM050	RW20-PZM050 (abandoned)	12.29	11.37	11.03	10.95	10.40

TABLE 7-A
Field pH Measurements During Construction - Shallow Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	pH Measurements							
		7/1/2016	11/10/2016	11/17/2016	11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
CM-MW1(S)	CM-MW1(S)	N/A	N/A	N/A	N/A	N/A	N/A	5.9	6.2
RW01-MW(S)	RW-TEMP-1-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW02-MW(S)	RW-TEMP-2-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW-03-PZM003	RW-03-PZM003 (abandoned)	4.87	6.6	7.1	5.8	6.9	6.21	N/A	N/A
RW03-MW(S)	RW-TEMP-3-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW04-MW(S)	TS04-PDM004	N/A	N/A	N/A	7.2	7.2	7.29	6.8	7.5
RW-04-PZM003	RW04-PZM003 (abandoned)	6.78	7.8	7.8	7.4	7.8	7.72	7.6	6.5
RW05-PZP001	RW05-PZP001 (abandoned)	N/A	7.4	7.6	N/A	N/A	N/A	N/A	N/A
RW05-MW(S)	TS04-PPM007, RW22-MW(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW06-MW(S)	RW-19-PZP003, RW-RWBW-11	N/A	N/A	N/A	9.8	9.6	9.7	9.0	7.6
RW07-MW(S)	RW-TEMP-5-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW08-MW(S)	RW-TEMP-4-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW09-MW(S)	RW-TEMP-7-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW-09-PZM004	RW09-PZM004 (abandoned)	10.55	11.6	11.7	11.4	11.3	10.66	10.7	10.4
RW-10-PZM004	RW10-PZM004 (abandoned)	N/A	N/A	N/A	N/A	N/A	7.62	7.1	5.0
RW11-MW(S)	RW-TEMP-6-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW12-MW(S)	RW-07-PZM004, RW-RWBW-7	8.0	7.5	6.8	6.3	6.8	6.95	6.5	6.4
RW-12-PZM004	RW12-PZM004 (abandoned)	N/A	N/A	N/A	N/A	N/A	6.92	7.3	6.4
RW14-MW(S)	RW-06-PZM001		N/A	N/A	7.0	8.0	6.7	7.8	6.0
RW15-MW(S)	RW20-MW(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW16-MW(S)	RW-TEMP-9-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW17-MW(S)	RW24-MW(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW18-MW(S)	RW-02-PZM000, RW-RWBW-3	6.27	6.5	7.3	6.5	7.3	6.46	7.0	5.8
RW19-MW(S)	RW-TEMP-8-S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW20-MW(S)	RW-23-MW(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW-20-PZP000	RW20-PZP000 (abandoned)	N/A	N/A	N/A	9.8	9.6	9.61	9.4	8.3
RW21-MW(S)	RW25-MW(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 7-B
Field pH Measurements During Construction - Intermediate Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	pH Measurements							
		7/1/2016	11/10/2016	11/17/2016	11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
CM-MW2(I)	CM-MW2(I)	N/A	N/A	N/A	N/A	N/A	N/A	6.2	6.4
RW01-MW(I)	RW-TEMP-1-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW-01-PZM020	RW01-PZM020 (abandoned)	6.72	6.8	7.1	6.7	7.4	6.51	7.0	6.2
RW02-MW(I)	RW-TEMP-2-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW03-MW(I)	RW-TEMP-3-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW05-MW(I)	TS04-PZM023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW06-MW(I)	RW-19-PZM020, RW-RWBW-21	N/A	N/A	N/A	8.1	7.3	7.22	6.9	6.7
RW07-MW(I)	RW-TEMP-5-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW08-MW(I)	RW-TEMP-4-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW09-MW(I)	RW-TEMP-7-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW10-MW(I)	PUMP-TEMP-1-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW10-PZM020	RW10-PZM020 (abandoned)	N/A	N/A	N/A	N/A	N/A	6.41	7.1	5.0
RW11-MW(I)	RW-14-PZM020	N/A	N/A	N/A	5.9	5.6	5.53	4.1	3.00
RW12-MW(I)	RW-07-PZM017, RW-RWBW-6	5.06	6.9	5.9	4.6	4.7	6.15	3.7	3.7
RW13-MW(I)	PUMP-TEMP-2-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW13-PZM020	RW13-PZM020 (abandoned)	N/A	N/A	N/A	3.7	3.9	4.96	3.8	2.9
RW15-MW(I)	RW20-MW(I)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW-16-PZM020	RW-16-PZM020 (abandoned)	N/A	N/A	N/A	6.9	4.1	4.2	3.5	3.1
RW16-MW(I)	RW-TEMP-9-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW17-PZM019	RW17-PZM019 (abandoned)	N/A	N/A	N/A	9.2	4.4	N/A	4.1	3.6
RW-18-PZM047	RW-18-PZM047 (abandoned)	N/A	N/A	7.5	6.5	6.44	7.2	6.5	N/A
RW18-MW(I)	RW-02-PZM020, RW-RWBW-2	5.35	7.1	7.4	6.7	6.7	6.92	6.3	4.6
RW19-MW(I)	RW-TEMP-8-I	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RW20-PZM020	RW20-PZM020 (abandoned)	N/A	N/A	N/A	4.7	4.6	4.61	3.9	3.4
RW21-PZM023	RW21-PZM023 (abandoned)	N/A	N/A	N/A	3.0	3.6	3.8	3.2	2.7
RW22-MW(I)	RW21-MW(D), RW21-MW(I), RW RWBW-21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 7-C
Field pH Measurements During Construction - Deep Wells
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Current Well ID	Former Well ID	pH Measurements						
		11/10/2016	11/17/2016	11/22/2016	11/30/2016	12/5/2016	12/13/2016	1/11/2017
RW06-MW(D)	RW-19-PZM050, RW-RWBW-13	N/A	N/A	7.2	7.1	7.32	6.5	6.2
RW10-PZM065	RW10-PZM065 (abandoned)	N/A	N/A	N/A	N/A	7.72	7.1	5.0
RW20-PZM050	RW20-PZM050 (abandoned)	N/A	N/A	10.8	10.7	10.17	10.2	10.7

TABLE 7-D
Field pH Measurements During Construction - Treatment Trenches
Former Rod and Wire Mill Area
Tradepoint Atlantic
Sparrows Point, Maryland
2016-3421

Sampling Location	pH Measurements					
	11/10/2016	11/17/2016	11/22/2016	11/30/2016	12/5/2016	12/13/2016
Primary Zinc South	12.1	12.4	11.5	10.8	10.4	N/A*
Primary Zinc Middle	7.2	7.3	8.3	8.2	8.4	N/A*
Primary Zinc North	11.7	12.0	12.1	9.0	9.8	N/A*
Secondary Zinc South	4.5	4.3	4.6	5.7	5.6	N/A**
Secondary Zinc Middle	N/A***	N/A***	Dry	8.3	8.7	N/A**
Secondary Zinc North	N/A***	N/A***	6.2	7.2	6.5	N/A**
Primary Cadmium South	N/A***	N/A***	12.7	11.6	11.1	7.8
Primary Cadmium Middle	N/A***	12.1	10.4	12.2	12.8	10.9
Primary Cadmium North	N/A***	10.2	9.5	11.3	10.4	8.5
Secondary Cadmium South	N/A***	N/A***	Dry	11.5	11.4	10.8
Secondary Cadmium Middle	N/A***	N/A***	12.6	11.4	10.6	10.8
Secondary Cadmium North	N/A***	N/A***	12.4	12.3	12.2	11.5

* Primary Zinc Trench was backfilled on 12/7/2016

** Secondary Zinc Trench was backfilled on 12/55/2016

*** Trench not yet excavated

DRAWING

TRENCH SURVEY

TRENCH SURVEY POINTS	NORTHING	EASTING
TT-01-01	572099.7878	1456740.743
TT-01-02	572169.391	1456693.092
TT-01-03	572169.9697	1456698.151
TT-01-04	572242.7764	1456652.017
TT-01-05	572239.0707	1456639.21
TT-01-06	572243.6039	1456630.299
TT-01-07	572349.2782	1456677.535
TT-01-08	572344.5791	1456683.458
TT-01-09	572247.4561	1456658.04
TT-01-10	572173.016	1456716.372
TT-01-11	572167.8122	1456711.584
TT-01-12	572104.9369	1456745.428
TT-02-01	571947.5601	1456736.588
TT-02-02	572011.0247	1456683.654
TT-02-03	572003.8558	1456675.679
TT-02-04	572072.5938	1456608.353
TT-02-05	572080.523	1456612.067
TT-02-06	572133.5714	1456563.43
TT-02-07	572208.0333	1456516.56
TT-02-08	572210.8993	1456521.678
TT-02-09	572212.3763	1456530.153
TT-02-10	572262.6907	1456551.248
TT-02-11	572266.0658	1456541.625
TT-02-12	572320.731	1456560.702
TT-02-13	572319.7358	1456566.506
TT-02-14	572344.4452	1456582.37
TT-02-15	572342.9698	1456587.345
TT-02-16	572294.0586	1456578.189
TT-02-17	572297.2796	1456572.05
TT-02-18	572262.6977	1456555.956
TT-02-19	572256.8746	1456563.243
TT-02-20	572206.5835	1456533.656
TT-02-21	572145.226	1456577.807
TT-02-22	572083.9411	1456624.357
TT-02-23	572076.539	1456618.599
TT-02-24	572014.0396	1456684.011
TT-02-25	572018.3575	1456691.977
TT-02-26	571949.8674	1456742.506
TT-03-01	572021.3202	1456513.875
TT-03-02	572109.7814	1456446.216
TT-03-03	572120.3815	1456443.63
TT-03-04	572178.7744	1456446.531
TT-03-05	572231.8608	1456461.035
TT-03-06	572230.3769	1456470.975
TT-03-07	572173.8498	1456461.604
TT-03-08	572123.1522	1456449.273
TT-03-09	572115.7689	1456448.616
TT-03-10	572028.747	1456518.277
TT-04-01	571857.5967	1456500.744
TT-04-02	571852.5186	1456494.763
TT-04-03	571887.9999	1456454.523
TT-04-04	571891.346	1456461.357
TT-04-05	571953.2391	1456398.221
TT-04-06	571947.4911	1456394.018
TT-04-07	572016.7594	1456322.814
TT-04-08	572023.7825	1456325.755
TT-04-09	572101.3017	1456274.198
TT-04-10	572138.1073	1456282.957
TT-04-11	572143.7525	1456274.23
TT-04-12	572227.8441	1456301.191
TT-04-13	572222.7962	1456316.4
TT-04-14	572290.8158	1456333.297
TT-04-15	572287.7738	1456341.15
TT-04-16	572219.8197	1456325.585
TT-04-17	572223.6345	1456311.811
TT-04-18	572141.7341	1456287.415
TT-04-19	572138.6316	1456298.101
TT-04-20	572104.2527	1456290.59
TT-04-21	572026.7142	1456338.811
TT-04-22	572018.8369	1456333.496
TT-04-23	571957.5912	1456394.912
TT-04-24	571963.8967	1456401.543
TT-04-25	571894.7745	1456470.872
TT-04-26	571886.7024	1456465.305

MONITORING WELL COORDINATES

WELL ID	NORTHING	EASTING
RW01-MW(I)	571516.2796	1455951.975
RW01-MW(S)	571519.1131	1455952.449
RW02-MW(I)	571668.9899	1455933.206
RW02-MW(S)	571673.0943	1455933.615
RW03-MW(I)	571820.5648	1455954.224
RW03-MW(S)	571826.3543	1455954.703
RW04-MW(S)	571784.1533	1456008.907
RW05-MW(I)	571723.2674	1455887.045
RW05-MW(S)	571708.8638	1455890.526
RW06-MW(D)	571977.0278	1455964.754
RW06-MW(I)	571978.5691	1455959.049
RW06-MW(S)	571984.8039	1455963.113
RW07-MW(I)	572124.8109	1456012.273
RW07-MW(S)	572128.58	1456014.127
RW08-MW(I)	572278.8871	1456065.616
RW08-MW(S)	572282.7341	1456067.155
RW09-MW(I)	572316.6046	1456164.535
RW09-MW(S)	572322.5793	1456162.446
RW10-MW(I)	572108.3123	1456114.626
RW11-MW(I)	572214.2324	1456202.746
RW11-MW(S)	572217.0953	1456199.492
RW12-MW(I)	572141.6159	1456309.38
RW12-MW(S)	572149.7307	1456305.74
RW13-MW(I)	572111.2321	1456415.263
RW14-MW(S)	572175.9406	1456419.177
RW15-MW(I)	572188.6028	1456511.756
RW15-MW(S)	572194.4948	1456510.132
RW16-MW(I)	572291.3387	1456458.221
RW16-MW(S)	572299.1245	1456458.422
RW17-MW(S)	572382.546	1456449.228
RW18-MW(I)	572162.5552	1456604.673
RW18-MW(S)	572171.0971	1456601.703
RW19-MW(I)	572243.7304	1456744.59
RW19-MW(S)	572250.64	1456744.219
RW20-MW(S)	572403.6715	1456552.372
RW21-MW(S)	572366.492	1456273.394
RW22-MW(I)	572425.1999	1456092.04

NOTES

1. TRENCH SURVEY POINTS AND WELL LOCATIONS PROVIDED BY ENVIROANALYTICS GROUP.
2. TRENCH SURVEY POINTS AND WELL LOCATIONS SURVEY BASED ON NAD83 MARYLAND STATE PLANE.
3. RW01-MW(I) AND RW01-MW(S), NOT SHOWN, ARE LOCATED APPROXIMATELY 150 FT SOUTH OF RW02-MW(S).

Number:	Date:	Revision:

SPARROWS POINT
SPARROWS POINT, MARYLAND

AS-BUILT DRAWING

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Scale:	1"=40'
Drawn By:	ALC
Checked By:	JSD
Project Mgr.:	JSD
Originated By:	ALC
Project No.:	2016-3421
Drawing Date:	12/20/2017
Sheet No.:	1 OF 1
Revision Number:	0

DRAWING 1

FIGURES

FIGURE 1

FORMER ROD AND WIRE MILL, PARCEL A3

INTERIM MEASURES CONSTRUCTION AREA

NORTH

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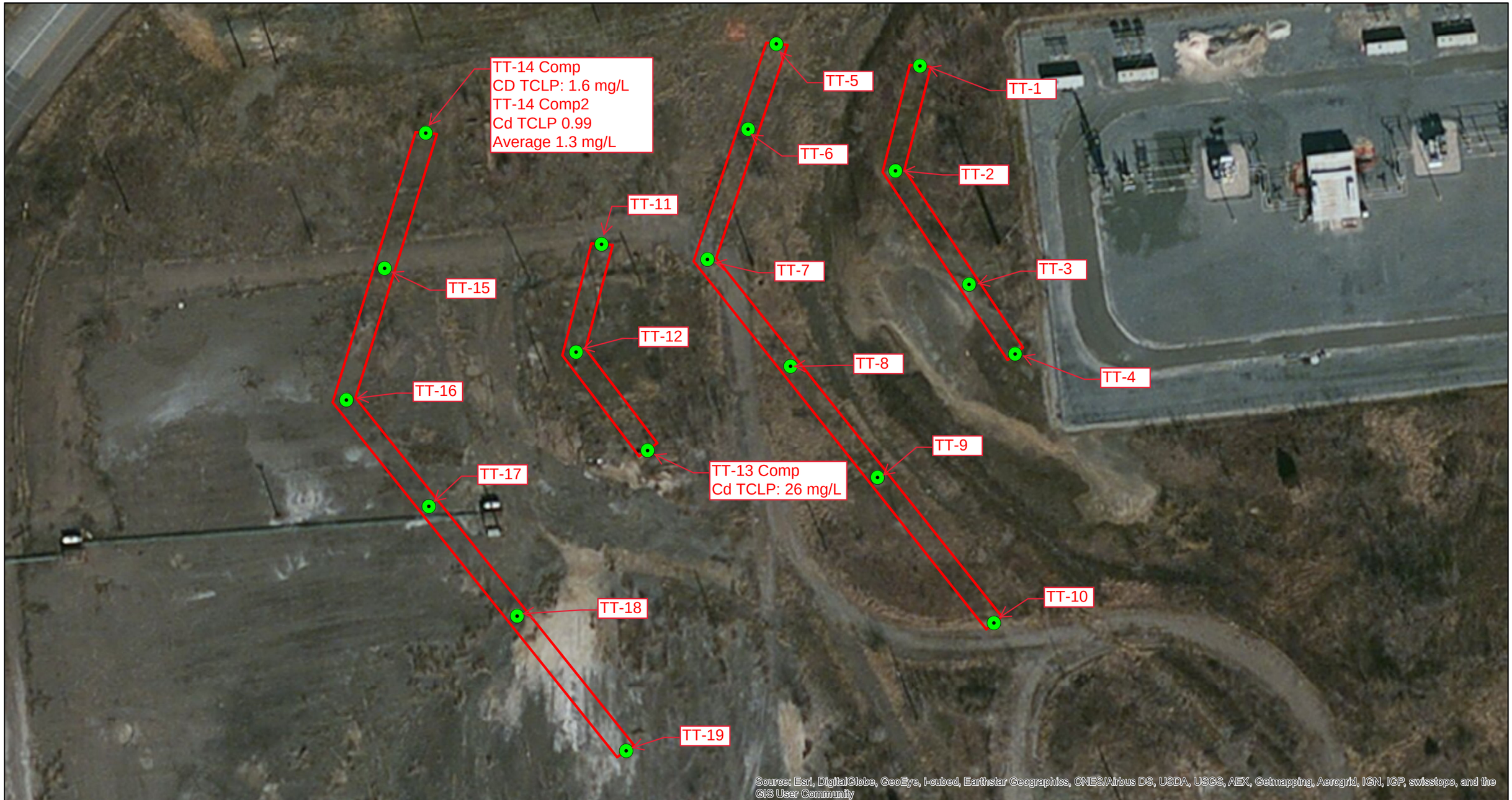
SITE LOCATION MAP
FORMER ROD AND WIRE MILL AREA, PARCEL A3
SPARROWS POINT, MD

PROJECT MANAGER: JSD	SCALE: 1"=1000'
CHECKED BY:	PROJECT NUMBER: 2016-3421
DRAWN BY: EEE	DATE: 1/30/2017

F:\Projects\2016\20163421 - Sparrows Point Rod and Wire Mill Area\Cad\Site Location.dwg



N

EnviroAnalytics Group

Environmental Engineers

0 50 100 Feet

Treatment Trench Overburden Pre-Excavation Sample Locations

TCLP Sampling Locations

Treatment Trench

Figure 2

RW18-PZM047
RW04-PZM003
RW01-PZM020
RW03-PZM003
20,000 GALLON FRAC TANK
RW14-PZM020
RW05-PZP001
RW06-PZM001
18,000 GALLON SETTLING TANK
RW02-PZM000
RW02-PZM020
RW07-PZM004
RW07-PZM017
RW08-PZM003
MATERIALS MANAGEMENT AREA
RW09-PZM004
RW12-PZM004
RW10-PZM004
RW11-PZM004
RW10-PZM065
RW19-PZP000
RW15-PZM020
RW19-PZM020
RW19-PZM050
RW13-PZM020
CADMIUM HOT SPOT
HAZARDOUS SOIL STOCKPILE/TEMPORARY CONTAINMENT CELL
RW16-PZM020
RW17-PZM019
TS04-PDM004
STABILIZED CONSTRUCTION ENTRANCE
NON-HAZARDOUS SOIL STOCKPILES
TS04-PZM023
TS04-PPM007
RW20-PZP000
RW20-PZM050
RW20-PZM020
N
RW21-PZM023

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- EXISTING SHALLOW AQUIFER MONITORING WELL
- EXISTING INTERMEDIATE AQUIFER MONITORING WELL
- EXISTING DEEP AQUIFER MONITORING WELL
- TREATMENT TRENCH (APPROXIMATE LOCATION)
- SILT FENCE

INTERIM MEASURES
FORMER ROD AND WIRE MILL AREA
SPARROWS POINT, MD

PROJECT MANAGER:	JSD	SCALE:	
CHECKED BY:		PROJECT NUMBER:	2016-3421
DRAWN BY:	EEE	DATE:	2/7/2017

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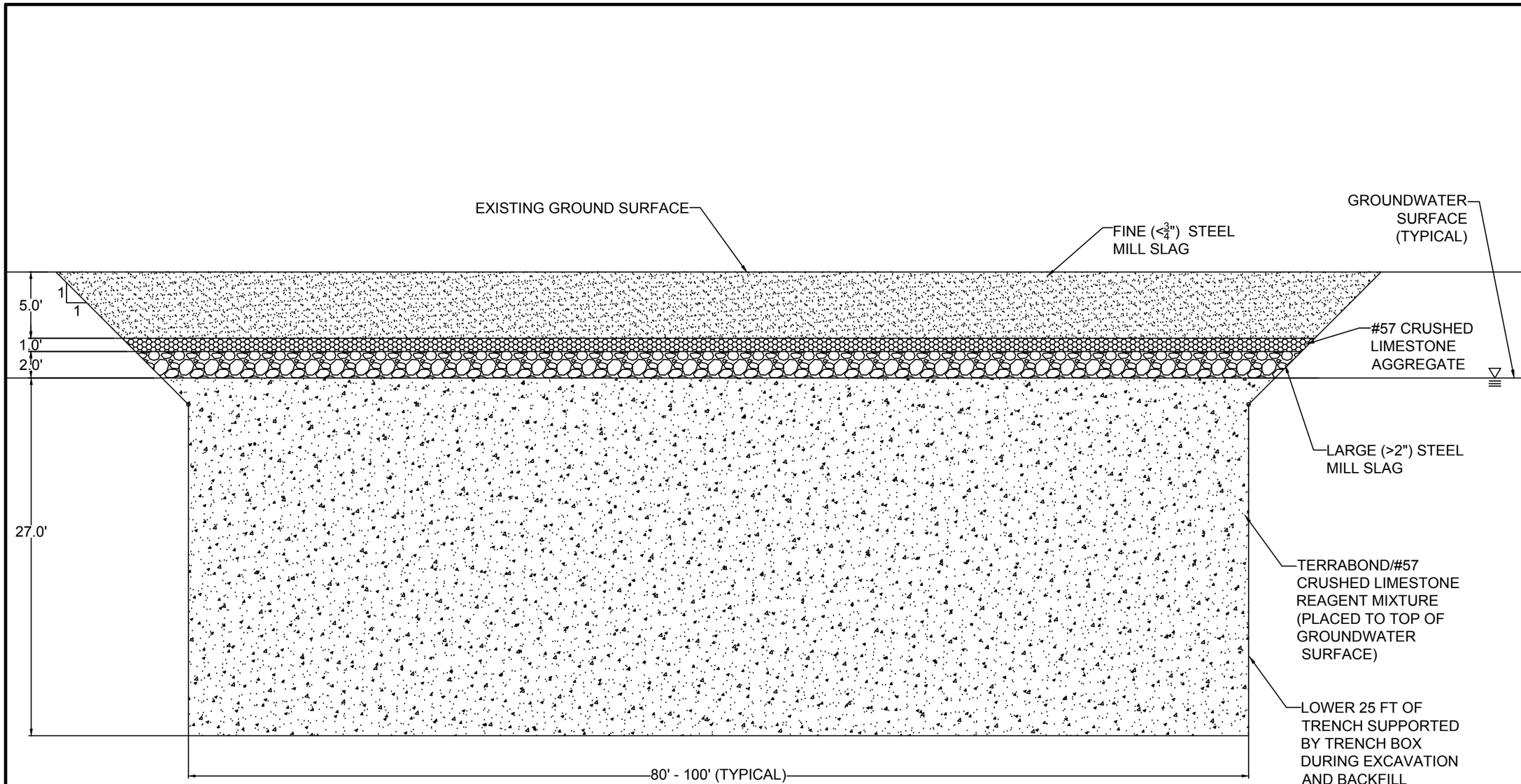
SITE LAYOUT PLAN

FIGURE 3

F:\Projects\2016\20163421 - Sparrows Point Rod and Wire Mill Area\Cad\Site Layout.dwg



INTERIM REMEDIAL MEASURES
FORMER ROD AND WIRE MILL AREA
SPARROWS POINT, MD

PROJECT MANAGER:	JSD	SCALE:	1" = 8'
CHECKED BY:		PROJECT NUMBER:	2016-3421
DRAWN BY:	EEE	DATE:	3/23/2017

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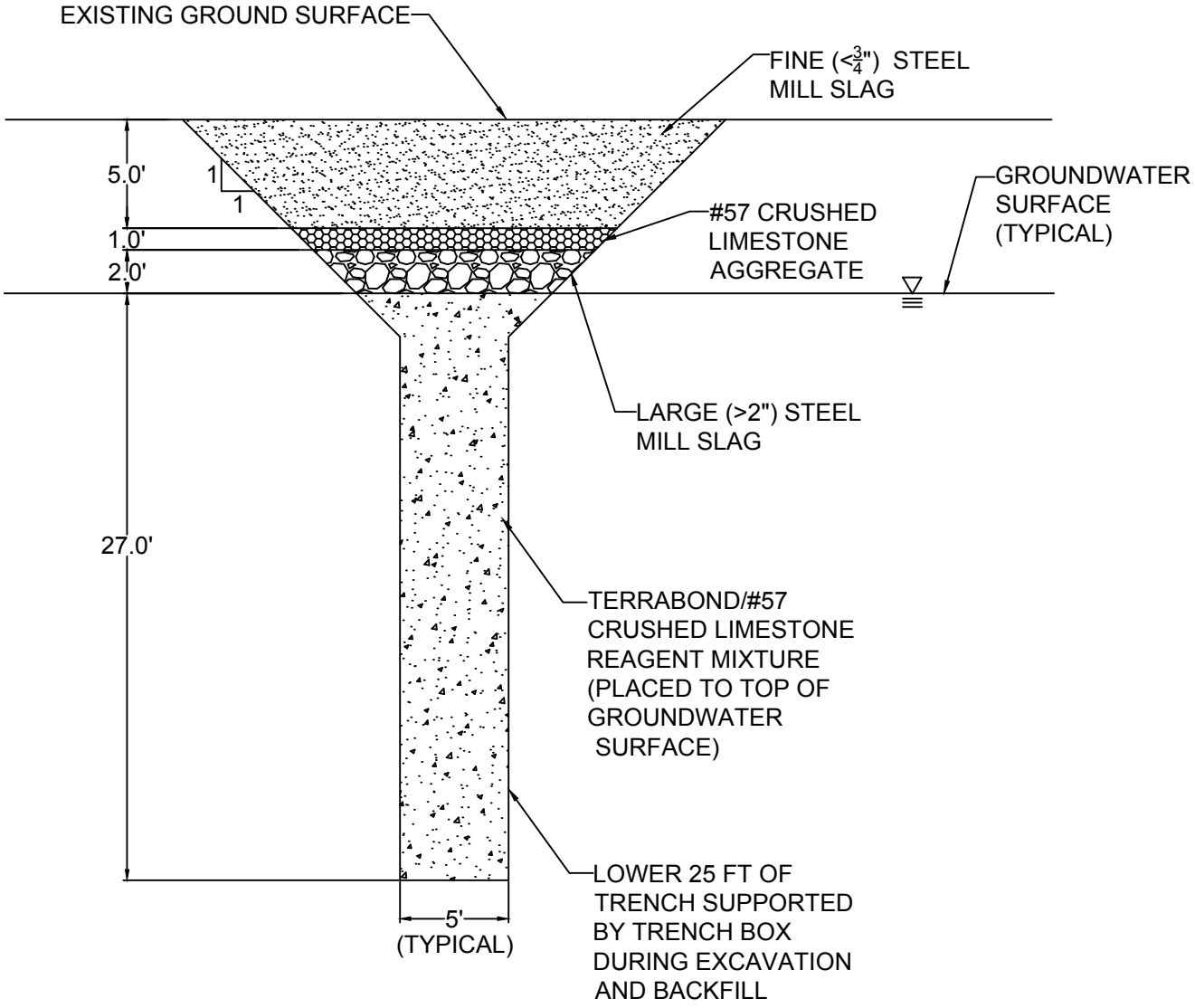
TYPICAL TREATMENT TRENCH
BACKFILL PROFILE

PROFILE VIEW

Figure
4A

F:\Projects\2016\20163421 - Sparrows Point Rod and Wire Mill Area\Cad\FIGURE 3 - Trench Profiles.dwg



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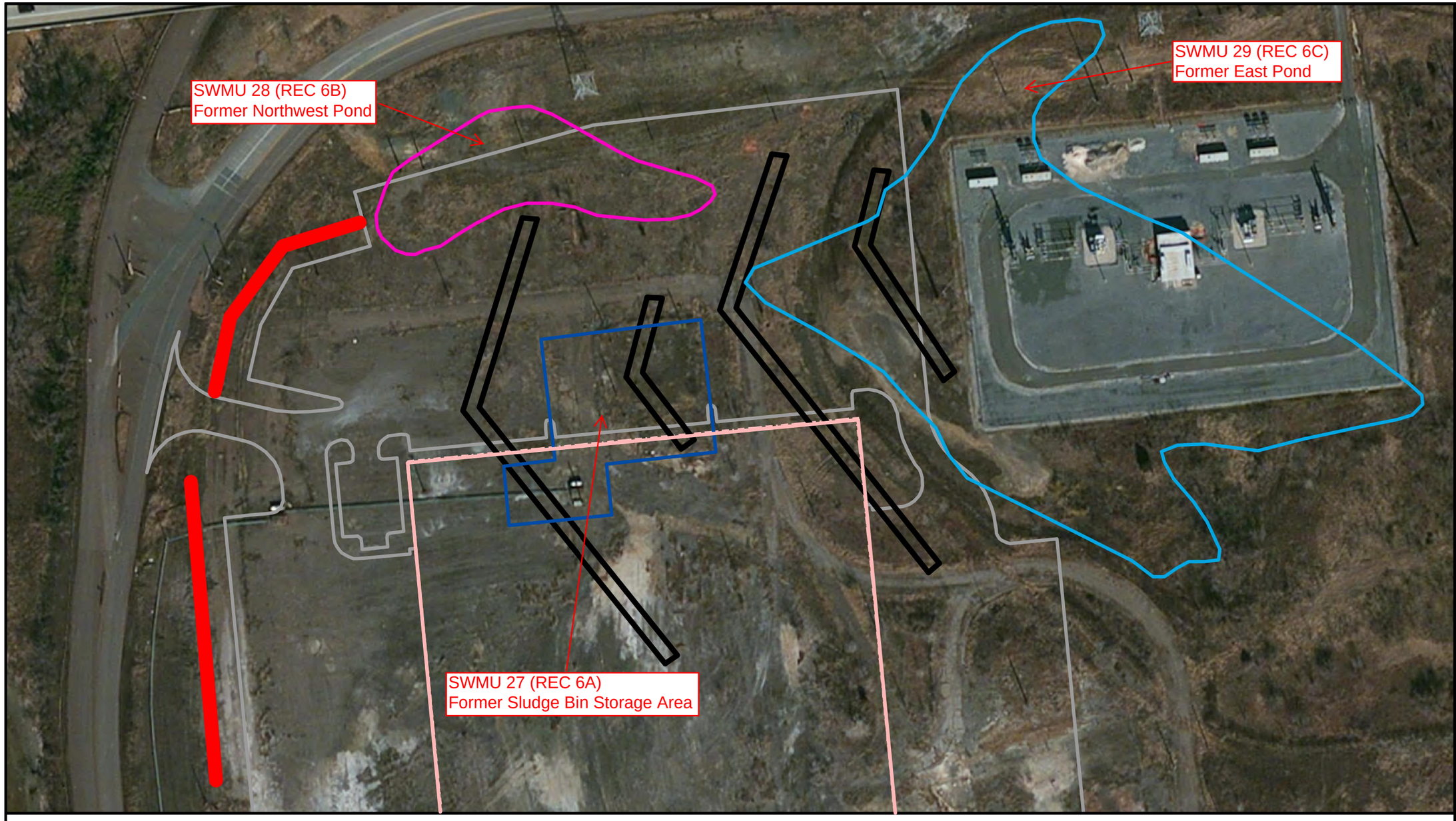
INTERIM REMEDIAL MEASURES
FORMER ROD AND WIRE MILL AREA
SPARROWS POINT, MD
TYPICAL TREATMENT TRENCH BACKFILL PROFILE SECTION VIEW

PROJECT ENGINEER: JSD	SCALE: 1" = 8'		
CHECKED BY:	PROJECT NUMBER: 2016-3421		
DRAWN BY: EEE	DATE: 3/23/2017	FIGURE: 4B	

F:\Projects\2016\2016-3421 - Sparrows Point Rod and Wire Mill Area\Cad\FIGURE 3 - Trench Profiles.dwg



NORTH

LEGEND

- FORMER EAST POND
- FORMER NORTHWEST POND
- FORMER SLUDGE BIN STORAGE AREA
- APPROXIMATE TREATMENT TRENCH LOCATION
- PROPOSED CONTINGENCY TREATMENT TRENCH LOCATION
- PROPOSED BUILDING FOOTPRINT
- PROPOSED PAVED AREA

INTERIM MEASURES
FORMER ROD AND WIRE MILL AREA
SPARROWS POINT, MD

PROJECT MANAGER: JSD
CHECKED BY:
DRAWN BY: EEE
SCALE:
PROJECT NUMBER: 2016-3421
DATE: 2/7/2017

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CONTINGENCY TREATMENT TRENCH LOCATION

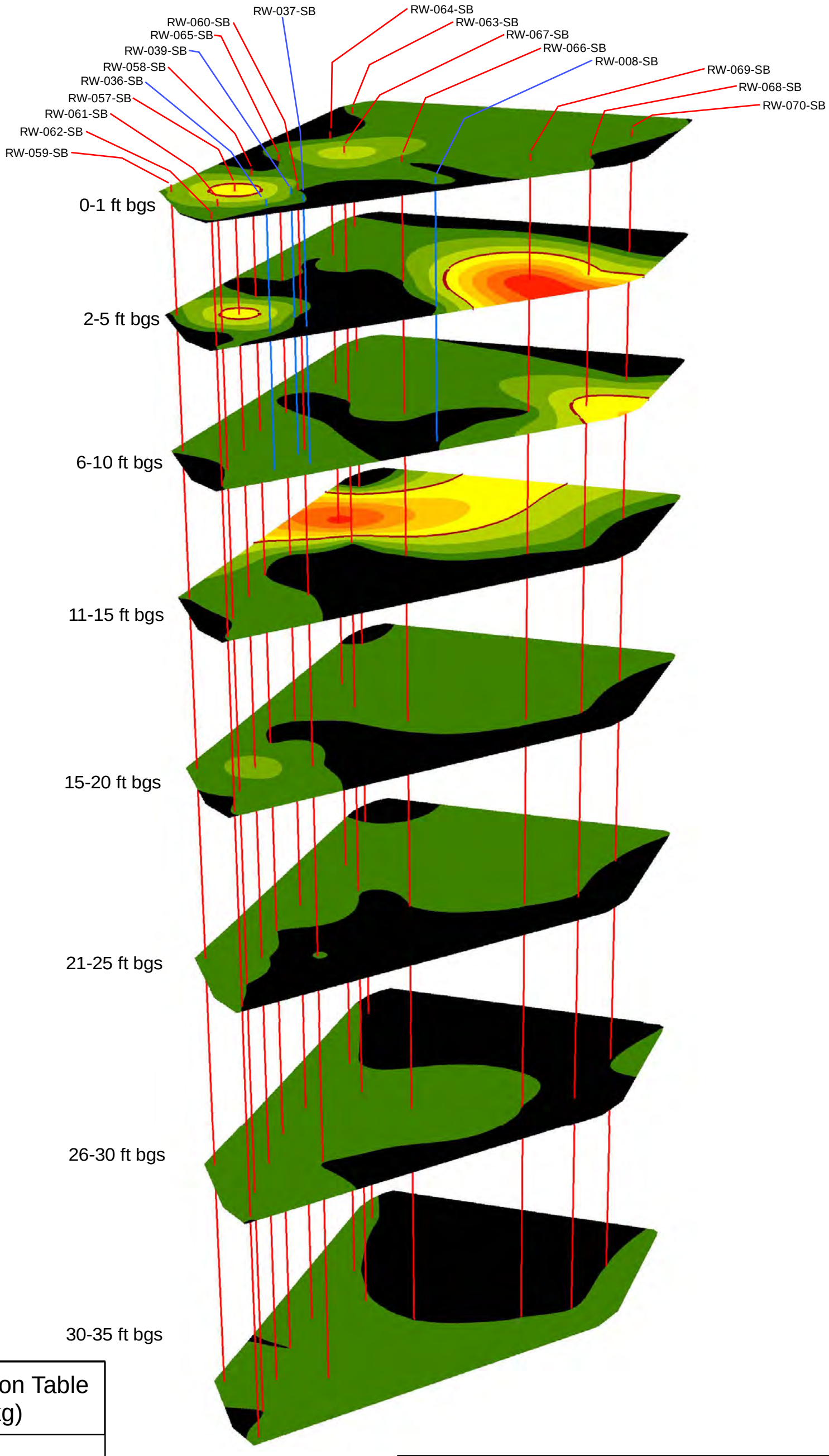
Figure 5

F:\Projects\2016\20163421 - Sparrows Point Rod and Wire Mill Area\Cad\FIGURE 14.dwg

APPENDICES

APPENDIX A

Select Figures and Tables from *Pre-Design Investigation Rod and Wire Mill Area Characterization Report (ARM June 6, 2016)*



Concentration Table (mg/kg)

- ND - 0.38 (GW Protection)
- >0.38 - 200
- >200 - 550
- >550 - 980 (PAL)
- >980 - 1,400
- >1,400 - 1,900
- >1,900 - 2,400
- >2,400 - 3,000
- >3,000 - 3,600

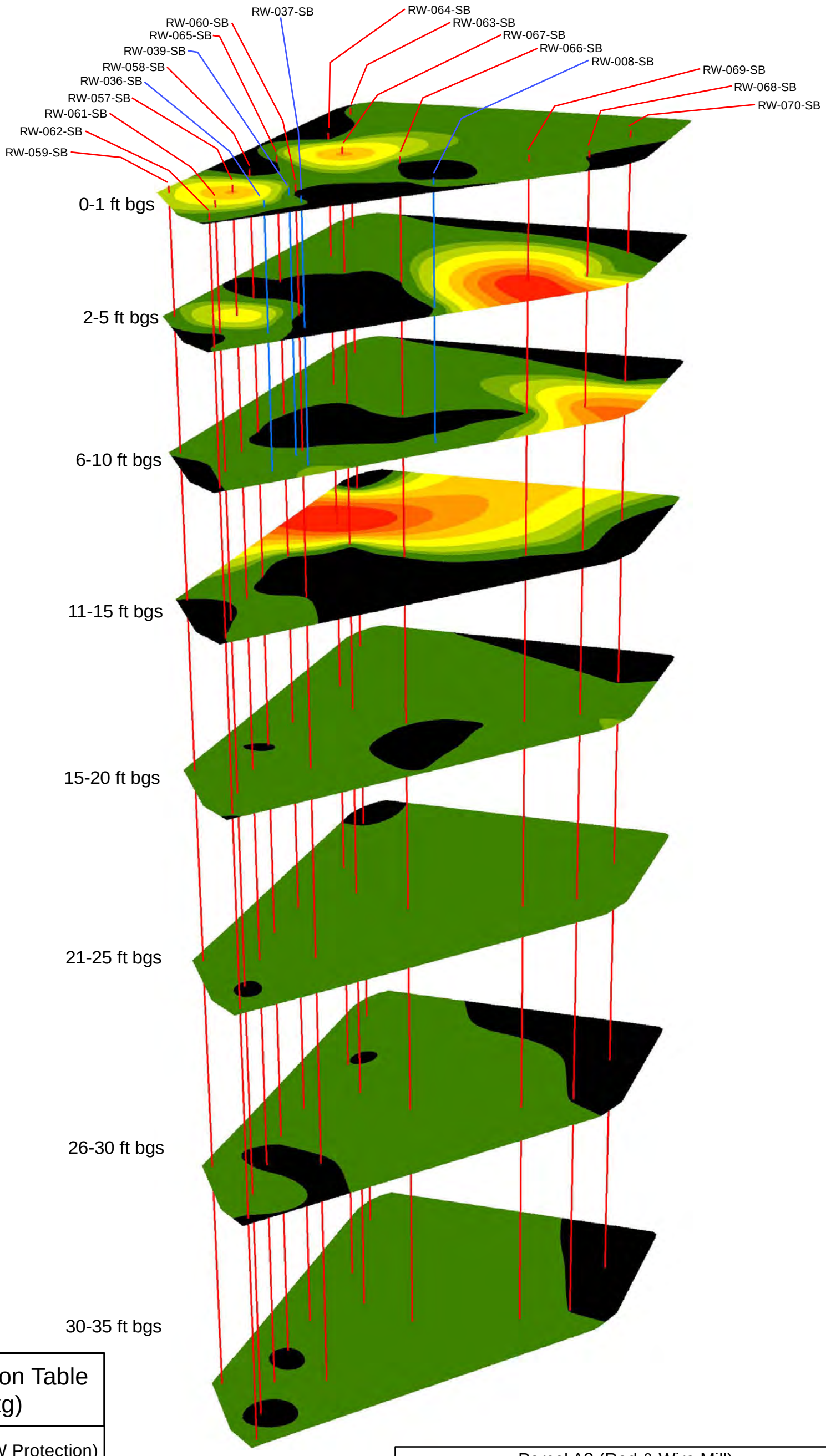
Parcel A3 (Rod & Wire Mill)
Soil Cadmium Contours (mg/kg)
Pre-Design Investigation (All Depths)
March 15, 2016

Figure 6

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

- Phase II - Soil Boring
- Remedial Design Boring
- PAL Indicator Line



Concentration Table (mg/kg)

- 0 - 370 (GW Protection)
- >370 - 8,000
- >8,000 - 11,800
- >11,800 - 20,400
- >20,400 - 34,000
- >34,000 - 48,000
- >48,000 - 63,000
- >63,000 - 80,000
- >80,000 - 118,000

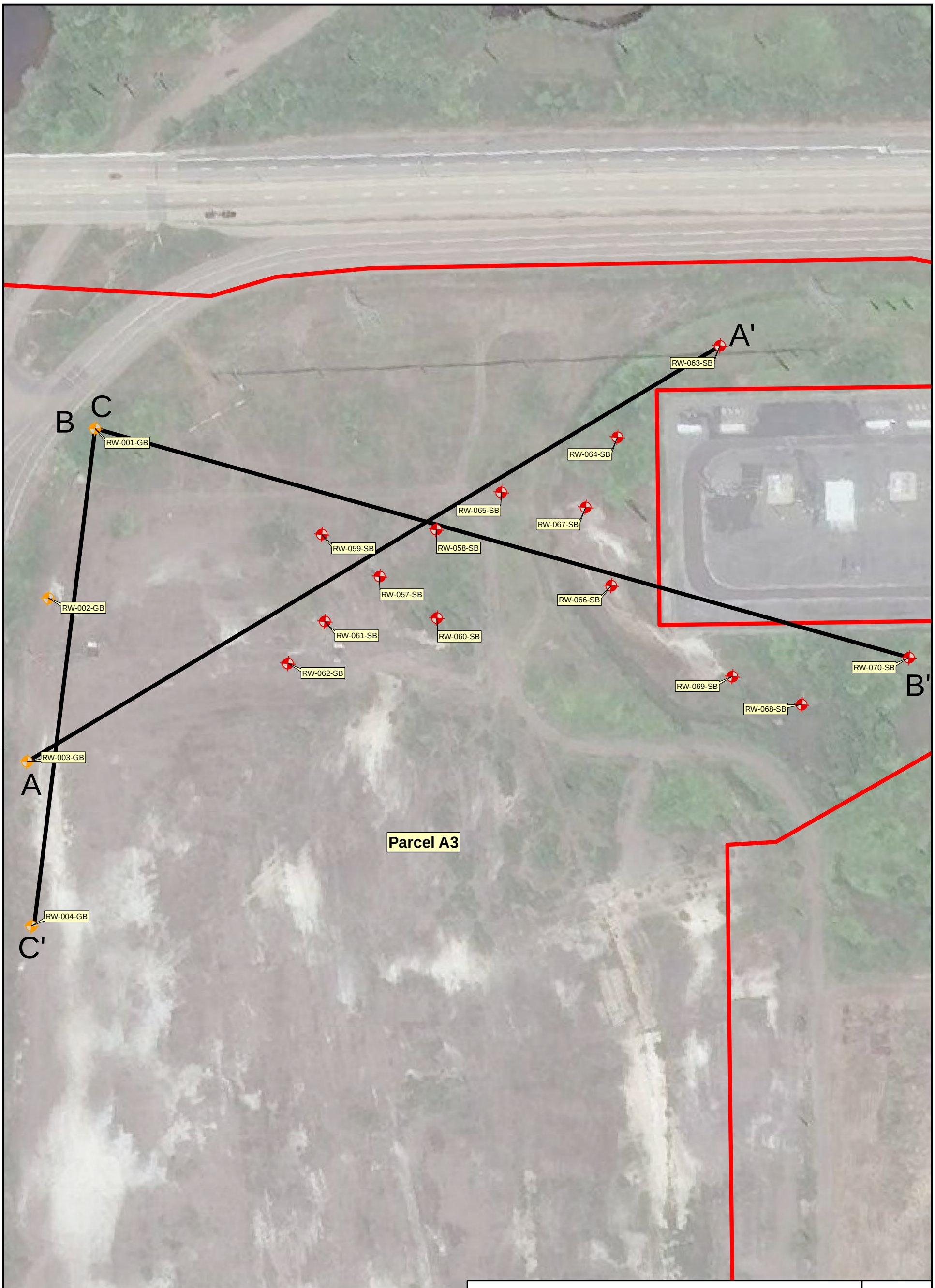
Parcel A3 (Rod & Wire Mill)
Soil Zinc Contours (mg/kg)
Pre-Design Investigation (All Depths)
March 15, 2016

Figure 7

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

- Phase II - Soil Boring
- Remedial Design Boring



Parcel A3 (Rod & Wire Mill)
Cross Section Map View
April 4, 2016

Figure
8

EnviroAnalytics Group	Sparrows Point Terminal
ARM Project 150298M	Baltimore County, MD

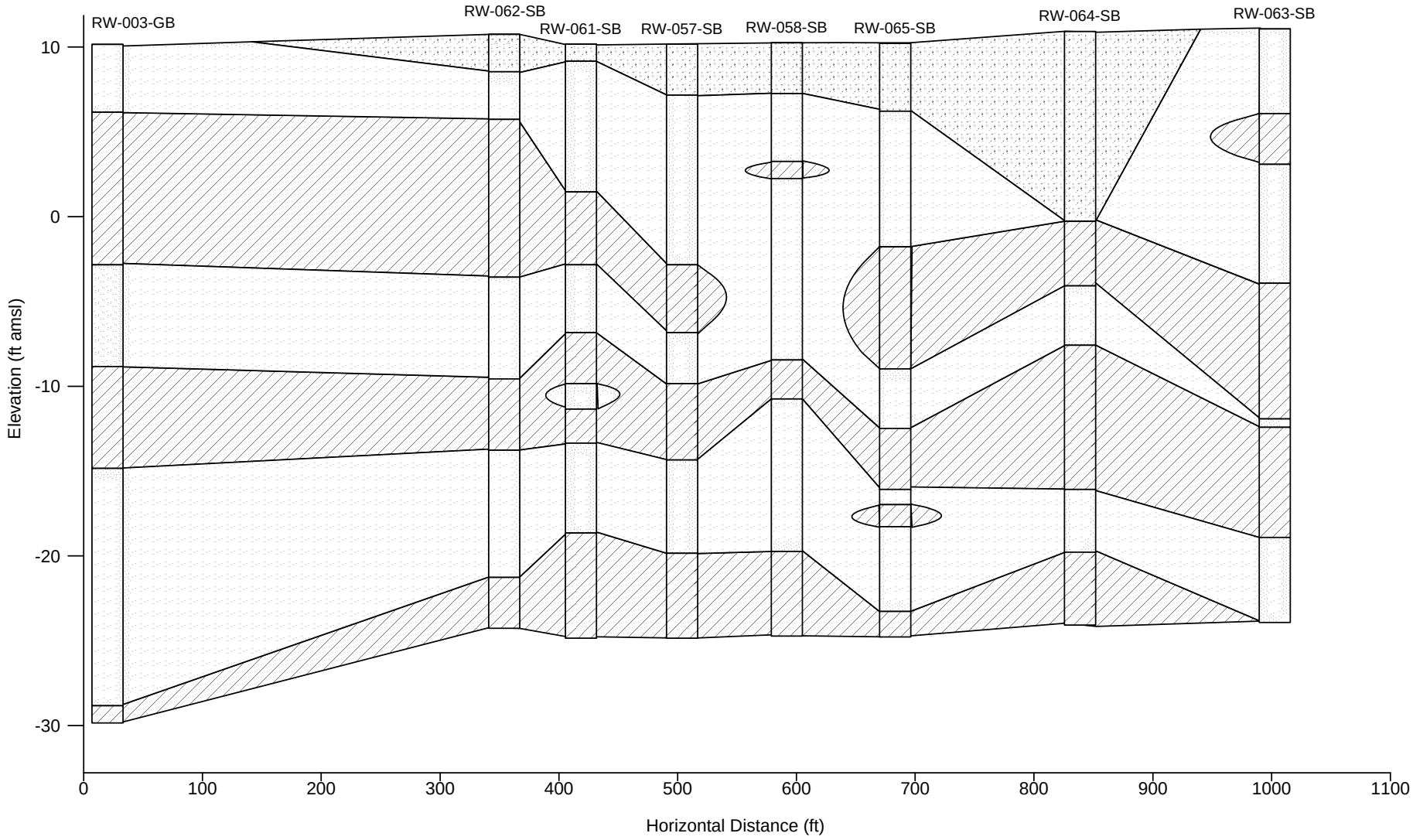
ARM Group Inc.
Earth Resource Engineers and Consultants

0 35 70 140
Feet

Remedial Design Borings
Geotechnical Borings
Approximate cross-section line

Southwest ← A

Northeast A' →



Parcel A3 (Rod & Wire Mill)
Cross Section

Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

Cross Section A-A'

EnviroAnalytics Group

ARM Project 150298M
March 2016

LEGEND

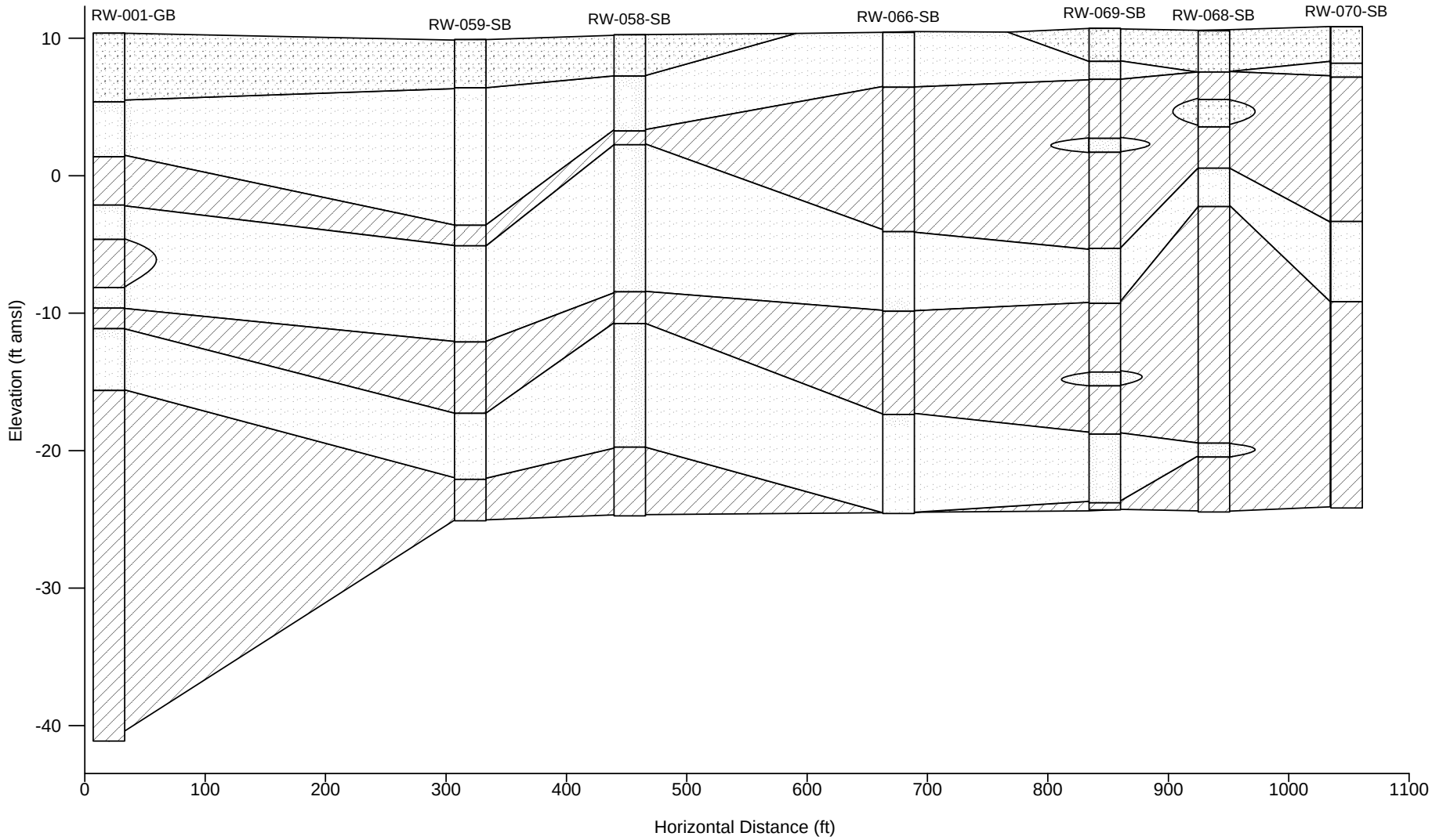
- Gravel/Slag
- Sand
- Clay

Note: amsl = above mean sea level
Cross-section is vertically exaggerated approximately 14:1

P:\EnviroAnalytics Group\150298M EAG_Sparrows Point Area A\Documents\Parcel A3 (RWM)\Boring Logs\A-A'.cro

Northwest ← B

Southeast B' →



Parcel A3 (Rod & Wire Mill)
Cross Section

Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

Cross Section B-B'

EnviroAnalytics Group

ARM Project 150298M
March 2016

LEGEND

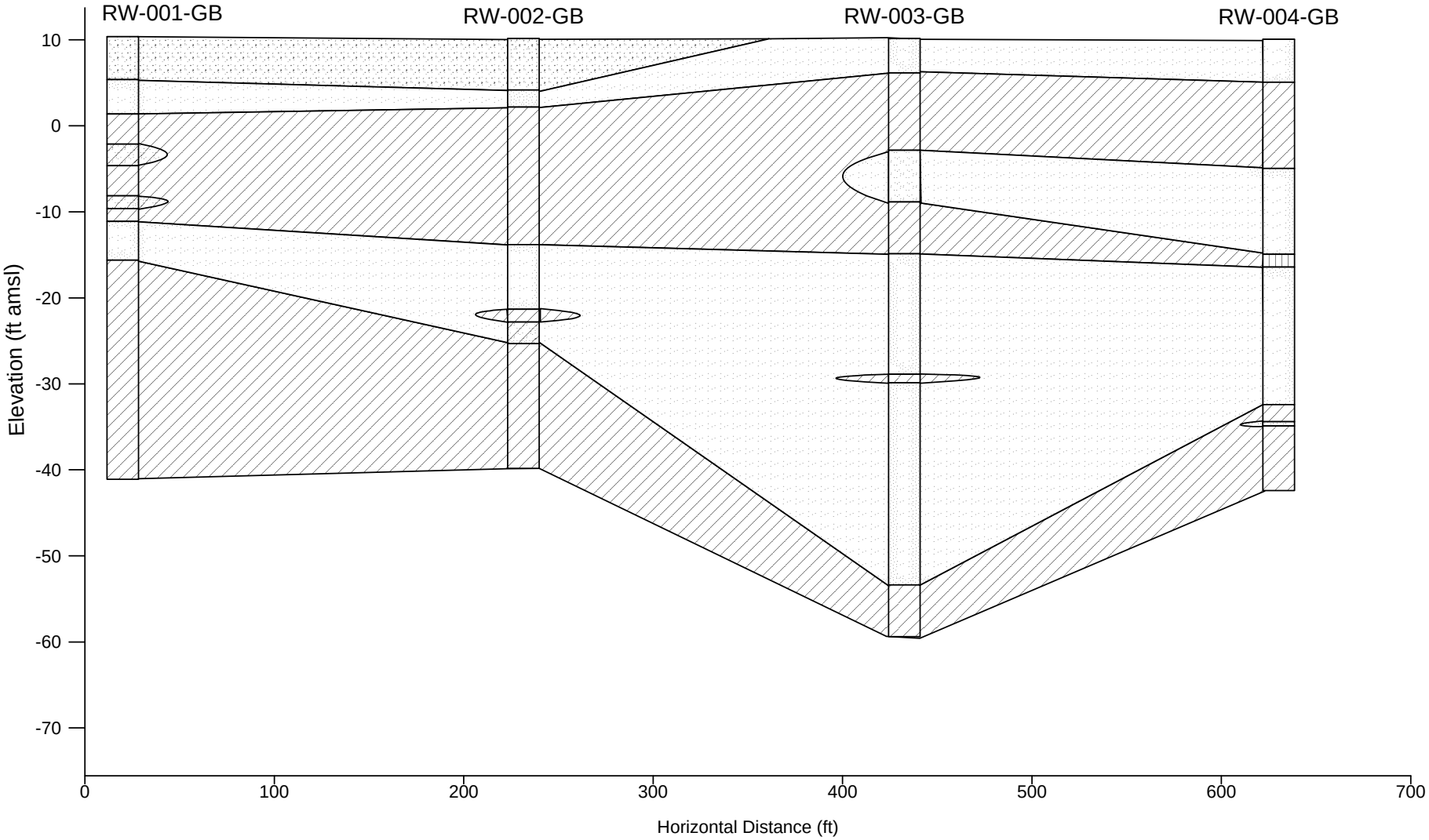
- Gravel/Slag
- Sand
- Clay

Note: amsl = above mean sea level
Cross-section is vertically exaggerated approximately 11:1

P:\EnviroAnalytics Group\150298M EAG_Sparrows Point Area A\Documents\Parcel A3 (RWM)\Boring Logs\B-B'.cro

North ← C

C' → South



Parcel A3 (Rod & Wire Mill)
Cross Section

Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

Cross Section C-C'

EnviroAnalytics Group

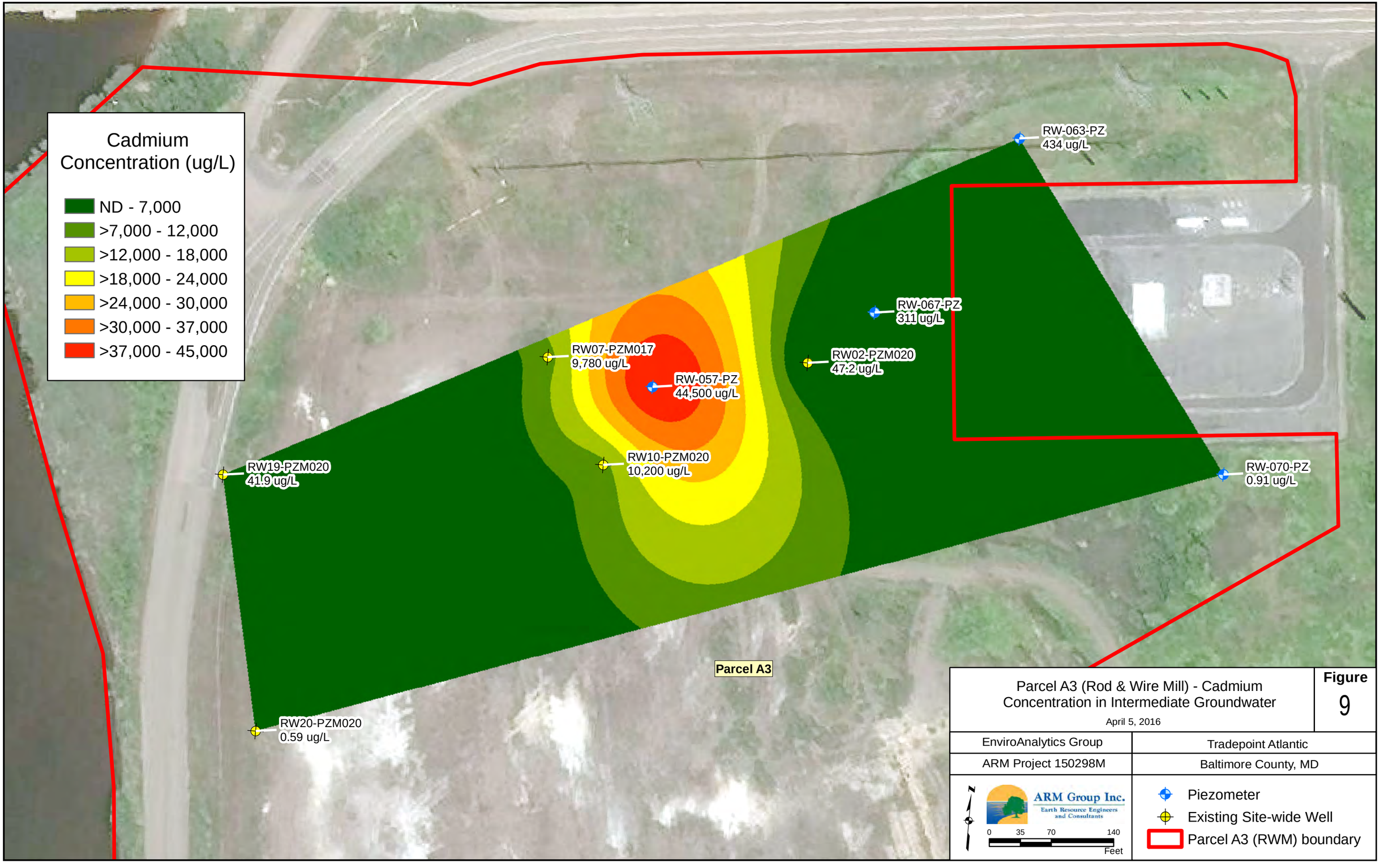
ARM Project 150298M
March 2016

LEGEND

- Gravel/Slag
- Sand
- Clay

amsl = above mean sea level
Cross-section is vertically exaggerated

P:\EnviroAnalytics Group\150298M EAG_Sparrows Point Area A\Documents\Parcel A3 (RWM)\Boring Logs\C-C'.cro



Parcel A3 (Rod & Wire Mill) - Cadmium Concentration in Intermediate Groundwater

April 5, 2016

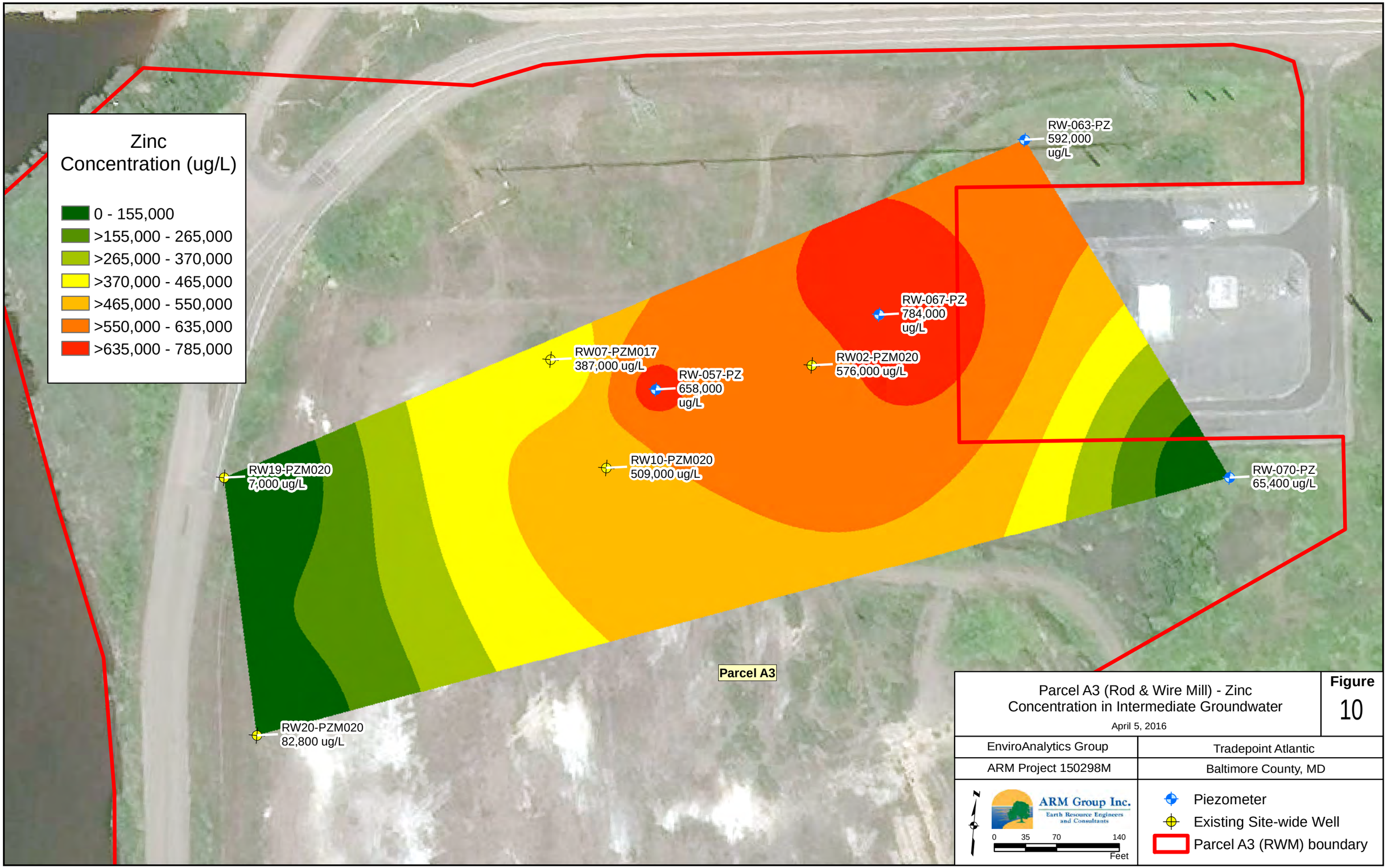
Figure 9

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 35 70 140
Feet

- Piezometer
- Existing Site-wide Well
- Parcel A3 (RWM) boundary



Parcel A3 (Rod & Wire Mill) - Zinc Concentration in Intermediate Groundwater

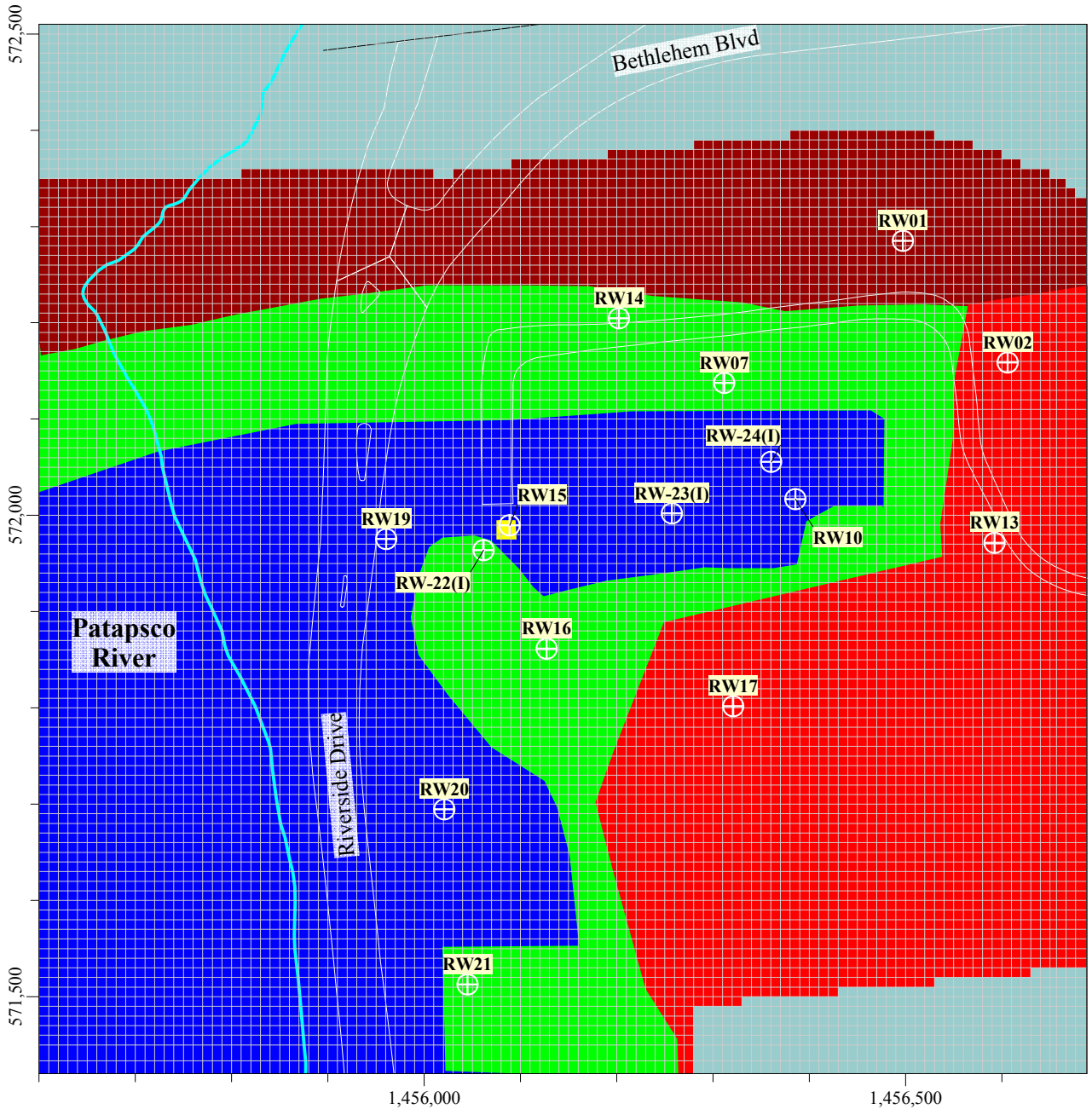
April 5, 2016

Figure 10

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

Numerical Groundwater Model

Model Grid, General Head Boundaries and Hydraulic Conductivity Zones



Map Legend

- Monitoring Well
- General Head Boundary

Hydraulic Conductivity Zones
(K units = feet per day)

- K=1.0e4 clean sand to gravel
- K=26.5 silty sand to clean sand
- K=24 silty sand to clean sand
- K=14.7 silty sand to clean sand
- K=4.3 silty sand to clean sand

0 200 400
Feet
MD State Plane Coordinates
NAD 1983

ARM Group Inc.
Earth Resource Engineers and Consultants

Numerical Groundwater Model

Pre-Design Investigation
Rod and Wire Mill Source Area
Characterization Report

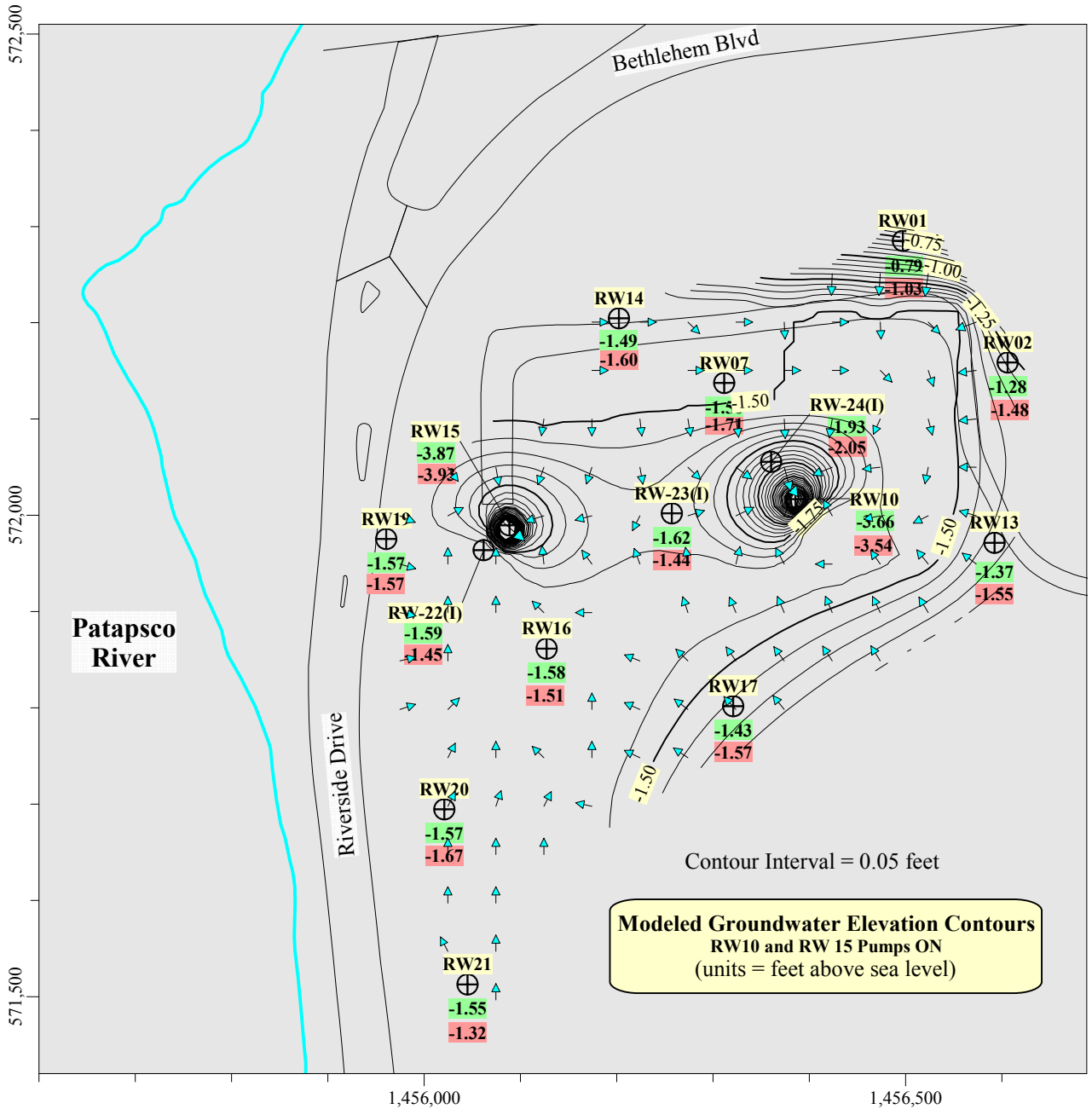
April 2016

150298

Figure 11

Numerical Groundwater Model
RW10 and RW15 ON
Calibrated Results

Groundwater Elevation Contours
Posted Measured and Calibrated Water Elevations



Map Legend

RW01
-0.79
-1.03

modeled groundwater elevation

measured groundwater elevation

Monitoring Well
with posted modeled and measured groundwater elevations*

Groundwater Flow Vector
Flow direction indicated by arrow orientation
Flow magnitude indicated by arrow length

*All modeled groundwater elevations were within 0.25 feet of the measured values.

N

0 200 400
Feet
MD State Plane Coordinates
NAD 1983

ARM Group Inc.
Earth Resource Engineers and Consultants

Numerical Groundwater Model

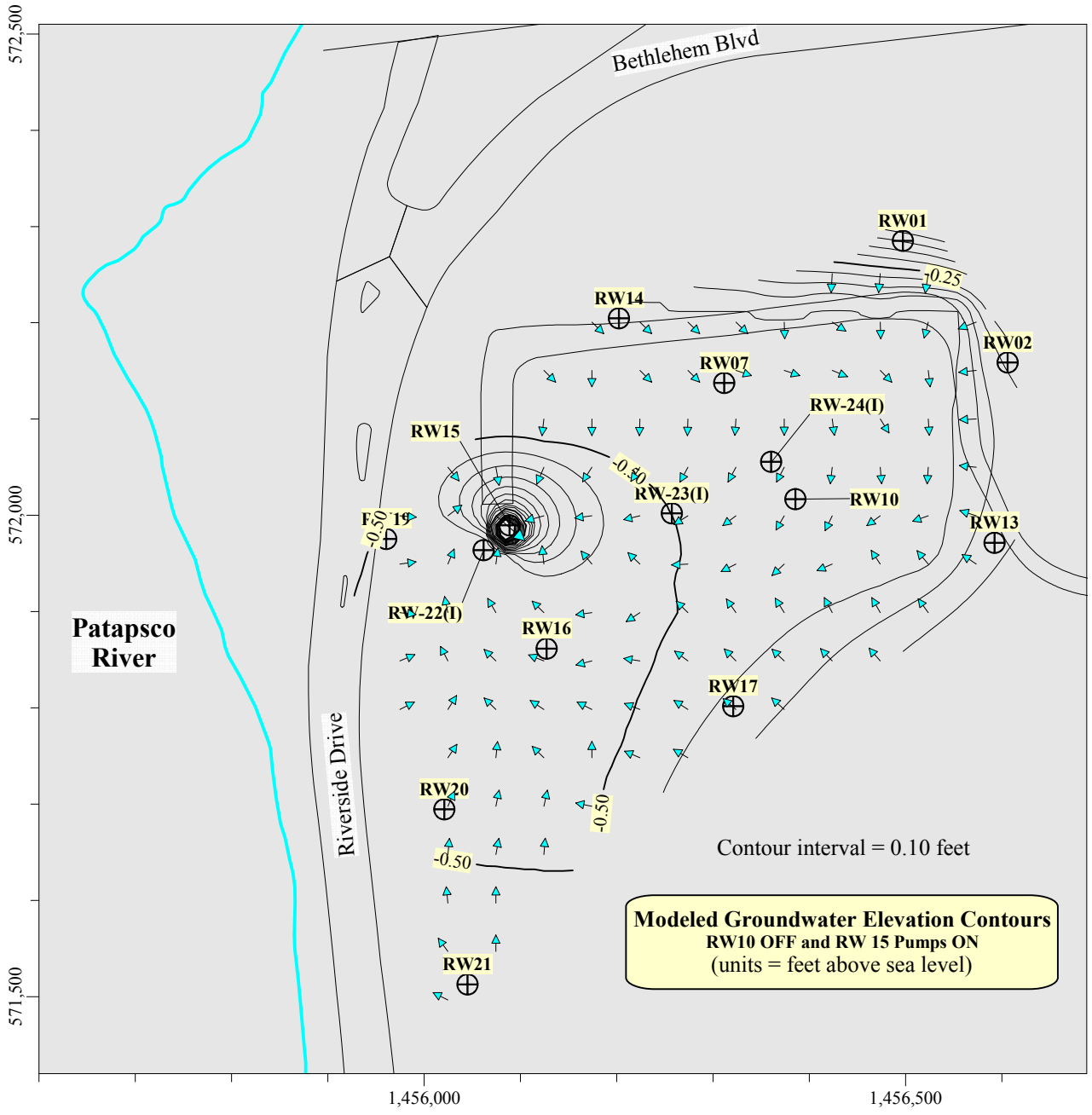
Pre-Design Investigation
Rod and Wire Mill Source Area
Characterization Report

April 2016

150298

Figure
12

Numerical Groundwater Model
RW10 OFF and RW15 ON
Modeled Groundwater Elevation Contours



Map Legend

RW01

Monitoring Well Location

Groundwater Flow Vector
Flow direction indicated by arrow orientation
Flow magnitude indicated by arrow length

N

0 200 400
Feet
MD State Plane Coordinates
NAD 1983

ARM Group Inc.
Earth Resource Engineers and Consultants

Numerical Groundwater Model

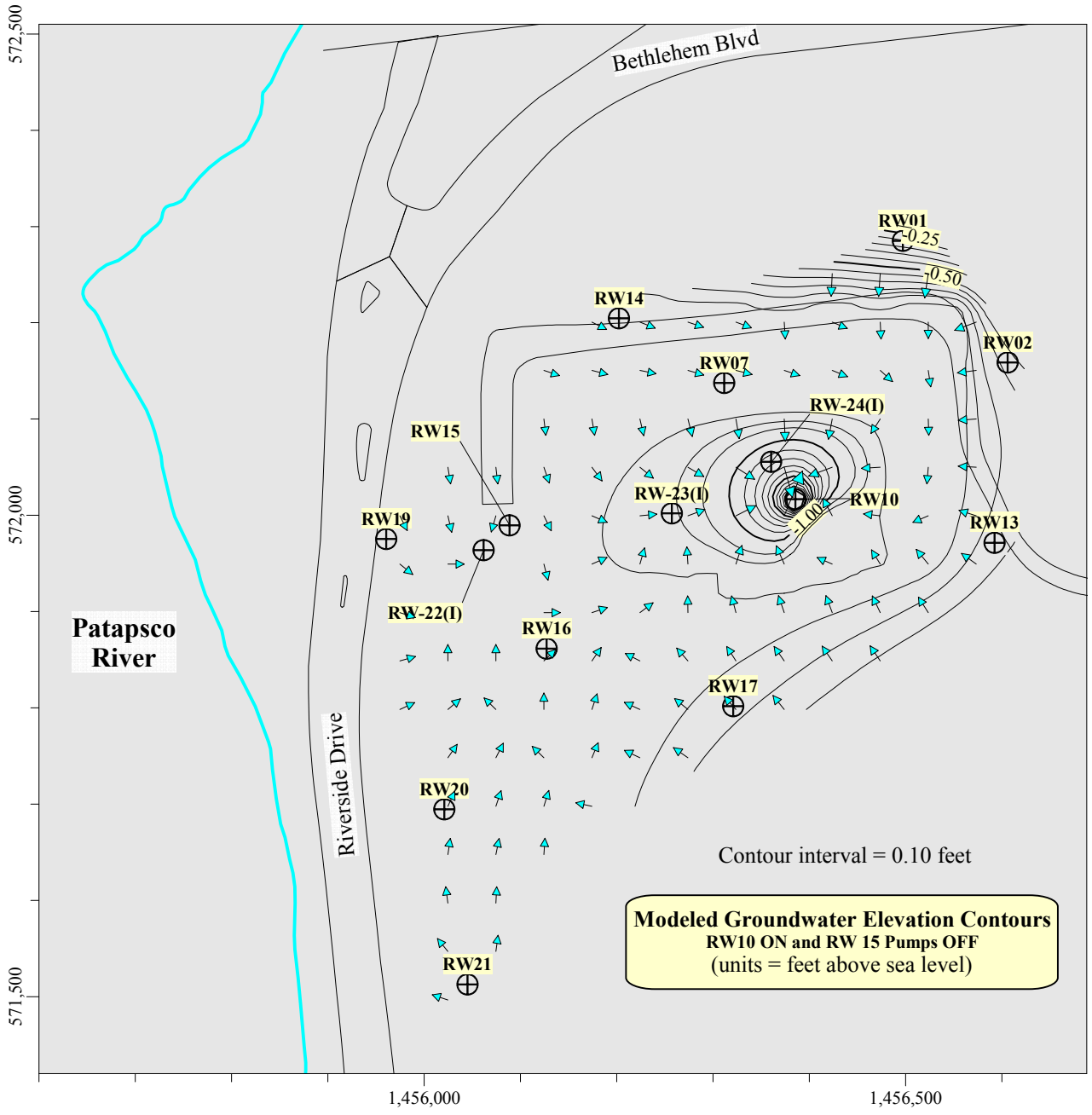
Pre-Design Investigation
Rod and Wire Mill Source Area
Characterization Report

April 2016

150298

Figure
15

Numerical Groundwater Model
RW10 ON and RW15 OFF
Modeled Groundwater Elevation Contours



Map Legend

RW01

Monitoring Well Location

Groundwater Flow Vector
Flow direction indicated by arrow orientation
Flow magnitude indicated by arrow length

N

0 200 400
Feet
MD State Plane Coordinates
NAD 1983

ARM Group Inc.
Earth Resource Engineers and Consultants

Numerical Groundwater Model

Pre-Design Investigation
Rod and Wire Mill Source Area
Characterization Report

April 2016

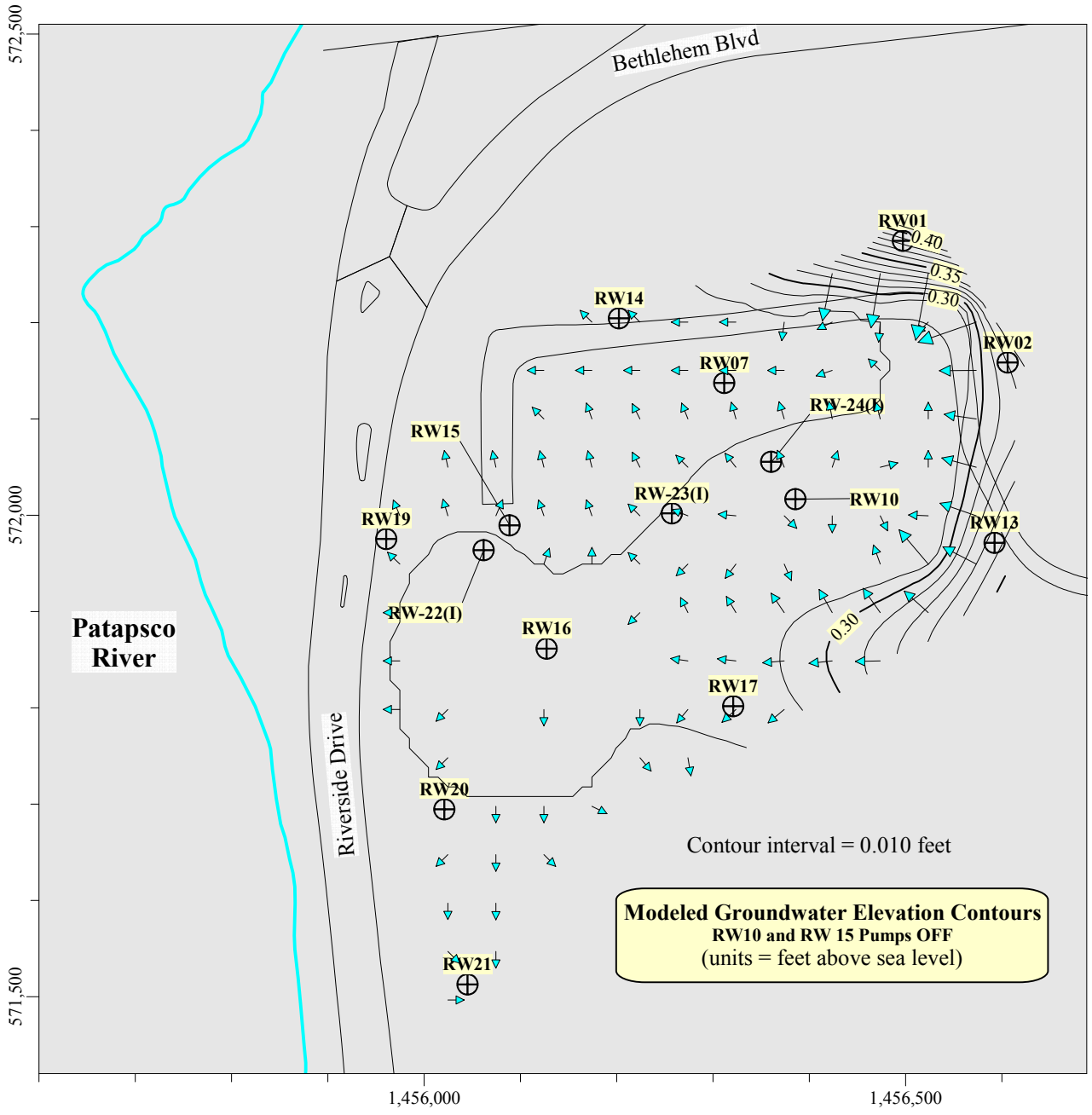
150298

Figure
16

Numerical Groundwater Model

RW10 and RW15 OFF

Modeled Groundwater Elevation Contours



Map Legend

RW01

Monitoring Well Location

Groundwater Flow Vector

Flow direction indicated by arrow orientation

Flow magnitude indicated by arrow length

N

0 200 400

Feet

MD State Plane Coordinates

NAD 1983

ARM Group Inc.

Earth Resource Engineers and Consultants

Numerical Groundwater Model

Pre-Design Investigation
Rod and Wire Mill Source Area
Characterization Report

April 2016

150298

Figure 17

APPENDIX B

Select Figures and Tables from *Interim Measures Work Plan, In-Situ Groundwater Treatment, Former Rod and Wire Mill Area (Advanced GeoServices, August 2016)*

TABLES

TABLE 1
PDI SUPPLEMENT GROUNDWATER DATA AND TITRATION STUDY
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Sample Location		RW-10			RW-2I			RW-2D			CW-MW-1 (S)		
Lab ID		2140225001			2140225002			2140225003			2140225004		
Sample Date		4/27/2016			4/27/2016			4/27/2016			4/27/2016		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater		
Remarks													
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Total Metals													
Aluminum, Total	mg/L		U	5.6		U	11.1		U	11.1	0.83		0.11
Antimony, Total	mg/L		U	1.1		U	2.2		U	2.2		U	0.022
Arsenic, Total	mg/L		U	0.45		U	0.9		U	0.9		U	0.009
Cadmium, Total	mg/L	9.9		0.11		U	0.22		U	0.22		U	0.0022
Calcium, Total	mg/L	198		5.6	261		11.1	262		11.1	10.4		0.11
Copper, Total	mg/L		U	0.56		U	1.1		U	1.1		U	0.011
Iron, Total	mg/L	209		3.3	736		6.7	700		6.7	51.2		0.067
Lead, Total	mg/L		U	0.33		U	0.67		U	0.67		U	0.0067
Magnesium, Total	mg/L	100		5.6	171		11.1	167		11.1	3.7		0.11
Manganese, Total	mg/L	18.2		0.28	26.2		0.56	25.5		0.56	0.41		0.0056
Nickel, Total	mg/L	1.1		1.1		U	2.2		U	2.2		U	0.022
Potassium, Total	mg/L		U	27.8		U	55.6		U	55.6	1.1		0.56
Silicon, Total	mg/L	13.1		0.05	13.5		0.05	13.7		0.05	23.1		0.05
Sodium, Total	mg/L	244		27.8	104		55.6	96		55.6	11.6		0.56
Zinc, Total	mg/L	444		1.1	712		2.2	679		2.2	0.068		0.022
Dissolved Metals													
Aluminum, Dissolved	mg/L		U	5		U	10		U	10		U	0.1
Antimony, Dissolved	mg/L		U	1		U	2		U	2		U	0.02
Arsenic, Dissolved	mg/L		U	0.4		U	0.8		U	0.8		U	0.008
Barium, Dissolved	mg/L		U	0.5		U	1		U	1	0.037		0.01
Beryllium, Dissolved	mg/L		U	0.2		U	0.4		U	0.4		U	0.004
Cadmium, Dissolved	mg/L	10		0.1		U	0.2		U	0.2		U	0.002
Calcium, Dissolved	mg/L	201		5	255		10	260		10	10.5		0.1
Chromium, Dissolved	mg/L		U	0.25		U	0.5		U	0.5		U	0.005
Cobalt, Dissolved	mg/L		U	0.25		U	0.5		U	0.5		U	0.005
Copper, Dissolved	mg/L		U	0.5		U	1		U	1		U	0.01
Iron, Dissolved	mg/L	217		3	690		6	716		6	49.9		0.06
Lead, Dissolved	mg/L		U	0.3		U	0.6		U	0.6		U	0.006
Magnesium, Dissolved	mg/L	103		5	162		10	168		10	3.7		0.1
Manganese, Dissolved	mg/L	18.7		0.25	24.9		0.5	25.8		0.5	0.4		0.005
Mercury, Dissolved	mg/L		U	0.0005		U	0.0005		U	0.0005		U	0.0005
Nickel, Dissolved	mg/L	1.2		1		U	2		U	2		U	0.02
Potassium, Dissolved	mg/L		U	25		U	50		U	50	0.99		0.5
Selenium, Dissolved	mg/L		U	1		U	2		U	2		U	0.02
Silver, Dissolved	mg/L		U	0.2		U	0.4		U	0.4		U	0.004
Sodium, Dissolved	mg/L	249		25	79.1		50	79.8		50	12.3		0.5
Thallium, Dissolved	mg/L		U	1		U	2		U	2		U	0.02
Vanadium, Dissolved	mg/L		U	0.25		U	0.5		U	0.5		U	0.005
Zinc, Dissolved	mg/L	447		1	653		2	679		2	0.069		0.02
Conventionals													
Acidity, Total	mg/L	1170		25	2900		125		NA		130		25
Alkalinity, Total	mg/L	5		5		U	5		NA		86		5
Chloride	mg/L	413		5	32.4		5	33.3		5	22.5		5
Nitrate/Nitrite-N	mg/L		U	0.5		U	0.5		U	0.5		U	0.5
Phosphorus, Total	mg/L	0.11		0.1	0.27		0.1	0.19		0.1	1.1		0.1
Sulfate	mg/L	2080		50	3900		100	3820		100		U	5

TABLE 1
PDI SUPPLEMENT GROUNDWATER DATA AND TITRATION STUDY
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Sample Location		CW-MW-2 (I)			RW-10 pH 7.5			RW-10 pH 9			RW-10 pH 10.5		
Lab ID		2140225005			2140225006			2140225007			2140225008		
Sample Date		4/27/2016			4/27/2016			4/27/2016			4/27/2016		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater		
Remarks				P									
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Total Metals													
Aluminum, Total	mg/L	1.6		0.11		NA			NA			NA	
Antimony, Total	mg/L		U	0.022		NA			NA			NA	
Arsenic, Total	mg/L		U	0.009		NA			NA			NA	
Cadmium, Total	mg/L		U	0.0022		NA			NA			NA	
Calcium, Total	mg/L	34.5		0.11		NA			NA			NA	
Copper, Total	mg/L		U	0.011		NA			NA			NA	
Iron, Total	mg/L	130		0.067		NA			NA			NA	
Lead, Total	mg/L		U	0.0067		NA			NA			NA	
Magnesium, Total	mg/L	13		0.11		NA			NA			NA	
Manganese, Total	mg/L	3.3		0.0056		NA			NA			NA	
Nickel, Total	mg/L		U	0.022		NA			NA			NA	
Potassium, Total	mg/L	3.3		0.56		NA			NA			NA	
Silicon, Total	mg/L	30.2		0.05		NA			NA			NA	
Sodium, Total	mg/L	39.3		0.56		NA			NA			NA	
Zinc, Total	mg/L	0.035		0.022		NA			NA			NA	
Dissolved Metals													
Aluminum, Dissolved	mg/L		U	0.1		U	1		U	1		U	1
Antimony, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Arsenic, Dissolved	mg/L		U	0.008		U	0.08		U	0.08		U	0.08
Barium, Dissolved	mg/L	0.15		0.01		U	0.1		U	0.1		U	0.1
Beryllium, Dissolved	mg/L		U	0.004		U	0.04		U	0.04		U	0.04
Cadmium, Dissolved	mg/L		U	0.002	7.4		0.02	0.42		0.02	0.031		0.02
Calcium, Dissolved	mg/L	34.5		0.1	177		1	170		1	148		1
Chromium, Dissolved	mg/L		U	0.005		U	0.05		U	0.05		U	0.05
Cobalt, Dissolved	mg/L		U	0.005	0.056		0.05		U	0.05		U	0.05
Copper, Dissolved	mg/L		U	0.01		U	0.1		U	0.1		U	0.1
Iron, Dissolved	mg/L	126		0.06	50		0.6		U	0.6		U	0.6
Lead, Dissolved	mg/L		U	0.006		U	0.06		U	0.06		U	0.06
Magnesium, Dissolved	mg/L	12.9		0.1	88.2		1	67.8		1	29.9		1
Manganese, Dissolved	mg/L	3.3		0.005	15.9		0.05	4.2		0.05	0.21		0.05
Mercury, Dissolved	mg/L		U	0.0005		U	0.0005		U	0.0005		U	0.0005
Nickel, Dissolved	mg/L		U	0.02	0.21		0.2		U	0.2		U	0.2
Potassium, Dissolved	mg/L	3.4		0.5	15.2		5	14.7		5	14.2		5
Selenium, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Silver, Dissolved	mg/L		U	0.004		U	0.04		U	0.04		U	0.04
Sodium, Dissolved	mg/L	40.6		0.5	570		5	747		5	834		5
Thallium, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Vanadium, Dissolved	mg/L		U	0.005		U	0.05		U	0.05		U	0.05
Zinc, Dissolved	mg/L	0.052		0.02	82.8		0.2	0.43		0.2		U	0.2
Conventionals													
Acidity, Total	mg/L	243		25		NA			NA			NA	
Alkalinity, Total	mg/L	42		5		NA			NA			NA	
Chloride	mg/L	144		5		NA			NA			NA	
Nitrate/Nitrite-N	mg/L		U	0.5		NA			NA			NA	
Phosphorus, Total	mg/L	0.45		0.1		NA			NA			NA	
Sulfate	mg/L	127		5		NA			NA			NA	

TABLE 1
PDI SUPPLEMENT GROUNDWATER DATA AND TITRATION STUDY
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Sample Location		RW-2I pH 7.5			RW-2I pH 9			RW-2I pH 10.5			RW-2D pH 7.5		
Lab ID		2140225009			2140225010			2140225011			2140225012		
Sample Date		4/27/2016			4/27/2016			4/27/2016			4/27/2016		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater		
Remarks													
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Total Metals													
Aluminum, Total	mg/L		NA			NA			NA			NA	
Antimony, Total	mg/L		NA			NA			NA			NA	
Arsenic, Total	mg/L		NA			NA			NA			NA	
Cadmium, Total	mg/L		NA			NA			NA			NA	
Calcium, Total	mg/L		NA			NA			NA			NA	
Copper, Total	mg/L		NA			NA			NA			NA	
Iron, Total	mg/L		NA			NA			NA			NA	
Lead, Total	mg/L		NA			NA			NA			NA	
Magnesium, Total	mg/L		NA			NA			NA			NA	
Manganese, Total	mg/L		NA			NA			NA			NA	
Nickel, Total	mg/L		NA			NA			NA			NA	
Potassium, Total	mg/L		NA			NA			NA			NA	
Silicon, Total	mg/L		NA			NA			NA			NA	
Sodium, Total	mg/L		NA			NA			NA			NA	
Zinc, Total	mg/L		NA			NA			NA			NA	
Dissolved Metals													
Aluminum, Dissolved	mg/L		U	1		U	1		U	1		U	1
Antimony, Dissolved	mg/L		U	0.2		U	0.2		U	0.2		U	0.2
Arsenic, Dissolved	mg/L		U	0.08		U	0.08		U	0.08		U	0.08
Barium, Dissolved	mg/L		U	0.1		U	0.1		U	0.1		U	0.1
Beryllium, Dissolved	mg/L		U	0.04		U	0.04		U	0.04		U	0.04
Cadmium, Dissolved	mg/L	0.077		0.02		U	0.02		U	0.02	0.05		0.02
Calcium, Dissolved	mg/L	219		1	203		1	209		1	218		1
Chromium, Dissolved	mg/L		U	0.05		U	0.05		U	0.05		U	0.05
Cobalt, Dissolved	mg/L	0.054		0.05		U	0.05		U	0.05		U	0.05
Copper, Dissolved	mg/L		U	0.1		U	0.1		U	0.1		U	0.1
Iron, Dissolved	mg/L	250		0.6	2.5		0.6		U	0.6	180		0.6
Lead, Dissolved	mg/L		U	0.06		U	0.06		U	0.06		U	0.06
Magnesium, Dissolved	mg/L	130		1	115		1	69.1		1	138		1
Manganese, Dissolved	mg/L	19.9		0.05	7.7		0.05	0.46		0.05	20.8		0.05
Mercury, Dissolved	mg/L		U	0.0005		U	0.0005		U	0.0005		U	0.0005
Nickel, Dissolved	mg/L		U	0.2		U	0.2		U	0.2		U	0.2
Potassium, Dissolved	mg/L	11		5	10.7		5	11.4		5	10.9		5
Selenium, Dissolved	mg/L		U	0.2		U	0.2		U	0.2		U	0.2
Silver, Dissolved	mg/L		U	0.04		U	0.04		U	0.04		U	0.04
Sodium, Dissolved	mg/L	672		5	904		5	1110		5	739		5
Thallium, Dissolved	mg/L		U	0.2		U	0.2		U	0.2		U	0.2
Vanadium, Dissolved	mg/L	0.056		0.05		U	0.05		U	0.05	0.061		0.05
Zinc, Dissolved	mg/L	57.9		0.2	1		0.2		U	0.2	45		0.2
Conventionals													
Acidity, Total	mg/L		NA			NA			NA			NA	
Alkalinity, Total	mg/L		NA			NA			NA			NA	
Chloride	mg/L		NA			NA			NA			NA	
Nitrate/Nitrite-N	mg/L		NA			NA			NA			NA	
Phosphorus, Total	mg/L		NA			NA			NA			NA	
Sulfate	mg/L		NA			NA			NA			NA	

TABLE 1
PDI SUPPLEMENT GROUNDWATER DATA AND TITRATION STUDY
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Sample Location		RW-2D pH 9			RW-2D pH 10.5			CW-MW 1(S) pH 7.5			CW-MW 1(S) pH 9		
Lab ID		2140225013			2140225014			2140225015			2140225016		
Sample Date		4/27/2016			4/27/2016			4/27/2016			4/27/2016		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater		
Remarks													
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Total Metals													
Aluminum, Total	mg/L		NA			NA			NA			NA	
Antimony, Total	mg/L		NA			NA			NA			NA	
Arsenic, Total	mg/L		NA			NA			NA			NA	
Cadmium, Total	mg/L		NA			NA			NA			NA	
Calcium, Total	mg/L		NA			NA			NA			NA	
Copper, Total	mg/L		NA			NA			NA			NA	
Iron, Total	mg/L		NA			NA			NA			NA	
Lead, Total	mg/L		NA			NA			NA			NA	
Magnesium, Total	mg/L		NA			NA			NA			NA	
Manganese, Total	mg/L		NA			NA			NA			NA	
Nickel, Total	mg/L		NA			NA			NA			NA	
Potassium, Total	mg/L		NA			NA			NA			NA	
Silicon, Total	mg/L		NA			NA			NA			NA	
Sodium, Total	mg/L		NA			NA			NA			NA	
Zinc, Total	mg/L		NA			NA			NA			NA	
Dissolved Metals													
Aluminum, Dissolved	mg/L		U	0.1		U	1		U	1		U	1
Antimony, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Arsenic, Dissolved	mg/L		U	0.008		U	0.08		U	0.08		U	0.08
Barium, Dissolved	mg/L		U	0.01		U	0.1		U	0.1		U	0.1
Beryllium, Dissolved	mg/L		U	0.004		U	0.04		U	0.04		U	0.04
Cadmium, Dissolved	mg/L		U	0.002		U	0.02		U	0.02		U	0.02
Calcium, Dissolved	mg/L	20.4		0.1	201		1	9.6		1	8.2		1
Chromium, Dissolved	mg/L		U	0.005		U	0.05		U	0.05		U	0.05
Cobalt, Dissolved	mg/L		U	0.005		U	0.05		U	0.05		U	0.05
Copper, Dissolved	mg/L		U	0.01		U	0.1		U	0.1		U	0.1
Iron, Dissolved	mg/L	0.12		0.06		U	0.6		U	0.6		U	0.6
Lead, Dissolved	mg/L		U	0.006		U	0.06		U	0.06		U	0.06
Magnesium, Dissolved	mg/L	11.8		0.1	62.9		1	3.4		1	3.1		1
Manganese, Dissolved	mg/L	0.43		0.005	0.31		0.05	0.16		0.05		U	0.05
Mercury, Dissolved	mg/L		U	0.0005		U	0.0005		U	0.0005		U	0.0005
Nickel, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Potassium, Dissolved	mg/L	1		0.5	10.7		5		U	5		U	5
Selenium, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Silver, Dissolved	mg/L		U	0.004		U	0.04		U	0.04		U	0.04
Sodium, Dissolved	mg/L	93.1		0.5	1070		5	74.8		5	81.9		5
Thallium, Dissolved	mg/L		U	0.02		U	0.2		U	0.2		U	0.2
Vanadium, Dissolved	mg/L		U	0.005		U	0.05		U	0.05		U	0.05
Zinc, Dissolved	mg/L	0.043		0.02		U	0.2		U	0.2		U	0.2
Conventionals													
Acidity, Total	mg/L		NA			NA			NA			NA	
Alkalinity, Total	mg/L		NA			NA			NA			NA	
Chloride	mg/L		NA			NA			NA			NA	
Nitrate/Nitrite-N	mg/L		NA			NA			NA			NA	
Phosphorus, Total	mg/L		NA			NA			NA			NA	
Sulfate	mg/L		NA			NA			NA			NA	

TABLE 1
PDI SUPPLEMENT GROUNDWATER DATA AND TITRATION STUDY
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Sample Location		CW-MW 1(S) pH 10.5			CW-MW 2(I) pH 7.5			CW-MW 2(I) pH 9			CW-MW 2(I) pH 10.5		
Lab ID		2140225017			2140225018			2140225019			2140225020		
Sample Date		4/27/2016			4/27/2016			4/27/2016			4/27/2016		
Matrix		Groundwater			Groundwater			Groundwater			Groundwater		
Remarks													
Parameter	**Units**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**	**Result**	**Q**	**RL**
Total Metals													
Aluminum, Total	mg/L		NA			NA			NA			NA	
Antimony, Total	mg/L		NA			NA			NA			NA	
Arsenic, Total	mg/L		NA			NA			NA			NA	
Cadmium, Total	mg/L		NA			NA			NA			NA	
Calcium, Total	mg/L		NA			NA			NA			NA	
Copper, Total	mg/L		NA			NA			NA			NA	
Iron, Total	mg/L		NA			NA			NA			NA	
Lead, Total	mg/L		NA			NA			NA			NA	
Magnesium, Total	mg/L		NA			NA			NA			NA	
Manganese, Total	mg/L		NA			NA			NA			NA	
Nickel, Total	mg/L		NA			NA			NA			NA	
Potassium, Total	mg/L		NA			NA			NA			NA	
Silicon, Total	mg/L		NA			NA			NA			NA	
Sodium, Total	mg/L		NA			NA			NA			NA	
Zinc, Total	mg/L		NA			NA			NA			NA	
Dissolved Metals													
Aluminum, Dissolved	mg/L		U	1		U	0.1		U	1		U	1
Antimony, Dissolved	mg/L		U	0.2		U	0.02		U	0.2		U	0.2
Arsenic, Dissolved	mg/L		U	0.08		U	0.008		U	0.08		U	0.08
Barium, Dissolved	mg/L		U	0.1		U	0.01		U	0.1		U	0.1
Beryllium, Dissolved	mg/L		U	0.04		U	0.004		U	0.04		U	0.04
Cadmium, Dissolved	mg/L		U	0.02		U	0.002		U	0.02		U	0.02
Calcium, Dissolved	mg/L	6.5		1	3		0.1	30.1		1	26.2		1
Chromium, Dissolved	mg/L		U	0.05		U	0.005		U	0.05		U	0.05
Cobalt, Dissolved	mg/L		U	0.05		U	0.005		U	0.05		U	0.05
Copper, Dissolved	mg/L		U	0.1		U	0.01		U	0.1		U	0.1
Iron, Dissolved	mg/L		U	0.6		U	0.06		U	0.6		U	0.6
Lead, Dissolved	mg/L		U	0.06		U	0.006		U	0.06		U	0.06
Magnesium, Dissolved	mg/L	2.6		1	1.1		0.1	10.7		1	9		1
Manganese, Dissolved	mg/L		U	0.05	0.16		0.005	0.37		0.05		U	0.05
Mercury, Dissolved	mg/L		U	0.0005		U	0.0005		U	0.0005		U	0.0005
Nickel, Dissolved	mg/L		U	0.2		U	0.02		U	0.2		U	0.2
Potassium, Dissolved	mg/L		U	5		U	0.5		U	5		U	5
Selenium, Dissolved	mg/L		U	0.2		U	0.02		U	0.2		U	0.2
Silver, Dissolved	mg/L		U	0.04		U	0.004		U	0.04		U	0.04
Sodium, Dissolved	mg/L	145		5	11.5		0.5	138		5	194		5
Thallium, Dissolved	mg/L		U	0.2		U	0.02		U	0.2		U	0.2
Vanadium, Dissolved	mg/L		U	0.05		U	0.005		U	0.05		U	0.05
Zinc, Dissolved	mg/L		U	0.2		U	0.02		U	0.2		U	0.2
Conventionals													
Acidity, Total	mg/L		NA			NA			NA			NA	
Alkalinity, Total	mg/L		NA			NA			NA			NA	
Chloride	mg/L		NA			NA			NA			NA	
Nitrate/Nitrite-N	mg/L		NA			NA			NA			NA	
Phosphorus, Total	mg/L		NA			NA			NA			NA	
Sulfate	mg/L		NA			NA			NA			NA	

TABLE 2
PDI SUPPLEMENT SOIL REAGENT JAR TESTING
Former Rod and Wire Mill, Pilot Scale Work Plan
Sparrows Point, Maryland

Material	Paste PH	Date
Soil	4.99	12-May
	5.07	13-May
	5.09	16-May
Agricultural Lime w/ Soil (1:5)	6.15	12-May
	6.12	13-May
	6.34	16-May
Agricultural Lime w/ Soil (2:5)	6.3	12-May
	6.17	13-May
Agricultural Lime w/ Soil (3:5)	6.3	12-May
	6.45	13-May
Agricultural Lime w/ Soil (1:1)	6.4	12-May
	6.67	13-May
	7.07	16-May
	8.2	6-Jun
Enviroblend w/ Soil (1:4)	8.4	12-May
	10.55	13-May
	10.38	16-May
Terrabond w/ Soil (1:10)	9.2	24-May
	10.2	25-May
	8.82	6-Jun
Terrabond w/ Soil (1:5)	11.3	24-May
	11.3	25-May
	11.6	6-Jun
Terrabond w/ Soil (1:2)	11.8	24-May
	11.8	25-May
	11.98	6-Jun

TABLE 3
PDI SUPPLEMENT GROUNDWATER REAGENT JAR TEST
Former Rod and Wire Mill Pilot Scale Work Plan
Sparrows Point, Maryland

Material	PH	Date
Groundwater	5.9	12-May
	5.9	13-May
Groundwater/Lime	7	12-May
	7.8	13-May
	8.7	6-Jun
Groundwater/Enviroblend	10.7	12-May
	11.17	13-May
	9.2 *	6-Jun
Groundwater/Terrabond	11.4	1-Jun
	11.4	6-Jun

* Possible calibration error on pH probe.

TABLE 4
REAGENT MEP/SPLP STUDY SUMMARY
Former Rod and Wire Mill Area
Sparrows Point Terminal, Sparrows Point, Maryland
2016-3421

Sample	Units	Groundwater	Terra 5% (Rot 1)	Reduction	Terra 5% (Rot 2)	Reduction	Terra 5% (Rot 3)	Reduction
PH	s.u.		7.02		6.81		NA	
Cadmium, dis	mg/L	11	1.1	90.00%	4	63.64%	5.9	46.36%
Zinc, dis	mg/L	710	253	64.37%	331	53.38%	398	43.94%
Arsenic, dis	mg/L	ND	ND	NA	ND	NA	0.0084	NA
Iron, dis	mg/L	140	ND	100.00%	ND	ND	33	ND
Magnesium, dis	mg/L	96	159	-65.63%	100	-4.17%	129	-34.38%
Manganese, dis	mg/L	24	14.5	39.58%	14.1	41.25%	19.7	17.92%

Sample	Units	Groundwater	Terra 30% (Rot 1)	Reduction	Terra 30% (Rot 2)	Reduction	Terra 20% (Rot 3)	Reduction
PH	s.u.		8.44		7.64		NA	
Cadmium, dis	mg/L	11	0.014	99.87%	0.44	96.00%	1.6	85.45%
Zinc, dis	mg/L	710	1	99.86%	22.8	96.79%	279	60.70%
Arsenic, dis	mg/L	ND	ND	NA	ND	NA	ND	NA
Iron, dis	mg/L	140	ND	100.00%	ND	ND	0.12	99.91%
Magnesium, dis	mg/L	96	204	-112.50%	280	-191.67%	188	-95.83%
Manganese, dis	mg/L	24	0.043	99.82%	16.1	32.92%	22.7	5.42%

Sample	Units	Groundwater	EB 10% (Rot 1)	Reduction	EB10% (Rot 2)	Reduction	EB 10% (Rot 3)	Reduction
PH	s.u.		7.04		6.97	NA	7	
Cadmium, dis	mg/L	11	6.7	39.09%	10.1	8.18%	12	-9.09%
Zinc, dis	mg/L	710	261	63.24%	533	NA	720	-1.41%
Arsenic, dis	mg/L	ND	ND	NA	ND	ND	0.023	NA
Iron, dis	mg/L	140	ND	100.00%	ND	100.00%	ND	NA
Magnesium, dis	mg/L	96	184	-91.67%	158	-64.58%	155	-61.46%
Manganese, dis	mg/L	24	13.4	44.17%	19.1	20%	20.1	16.25%

Sample	Units	Groundwater	EB 20% (Rot 1)	Reduction	EB20% (Rot 2)	Reduction	EB20% (Rot 3)	Reduction
PH	s.u.		9.23		9.1	NA	7.44	
Cadmium, dis	mg/L	11	0.024	99.78%	0.051	99.54%	7.6	30.91%
Zinc, dis	mg/L	710	0.72	99.90%	0.29	99.96%	56.5	92.04%
Arsenic, dis	mg/L	ND	ND	NA	ND	ND	ND	NA
Iron, dis	mg/L	140	ND	100.00%	ND	100.00%	ND	NA
Magnesium, dis	mg/L	96	255	-165.63%	373	-288.54%	302	-214.58%
Manganese, dis	mg/L	24	0.044	99.82%	0.84	97%	24.7	-2.92%

TABLE 5
MONITORING WELL NETWORK MODIFICATIOINS
Former Rod and Wire Mill Area
Sparrows Point Terminal, Sparrows Point, Maryland
2016-3421

	Existing Monitoring Well to Remain	Existing Monitoring Well to be Abandoned and Replaced
Shallow Zone		
RW02-PZM000	**X**	
RW03-PZM003	**X**	
RW04-PZM003	**X**	
RW05-PZP001	**X**	
RW06-PZM001	**X**	
RW07-PZM004	**X**	
RW08-PZM003		**X**
RW09-PZM004		**X**
RW10-PZM004		**X**
RW11-PZM004		**X**
RW12-PZM004		**X**
RW19-PZP000	**X**	
RW20-PZP000		**X**
RW22		**X**
RW23		**X**
RW24		**X**
TS04-PDM004		**X**
TS04-PPM007	**X**	

Intermediate Zone		
RW01-PZM020	**X**	
RW02-PZM020	**X**	
RW07-PZM017	**X**	
RW10-PZM020		**X**
RW13-PZM020		**X**
RW14-PZM020	**X**	
RW15-PZM020		**X**
RW16-PZM020		**X**
RW17-PZM019		**X**
RW19-PZM020	**X**	
RW20-PZM020		**X**
RW21-PZM023		**X**
RW22		**X**
RW23		**X**
RW24		**X**
TS04-PZM023	**X**	

TABLE 6
ENHANCED GROUNDWATER MONITORING PROGRAM
Former Rod and Wire Mill Area
Sparrows Point Terminal, Sparrows Point, Maryland
2016-3421

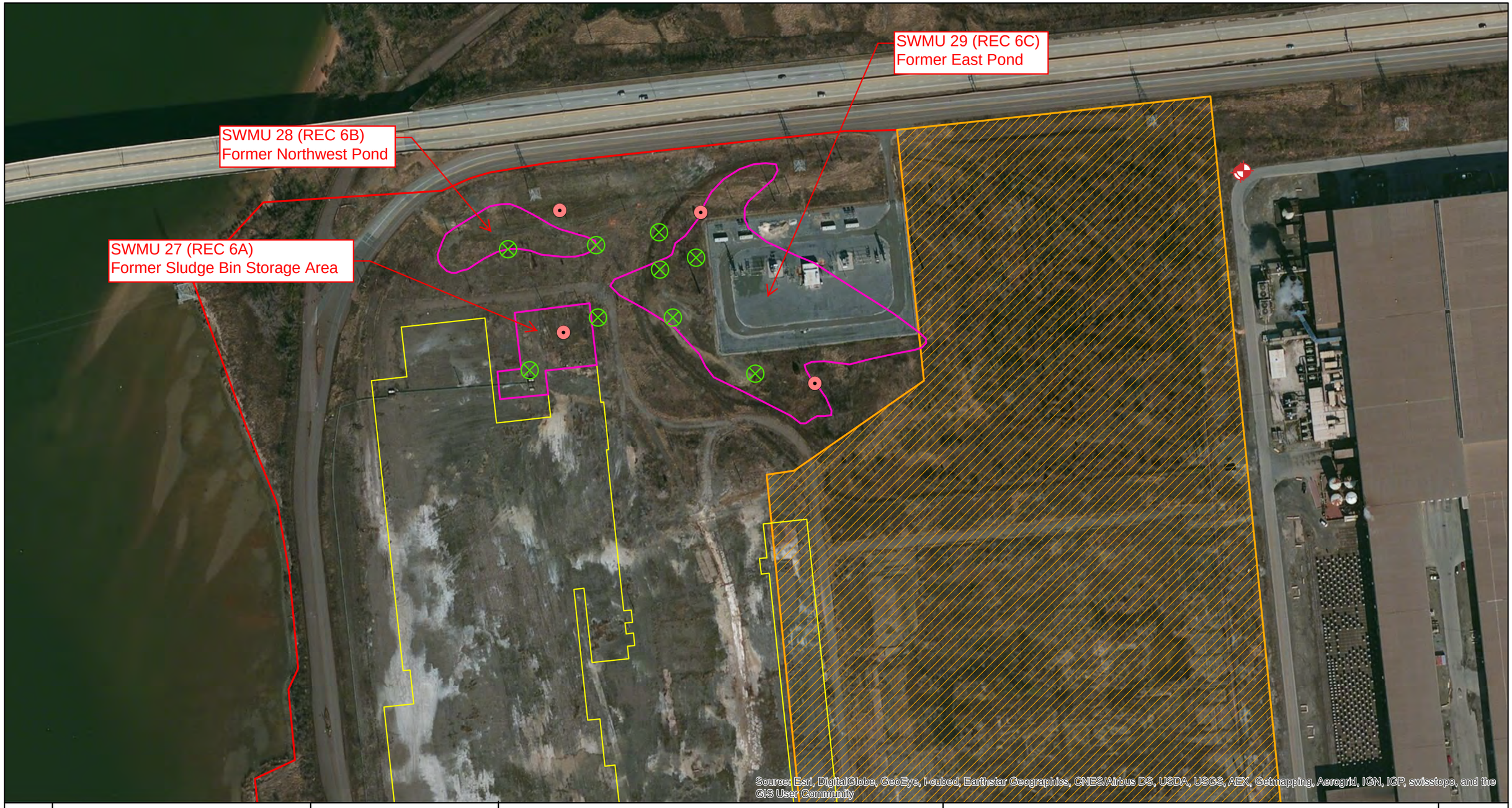
GROUNDWATER WELL	FREQUENCY	PARAMETERS
Existing Wells		
RW-O2-PZM020	Monthly	pH, Zn, Cd
RW-01-PZM020	Monthly	pH, Zn, Cd
RW-07-PZ017	Monthly	pH, Zn, Cd
RW-14-PZ020	Monthly	pH, Zn, Cd
RW-15-PZM020	Monthly	pH, Zn, Cd
RW-19-PZM020	Quarterly	pH, Zn, Cd
TS04-PZM023	Quarterly	pH, Zn, Cd
Re-Located Wells		
RW-10A	Monthly	pH, Zn, Cd
New Wells		
A thru P	Monthly	pH, Zn, Cd

Notes:

1. Sampling frequency to be integrated into current site-wide monitoring program.

2. All new/replacement wells to be sampled at least once prior to a shutdown of the pump and treat system (unless otherwise approved by MDE and/or USEPA).

3. Sampling frequency to be re-evaluated after one year



N

EnviroAnalytics Group
Environmental Engineers

1 inch = 200 feet

0 100 200 Feet

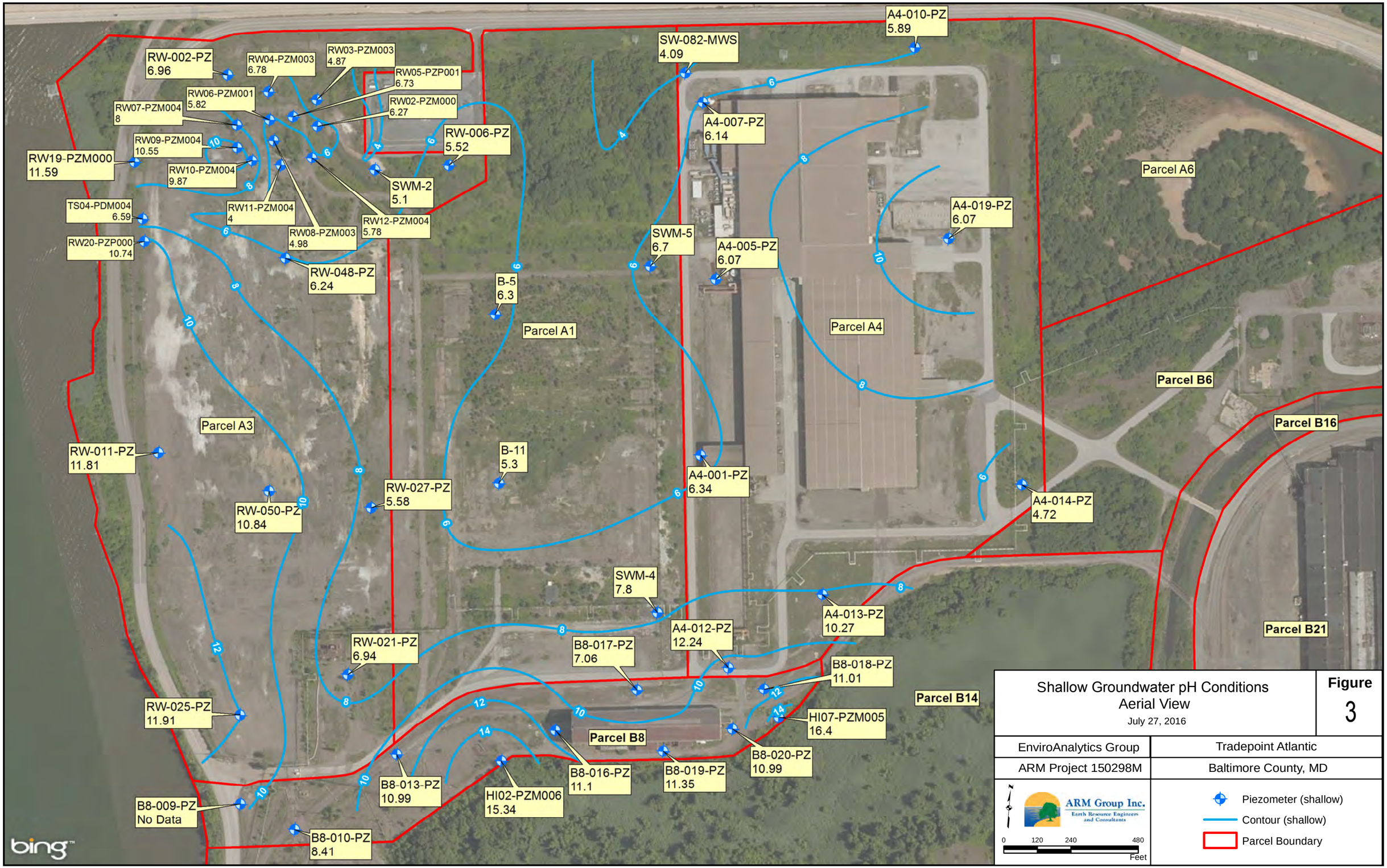
Proposed Investigation Plan

PDI Supplemental Data Collection
Parcel A-3, Former Rod and Wire Mill Area

Legend

- Proposed Test Pit
- Proposed Soil Boring
- Proposed Monitoring Well
- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Former Building Footprint
- Parcel A-1 Boundary
- Parcel A-3 Boundary

Figure 2



Shallow Groundwater pH Conditions
Aerial View
July 27, 2016

Figure 3

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 120 240 480
Feet

Piezometer (shallow)
Contour (shallow)
Parcel Boundary

Intermediate Groundwater pH Conditions
Aerial View

July 27, 2016

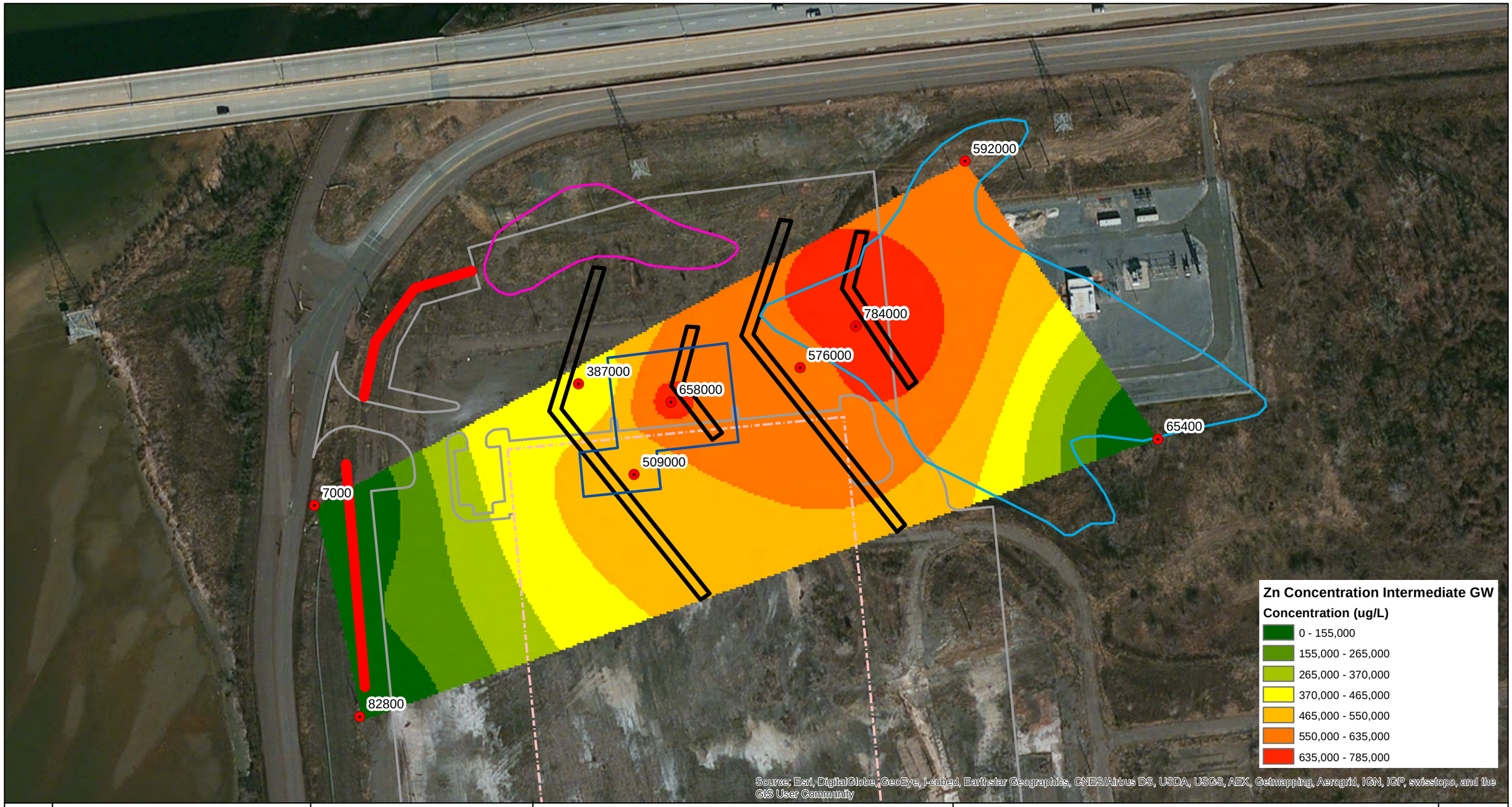
Figure
4

EnviroAnalytics Group	Tradepoint Atlantic
ARM Project 150298M	Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 60 120 240
Feet

Piezometer (intermediate)
Contour (intermediate)
Parcel Boundary



N

EnviroAnalytics Group
Environmental Engineers

0 100 200 Feet

Parcel A-3
Former Rod and Wire Mill Area

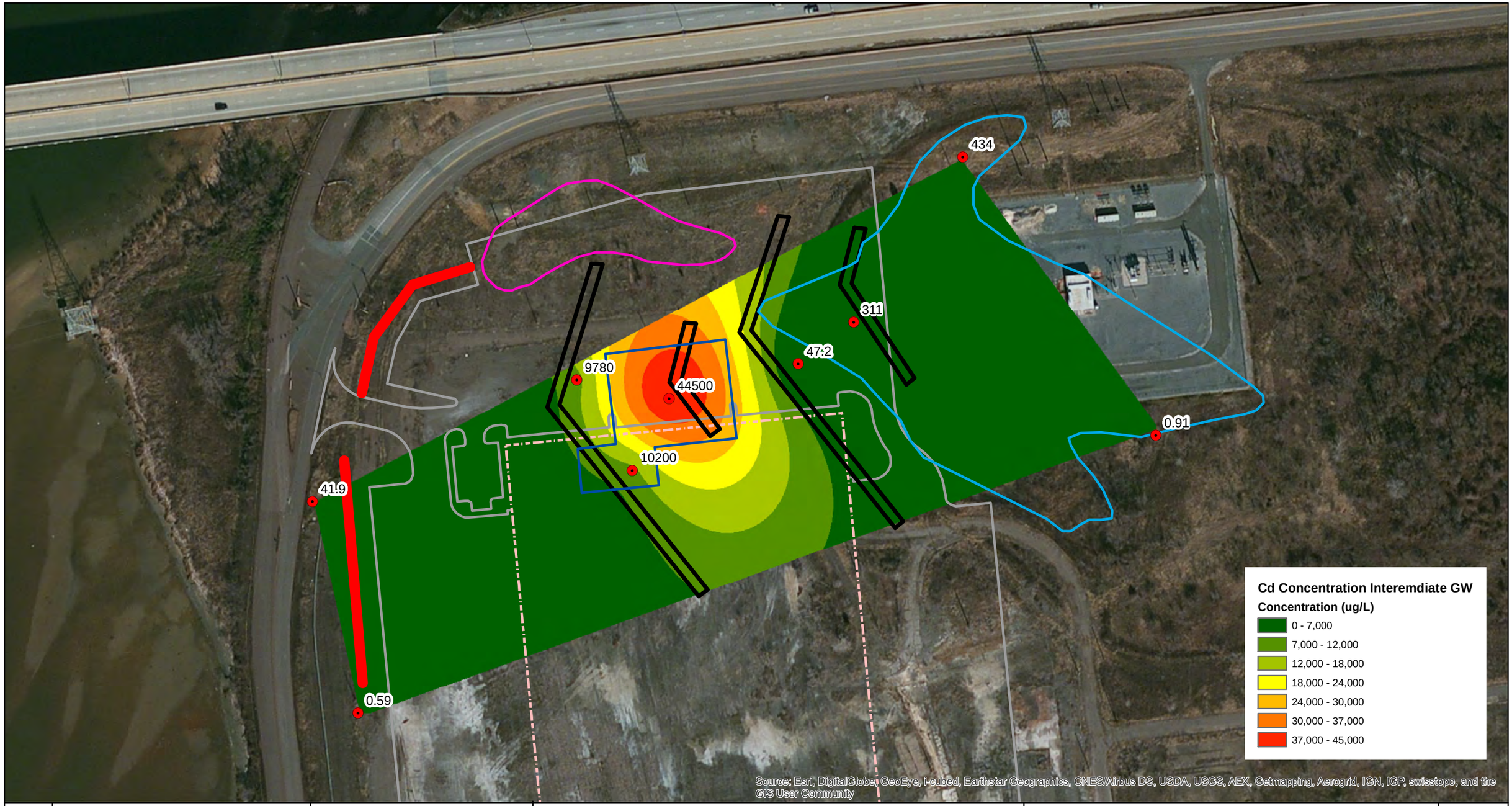
Treatment Trench Layout - Zinc

Legend

- Int GW Sample Location
- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Proposed Treatment Trench Location
- Proposed Treatment Trench Contingency Loaction
- Proposed Building Footprint
- Proposed Paved Area

Figure

6A



N

EnviroAnalytics Group

Environmental Engineers

0 100 200 Feet

Parcel A-3
Former Rod and Wire Mill Area

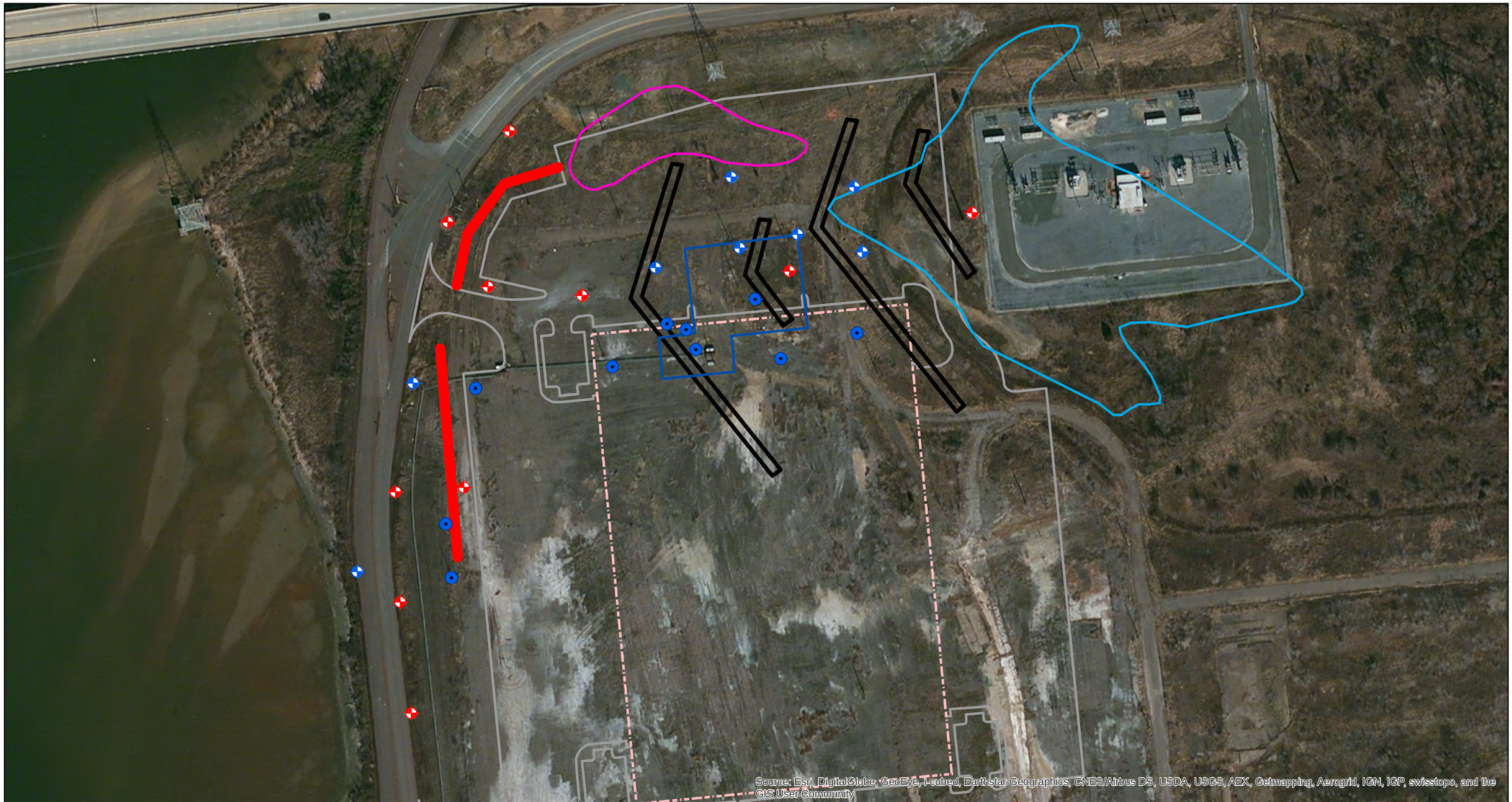
Treatment Trench Layout - Cadmium

Legend

- Int GW Sample Location
- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Proposed Treatment Trench Location
- Proposed Treatment Trench Contingency Location
- Proposed Building Footprint
- Proposed Paved Area

Figure

6B



N

EnviroAnalytics Group

Environmental Engineers

0 100 200 Feet

Parcel A-3
Former Rod and Wire Mill Area

Enhanced GW Monitoring Network
Proposed MW Shallow Zone

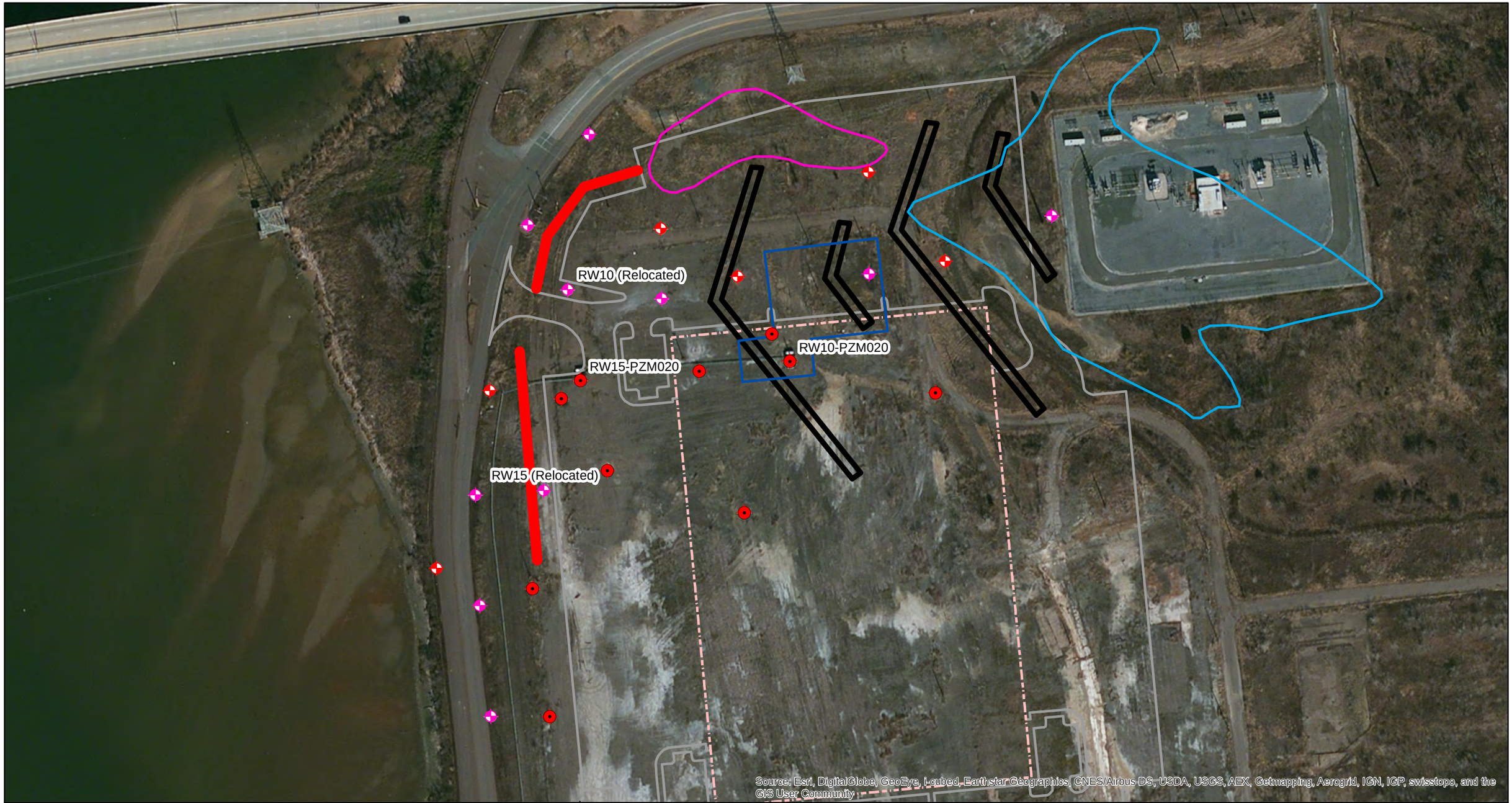
Legend

- Proposed New Monitoring Well Shallow Zone
- Proposed Abandoned Monitoring Well Shallow Zone
- Monitoring Well Shallow Zone
- Proposed Treatment Trench Contingency Location
- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Proposed Treatment Trench Location
- Proposed Building Footprint
- Proposed Paved Area

Proposed MW locations may change slightly based on final site development layout

Figure

11A



N

EnviroAnalytics Group

Environmental Engineers

0 100 200 Feet

Parcel A-3
Former Rod and Wire Mill Area

Enhanced GW Monitoring Network
Proposed MW Intermediate Zone

Legend

- Proposed New Monitoring Well Interemdiate Zone
- Proposed Abandoned Monitoring Well Intermediate Zone
- Monitoring Well Intermediate Zone
- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Proposed Treatment Trench Location
- Proposed Treatment Trench Contingency Location
- Proposed Building Footprint
- Proposed Paved Area

Proposed MW locations may change slightly based on final site development layout

Figure

11B

APPENDIX C

Analytical Laboratory Reports

CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 8:52
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-1 Comp **Matrix: Soil** **Lab ID: 16082904-11**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:42	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:42	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:42	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:42	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:42	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:42	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:42	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:42	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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

CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 8:56
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-1 Comp2 **Matrix: Soil** **Lab ID: 16082904-12**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:48	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:48	MEL
Cadmium	**0.73**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:48	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:48	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:48	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:48	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:48	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:48	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 9:30
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-2 Comp **Matrix: Soil** **Lab ID: 16082904-13**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:54	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:54	MEL
Cadmium	**0.36**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:54	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:54	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:54	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:54	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:54	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:54	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ochs
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EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 10:21
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-3 Comp **Matrix: Soil** **Lab ID: 16082904-14**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:59	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:59	MEL
Cadmium	**0.36**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:59	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:59	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:59	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:59	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:59	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:59	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ocker
QC Chemist

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1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 11:11
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-4 Comp **Matrix: Soil** **Lab ID: 16082904-15**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:05	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:05	MEL
Cadmium	**0.69**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:05	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:05	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:05	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:05	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:05	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:05	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 12:12
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-5 Comp **Matrix: Soil** **Lab ID: 16082904-16**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:11	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:11	MEL
Cadmium	**0.71**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:11	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:11	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:11	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:11	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:11	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:11	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 13:52
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-6 Comp **Matrix: Soil** **Lab ID: 16082904-17**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:16	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:16	MEL
Cadmium	**0.34**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:16	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:16	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:16	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:16	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:16	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:16	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/19/16 14:44
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-7 Comp **Matrix: Soil** **Lab ID: 16082904-18**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:22	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:22	MEL
Cadmium	**0.11**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:22	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:22	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:22	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:22	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:22	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:22	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/22/16 8:13
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-8 Comp **Matrix: Soil** **Lab ID: 16082904-19**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:27	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:27	MEL
Cadmium	**0.16**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:27	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:27	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:27	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:27	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:27	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:27	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/22/16 8:54
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-9 Comp **Matrix: Soil** **Lab ID: 16082904-20**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:33	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 15:33	MEL
Cadmium	**0.38**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:33	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:33	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:33	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 15:33	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 15:33	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 15:33	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 08/22/16 9:40
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-10 Comp **Matrix: Soil** **Lab ID: 16082904-21**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/30/16 13:08	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/30/16 13:08	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/30/16 13:08	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/30/16 13:08	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/30/16 13:08	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/30/16 13:08	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/30/16 13:08	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/30/16 13:08	MEL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher

QC Chemist

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Date Sampled: 08/18/16 15:11
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-11 Comp **Matrix: Soil** **Lab ID: 16082904-09**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:20	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:20	MEL
Cadmium	**0.82**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:20	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:20	MEL
Lead	**4.8**	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:20	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:20	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:20	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:20	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Sampled: 08/18/16 14:27
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-12 Comp **Matrix: Soil** **Lab ID: 16082904-08**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:14	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:14	MEL
Cadmium	**0.92**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:14	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:14	MEL
Lead	**2.1**	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:14	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:14	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:14	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:14	MEL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher

QC Chemist

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Date Sampled: 08/19/16 8:00
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-13 Comp **Matrix: Soil** **Lab ID: 16082904-10**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:25	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:25	MEL
Cadmium	* 26	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:25	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:25	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:25	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:25	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:25	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:25	MEL

Approved by: Matt Cohen
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic
* - Result exceeds TCLP limit.

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Date Sampled: 08/19/16 7:33
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-13 0-1 **Matrix: Soil** **Lab ID: 16082904-26**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:18	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:18	MEL
Cadmium	**200**	mg/L	100	1	1311/6020A	09/07/16	09/07/16 15:16	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:18	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:18	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:18	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:18	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:18	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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Date Sampled: 08/19/16 7:39
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-13 4-5 **Matrix: Soil** **Lab ID: 16082904-27**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:35	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:35	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:35	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:35	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:35	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:35	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:35	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:35	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Sampled: 08/19/16 7:44
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-13 9-10 **Matrix: Soil** **Lab ID: 16082904-28**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:41	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:41	MEL
Cadmium	**2.7**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:41	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:41	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:41	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:41	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:41	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:41	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
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Date Sampled: 08/19/16 7:48
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-13 14-15 **Matrix: Soil** **Lab ID: 16082904-29**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 15:22	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 15:22	MEL
Cadmium	**1.4**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 15:22	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 15:22	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 15:22	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 15:22	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 15:22	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 15:22	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
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Date Sampled: 08/18/16 8:47
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 Comp **Matrix: Soil** **Lab ID: 16082904-01**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:07	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 13:07	MEL
Cadmium	**1.6**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:07	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:07	MEL
Lead	**0.70**	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:07	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 13:07	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:07	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:07	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Sampled: 08/18/16 8:52
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 Comp2 **Matrix: Soil** **Lab ID: 16082904-02**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:40	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 13:40	MEL
Cadmium	**0.99**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:40	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:40	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:40	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 13:40	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:40	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:40	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Sampled: 08/18/16 8:23
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 0-1 **Matrix: Soil** **Lab ID: 16082904-22**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 13:56	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 13:56	MEL
Cadmium	**0.10**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 13:56	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 13:56	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 13:56	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 13:56	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 13:56	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 13:56	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ochs
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Date Sampled: 08/18/16 8:28
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 4-5 **Matrix: Soil** **Lab ID: 16082904-23**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:01	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:01	MEL
Cadmium	**0.45**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:01	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:01	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:01	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:01	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:01	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:01	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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Date Sampled: 08/18/16 8:34
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 9-10 **Matrix: Soil** **Lab ID: 16082904-24**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:07	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:07	MEL
Cadmium	**0.72**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:07	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:07	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:07	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:07	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:07	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:07	MEL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen

QC Chemist

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Certificate of Analysis

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Suite 303
St. Louis, MO 63131

Date Sampled: 08/18/16 8:38
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-14 14-15 **Matrix: Soil** **Lab ID: 16082904-25**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:13	MEL
Barium	ND	mg/L	10	100	1311/6020A	09/07/16	09/07/16 14:13	MEL
Cadmium	**6.6**	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:13	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:13	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:13	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	09/07/16	09/07/16 14:13	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	09/07/16	09/07/16 14:13	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	09/07/16	09/07/16 14:13	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Oshen
QC Chemist

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Date Sampled: 08/18/16 9:39
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-15 Comp **Matrix: Soil** **Lab ID: 16082904-03**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:46	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 13:46	MEL
Cadmium	**0.23**	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:46	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:46	MEL
Lead	**1.2**	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:46	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 13:46	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:46	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:46	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Oshen
QC Chemist

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Date Sampled: 08/18/16 10:18
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-16 Comp **Matrix: Soil** **Lab ID: 16082904-04**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:52	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 13:52	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:52	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:52	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:52	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 13:52	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:52	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:52	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
QC Chemist

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Date Sampled: 08/18/16 11:07
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-17 Comp **Matrix: Soil** **Lab ID: 16082904-05**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:57	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 13:57	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:57	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:57	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:57	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 13:57	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 13:57	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 13:57	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osborne
QC Chemist

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Date Sampled: 08/18/16 12:22
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-18 Comp **Matrix: Soil** **Lab ID: 16082904-06**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:03	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:03	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:03	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:03	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:03	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:03	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:03	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:03	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
QC Chemist

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Date Sampled: 08/18/16 13:37
Date Received: 08/29/16 12:30
Date Issued: 09/08/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
Project Number: EAG-SPT-2411

SDG Number: 16082904

Field Sample ID: TT-19 Comp **Matrix: Soil** **Lab ID: 16082904-07**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:09	MEL
Barium	ND	mg/L	10	100	1311/6020A	08/30/16	08/31/16 14:09	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:09	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:09	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:09	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	08/30/16	08/31/16 14:09	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	08/30/16	08/31/16 14:09	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	08/30/16	08/31/16 14:09	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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Date Sampled: 11/29/16 15:14
Date Received: 11/30/16 11:50
Date Issued: 12/02/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16113006

Field Sample ID: TT-01-Comp-01 **Matrix: Soil** **Lab ID: 16113006-01**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:44	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:44	MEL
Cadmium	* **1.9**	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:44	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:44	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:44	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:44	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:44	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:44	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

* - Result exceeds TCLP limit.

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Date Received: 12/02/16 15:05
Date Issued: 12/06/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16120206

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-01-COMP-02	**Matrix: Soil**		**Date Sampled: 12/01/16 16:02**				**Lab ID: 16120206-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 12:52	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/05/16	12/05/16 12:52	MEL
Cadmium	* **1.9**	mg/L	0.1	1	1311/6020A	12/05/16	12/05/16 12:52	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 12:52	MEL
Lead	**0.51**	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 12:52	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/05/16	12/05/16 12:52	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/05/16	12/05/16 12:52	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 12:52	MEL
Field Sample ID: TT-01-COMP-03	**Matrix: Soil**		**Date Sampled: 12/02/16 13:13**				**Lab ID: 16120206-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 13:21	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/05/16	12/05/16 13:21	MEL
Cadmium	**0.90**	mg/L	0.1	1	1311/6020A	12/05/16	12/05/16 13:21	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 13:21	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 13:21	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/05/16	12/05/16 13:21	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/05/16	12/05/16 13:21	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/05/16	12/05/16 13:21	MEL

Approved by: Matt Oshea
QC Chemist

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

* - Result exceeds TCLP limit.

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Date Received: 10/21/16 15:46
Date Issued: 10/25/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16102107

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-Comp-01	**Matrix: Soil**				**Date Sampled: 10/21/16 14:10**		**Lab ID: 16102107-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 12:47	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/23/16	10/24/16 12:47	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	10/23/16	10/24/16 12:47	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 12:47	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 12:47	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/23/16	10/24/16 12:47	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/23/16	10/24/16 12:47	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 12:47	MEL
Field Sample ID: TT-02-Comp-02	**Matrix: Soil**				**Date Sampled: 10/21/16 14:20**		**Lab ID: 16102107-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 13:14	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/23/16	10/24/16 13:14	MEL
Cadmium	**0.36**	mg/L	0.1	1	1311/6020A	10/23/16	10/24/16 13:14	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 13:14	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 13:14	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/23/16	10/24/16 13:14	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/23/16	10/24/16 13:14	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/23/16	10/24/16 13:14	MEL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher

QC Chemist

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Date Received: 10/25/16 14:14
Date Issued: 10/27/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16102504

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-Comp-03	**Matrix: Soil**		**Date Sampled: 10/24/16 16:35**				**Lab ID: 16102504-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/26/16	10/27/16 12:05	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/26/16	10/27/16 12:05	MEL
Cadmium	**0.14**	mg/L	0.1	1	1311/6020A	10/26/16	10/27/16 12:05	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/26/16	10/27/16 12:05	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	10/26/16	10/27/16 12:05	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/26/16	10/27/16 12:05	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/26/16	10/27/16 12:05	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/26/16	10/27/16 12:05	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ochs
QC Chemist

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Date Sampled: 10/25/16 16:40
Date Received: 10/26/16 13:36
Date Issued: 10/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16102603

Field Sample ID: TT-02-Comp-04 **Matrix: Soil** **Lab ID: 16102603-01**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:09	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/28/16	10/28/16 12:09	MEL
Cadmium	**0.16**	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:09	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:09	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:09	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/28/16	10/28/16 12:09	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:09	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:09	MEL

Approved by: Matt Cohen
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Received: 11/02/16 11:37
Date Issued: 11/04/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110205

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-COMP-05	**Matrix: Soil**			**Date Sampled: 11/02/16 7:45**			**Lab ID: 16110205-10**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:49	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:49	MEL
Cadmium	**0.76**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:49	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:49	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:49	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:49	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:49	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:49	MEL
Field Sample ID: TT-02-COMP-06	**Matrix: Soil**			**Date Sampled: 11/02/16 8:00**			**Lab ID: 16110205-11**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:54	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:54	MEL
Cadmium	**0.50**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:54	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:54	MEL
Lead	**0.51**	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:54	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:54	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:54	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:54	MEL

Approved by: Matt Ochee
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic
* - Result exceeds TCLP limit.

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Date Received: 11/03/16 9:30
Date Issued: 11/07/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110304

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-COMP-07	**Matrix: Soil**		**Date Sampled: 11/02/16 16:30**				**Lab ID: 16110304-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 15:00	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 15:00	MEL
Cadmium	**0.16**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 15:00	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 15:00	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 15:00	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 15:00	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 15:00	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 15:00	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Received: 11/04/16 14:35
Date Issued: 11/08/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110403

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-COMP-08	**Matrix: Soil**			**Date Sampled: 11/04/16 13:25**			**Lab ID: 16110403-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:30	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/07/16	11/08/16 10:30	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	11/07/16	11/08/16 10:30	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:30	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:30	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/07/16	11/08/16 10:30	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/07/16	11/08/16 10:30	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:30	MEL
Field Sample ID: TT-02-COMP-09	**Matrix: Soil**			**Date Sampled: 11/04/16 13:25**			**Lab ID: 16110403-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:58	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/07/16	11/08/16 10:58	MEL
Cadmium	**0.17**	mg/L	0.1	1	1311/6020A	11/07/16	11/08/16 10:58	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:58	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:58	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/07/16	11/08/16 10:58	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/07/16	11/08/16 10:58	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/07/16	11/08/16 10:58	MEL

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ochee
QC Chemist

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Date Received: 11/08/16 9:40
Date Issued: 11/10/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-02-COMP-10	**Matrix: Soil**			**Date Sampled: 11/07/16 16:18**			**Lab ID: 16110802-07**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:02	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:02	MEL
Cadmium	**0.45**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:02	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:02	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:02	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:02	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:02	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:02	MEL
Field Sample ID: TT-02-COMP-11	**Matrix: Soil**			**Date Sampled: 11/07/16 16:26**			**Lab ID: 16110802-08**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:08	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:08	MEL
Cadmium	**0.25**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:08	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:08	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:08	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:08	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:08	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:08	MEL
Field Sample ID: HS-COMP-15	**Matrix: Soil**			**Date Sampled: 11/07/16 7:29**			**Lab ID: 16110802-09**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:14	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:14	MEL
Cadmium	* **20**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:14	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:14	MEL
Lead	* **59**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:14	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:14	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:14	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:14	MEL

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Date Received: 11/29/16 12:21
Date Issued: 12/01/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16112903

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-03-COMP-01	**Matrix: Soil**		**Date Sampled: 11/19/16 13:27**				**Lab ID: 16112903-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:00	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:00	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:00	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:00	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:00	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:00	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:00	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:00	MEL
Field Sample ID: TT-03-COMP-02	**Matrix: Soil**		**Date Sampled: 11/19/16 13:36**				**Lab ID: 16112903-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:05	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:05	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:05	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:05	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:05	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:05	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:05	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:05	MEL
Field Sample ID: TT-03-COMP-03	**Matrix: Soil**		**Date Sampled: 11/19/16 13:45**				**Lab ID: 16112903-03**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:11	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:11	MEL
Cadmium	* **5.6**	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:11	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:11	MEL
Lead	**0.68**	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:11	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:11	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:11	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:11	MEL

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Date Received: 11/29/16 12:21
Date Issued: 12/01/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16112903

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-03-COMP-04	**Matrix: Soil**		**Date Sampled: 11/19/16 13:54**			**Lab ID: 16112903-04**		
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:16	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:16	MEL
Cadmium	* **4.0**	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:16	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:16	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:16	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:16	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:16	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:16	MEL
Field Sample ID: TT-03-COMP-05	**Matrix: Soil**		**Date Sampled: 11/19/16 14:03**			**Lab ID: 16112903-05**		
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:22	MEL
Barium	ND	mg/L	10	100	1311/6020A	12/01/16	12/01/16 13:22	MEL
Cadmium	* **3.7**	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:22	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:22	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:22	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	12/01/16	12/01/16 13:22	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	12/01/16	12/01/16 13:22	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	12/01/16	12/01/16 13:22	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic
* - Result exceeds TCLP limit.

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Date Sampled: 11/08/16 16:36
Date Received: 11/09/16 10:30
Date Issued: 11/11/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110903

Field Sample ID: TT-04-COMP-01 **Matrix: Soil** **Lab ID: 16110903-01**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:21	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 13:21	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:21	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:21	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:21	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 13:21	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:21	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:21	MEL

Approved by: Matt Osher
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Received: 11/11/16 14:25
Date Issued: 11/15/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111106

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-04-COMP-02	**Matrix: Soil**		**Date Sampled: 11/10/16 15:01**				**Lab ID: 16111106-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 11:59	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/14/16	11/15/16 11:59	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	11/14/16	11/15/16 11:59	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 11:59	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 11:59	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/14/16	11/15/16 11:59	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/14/16	11/15/16 11:59	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 11:59	MEL
Field Sample ID: TT-04-COMP-03	**Matrix: Soil**		**Date Sampled: 11/11/16 12:09**				**Lab ID: 16111106-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 12:05	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/14/16	11/15/16 12:05	MEL
Cadmium	**0.23**	mg/L	0.1	1	1311/6020A	11/14/16	11/15/16 12:05	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 12:05	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 12:05	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/14/16	11/15/16 12:05	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/14/16	11/15/16 12:05	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/14/16	11/15/16 12:05	MEL

Approved by: Matt Cohen
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

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Date Received: 11/16/16 10:55
Date Issued: 11/18/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111604

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: TT-4-COMP-04	**Matrix: Soil**		**Date Sampled: 11/15/16 13:12**				**Lab ID: 16111604-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/17/16	11/17/16 11:29	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/17/16	11/17/16 11:29	MEL
Cadmium	ND	mg/L	0.1	1	1311/6020A	11/17/16	11/17/16 11:29	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/17/16	11/17/16 11:29	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/17/16	11/17/16 11:29	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/17/16	11/17/16 11:29	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/17/16	11/17/16 11:29	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/17/16	11/17/16 11:29	MEL

Notes/Qualifiers:

LLQ- Lowest Level of Quantitation

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

REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Ocker

QC Chemist

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Date Receive 11/18/16 14:25
Date Issued: 11/22/16 14:59
Matrix: Soil

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD
Project Number: NA

SDG Number: 16111805

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Field Sample ID TT-04-COMP-05			**Date Sampled:** 11/16/16 16:5			**Lab ID:** 16111805-01	
TCLP Metals							
Arsenic	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:1	MEL
Barium	ND	mg/L	10	1311/6020A	11/21/16	11/21/16 12:1	MEL
Cadmium	ND	mg/L	0.1	1311/6020A	11/21/16	11/21/16 12:1	MEL
Chromium	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:1	MEL
Lead	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:1	MEL
Mercury	ND	mg/L	0.02	1311/6020A	11/21/16	11/21/16 12:1	MEL
Selenium	ND	mg/L	0.1	1311/6020A	11/21/16	11/21/16 12:1	MEL
Silver	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:1	MEL
Field Sample ID TT-04-COMP-06			**Date Sampled:** 11/16/16 14:3			**Lab ID:** 16111805-02	
TCLP Metals							
Arsenic	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:3	MEL
Barium	ND	mg/L	10	1311/6020A	11/21/16	11/21/16 12:3	MEL
Cadmium	ND	mg/L	0.1	1311/6020A	11/21/16	11/21/16 12:3	MEL
Chromium	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:3	MEL
Lead	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:3	MEL
Mercury	ND	mg/L	0.02	1311/6020A	11/21/16	11/21/16 12:3	MEL
Selenium	ND	mg/L	0.1	1311/6020A	11/21/16	11/21/16 12:3	MEL
Silver	ND	mg/L	0.5	1311/6020A	11/21/16	11/21/16 12:3	MEL

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

Approved by Matt Cohen
QC Chemist

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Date Received: 10/27/16 12:07
Date Issued: 10/31/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16102703

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-01	**Matrix: Soil**		**Date Sampled: 10/26/16 16:20**				**Lab ID: 16102703-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:37	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/28/16	10/28/16 12:37	MEL
Cadmium	* **9.5**	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:37	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:37	MEL
Lead	**1.6**	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:37	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/28/16	10/28/16 12:37	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:37	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:37	MEL
Field Sample ID: HS-COMP-02	**Matrix: Soil**		**Date Sampled: 10/26/16 16:30**				**Lab ID: 16102703-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:43	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/28/16	10/28/16 12:43	MEL
Cadmium	* **21**	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:43	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:43	MEL
Lead	**1.5**	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:43	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/28/16	10/28/16 12:43	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:43	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:43	MEL
Field Sample ID: HS-COMP-03	**Matrix: Soil**		**Date Sampled: 10/26/16 16:40**				**Lab ID: 16102703-03**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:48	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/28/16	10/28/16 12:48	MEL
Cadmium	* **12**	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:48	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:48	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:48	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/28/16	10/28/16 12:48	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:48	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:48	MEL

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16102703

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-04	**Matrix: Soil**		**Date Sampled: 10/26/16 16:50**				**Lab ID: 16102703-04**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:54	MEL
Barium	ND	mg/L	10	100	1311/6020A	10/28/16	10/28/16 12:54	MEL
Cadmium	* **34**	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:54	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:54	MEL
Lead	**0.75**	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:54	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	10/28/16	10/28/16 12:54	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	10/28/16	10/28/16 12:54	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	10/28/16	10/28/16 12:54	MEL

Approved by: Matt Ochs
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic
* - Result exceeds TCLP limit.

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Date Received: 11/02/16 11:37
Date Issued: 11/04/16

Project: Rod & Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110205

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-05	**Matrix: Soil**		**Date Sampled: 10/27/16 9:20**				**Lab ID: 16110205-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:47	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 13:47	MEL
Cadmium	* **5.2**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 13:47	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:47	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:47	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 13:47	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 13:47	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:47	MEL
Field Sample ID: HS-COMP-06	**Matrix: Soil**		**Date Sampled: 10/27/16 14:45**				**Lab ID: 16110205-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:52	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 13:52	MEL
Cadmium	* **7.2**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 13:52	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:52	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:52	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 13:52	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 13:52	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 13:52	MEL
Field Sample ID: HS-DISC-01	**Matrix: Soil**		**Date Sampled: 10/27/16 15:00**				**Lab ID: 16110205-03**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:09	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:09	MEL
Cadmium	* **11**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:09	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:09	MEL
Lead	**95**	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:09	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:09	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:09	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:09	MEL

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Date Received: 11/08/16 9:40
Date Issued: 11/10/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-09	**Matrix: Soil**		**Date Sampled: 11/04/16 17:00**				**Lab ID: 16110802-01**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:29	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:29	MEL
Cadmium	* **24**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:29	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:29	MEL
Lead	**0.78**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:29	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:29	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:29	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:29	MEL
Field Sample ID: HS-COMP-10	**Matrix: Soil**		**Date Sampled: 11/04/16 17:12**				**Lab ID: 16110802-02**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:34	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:34	MEL
Cadmium	* **8.7**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:34	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:34	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:34	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:34	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:34	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:34	MEL
Field Sample ID: HS-COMP-11	**Matrix: Soil**		**Date Sampled: 11/04/16 17:19**				**Lab ID: 16110802-03**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:40	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:40	MEL
Cadmium	* **8.8**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:40	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:40	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:40	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:40	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:40	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:40	MEL

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Site Location: Sparrows Point, MD
SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-12	**Matrix: Soil**		**Date Sampled: 11/04/16 17:25**				**Lab ID: 16110802-04**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:46	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:46	MEL
Cadmium	* **17**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:46	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:46	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:46	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:46	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:46	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:46	MEL
Field Sample ID: HS-COMP-13	**Matrix: Soil**		**Date Sampled: 11/04/16 17:31**				**Lab ID: 16110802-05**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:51	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:51	MEL
Cadmium	* **13**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:51	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:51	MEL
Lead	* **6.8**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:51	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:51	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:51	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:51	MEL
Field Sample ID: HS-COMP-14	**Matrix: Soil**		**Date Sampled: 11/04/16 17:38**				**Lab ID: 16110802-06**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:57	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 11:57	MEL
Cadmium	* **26**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:57	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:57	MEL
Lead	* **5.2**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:57	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 11:57	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 11:57	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 11:57	MEL

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Date Issued: 11/10/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-16	**Matrix: Soil**		**Date Sampled: 11/07/16 7:36**				**Lab ID: 16110802-10**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:30	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:30	MEL
Cadmium	* **19**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:30	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:30	MEL
Lead	**3.1**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:30	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:30	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:30	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:30	MEL
Field Sample ID: HS-COMP-17	**Matrix: Soil**		**Date Sampled: 11/07/16 7:43**				**Lab ID: 16110802-11**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:36	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:36	MEL
Cadmium	* **8.6**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:36	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:36	MEL
Lead	* **6.2**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:36	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:36	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:36	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:36	MEL
Field Sample ID: HS-COMP-18	**Matrix: Soil**		**Date Sampled: 11/07/16 7:50**				**Lab ID: 16110802-12**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:42	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:42	MEL
Cadmium	* **12**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:42	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:42	MEL
Lead	**0.91**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:42	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:42	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:42	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:42	MEL

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Date Received: 11/08/16 9:40
Date Issued: 11/10/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-19	**Matrix: Soil**		**Date Sampled: 11/07/16 7:56**				**Lab ID: 16110802-13**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:47	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:47	MEL
Cadmium	* **2.6**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:47	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:47	MEL
Lead	**1.6**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:47	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:47	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:47	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:47	MEL
Field Sample ID: HS-COMP-20	**Matrix: Soil**		**Date Sampled: 11/07/16 8:04**				**Lab ID: 16110802-14**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:53	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:53	MEL
Cadmium	* **6.2**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:53	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:53	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:53	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:53	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:53	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:53	MEL
Field Sample ID: HS-DISC-04	**Matrix: Soil**		**Date Sampled: 11/07/16 8:19**				**Lab ID: 16110802-15**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:58	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 12:58	MEL
Cadmium	* **13**	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:58	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:58	MEL
Lead	**0.85**	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:58	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 12:58	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 12:58	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 12:58	MEL

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Project: Rod & Wire Mill
Site Location: Sparrows Point, MD
SDG Number: 16110205

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-DISC-02	**Matrix: Soil**		**Date Sampled: 10/27/16 16:20**				**Lab ID: 16110205-04**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:15	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:15	MEL
Cadmium	* **21**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:15	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:15	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:15	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:15	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:15	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:15	MEL
Field Sample ID: HS-DISC-03	**Matrix: Soil**		**Date Sampled: 10/27/16 16:30**				**Lab ID: 16110205-05**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:20	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:20	MEL
Cadmium	* **4.9**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:20	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:20	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:20	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:20	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:20	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:20	MEL
Field Sample ID: HS-COMP-07	**Matrix: Soil**		**Date Sampled: 10/27/16 16:40**				**Lab ID: 16110205-06**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:26	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:26	MEL
Cadmium	* **7.7**	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:26	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:26	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:26	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:26	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:26	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:26	MEL

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Project: Rod & Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110205

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-COMP-08	**Matrix: Soil**		**Date Sampled: 10/27/16 16:50**				**Lab ID: 16110205-07**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:32	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:32	MEL
Cadmium	* 11	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:32	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:32	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:32	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:32	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:32	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:32	MEL
Field Sample ID: HS-DISC-05	**Matrix: Soil**		**Date Sampled: 10/28/16 10:45**				**Lab ID: 16110205-08**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:37	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:37	MEL
Cadmium	* 1.8	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:37	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:37	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:37	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:37	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:37	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:37	MEL
Field Sample ID: HS-DISC-06	**Matrix: Soil**		**Date Sampled: 10/28/16 11:00**				**Lab ID: 16110205-09**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:43	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/04/16	11/04/16 14:43	MEL
Cadmium	* 12	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:43	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:43	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:43	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/04/16	11/04/16 14:43	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/04/16	11/04/16 14:43	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/04/16	11/04/16 14:43	MEL

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16110802

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
Field Sample ID: HS-DISC-07	**Matrix: Soil**		**Date Sampled: 11/07/16 8:22**				**Lab ID: 16110802-16**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:04	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 13:04	MEL
Cadmium	* 26	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:04	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:04	MEL
Lead	* 29	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:04	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 13:04	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:04	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:04	MEL
Field Sample ID: HS-DISC-08	**Matrix: Soil**		**Date Sampled: 11/07/16 8:25**				**Lab ID: 16110802-17**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:10	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 13:10	MEL
Cadmium	* 29	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:10	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:10	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:10	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 13:10	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:10	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:10	MEL
Field Sample ID: HS-DISC-09	**Matrix: Soil**		**Date Sampled: 11/07/16 8:28**				**Lab ID: 16110802-18**	
TCLP Metals								
Arsenic	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:15	MEL
Barium	ND	mg/L	10	100	1311/6020A	11/10/16	11/10/16 13:15	MEL
Cadmium	* 14	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:15	MEL
Chromium	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:15	MEL
Lead	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:15	MEL
Mercury	ND	mg/L	0.02	0.2	1311/6020A	11/10/16	11/10/16 13:15	MEL
Selenium	ND	mg/L	0.1	1	1311/6020A	11/10/16	11/10/16 13:15	MEL
Silver	ND	mg/L	0.5	5	1311/6020A	11/10/16	11/10/16 13:15	MEL

Approved by: Matt Cohen
QC Chemist

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic
* - Result exceeds TCLP limit.

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Date Sampled: 11/18/16 8:49
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-01 **Matrix: Soil** **Lab ID: 16111805-07**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Corrosivity / pH							
pH	**9.07**	pH units		EPA 9045	11/18/16	11/18/16	MEL
Percent Solids							
Percent Solids	**89**	%		SM2540G	11/18/16	11/21/16 9:58	MEL
Polychlorinated Biphenyls							
Aroclor 1016	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1221	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1232	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1242	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1248	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1254	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Aroclor 1260	ND	mg/kg	0.058	EPA 8082	11/23/16	11/23/16 11:38	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Bis (2-chloroethyl) ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Chlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Bis (2-chloroisopropyl) ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Acetophenone	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
N-Nitroso-di-n-propylamine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Hexachloroethane	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Nitrobenzene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Isophorone	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Nitrophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4-Dimethylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Bis (2-chloroethoxy) methane	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4-Dichlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Naphthalene`	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Chloroaniline	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Hexachlorobutadiene`	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Caprolactam	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Chloro-3-methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Methylnaphthalene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Hexachlorocyclopentadiene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4,6-Trichlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4,5-Trichlorophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
1,1-Biphenyl	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Chloronaphthalene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-01 **Matrix: Soil** **Lab ID: 16111805-07**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Dimethyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,6-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Acenaphthylene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
3-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Acenaphthene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4-Dinitrophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Nitrophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Dibenzofuran	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
2,4-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Diethyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Fluorene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Chlorophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4,6-Dinitro-2-methylphenol	ND	ug/kg	240	EPA 8270C	11/21/16	11/23/16 6:47	GFH
N-Nitrosodiphenylamine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
4-Bromophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Hexachlorobenzene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Atrazine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Pentachlorophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Phenanthrene	**500**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Anthracene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Carbazole	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Di-n-butyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Fluoranthene	**930**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Pyrene	**840**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Butyl benzyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
3,3-Dichlorobenzidine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Benzo[a]anthracene	**460**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Chrysene	**590**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Di-n-octyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Benzo[b]fluoranthene	**930**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Benzo[k]fluoranthene	**410**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Benzo[a]pyrene	**500**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Dibenz[a,h]anthracene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Benzo[g,h,i]perylene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 6:47	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH

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1650 Des Peres Rd.
Suite 303
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Date Sampled: 11/18/16 8:49
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-01 **Matrix: Soil** **Lab ID: 16111805-07**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Chloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Vinyl chloride	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Bromomethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Chloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Trichlorofluoromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Acetone	ND	ug/kg	58	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Carbon disulfide	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Methyl acetate	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Methylene chloride	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 21:34	GFH
trans-1,2-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Methyl t-butyl ether (MTBE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1-Dichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
cis-1,2-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
2-Butanone (MEK)	ND	ug/kg	58	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Chloroform	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1,1-Trichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Cyclohexane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Carbon tetrachloride	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Benzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2-Dichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Trichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Methylcyclohexane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2-Dichloropropane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Bromodichloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
cis-1,3-Dichloropropene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Toluene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
trans-1,3-Dichloropropene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1,2-Trichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Tetrachloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
2-Hexanone (MBK)	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Dibromochloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2-Dibromoethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Chlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Ethylbenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
m&p-Xylene	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 21:34	GFH
o-Xylene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-01 **Matrix: Soil** **Lab ID: 16111805-07**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Styrene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Bromoform	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Isopropylbenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,1,2,2-Tetrachloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,3-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,4-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2-Dibromo-3-chloropropane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
1,2,4-Trichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Naphthalene	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
tert-Butanol (TBA)	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 21:34	GFH
Diisopropyl ether (DIPE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
tert-Amyl methyl ether (TAME)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH
tert-Amyl alcohol (TAA)	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 21:34	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 21:34	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
Results reported on a dry weight basis.

Approved by: Matt Osher
QC Chemist

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-01 **Matrix: Soil** **Lab ID: 16111805-03**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Polychlorinated Biphenyls								
Aroclor 1016	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1221	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1232	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1242	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1248	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1254	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
Aroclor 1260	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:27	GFH
TCLP Semi-Volatiles								
2-Methylphenol	ND	ug/L	100	200000	1311/8270	11/22/16	11/23/16 2:47	GFH
3+4-Methylphenol	ND	ug/L	200	200000	1311/8270	11/22/16	11/23/16 2:47	GFH
2,4-Dinitrotoluene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 2:47	GFH
Hexachloroethane	ND	ug/L	100	3000	1311/8270	11/22/16	11/23/16 2:47	GFH
Hexachlorobenzene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 2:47	GFH
Nitrobenzene	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 2:47	GFH
Pentachlorophenol	ND	ug/L	500	100000	1311/8270	11/22/16	11/23/16 2:47	GFH
Pyridine	ND	ug/L	100	5000	1311/8270	11/22/16	11/23/16 2:47	GFH
2,4,5-Trichlorophenol	ND	ug/L	100	400000	1311/8270	11/22/16	11/23/16 2:47	GFH
2,4,6-Trichlorophenol	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 2:47	GFH
Hexachlorobutadiene`	ND	ug/L	100	500	1311/8270	11/22/16	11/23/16 2:47	GFH
TCLP Volatiles								
Benzene	ND	ug/L	20	500	1311/8260	11/22/16	11/22/16 19:32	GFH
Carbon Tetrachloride	ND	ug/L	20	500	1311/8260	11/22/16	11/22/16 19:32	GFH
Chloroform	ND	ug/L	20	6000	1311/8260	11/22/16	11/22/16 19:32	GFH
1,2-Dichloroethane	ND	ug/L	20	500	1311/8260	11/22/16	11/22/16 19:32	GFH
Tetrachloroethene	ND	ug/L	20	700	1311/8260	11/22/16	11/22/16 19:32	GFH
Vinyl Chloride	ND	ug/L	20	200	1311/8260	11/22/16	11/22/16 19:32	GFH
2-Butanone (MEK)	ND	ug/L	40	200000	1311/8260	11/22/16	11/22/16 19:32	GFH
Chlorobenzene	ND	ug/L	20	100000	1311/8260	11/22/16	11/22/16 19:32	GFH
1,4-Dichlorobenzene	ND	ug/L	20	7500	1311/8260	11/22/16	11/22/16 19:32	GFH
1,1-Dichloroethene	ND	ug/L	20	700	1311/8260	11/22/16	11/22/16 19:32	GFH
Trichloroethene	ND	ug/L	20	500	1311/8260	11/22/16	11/22/16 19:32	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-02 **Matrix: Soil** **Lab ID: 16111805-08**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Corrosivity / pH							
pH	**8.95**	pH units		EPA 9045	11/18/16	11/18/16	MEL
Percent Solids							
Percent Solids	**88**	%		SM2540G	11/18/16	11/21/16 9:58	MEL
Polychlorinated Biphenyls							
Aroclor 1016	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1221	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1232	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1242	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1248	**0.23**	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1254	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Aroclor 1260	ND	mg/kg	0.06	EPA 8082	11/23/16	11/23/16 12:07	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Bis (2-chloroethyl) ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Chlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Bis (2-chloroisopropyl) ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Acetophenone	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
N-Nitroso-di-n-propylamine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Hexachloroethane	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Nitrobenzene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Isophorone	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Nitrophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4-Dimethylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Bis (2-chloroethoxy) methane	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4-Dichlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Naphthalene`	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Chloroaniline	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Hexachlorobutadiene`	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Caprolactam	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Chloro-3-methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Methylnaphthalene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Hexachlorocyclopentadiene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4,6-Trichlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4,5-Trichlorophenol	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
1,1-Biphenyl	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Chloronaphthalene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2-Nitroaniline	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-02 **Matrix: Soil** **Lab ID: 16111805-08**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Dimethyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,6-Dinitrotoluene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Acenaphthylene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
3-Nitroaniline	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Acenaphthene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4-Dinitrophenol	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Nitrophenol	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Dibenzofuran	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
2,4-Dinitrotoluene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Diethyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Fluorene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Chlorophenyl phenyl ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Nitroaniline	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4,6-Dinitro-2-methylphenol	ND	ug/kg	250	EPA 8270C	11/21/16	11/23/16 7:23	GFH
N-Nitrosodiphenylamine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
4-Bromophenyl phenyl ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Hexachlorobenzene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Atrazine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Pentachlorophenol	ND	ug/kg	270	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Phenanthrene	**1,400**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Anthracene	**390**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Carbazole	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Di-n-butyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Fluoranthene	**3,900**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Pyrene	**2,700**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Butyl benzyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
3,3-Dichlorobenzidine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Benzo[a]anthracene	**1,800**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Chrysene	**1,800**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Di-n-octyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Benzo[b]fluoranthene	**2,300**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Benzo[k]fluoranthene	**1,000**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Benzo[a]pyrene	**1,500**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Indeno[1,2,3-cd]pyrene	**490**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Dibenz[a,h]anthracene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Benzo[g,h,i]perylene	**470**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:23	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH

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Date Sampled: 11/18/16 8:58
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-02 **Matrix: Soil** **Lab ID: 16111805-08**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Chloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Vinyl chloride	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Bromomethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Chloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Trichlorofluoromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Acetone	ND	ug/kg	53	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Carbon disulfide	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Methyl acetate	ND	ug/kg	27	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Methylene chloride	ND	ug/kg	27	EPA 8260B	11/22/16	11/22/16 22:05	GFH
trans-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Methyl t-butyl ether (MTBE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1-Dichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
cis-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
2-Butanone (MEK)	ND	ug/kg	53	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Chloroform	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1,1-Trichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Cyclohexane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Carbon tetrachloride	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Benzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2-Dichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Trichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Methylcyclohexane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2-Dichloropropane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Bromodichloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
cis-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Toluene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
trans-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1,2-Trichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Tetrachloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
2-Hexanone (MBK)	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Dibromochloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2-Dibromoethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Chlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Ethylbenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
m&p-Xylene	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 22:05	GFH
o-Xylene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH

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Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-02 **Matrix: Soil** **Lab ID: 16111805-08**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Styrene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Bromoform	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Isopropylbenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,3-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,4-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2-Dibromo-3-chloropropane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
1,2,4-Trichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Naphthalene	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
tert-Butanol (TBA)	ND	ug/kg	27	EPA 8260B	11/22/16	11/22/16 22:05	GFH
Diisopropyl ether (DIPE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
tert-Amyl methyl ether (TAME)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH
tert-Amyl alcohol (TAA)	ND	ug/kg	27	EPA 8260B	11/22/16	11/22/16 22:05	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 22:05	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
Results reported on a dry weight basis.

Approved by: Matt Osher
QC Chemist

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-02 **Matrix: Soil** **Lab ID: 16111805-04**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Polychlorinated Biphenyls								
Aroclor 1016	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1221	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1232	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1242	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1248	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1254	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
Aroclor 1260	ND	mg/L	5		1311/8082	11/23/16	11/23/16 15:56	GFH
TCLP Semi-Volatiles								
2-Methylphenol	ND	ug/L	100	200000	1311/8270	11/22/16	11/23/16 3:23	GFH
3+4-Methylphenol	ND	ug/L	200	200000	1311/8270	11/22/16	11/23/16 3:23	GFH
2,4-Dinitrotoluene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 3:23	GFH
Hexachloroethane	ND	ug/L	100	3000	1311/8270	11/22/16	11/23/16 3:23	GFH
Hexachlorobenzene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 3:23	GFH
Nitrobenzene	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 3:23	GFH
Pentachlorophenol	ND	ug/L	500	100000	1311/8270	11/22/16	11/23/16 3:23	GFH
Pyridine	ND	ug/L	100	5000	1311/8270	11/22/16	11/23/16 3:23	GFH
2,4,5-Trichlorophenol	ND	ug/L	100	400000	1311/8270	11/22/16	11/23/16 3:23	GFH
2,4,6-Trichlorophenol	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 3:23	GFH
Hexachlorobutadiene`	ND	ug/L	100	500	1311/8270	11/22/16	11/23/16 3:23	GFH
TCLP Volatiles								
Benzene	ND	ug/L	17	500	1311/8260	11/22/16	11/22/16 20:03	GFH
Carbon Tetrachloride	ND	ug/L	17	500	1311/8260	11/22/16	11/22/16 20:03	GFH
Chloroform	ND	ug/L	17	6000	1311/8260	11/22/16	11/22/16 20:03	GFH
1,2-Dichloroethane	ND	ug/L	17	500	1311/8260	11/22/16	11/22/16 20:03	GFH
Tetrachloroethene	ND	ug/L	17	700	1311/8260	11/22/16	11/22/16 20:03	GFH
Vinyl Chloride	ND	ug/L	17	200	1311/8260	11/22/16	11/22/16 20:03	GFH
2-Butanone (MEK)	ND	ug/L	35	200000	1311/8260	11/22/16	11/22/16 20:03	GFH
Chlorobenzene	ND	ug/L	17	100000	1311/8260	11/22/16	11/22/16 20:03	GFH
1,4-Dichlorobenzene	ND	ug/L	17	7500	1311/8260	11/22/16	11/22/16 20:03	GFH
1,1-Dichloroethene	ND	ug/L	17	700	1311/8260	11/22/16	11/22/16 20:03	GFH
Trichloroethene	ND	ug/L	17	500	1311/8260	11/22/16	11/22/16 20:03	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
QC Chemist

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Date Sampled: 11/18/16 9:07
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-03 **Matrix: Soil** **Lab ID: 16111805-09**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Corrosivity / pH							
pH	**8.76**	pH units		EPA 9045	11/18/16	11/18/16	MEL
Percent Solids							
Percent Solids	**87**	%		SM2540G	11/18/16	11/21/16 9:58	MEL
Polychlorinated Biphenyls							
Aroclor 1016	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1221	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1232	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1242	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1248	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1254	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Aroclor 1260	ND	mg/kg	0.063	EPA 8082	11/21/16	11/23/16 12:36	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Bis (2-chloroethyl) ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Chlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Bis (2-chloroisopropyl) ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Acetophenone	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
N-Nitroso-di-n-propylamine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Hexachloroethane	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Nitrobenzene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Isophorone	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Nitrophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4-Dimethylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Bis (2-chloroethoxy) methane	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4-Dichlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Naphthalene`	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Chloroaniline	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Hexachlorobutadiene`	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Caprolactam	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Chloro-3-methylphenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Methylnaphthalene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Hexachlorocyclopentadiene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4,6-Trichlorophenol	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4,5-Trichlorophenol	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
1,1-Biphenyl	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Chloronaphthalene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2-Nitroaniline	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-03 **Matrix: Soil** **Lab ID: 16111805-09**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Dimethyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,6-Dinitrotoluene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Acenaphthylene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
3-Nitroaniline	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Acenaphthene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4-Dinitrophenol	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Nitrophenol	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Dibenzofuran	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
2,4-Dinitrotoluene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Diethyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Fluorene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Chlorophenyl phenyl ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Nitroaniline	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4,6-Dinitro-2-methylphenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 7:59	GFH
N-Nitrosodiphenylamine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
4-Bromophenyl phenyl ether	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Hexachlorobenzene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Atrazine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Pentachlorophenol	ND	ug/kg	280	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Phenanthrene	**340**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Anthracene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Carbazole	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Di-n-butyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Fluoranthene	**650**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Pyrene	**770**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Butyl benzyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
3,3-Dichlorobenzidine	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Benzo[a]anthracene	**310**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Chrysene	**410**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Di-n-octyl phthalate	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Benzo[b]fluoranthene	**540**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Benzo[k]fluoranthene	**240**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Benzo[a]pyrene	**310**	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Dibenz[a,h]anthracene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Benzo[g,h,i]perylene	ND	ug/kg	110	EPA 8270C	11/21/16	11/23/16 7:59	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH

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St. Louis, MO 63131

Date Sampled: 11/18/16 9:07
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-03 **Matrix: Soil** **Lab ID: 16111805-09**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Chloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Vinyl chloride	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Bromomethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Chloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Trichlorofluoromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Acetone	ND	ug/kg	59	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Carbon disulfide	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Methyl acetate	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Methylene chloride	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 22:35	GFH
trans-1,2-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Methyl t-butyl ether (MTBE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1-Dichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
cis-1,2-Dichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
2-Butanone (MEK)	ND	ug/kg	59	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Chloroform	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1,1-Trichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Cyclohexane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Carbon tetrachloride	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Benzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2-Dichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Trichloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Methylcyclohexane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2-Dichloropropane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Bromodichloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
cis-1,3-Dichloropropene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Toluene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
trans-1,3-Dichloropropene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1,2-Trichloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Tetrachloroethene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
2-Hexanone (MBK)	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Dibromochloromethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2-Dibromoethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Chlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Ethylbenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
m&p-Xylene	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 22:35	GFH
o-Xylene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH

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Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-03 **Matrix: Soil** **Lab ID: 16111805-09**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Styrene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Bromoform	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Isopropylbenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,1,2,2-Tetrachloroethane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,3-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,4-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2-Dichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2-Dibromo-3-chloropropane	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
1,2,4-Trichlorobenzene	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Naphthalene	ND	ug/kg	12	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
tert-Butanol (TBA)	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 22:35	GFH
Diisopropyl ether (DIPE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
tert-Amyl methyl ether (TAME)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH
tert-Amyl alcohol (TAA)	ND	ug/kg	29	EPA 8260B	11/22/16	11/22/16 22:35	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/kg	6	EPA 8260B	11/22/16	11/22/16 22:35	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
Results reported on a dry weight basis.

Approved by: Matt Osher
QC Chemist

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-03 **Matrix: Soil** **Lab ID: 16111805-05**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Polychlorinated Biphenyls								
Aroclor 1016	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1221	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1232	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1242	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1248	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1254	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
Aroclor 1260	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:24	GFH
TCLP Semi-Volatiles								
2-Methylphenol	ND	ug/L	100	200000	1311/8270	11/22/16	11/23/16 3:59	GFH
3+4-Methylphenol	ND	ug/L	200	200000	1311/8270	11/22/16	11/23/16 3:59	GFH
2,4-Dinitrotoluene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 3:59	GFH
Hexachloroethane	ND	ug/L	100	3000	1311/8270	11/22/16	11/23/16 3:59	GFH
Hexachlorobenzene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 3:59	GFH
Nitrobenzene	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 3:59	GFH
Pentachlorophenol	ND	ug/L	500	100000	1311/8270	11/22/16	11/23/16 3:59	GFH
Pyridine	ND	ug/L	100	5000	1311/8270	11/22/16	11/23/16 3:59	GFH
2,4,5-Trichlorophenol	ND	ug/L	100	400000	1311/8270	11/22/16	11/23/16 3:59	GFH
2,4,6-Trichlorophenol	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 3:59	GFH
Hexachlorobutadiene`	ND	ug/L	100	500	1311/8270	11/22/16	11/23/16 3:59	GFH
TCLP Volatiles								
Benzene	ND	ug/L	21	500	1311/8260	11/22/16	11/22/16 20:33	GFH
Carbon Tetrachloride	ND	ug/L	21	500	1311/8260	11/22/16	11/22/16 20:33	GFH
Chloroform	ND	ug/L	21	6000	1311/8260	11/22/16	11/22/16 20:33	GFH
1,2-Dichloroethane	ND	ug/L	21	500	1311/8260	11/22/16	11/22/16 20:33	GFH
Tetrachloroethene	ND	ug/L	21	700	1311/8260	11/22/16	11/22/16 20:33	GFH
Vinyl Chloride	ND	ug/L	21	200	1311/8260	11/22/16	11/22/16 20:33	GFH
2-Butanone (MEK)	ND	ug/L	42	200000	1311/8260	11/22/16	11/22/16 20:33	GFH
Chlorobenzene	ND	ug/L	21	100000	1311/8260	11/22/16	11/22/16 20:33	GFH
1,4-Dichlorobenzene	ND	ug/L	21	7500	1311/8260	11/22/16	11/22/16 20:33	GFH
1,1-Dichloroethene	ND	ug/L	21	700	1311/8260	11/22/16	11/22/16 20:33	GFH
Trichloroethene	ND	ug/L	21	500	1311/8260	11/22/16	11/22/16 20:33	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Osher
QC Chemist

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Date Sampled: 11/18/16 9:16
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-04 **Matrix: Soil** **Lab ID: 16111805-10**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Corrosivity / pH							
pH	**8.52**	pH units		EPA 9045	11/18/16	11/18/16	MEL
Percent Solids							
Percent Solids	**92**	%		SM2540G	11/18/16	11/21/16 9:58	MEL
Polychlorinated Biphenyls							
Aroclor 1016	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1221	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1232	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1242	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1248	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1254	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Aroclor 1260	ND	mg/kg	0.053	EPA 8082	11/21/16	11/23/16 13:04	AC
Target Compound List - SEMIVOLATILES							
Phenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Bis (2-chloroethyl) ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Chlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Bis (2-chloroisopropyl) ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Acetophenone	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
N-Nitroso-di-n-propylamine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Hexachloroethane	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Nitrobenzene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Isophorone	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Nitrophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4-Dimethylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Bis (2-chloroethoxy) methane	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4-Dichlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Naphthalene`	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Chloroaniline	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Hexachlorobutadiene`	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Caprolactam	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Chloro-3-methylphenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Methylnaphthalene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Hexachlorocyclopentadiene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4,6-Trichlorophenol	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4,5-Trichlorophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
1,1-Biphenyl	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Chloronaphthalene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH

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Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-04 **Matrix: Soil** **Lab ID: 16111805-10**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - SEMIVOLATILES							
Dimethyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,6-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Acenaphthylene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
3-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Acenaphthene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4-Dinitrophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Nitrophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Dibenzofuran	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
2,4-Dinitrotoluene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Diethyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Fluorene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Chlorophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Nitroaniline	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4,6-Dinitro-2-methylphenol	ND	ug/kg	240	EPA 8270C	11/21/16	11/23/16 8:35	GFH
N-Nitrosodiphenylamine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
4-Bromophenyl phenyl ether	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Hexachlorobenzene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Atrazine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Pentachlorophenol	ND	ug/kg	260	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Phenanthrene	**340**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Anthracene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Carbazole	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Di-n-butyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Fluoranthene	**500**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Pyrene	**450**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Butyl benzyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
3,3-Dichlorobenzidine	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Benzo[a]anthracene	**220**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Chrysene	**290**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Bis (2-ethylhexyl) phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Di-n-octyl phthalate	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Benzo[b]fluoranthene	**410**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Benzo[k]fluoranthene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Benzo[a]pyrene	**210**	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Indeno[1,2,3-cd]pyrene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Dibenz[a,h]anthracene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Benzo[g,h,i]perylene	ND	ug/kg	100	EPA 8270C	11/21/16	11/23/16 8:35	GFH
Target Compound List - VOLATILES							
Dichlorodifluoromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH

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Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 11/18/16 9:16
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-04 **Matrix: Soil** **Lab ID: 16111805-10**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Chloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Vinyl chloride	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Bromomethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Chloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Trichlorofluoromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Acetone	ND	ug/kg	53	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Carbon disulfide	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Methyl acetate	ND	ug/kg	26	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Methylene chloride	ND	ug/kg	26	EPA 8260B	11/22/16	11/22/16 23:06	GFH
trans-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Methyl t-butyl ether (MTBE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1-Dichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
cis-1,2-Dichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
2-Butanone (MEK)	ND	ug/kg	53	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Chloroform	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1,1-Trichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Cyclohexane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Carbon tetrachloride	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Benzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2-Dichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Trichloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Methylcyclohexane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2-Dichloropropane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Bromodichloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
cis-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Toluene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
trans-1,3-Dichloropropene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1,2-Trichloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Tetrachloroethene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
2-Hexanone (MBK)	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Dibromochloromethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2-Dibromoethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Chlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Ethylbenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
m&p-Xylene	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 23:06	GFH
o-Xylene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 11/18/16 9:16
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-04 **Matrix: Soil** **Lab ID: 16111805-10**

	Result	Unit	LLQ	Method	Prepared	Analyzed	Init.
Target Compound List - VOLATILES							
Styrene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Bromoform	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Isopropylbenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,1,2,2-Tetrachloroethane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,3-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,4-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2-Dichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2-Dibromo-3-chloropropane	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
1,2,4-Trichlorobenzene	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Naphthalene	ND	ug/kg	11	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Ethyl t-butyl ether (ETBE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
tert-Butanol (TBA)	ND	ug/kg	26	EPA 8260B	11/22/16	11/22/16 23:06	GFH
Diisopropyl ether (DIPE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
tert-Amyl methyl ether (TAME)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH
tert-Amyl alcohol (TAA)	ND	ug/kg	26	EPA 8260B	11/22/16	11/22/16 23:06	GFH
tert-Amyl ethyl ether (TAEE)	ND	ug/kg	5	EPA 8260B	11/22/16	11/22/16 23:06	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
Results reported on a dry weight basis.

Approved by: Matt Cohen
QC Chemist

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CALIBER ANALYTICAL SERVICES

Certificate of Analysis

EnviroAnalytics Group, LLC
1650 Des Peres Rd.
Suite 303
St. Louis, MO 63131

Date Sampled: 11/18/16 9:16
Date Received: 11/18/16 14:25
Date Issued: 11/28/16

Project: Rod and Wire Mill
Site Location: Sparrows Point, MD

SDG Number: 16111805

Field Sample ID: HAZ-COMP-04 **Matrix: Soil** **Lab ID: 16111805-06**

	Result	Unit	LLQ	REGL	Method	Prepared	Analyzed	Init.
TCLP Polychlorinated Biphenyls								
Aroclor 1016	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1221	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1232	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1242	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1248	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1254	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
Aroclor 1260	ND	mg/L	5		1311/8082	11/23/16	11/23/16 16:53	GFH
TCLP Semi-Volatiles								
2-Methylphenol	ND	ug/L	100	200000	1311/8270	11/22/16	11/23/16 4:35	GFH
3+4-Methylphenol	ND	ug/L	200	200000	1311/8270	11/22/16	11/23/16 4:35	GFH
2,4-Dinitrotoluene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 4:35	GFH
Hexachloroethane	ND	ug/L	100	3000	1311/8270	11/22/16	11/23/16 4:35	GFH
Hexachlorobenzene	ND	ug/L	100	130	1311/8270	11/22/16	11/23/16 4:35	GFH
Nitrobenzene	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 4:35	GFH
Pentachlorophenol	ND	ug/L	500	100000	1311/8270	11/22/16	11/23/16 4:35	GFH
Pyridine	ND	ug/L	100	5000	1311/8270	11/22/16	11/23/16 4:35	GFH
2,4,5-Trichlorophenol	ND	ug/L	100	400000	1311/8270	11/22/16	11/23/16 4:35	GFH
2,4,6-Trichlorophenol	ND	ug/L	100	2000	1311/8270	11/22/16	11/23/16 4:35	GFH
Hexachlorobutadiene`	ND	ug/L	100	500	1311/8270	11/22/16	11/23/16 4:35	GFH
TCLP Volatiles								
Benzene	ND	ug/L	22	500	1311/8260	11/22/16	11/22/16 21:03	GFH
Carbon Tetrachloride	ND	ug/L	22	500	1311/8260	11/22/16	11/22/16 21:03	GFH
Chloroform	ND	ug/L	22	6000	1311/8260	11/22/16	11/22/16 21:03	GFH
1,2-Dichloroethane	ND	ug/L	22	500	1311/8260	11/22/16	11/22/16 21:03	GFH
Tetrachloroethene	ND	ug/L	22	700	1311/8260	11/22/16	11/22/16 21:03	GFH
Vinyl Chloride	ND	ug/L	22	200	1311/8260	11/22/16	11/22/16 21:03	GFH
2-Butanone (MEK)	ND	ug/L	43	200000	1311/8260	11/22/16	11/22/16 21:03	GFH
Chlorobenzene	ND	ug/L	22	100000	1311/8260	11/22/16	11/22/16 21:03	GFH
1,4-Dichlorobenzene	ND	ug/L	22	7500	1311/8260	11/22/16	11/22/16 21:03	GFH
1,1-Dichloroethene	ND	ug/L	22	700	1311/8260	11/22/16	11/22/16 21:03	GFH
Trichloroethene	ND	ug/L	22	500	1311/8260	11/22/16	11/22/16 21:03	GFH

Notes/Qualifiers:
LLQ- Lowest Level of Quantitation
ND - Not Detected at a concentration greater than or equal to the LLQ.
REGL - RCRA Regulatory Limit. For TCLP reference 40CFR, Part 261.24, Table 1 - Maximum Concentration of Contaminants for the Toxicity Characteristic

Approved by: Matt Cohen
QC Chemist

8851 Orchard Tree Lane Towson, Maryland 21286
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APPENDIX D

Construction Photographs

Stockpiles of Terrabond (right) and #57 limestone (left) in the Materials Management Area.

Using an excavator to mix the reagent blend in the Materials Management Area.

Mixed reagent blend, 40% Terrabond, 60% #57 limestone by weight.

Terrabond stockpile covered with tarps when not being accessed.

VE Enterprises 20,000 frac tank located in the Materials Management Area.

Sabre Manufacturing 18,000 gallon weir tank located in the Materials Management Area.

Example of groundwater causing trench sidewall collapse when shoring was not used.

Treatment trench excavation using a trench box and steel plates to hold the sidewalls in place.

Positioning trench box and steel plates into the trench.

Due to the trench excavation method, the width of the trench footprints increased considerably.

Sections of trench were offset by 5 feet and overlapped a distance of 5 feet.

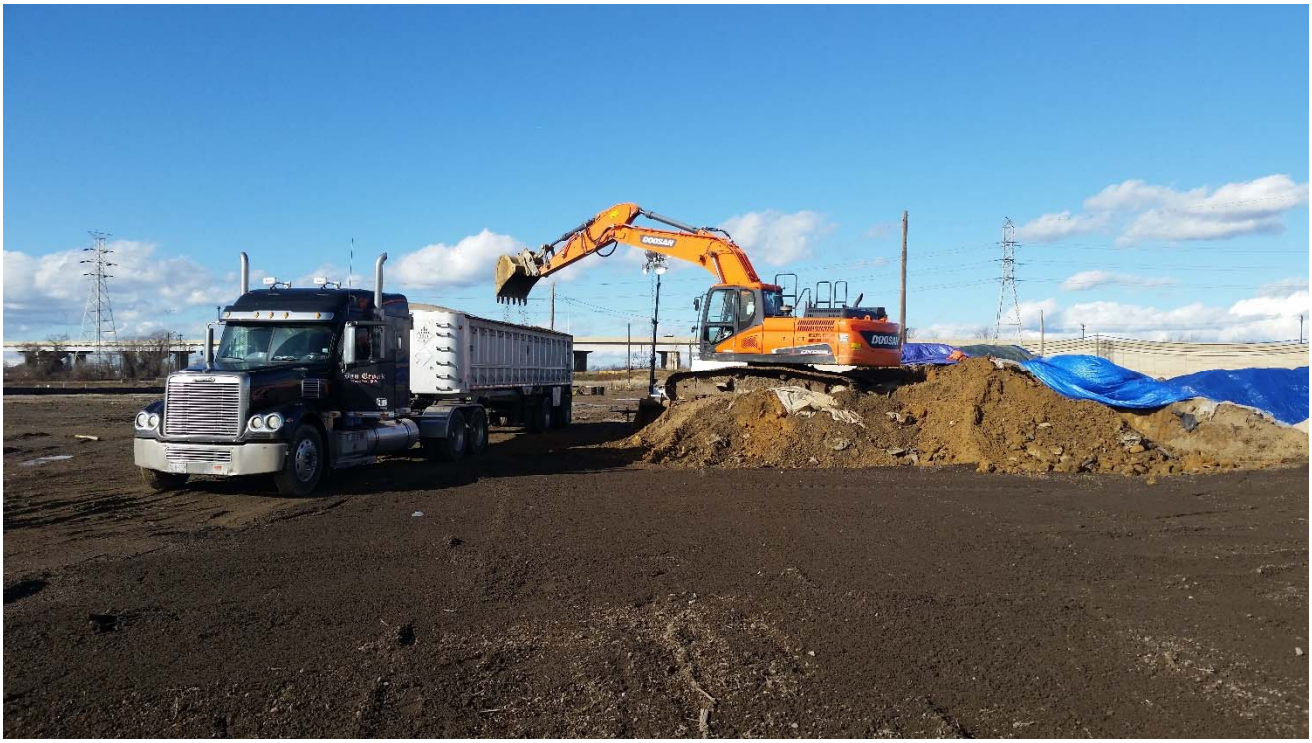
Non-hazardous soil stockpiles along southern site boundary awaiting disposal in on-site landfill.

Liner used to create temporary containment cell for hazardous soil stockpiles.

Hazardous soil stockpiles in temporary containment cell.

Temporary cover of plastic sheeting over hazardous soil stockpiles.

Long-term cover of tarps held in place by sand bags over hazardous soil stockpiles.



Hazardous soil stockpile being loaded into trucks for transportation to permitted disposal facility.

Backfilling a section of trench with the reagent mixture using a dump truck.

Section of trench backfilled with the reagent blend up to the top of the water table.

Metal precipitates forming in water ponded on top of reagent blend in main cadmium trench.

Metal precipitates forming in water ponded on top of reagent blend in portion of the secondary cadmium trench located in the cadmium hot spot.

Placing base layer of large steel mill slag backfill on top of reagent blend.

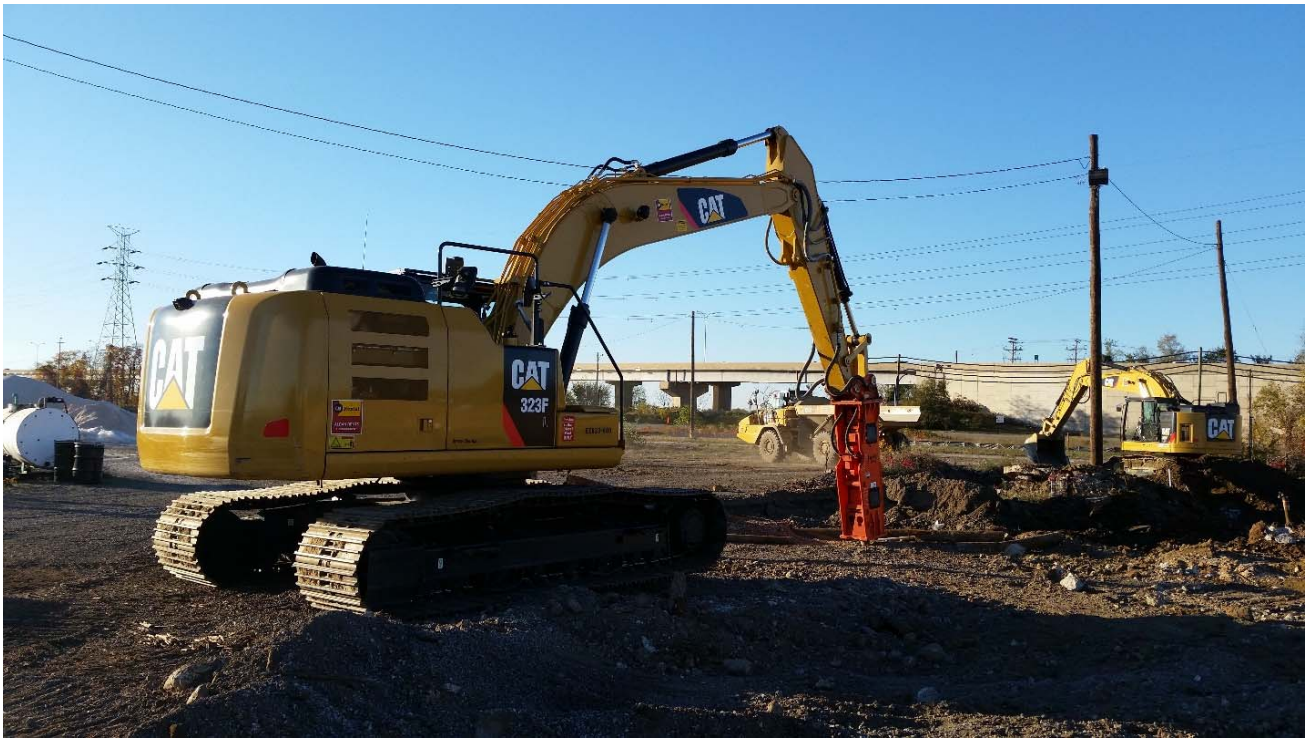
Using a bull dozer to spread base layer of large steel mill slag backfill.

Choke layer of #57 limestone placed between base of large steel mill slag and fine steel mill slag.

Fine steel mill slag backfill placed in 12 inch lifts.

Lifts of fine steel mill slag were compacted with repeated passes of a large, smooth drum, vibratory roller.

Excavation of the top 2 feet of soil out of the cadmium hot spot.



The cadmium hot spot contained large concrete foundations that had to be hammered out.

Remnants of concrete foundation in southwest corner of cadmium hot spot.

Cadmium hot spot soils from 2-7 feet bgs were mixed with Terrabond.

Terrabond being dumped into cadmium hot spot and mixed with hot spot soils from 2-7 feet bgs.

Cadmium hot spot soils mixed with Terrabond were placed back into the hot spot excavation.

Cadmium hot spot being prepped for steel mill slag cap after being mixed with Terrabond.

12 inch thick cap of fine steel mill slag placed over cadmium hot spot.

The steel mill slag cap over the remediated cadmium hot spot was sealed with repeated passes of a large smooth drum vibratory roller.

APPENDIX E

Advanced GeoServices Trench Backfill Geotechnical Report

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
1055 Andrew Drive, Suite A
West Chester, PA 19380-4293
tel 610.840.9100 fax 610.840.9199
www.advancedgeoservices.com

December 21, 2017 2016-3421-15

EnviroAnalytics Group
1650 Des Peres Road
Saint Louis, MO 63131

Attention: Mr. James Calenda

Reference: Construction Summary Report
Treatment Trench Backfill
Sparrows Point Rod and Wire Mill, Parcel A-3
Sparrows Point, Maryland

Dear Mr. Calenda:

At your request, Advanced GeoServices Corp. (Advanced GeoServices) provided full-time oversight during the backfilling of the four Treatment Trenches within Parcel A-3 at the Sparrows Point Rod and Wire Mill in Sparrows Point, Maryland. The four Treatment Trenches consist of the Primary Cadmium Trench; Secondary Cadmium Trench; Primary Zinc Trench; and Secondary Zinc Trench. The backfilling of these four Treatment Trenches was performed between December 13, 2016 and January 11, 2017 by Enterprise Network Resolutions Contracting LLC (ENRC) of Winslow, New Jersey.

Our oversight activities consisted of the monitoring of the preparation of the reagent material subgrade within each Treatment Trench prior to backfilling, and the placement and compaction of the backfill materials. A summary of the preparation and backfilling activities for the four Treatment Trenches is provided below.

TREATMENT TRENCH SUBGRADE PREPARATION

Prior to placement of the backfill, loose/saturated soils were removed from each Treatment Trench exposing the top of the reagent material. During removal of the loose/saturated soils, the sidewalls of each Treatment Trench were sloped back to prevent sloughing and to provide better access for the construction equipment. Groundwater, when encountered, was pumped from each Treatment Trench as the loose/saturated soils were removed.

TREATMENT TRENCH BACKFILLING

Following removal of the loose/saturated soils, each Treatment Trench was backfilled. The backfilling activities are summarized below.

Coarse Slag Backfill

In order to provide a stable surface for backfill placement, a two- to three-feet thick layer of crushed slag (Coarse Slag Backfill) was placed directly on the exposed reagent material in each Treatment Trench. The Coarse Slag Backfill was delivered to the site from a nearby source and contained particles generally ranging from one to four inches in diameter. It was reported to Advanced GeoServices that the slag is from a blast furnace.

The layer of Coarse Slag Backfill was compacted by repeated passes of a smooth-drum roller set in the vibratory mode. The compaction of the Coarse Slag Backfill was judged to be adequate as no appreciable movement was observed beneath the smooth-drum roller during the final pass and beneath the loaded dump trucks that traveled over the compacted material.

AASHTO #57 Coarse Aggregate Backfill

In each Treatment Trench, a 12-inch thick layer of AASHTO #57 Coarse Aggregate was placed over the Coarse Slag Backfill in order to "choke off" the voids within the underlying slag. The layer of AASHTO #57 Coarse Aggregate was compacted by repeated passes of a smooth-drum roller set in the static mode and was observed to be stable.

Fine Slag Backfill

The remainder of each Treatment Trench was backfilled to the level of the surrounding ground surface with a finer crushed slag (Fine Slag Backfill) that was delivered to the site from a nearby source. It was reported to Advanced GeoServices that the slag is from a blast furnace. The results of geotechnical laboratory testing (moisture content, grain size analysis, and modified Proctor) performed on a bulk sample of the Fine Slag Backfill are attached.

The Fine Slag Backfill was placed in approximate 12-inch thick loose lifts. The first lift of Fine Slag Backfill placed over the AASHTO #57 Coarse Aggregate was compacted by repeated passes of a smooth-drum roller set in the static mode. Each of the remaining lifts of Fine Slag Backfill was compacted by a minimum of four passes of a smooth-drum roller set in the vibratory mode.

The compaction of each lift of Fine Slag Backfill was judged to be adequate as no appreciable movement was observed beneath the smooth-drum roller during the final pass. In addition, each lift was proof-rolled using a loaded off-road dump truck following compaction. During the proof-rolling of each lift, no appreciable movement was observed beneath the loaded dump truck.

The compaction of the Fine Slag Backfill was also monitored by the performance of in-place moisture-density tests. The in-place moisture-density testing locations and results for each day of backfill placement are documented on the attached "Summary of In-Place Density Tests". We note that the locations of the in-place moisture-density tests shown on the "Summary of In-Place Density Tests" are identified by stationing referenced from the southern end of each Treatment Trench.

CONCLUSIONS

The fill materials were placed and compacted using good earthwork practices and were observed to be stable and unyielding. Based on these observations, it is our engineering opinion that the fill placed within the Treatment Trenches is suitable for its intended use.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul F. Marano
Senior Project Consultant

Todd D. Trotman, P.E.
Project Consultant

TDT:PFM:kk

Enclosures

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 12/16/2016		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	90.8%	115.1	12.5%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 0+75	CGS-4'	2 passes of roller (static)
2	92.0%	116.6	12.1%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 1+20	CGS-4'	2 passes of roller (static)
3	99.4%	126.1	6.6%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 0+75	CGS-4'	4 passes of roller (static)
4	100.1%	126.9	8.7%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 1+20	CGS-4'	4 passes of roller (static)
5	96.5%	122.4	10.1%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 2+20	CGS-3'	4 passes of roller (static)

CGC=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 12/19/2016		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	94.2%	119.4	11.1%	95%	Fine Slag (uncorrected)	Secondary Cadmium Trench-north end	CGS-4'	stable and approved
2	96.1%	121.8	12.7%	95%	Fine Slag (uncorrected)	Secondary Cadmium Trench-middle	CGS-3'	
3	95.1%	120.6	10.0%	95%	Fine Slag (uncorrected)	Secondary Cadmium Trench-south end	CGS-3'	
4	99.1%	125.6	10.6%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 0+50	CGS-2'	
5	97.8%	124.0	9.7%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 1+00	CGS-2'	
6	95.8%	127.6	11.9%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 1+50	CGS-2'	
7	95.3%	127.0	10.7%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 2+00	CGS-2'	
8	94.1%	125.4	11.3%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 2+50	CGS-2'	stable and approved
9	95.4%	127.1	11.1%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 3+00	CGS-2'	
10	94.6%	126.0	12.0%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 3+50	CGS-2'	stable and approved
11	94.1%	125.4	11.5%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 4+00	CGS-3'	stable and approved
12	95.2%	126.8	10.8%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 4+50	CGS-2.5'	
13	97.4%	123.5	9.8%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 5+00	CGS-4'	
14	94.2%	125.5	10.9%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 4+00	CGS-2'	stable and approved
15	97.1%	123.1	11.0%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 4+50	CGS-3'	
16	95.8%	127.6	10.6%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 5+00	CGS-3'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 12/20/2016		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	101.7%	135.4	9.6%	95%	Fine Slag (corrected)	Secondary Cadmium Trench-south end	CGS-2'	
2	100.9%	134.4	10.1%	95%	Fine Slag (corrected)	Secondary Cadmium Trench-middle	CGS-2'	
3	97.6%	123.8	8.2%	95%	Fine Slag (uncorrected)	Secondary Cadmium Trench-north end	CGS-3'	
4	97.9%	124.1	11.2%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 0+50	CGS-1'	
5	102.6%	136.7	11.1%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 1+50	CGS-1'	
6	96.5%	128.6	6.8%	95%	Fine Slag (corrected)	Primary Cadmium Trench- station 2+50	CGS-1'	
7	96.8%	128.9	9.6%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 3+50	CGS-1'	
8	94.5%	125.9	11.6%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 4+50	CGS-1'	stable and approved
9	97.4%	123.5	13.1%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 0+50	CGS-0'	
10	97.3%	123.4	8.9%	95%	Fine Slag (uncorrected)	Primary Cadmium Trench-station 1+50	CGS-0'	
11	98.5%	131.2	9.2%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 2+50	CGS-0'	
12	94.9%	126.4	8.2%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 3+50	CGS-0'	stable and approved
13	94.1%	125.3	10.2%	95%	Fine Slag (corrected)	Primary Cadmium Trench-station 4+50	CGS-0'	stable and approved
14	97.8%	130.3	8.8%	95%	Fine Slag (corrected)	Secondary Cadmium Trench-north end	CGS-2'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 12/21/2016		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	98.7%	125.2	10.5%	95%	Fine Slag (uncorrected)	Station 5+00 in primary cadmium trench	CGS	
2	91.8%	116.4	10.8%	95%	Fine Slag (uncorrected)	Station 0+90 in primary zinc trench	CGS-4'	stable and approved
3	93.5%	118.5	10.7%	95%	Fine Slag (uncorrected)	Station 2+50 in primary zinc trench	CGS-2'	stable and approved
5	96.9%	122.9	10.0%	95%	Fine Slag (uncorrected)	Station 1+10 in primary zinc trench	CGS-3'	
6	97.3%	123.4	10.1%	95%	Fine Slag (uncorrected)	Station 0+95 in primary zinc trench	CGS-2'	
7	95.9%	127.8	8.0%	95%	Fine Slag (corrected)	Station 2+80 in primary zinc trench	CGS-1'	
8	95.0%	126.5	10.5%	95%	Fine Slag (corrected)	Station 1+30 in primary zinc trench	CGS-2'	
9	94.8%	126.3	6.3%	95%	Fine Slag (corrected)	Station 1+98 in primary zinc trench	CGS-2'	stable and approved

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 12/22/2016		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	96.1%	121.8	16.6%	95%	Fine Slag (uncorrected)	Station 3+40 in primary zinc trench	CGS-2'	
2	97.3%	123.4	13.4%	95%	Fine Slag (uncorrected)	Station 4-70 in primary zinc trench	CGS-2'	
3	95.4%	127.1	8.1%	95%	Fine Slag (corrected)	Station 3+05 in primary zinc trench	CGS	
4	95.9%	127.7	12.2%	95%	Fine Slag (corrected)	Station 2+25 in primary zinc trench	CGS-1'	
5	97.1%	129.3	12.0%	95%	Fine Slag (corrected)	Station 1+20 in primary zinc trench	CGS-2'	
6	96.7%	128.8	10.1%	95%	Fine Slag (corrected)	Station 0+60 in primary zinc trench	CGS-2'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 1/4/2017		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	99.4%	132.4	10.5%	95%	Fine Slag (corrected)	Station 2+55 in primary zinc trench	CGS-1'	
2	94.4%	125.8	13.0%	95%	Fine Slag (corrected)	Station 1+85 in primary zinc trench	CGS-1'	Stable and approved
3	95.1%	126.7	11.8%	95%	Fine Slag (corrected)	Station 1+20 in primary zinc trench	CGS-1'	
4	96.2%	128.2	11.9%	95%	Fine Slag (corrected)	Station 0+60 in primary zinc trench	CGS-1'	
5	95.6%	127.4	15.2%	95%	Fine Slag (corrected)	Station 2+15 in primary zinc trench	CGS	
6	97.5%	129.9	9.8%	95%	Fine Slag (corrected)	Station 2+98 in primary zinc trench	CGS	
7	95.6%	127.3	12.9%	95%	Fine Slag (corrected)	Station 1+48 in primary zinc trench	CGS	
8	95.8%	127.6	13.5%	95%	Fine Slag (corrected)	Station 0+45 in primary zinc trench	CGS	
9	98.4%	131.1	11.4%	95%	Fine Slag (corrected)	Station 4+40 in primary zinc trench	CGS-1'	
10	98.4%	124.8	13.1%	95%	Fine Slag (uncorrected)	Station 3+48 in primary zinc trench	CGS-1'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 1/5/2017		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	95.6%	127.3	10.9%	95%	Fine Slag (corrected)	Station 3+50 in primary zinc trench	CGS	
2	94.4%	125.8	7.3%	95%	Fine Slag (corrected)	Station 4+40 in primary zinc trench	CGS	Stable and approved
3	97.9%	130.4	12.2%	95%	Fine Slag (corrected)	Station 1+05 in secondary zinc trench	CGS-5'	First lift
4	96.2%	128.1	10.3%	95%	Fine Slag (corrected)	Station 0+48 in secondary zinc trench	CGS-3'	First lift
5	95.6%	127.4	9.5%	95%	Fine Slag (corrected)	Station 0+15 in secondary zinc trench	CGS-2'	
6	99.2%	132.2	11.1%	95%	Fine Slag (corrected)	Station 1+10 in secondary zinc trench	CGS-4'	
7	94.1%	125.3	9.6%	95%	Fine Slag (corrected)	Station 1+70 in secondary zinc trench	CGS-5'	First Lift (stable/approved)
8	95.0%	126.5	10.2%	95%	Fine Slag (corrected)	Station 2+40 in secondary zinc trench	CGS-5'	First Lift

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 1/6/2017		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	96.7%	128.8	9.8%	95%	Fine Slag (corrected)	Station 0+85 in secondary zinc trench	CGS-2'	
2	94.2%	125.5	7.2%	95%	Fine Slag (corrected)	Station 1+40 in secondary zinc trench	CGS-3'	Stable and approved
3	97.5%	129.9	7.0%	95%	Fine Slag (corrected)	Station 2+15 in secondary zinc trench	CGS-4'	
4	97.4%	129.8	7.8%	95%	Fine Slag (corrected)	Station 2+10 in secondary zinc trench	CGS-3'	
5	94.3%	125.6	8.3%	95%	Fine Slag (corrected)	Station 0+80 in secondary zinc trench	CGS-1'	Stable and approved
6	95.2%	126.8	13.2%	95%	Fine Slag (corrected)	Station 1+35 in secondary zinc trench	CGS-2'	
7	97.1%	129.4	10.3%	95%	Fine Slag (corrected)	Station 1+85 in secondary zinc trench	CGS-4'	
8	100.1%	133.3	6.6%	95%	Fine Slag (corrected)	Station 0+30 in secondary zinc trench	CGS	
9	95.3%	127.0	11.5%	95%	Fine Slag (corrected)	Station 1+05 in secondary zinc trench	CGS-1'	
10	93.9%	125.1	6.1%	95%	Fine Slag (corrected)	Station 2+45 in secondary zinc trench	CGS-3'	Stable and approved
11	97.8%	130.3	8.0%	95%	Fine Slag (corrected)	Station 1+90 in secondary zinc trench	CGS-3'	
12	97.1%	129.4	9.1%	95%	Fine Slag (corrected)	Station 0+85 in secondary zinc trench	CGS	
13	95.3%	126.9	8.7%	95%	Fine Slag (corrected)	Station 1+50 in secondary zinc trench	CGS-1'	
14	94.5%	125.9	7.2%	95%	Fine Slag (corrected)	Station 2+10 in secondary zinc trench	CGS-2'	Stable and approved
15	97.4%	129.8	8.1%	95%	Fine Slag (corrected)	Station 2+48 in secondary zinc trench	CGS-2'	
16	96.2%	128.1	8.4%	95%	Fine Slag (corrected)	Station 1+80 in secondary zinc trench	CGS-2'	
17	93.9%	125.1	6.5%	95%	Fine Slag (corrected)	Station 1+95 in secondary zinc trench	CGS-1'	Stable and approved
18	97.2%	129.5	8.1%	95%	Fine Slag (corrected)	Station 2+40 in secondary zinc trench	CGS-1'	
19	96.4%	128.4	8.9%	95%	Fine Slag (corrected)	Station 1+75 in secondary zinc trench	CGS-1'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 1/9/2017		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	97.1%	129.4	5.8%	95%	Fine Slag (corrected)	Station 2+50 in secondary zinc trench	CGS	
2	98.6%	131.3	7.5%	95%	Fine Slag (corrected)	Station 1+70 in secondary zinc trench	CGS	
3	98.0%	130.5	5.5%	95%	Fine Slag (corrected)	Station 1+20 in secondary zinc trench	CGS	
4	99.4%	132.4	5.2%	95%	Fine Slag (corrected)	Station 2+00 in secondary cadmium trench	CGS-1'	
5	99.3%	132.3	8.3%	95%	Fine Slag (corrected)	Station 1+55 in secondary cadmium trench	CGS-1'	
6	95.4%	127.1	8.8%	95%	Fine Slag (corrected)	Station 2+00 in secondary cadmium trench	CGS	
7	98.0%	130.5	7.3%	95%	Fine Slag (corrected)	Station 1+48 in secondary cadmium trench	CGS	
8	96.5%	128.5	7.0%	95%	Fine Slag (corrected)	Station 0+95 in secondary cadmium trench	CGS-1'	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

ADVANCED GEOSERVICES

SUMMARY OF IN-PLACE DENSITY TESTS			PROJECT: Sparrows Point Rod and Wire Mill-Parcel A3			PROJECT NO.: 2016-3421-11	SHEET 1 OF 1	
			LOCATION: Sparrows Point, MD			DATE OF TESTS: 1/11/2017		
#	Percent Compaction	Dry Density (PCF)	Percent Moisture Content	Percent Compaction Required	Proctor *	Approximate Location	Approximate Elevation of Test	Comments
1	96.9%	129.1	8.4%	95%	Fine Slag (corrected)	Station 0+25 in secondary zinc trench	CGS-1'	
2	95.3%	126.9	9.7%	95%	Fine Slag (corrected)	Station 1+00 in secondary zinc trench	CGS-1'	
3	99.1%	132.0	8.6%	95%	Fine Slag (corrected)	Station 1+25 in secondary zinc trench	CGS	
4	94.8%	126.3	8.0%	95%	Fine Slag (corrected)	Station 0+20 in secondary cadmium trench	CGS	Stable and approved
5	96.5%	128.6	8.6%	95%	Fine Slag (corrected)	Station 0+70 in secondary cadmium trench	CGS	

CGS=current ground surface

Proctor Type:

● Modified

○ Standard

Proctor Designation	Fine Slag (uncorrected)	Fine Slag (corrected)		
Max. Dry Density (PCF)	126.8	133.2		
Optimum Moisture (%)	12.2	10.0		

SUMMARY OF LABORATORY TESTING

SPARROW'S POINT

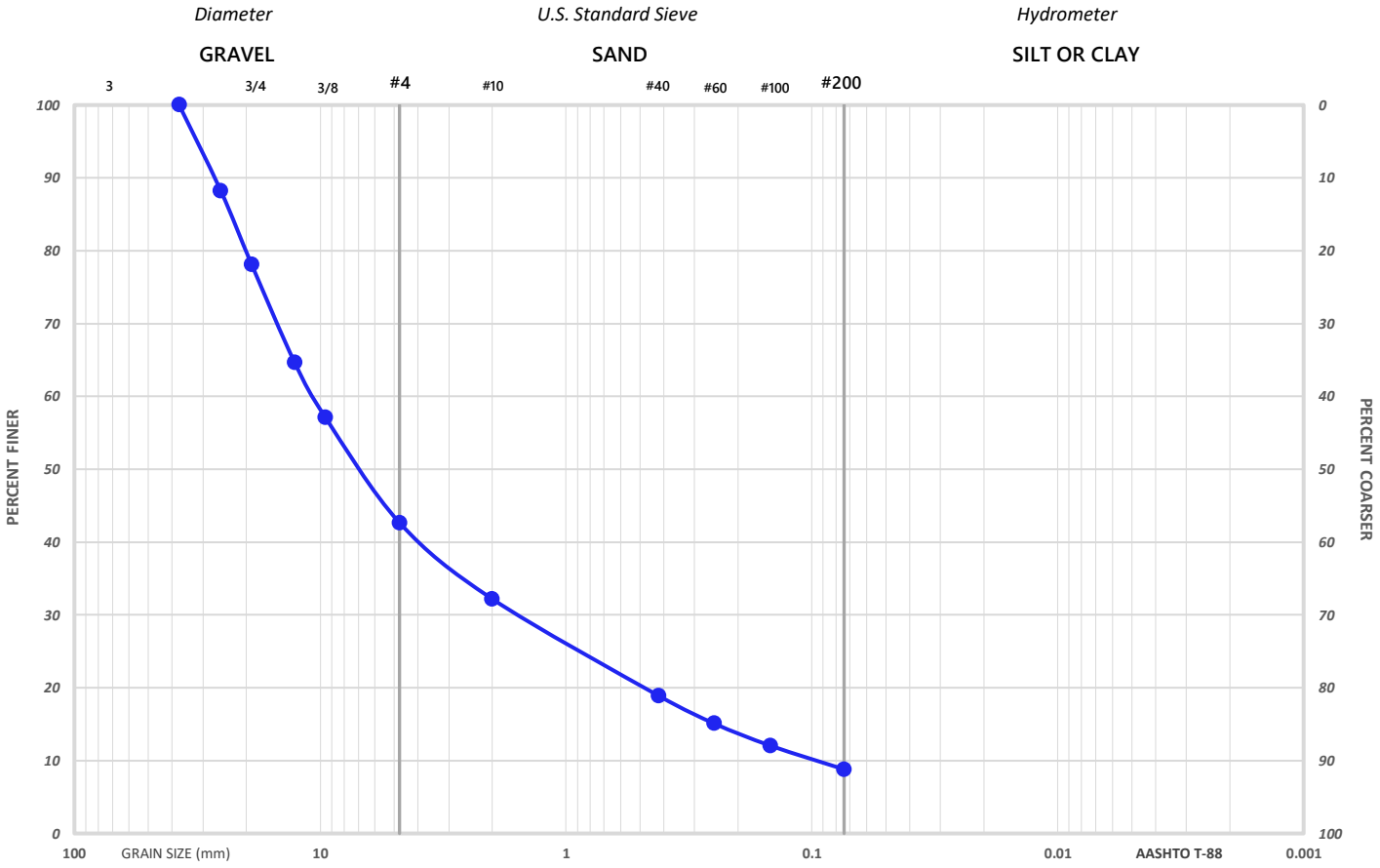
PROJECT NO.	2016-3421	**SAMPLE DATE**	-	**JAY KAY TESTING, INC.**
SAMPLES:	1	**LOCATION:**	-	5233 Lehman Road, Suite 110
REPORT:	12/14/16	**REMARKS:**	-	Spring Grove, PA 17362
				Phone: (410) 259-5101

BORING	SAMPLE	DEPTH	MC %	OM %	LL	PL	PI	% FINES	USCS
-	Bulk Slag	-	13.6	-	-	-	-	8.8	-

Jay Kay Testing, Inc. (AASHTO-Accredited)

SPARROW'S POINT

Boring:		Project No.:	2016-3421	**JAY KAY TESTING, INC.**	
Sample:	**Bulk Slag**	Sample Date:	-	5233 Lehman Road, Suite 110	
Depth:	-	Location:	-	Spring Grove, PA 17362	
				Phone: (410) 259-5101	



GRAIN SIZE ANALYSIS

Diameter	75.0	50.8	37.5	25.4	19.0	12.7	9.51	4.75	2.0	0.42	0.25	0.147	0.074
Sieve Size	3"	2"	1.5"	1"	3/4"	1/2"	3/8"	#4	#10	#40	#60	#100	**# 200**
% Passing	-	-	100.0	88.3	78.1	64.6	57.1	42.6	32.2	18.9	15.1	12.0	**8.8**

% GRAVEL	% SAND	*Coarse Gravel*	*Fine Gravel*	*Coarse Sand*	*Medium Sand*	*Fine Sand*	CC	CU
57.4	**33.8**	21.9	35.5	10.4	13.3	10.1	2.60	113.98

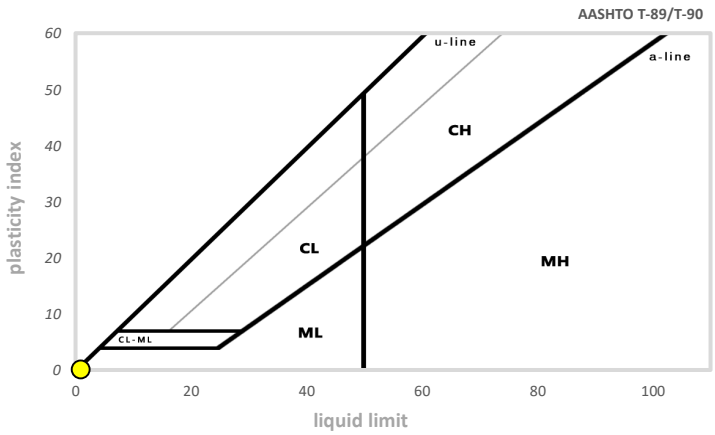
Moisture Content	13.6	Organic Content	-
pH	-	Other	-

ATTERBERG LIMITS

Liquid Limit	-
Plastic Limit	-
Plasticity Index	-

CLASSIFICATION

AASHTO	-
USCS	-



VISUAL SOIL DESCRIPTION

Dark gray well graded ROCK with silt and sand (slag)

12/14/16 TESTED BY: JMK REVIEWED BY: JD

SPARROW'S POINT

Boring:
Sample: **Bulk Slag**
Depth: -

Project No.: 2016-3421
Sample Date: -
Location: -

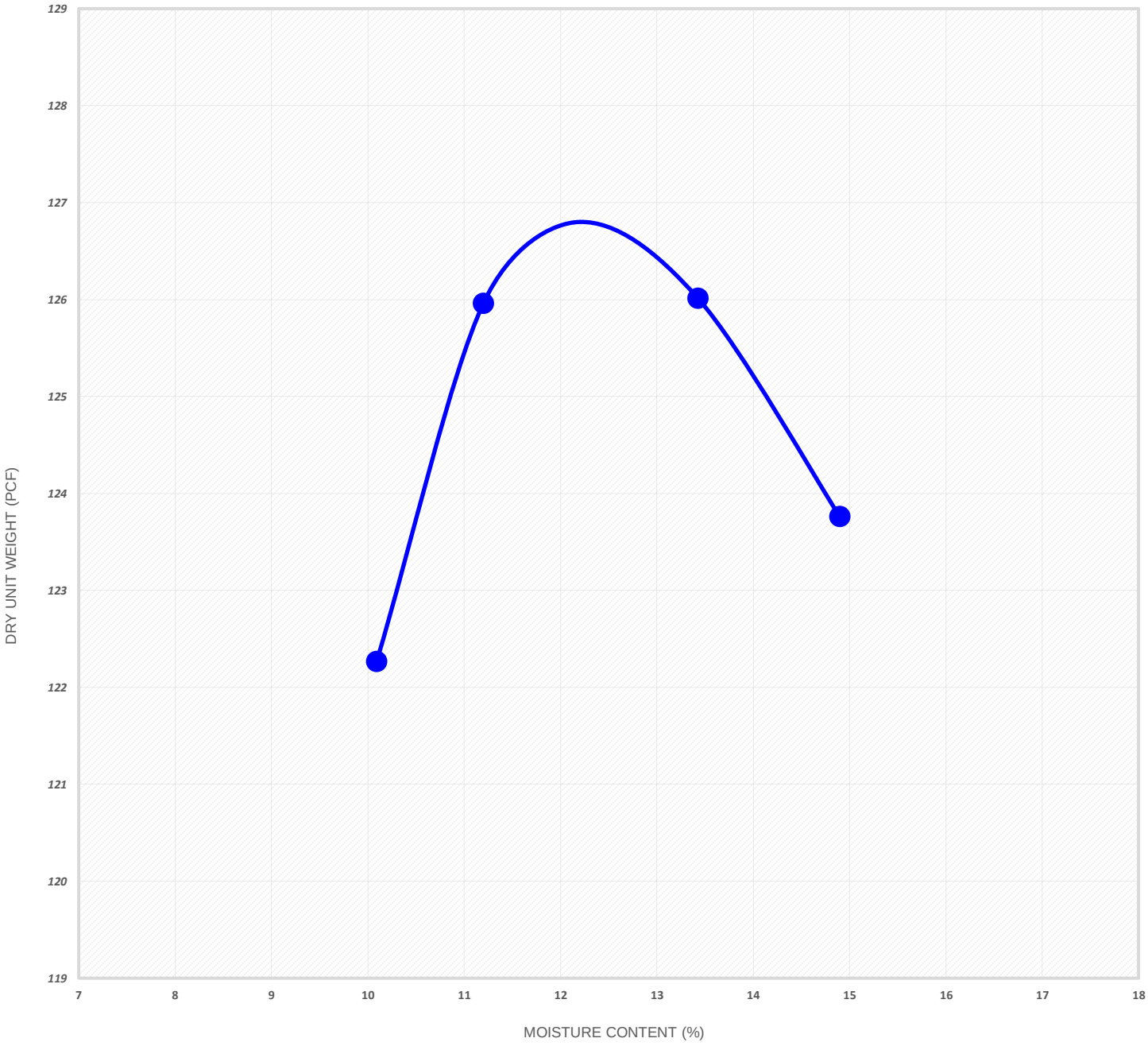
JAY KAY TESTING, INC.
5233 Lehman Road, Suite 110
Spring Grove, PA 17362
Phone: (410) 259-5101

MODIFIED PROCTOR TEST RESULTS

TEST METHOD: AASHTO T-180 (C)

*Corrected for 21.9% retained on 3/4" sieve

	UNCORRECTED		CORRECTED *
Maximum Dry Unit Weight	126.8	PCF	133.2
Optimum Moisture Content	12.2	MC	10.0



MC	LL	PL	PI	USCS	AASHTO	FINES	VISUAL SOIL DESCRIPTION
13.6	-	-	-	-	-	8.8	Dark gray well graded ROCK with silt and sand (slag)

12/14/16 TESTED BY: JMK REVIEWED BY: JD

APPENDIX F

Hillis-Carnes Geotechnical Reports

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
Annapolis Junction, MD 20701
(410) 880-4788 (410) 880-4098

LETTER OF TRANSMITTAL

December 19, 2016

Tradepoint Atlantic
1600 Sparrrows Point Blvd

Baltimore, MD 21219

RE: Area A-3 Reactive Wall Monitor

HCEA Job # 16728A

Location: Baltimore, MD

We are enclosing:

X Materials Engineering Division Reports

____ Materials Laboratory Reports

CC: EAG - James Calenda

Tradepoint Atlantic - Justin Dunn

ENCL:

Daily Report	12/14/2016
Daily Report	12/15/2016
Daily Report	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Picture	12/16/2016
Sketch	12/16/2016
Soil Density Report	12/16/2016

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 14, 2016

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: EAG **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site for testing and observational services.

Observed the placement of 3 feet of #3 stone for the primary trench. Prior to the placement of the stone, the contractor removed standing water from the base of the trench and cleared loose soils from the base of the excavation. As client removed soils from excavation, the top of the terrabond/#57 mixture was observed. Terabond was added to the soils at the base of the excavation as a drying agent. Then the #3 stone was placed and compacted using a smooth drum roller.

Work performed today was in accordance to HCEA's recommendations sent to TPA on 12/09/2016.

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 15, 2016

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: EAG **On Site Time:** hr **Total Time:** 4.5 hr

A. Description of Work:

HCEA representative arrived on site for testing and observational services.

Observed the placement of 3 feet of #3 stone for the primary trench. Prior to the placement of the stone, the contractor removed standing water from the base of the trench and cleared loose soils from the base of the excavation. As client removed soils from excavation, the top of the terrabond/#57 mixture was observed. Terabond was added to the soils at the base of the excavation as a drying agent. Then the #3 stone was placed and compacted using a smooth drum roller.

Work performed today was in accordance to HCEA's recommendations sent to TPA on 12/09/2016.

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 16, 2016

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/19

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8.5 hr

A. Description of Work:

HCEA representative arrived on site to provide observation and testing services.

Upon arrival onsite, HCEA representative witnessed the contractor placing a 12 inch lift of #57 stone on top of the previously placed #3 stones. The lift was compacted with a smooth drum roller prior to the palcement of subsequent lifts.

HCEA representative observed and tested the placement of one 12" loose lift of blast furnace slag on top of the #57 stone. The slag compacted with a static smooth drum roller for the furtherest west trench. The Nuclear Density Test Method(ASTM D 6938) was used to determine the percent compaction of the soil. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Field Adjusted Modified Proctor Method.

B. Tests Performed/Testing Equipment Used

Visual Observation and Nuclear Density Testing

C: Problems **Non-Compliance** ☐

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** Todd Johnson


CASE


CASE


ADLER


ADLER


ADLER


DOOSA


CAT
SV212
CASE


TT-1
TT-2
TT-3
TT-4
TT-5
TT-6
TT-7
TT-8
TT-9
TT-10
TT-11
TT-12
TT-13
TT-14
TT-15
TT-16
TT-17
TT-18
TT-19

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reative Wall Monitor

Job No:: 16728A

Date: 12-16-16

Taken By: Todd Johnson

TEST NUMBER	1	2	3							
LOCATION	0+50	1+00	2+00							
OFFSET										
ELEVATION	-3' subgrade	-3' subgrade	-3' subgrade							
DEPTH	10"	10"	10"							
DENSITY CT.										
WET DENSITY	132.1	133.1	132.4							
MOISTURE CT.										
MOISTURE PCF										
DRY DENSITY	119.98	120.23	120.15							
% MOISTURE	10.1	10.7	10.2							
MAX DENSITY	126.5	126.5	126.5							
OPT MOISTURE										
% COMPACTION	94.8	95	95							
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

Furtherest western trench
stopped inside building line

V3.0

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
Annapolis Junction, MD 20701
(410) 880-4788 (410) 880-4098

LETTER OF TRANSMITTAL

January 03, 2017

Tradepoint Atlantic
1600 Sparrrows Point Blvd

Baltimore, MD 21219

RE: Area A-3 Reactive Wall Monitor

HCEA Job # 16728A

Location: Baltimore, MD

We are enclosing:

X Materials Engineering Division Reports

____ Materials Laboratory Reports

CC: EAG - James Calenda

Tradepoint Atlantic - Justin Dunn

ENCL:

Daily Report	12/19/2016
Soil Density Report	12/19/2016
Daily Report	12/20/2016
Soil Density Report	12/20/2016
Daily Report	12/21/2016
Soil Density Report	12/21/2016
Daily Report	12/22/2016
Soil Density Report	12/22/2016

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 19, 2016

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site to provide observation and testing services.

Upon arrival onsite, HCEA representative witnessed the contractor placing a 12 inch lift of #57 stone on top of the previously placed #3 stones. The lift was compacted with a smooth drum roller prior to the palcement of subsequent lifts.

HCEA representative observed and tested the placement of one 12" loose lift of blast furnace slag on top of the #57 stone. The slag compacted with a static smooth drum roller for the furtherest west trench. The Nuclear Density Test Method(ASTM D 6938) was used to determine the percent compaction of the soil. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Field Adjusted Modified Proctor Method.

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 12.19.16

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7	8	9	
LOCATION	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	
OFFSET										
ELEVATION	-4	-4	-4	-4	-4	-4	-4	-4	-4	
DEPTH	8	8	8	8	8	8	8	8	8	
DENSITY CT.	132	133	132	131	133	134	132	132	133	
WET DENSITY	131	131	130	131	132	132	131	132	132	
MOISTURE CT.	127	126	127	125	127	125	127	127	126	
MOISTURE PCF	4.5	4.6	4.9	4.2	4	4.3	4	4.5	4.3	
DRY DENSITY	127.43	127.31	126.46	127.56	128.65	128.4	127.31	128.28	128.28	
% MOISTURE	2.8	2.9	2.8	2.7	2.6	2.8	2.9	2.9	2.9	
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
% COMPACTION	96.9	96.8	96.2	97	97.8	97.6	96.8	97.6	97.6	
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 20, 2016

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site to provide observation and testing services.

Upon arrival onsite, HCEA representative witnessed the contractor placing a 12 inch lift of #57 stone on top of the previously placed #3 stones. The lift was compacted with a smooth drum roller prior to the palcement of subsequent lifts.

HCEA representative observed and tested the placement of one 12" loose lift of blast furnace slag on top of the previous placed lift. The slag compacted with a static smooth drum roller for the furtherest west trench. The Nuclear Density Test Method(ASTM D 6938) was used to determine the percent compaction of the soil. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Field Adjusted Modified Proctor Method.

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 12.20.16

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7	8	9	
LOCATION	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	
OFFSET										
ELEVATION	-4	-4	-4	-4	-4	-4	-4	-4	-4	
DEPTH	8	8	8	8	8	8	8	8	8	
DENSITY CT.	133	134	133	133	132	132	131	133	134	
WET DENSITY	131	132	131	132	131	132	130	132	133	
MOISTURE CT.	127	125	129	128	126	124	121	122	125	
MOISTURE PCF	4.1	4.3	4.6	4.3	4.3	4	4.3	4.4	4.5	
DRY DENSITY	127.56	128.4	127.31	128.4	127.31	128.53	126.71	128.4	129.5	
% MOISTURE	2.7	2.8	2.9	2.8	2.9	2.7	2.6	2.8	2.7	
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
% COMPACTION	97	97.6	96.8	97.6	96.8	97.7	96.4	97.6	98.5	
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 21, 2016

Project Name: Area A-3 Reactive Wall Monitoring **Weather/Temp:** Clear 40°

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

Tech arrived on site per client request to provide monitoring and testing services. Tech observed and documented methods used by contractors.

ENRC continues backfill of primary zinc trench. Contractor has already placed #2 stone in trench. Contractor places a 6" lift of limestone and begins to backfill remainder of trench using blast furnace slag. Slag is placed in 1' lifts and compacted using a smooth drum roller.

HCEA representative performed field in-place density testing in general conformance ASTM D 6938 nuclear density method. Tech used Troxler gauge to test compaction of placed lifts. Test results confirm compaction to be a minimum 95% of max. dry density per the modified Proctor. (AASHTO T-180)

B. Tests Performed/Testing Equipment Used

Moisture-Density with Troxler gauge

C: Problems **Non-Compliance** ☐

none

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** Nick Stella

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitoring

Job No:: 16728A

Date: 12.21.16

Taken By: Nick Stella

TEST NUMBER	1	2	3	4						
LOCATION	prim. zinc trench	prim. zinc trench	prim. zinc trench	prim. zinc trench						
OFFSET										
ELEVATION	-3'	-3'	-2'	-2'						
DEPTH	6"	6"	6"	6"						
DENSITY CT.										
WET DENSITY	139.7	137.6	139	139.5						
MOISTURE CT.										
MOISTURE PCF										
DRY DENSITY	126.54	125.32	126.94	125.56						
% MOISTURE	10.4	9.8	9.5	11.1						
MAX DENSITY	127.3	127.3	127.3	127.3						
OPT MOISTURE	10.1	10.1	10.1	10.1						
% COMPACTION	99.4	98.4	99.7	98.6						
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

dark grey slag backfill 150.4pcf @ 10.0%
blast furnace slag 127.3pcf @ 10.1%

V3.0

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** December 22, 2016

Project Name: Area A-3 Reactive Wall Monitoring **Weather/Temp:** Clear 40°

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 4 hr

A. Description of Work:

Tech arrived on site per client request to provide monitoring and testing services. Tech observed and documented methods used by contractors.

ENRC continues backfill of primary zinc trench. Contractor has already placed #2 stone and limestone lifts. Contractor continues to place 1' lifts of blast furnace slag and compact using a smooth drum roller.

HCEA representative performed field in-place density testing in general conformance ASTM D 6938 nuclear density method. Tech used Troxler gauge to test compaction of placed lifts. Test results confirm compaction to be a minimum 95% of max. dry density per the modified Proctor. (AASHTO T-180)

B. Tests Performed/Testing Equipment Used

Moisture-Density with Troxler gauge

C: Problems

Non-Compliance ☐

none

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** Nick Stella

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitoring

Job No:: 16728A

Date: 12.22.16

Taken By: Nick Stella

TEST NUMBER	1	2	3	4						
LOCATION	prim. zinc trench	prim. zinc trench	prim. zinc trench	prim. zinc trench						
OFFSET										
ELEVATION	-1'	-1'	SG	SG						
DEPTH	6"	6"	6"	6"						
DENSITY CT.										
WET DENSITY	138.9	140.3	139.3	139.1						
MOISTURE CT.										
MOISTURE PCF										
DRY DENSITY	126.39	126.97	126.52	125.54						
% MOISTURE	9.9	10.5	10.1	10.8						
MAX DENSITY	127.3	127.3	127.3	127.3						
OPT MOISTURE	10.1	10.1	10.1	10.1						
% COMPACTION	99.3	99.7	99.4	98.6						
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

dark grey slag backfill 150.4pcf @ 10.0%
blast furnace slag 127.3pcf @ 10.1%

V3.0

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
Annapolis Junction, MD 20701
(410) 880-4788 (410) 880-4098

LETTER OF TRANSMITTAL

January 05, 2017

Tradepoint Atlantic
1600 Sparrrows Point Blvd

Baltimore, MD 21219

RE: Area A-3 Reactive Wall Monitor

HCEA Job # 16728A

Location: Baltimore, MD

We are enclosing:

X Materials Engineering Division Reports

____ Materials Laboratory Reports

CC: EAG - James Calenda

Tradepoint Atlantic - Justin Dunn

ENCL:

Daily Report	1/4/2017
Soil Density Report	1/4/2017

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** January 4, 2017

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 6 hr

A. Description of Work:

HCEA representative arrived on site to provide testing services and observation .

Observed the placement of one 12 inch loose lift of blast furnace slag, compacted with a smooth drum roller for the primary zinc trench. The Nuclear Density Test Method (ASTM D 6938) was used to determine the percent compaction of the slag. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Modified Proctor Method (ASTM D 1557).

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 1.4.17

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7	8	9	
LOCATION	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	
OFFSET										
ELEVATION	-4	-4	-4	-4	-4	-4	-4	-4	-4	
DEPTH	8	8	8	8	8	8	8	8	8	
DENSITY CT.	1341	132	133	132	134	133	132	133	134	
WET DENSITY	131	131	130	131	132	132	131	132	132	
MOISTURE CT.	125	126	126	127	126	127	125	126	125	
MOISTURE PCF	4.2	4.7	4.5	4.3	4.2	4	4.3	4.6	4.8	
DRY DENSITY	127.68	127.68	126.09	127.06	128.16	128.28	127.43	128.28	128.16	
% MOISTURE	2.6	2.6	3.1	3.1	3	2.9	2.8	2.9	3	
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	
% COMPACTION	97.1	97.1	95.9	96.6	97.5	97.6	96.9	97.6	97.5	
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
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(410) 880-4788 (410) 880-4098

LETTER OF TRANSMITTAL

January 09, 2017

Tradepoint Atlantic
1600 Sparrrows Point Blvd

Baltimore, MD 21219

RE: Area A-3 Reactive Wall Monitor

HCEA Job # 16728A

Location: Baltimore, MD

We are enclosing:

X Materials Engineering Division Reports

____ Materials Laboratory Reports

CC: EAG - James Calenda

Tradepoint Atlantic - Justin Dunn

ENCL:

Daily Report	1/5/2017
Soil Density Report	1/5/2017
Daily Report	1/6/2017
Soil Density Report	1/6/2017

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** January 5, 2017

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site to provide testing services and observation .

Observed the placement of one 12 inch loose lift of blast furnace slag, compacted with a smooth drum roller for the Secondary zinc trench. 1 lift was placed today. The Nuclear Density Test Method (ASTM D 6938) was used to determine the percent compaction of the slag. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Modified Proctor Method (ASTM D 1557).

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems **Non-Compliance** ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 1.5.17

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7	8	9	10
LOCATION	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50
OFFSET										
ELEVATION	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
DEPTH	8	8	8	8	8	8	8	8	8	8
DENSITY CT.	131	133	134	133	132	132	133	134	132	133
WET DENSITY	130	132	130	132	130	131	130	131	130	131
MOISTURE CT.	126	127	126	126	125	126	127	127	124	127
MOISTURE PCF	4.6	4.6	4.5	4.3	4.3	4.5	4.2	4.5	4	4.8
DRY DENSITY	126.34	128.53	126.21	128.4	126.34	127.18	126.09	127.18	126.09	127.31
% MOISTURE	2.9	2.7	3	2.8	2.9	3	3.1	3	3.1	2.9
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
% COMPACTION	96.1	97.7	96	97.6	96.1	96.7	95.9	96.7	95.9	96.8
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** January 6, 2017

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site to provide testing services and observation .

Observed the placement of one 12 inch loose lift of blast furnace slag, compacted with a smooth drum roller for the Secondary zinc trench. A total of two lifts were placed today. The Nuclear Density Test Method (ASTM D 6938) was used to determine the percent compaction of the slag. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Modified Proctor Method (ASTM D 1557).

B. Tests Performed/Testing Equipment Used

Nuclear Density Testing

C: Problems

Non-Compliance ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 1.5.17

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7	8	9	10
LOCATION	0+50	1+50	2+00	2+50	3+00	0+50	1+00	1+50	`2+00	2+50
OFFSET										
ELEVATION	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1
DEPTH	8	8	8	8	8	8	8	8	8	8
DENSITY CT.	133	133	132	132	131	133	132	132	133	132
WET DENSITY	131	131	132	130	131	132	131	130	132	130
MOISTURE CT.	127	126	125	127	126	127	127	126	125	126
MOISTURE PCF	4.5	4.3	4.5	4.4	4.4	4	4.1	4.3	4.3	
DRY DENSITY	127.43	127.56	128.4	126.21	127.43	128.28	127.18	126.34	128.16	126.21
% MOISTURE	2.8	2.7	2.8	3	2.8	2.9	3	2.9	3	3
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
% COMPACTION	96.9	97	97.6	96	96.9	97.6	96.7	96.1	97.5	96
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL				
2. WEIGHT OF MOLD				
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	0	0	0	0
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	0	0	0	0
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	0	0	0	0
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN				
8. WT. WET SOIL & PAN				
9. WT. DRY SOIL & PAN				
10. WT. OF MOISTURE (LINE 8 - LINE 9)	0	0	0	0
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	0	0	0	0
12. % MOISTURE (LINE 10 /LINE 11) X 100	0	0	0	0

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

HILLIS-CARNES ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
Annapolis Junction, MD 20701
(410) 880-4788 (410) 880-4098

LETTER OF TRANSMITTAL

January 10, 2017

Tradepoint Atlantic
1600 Sparrrows Point Blvd

Baltimore, MD 21219

RE: Area A-3 Reactive Wall Monitor

HCEA Job # 16728A

Location: Baltimore, MD

We are enclosing:

X Materials Engineering Division Reports

____ Materials Laboratory Reports

CC: EAG - James Calenda

Tradepoint Atlantic - Justin Dunn

ENCL:

Daily Report	1/9/2017
Sketch	1/9/2017
Soil Density Report	1/9/2017

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Rd. Suite A
Annapolis Junction, MD 20701
Phone:410-880-4788 Fax:410-880-4098

FIELD REPORT

Project No.: 16728A **Report No.:** **Date:** January 9, 2017

Project Name: Area A-3 Reactive Wall Monitor **Weather/Temp:** Cloudy/40

Client: Tradepoint Atlantic **Travel Time:** hr **Lunch Time:** hr

Contractor: ENRC **On Site Time:** hr **Total Time:** 8 hr

A. Description of Work:

HCEA representative arrived on site to provide testing services and observation .

Observed the placement of one 12 inch loose lift of furnace blasted slag, compacted with a smooth drum roller for the Secondary zinc trench. The Nuclear Density Test Method (ASTM D 6938) was used to determine the percent compaction of the slag. The test results indicated that the compacted material at the areas tested, met the project requirements of 95% of the maximum dry density in general conformance with the Modified Proctor Method (ASTM D 1557).

B. Tests Performed/Testing Equipment Used

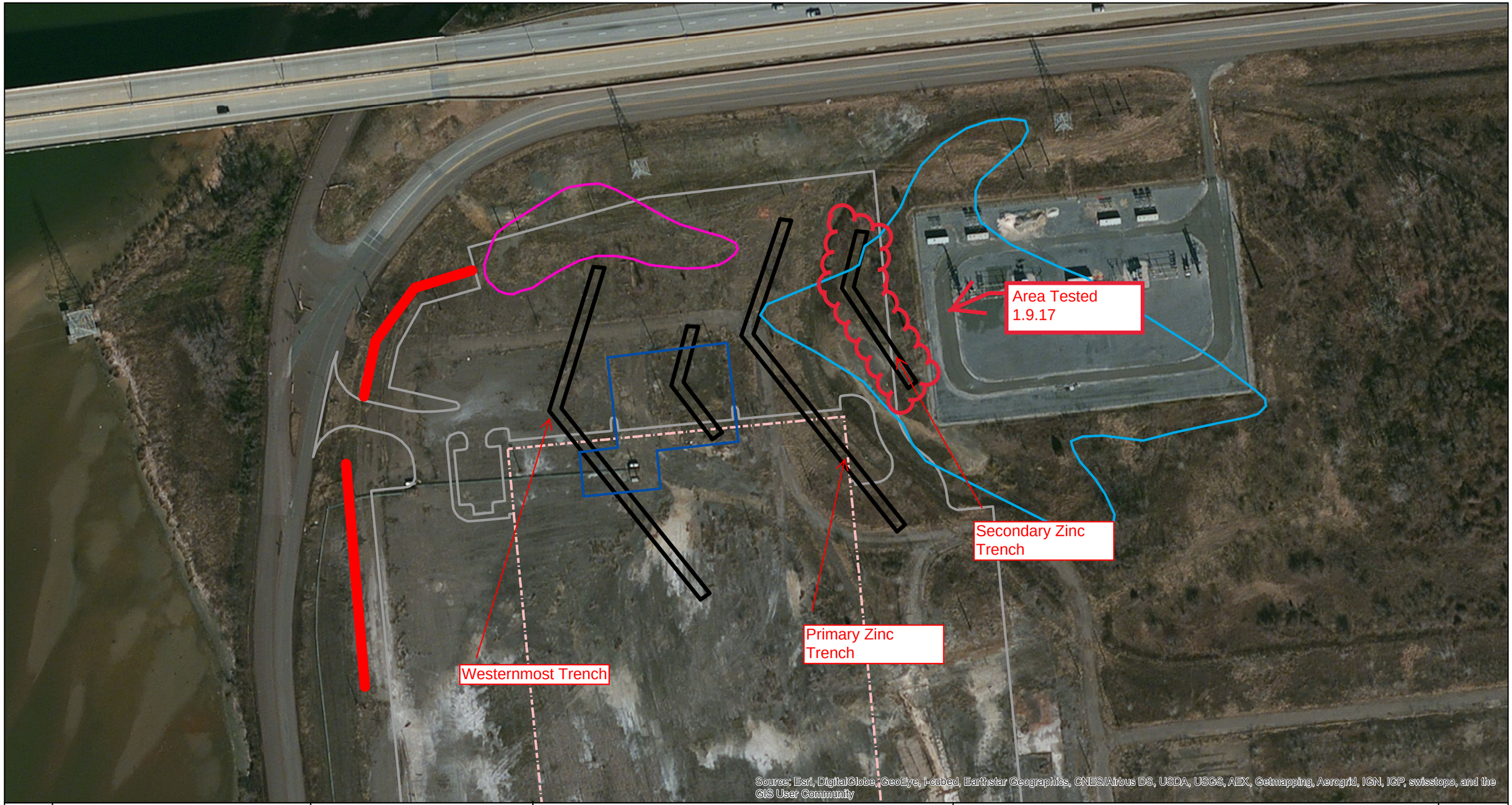
Nuclear Density Testing

C: Problems **Non-Compliance** ☐

N/A

D. Referenced Plans/Drawings

Verification: _____ **Reviewed By:** _____ **Technician:** James Wheelton



N

EnviroAnalytics Group

Environmental Engineers

0 100 200 Feet

Parcel A-3
Former Rod and Wire Mill Area

Contingency Treatment Trench Location

Legend

- Former East Pond
- Former Northwest Pond
- Former Sludge Bin Storage Area
- Proposed Treatment Trench Location
- Proposed Treatment Trench Contingency Loaction
- Proposed Building Footprint
- Proposed Paved Area

Figure

12

HILLIS-CARNES ENGINEERING ASSOCIATES, INC

NUCLEAR COMPACTION TEST DATA

Project Name: Area A-3 Reactive Wall Monitor

Job No:: 16728A

Date: 1.9.17

Taken By: James Wheelton

TEST NUMBER	1	2	3	4	5	6	7			
LOCATION	0+00	0+50	1+00	1+50	2+00	2+50	3+00			
OFFSET										
ELEVATION	SG	SG	SG	SG	SG	SG	SG			
DEPTH	8"	8"	8"	8"	8"	8"	8"			
DENSITY CT.	132	133	131	134	133	132	132			
WET DENSITY	131	132	130	132	131	130	131			
MOISTURE CT.	127	126	127	126	125	128	127			
MOISTURE PCF	4.5	4.1	4.8	4.7	4.4	4.5	4.6			
DRY DENSITY	127.31	128.16	126.46	128.28	127.18	126.21	127.06			
% MOISTURE	2.9	3	2.8	2.9	3	3	3.1			
MAX DENSITY	131.5	131.5	131.5	131.5	131.5	131.5	131.5			
OPT MOISTURE	2.6	2.6	2.6	2.6	2.6	2.6	2.6			
% COMPACTION	96.8	97.5	96.2	97.6	96.7	96	96.6			
MSTRE. CORR.										

ONE POINT PROCTOR VERIFICATION

1. WT. OF MOLD PLUS SOIL	13.9	13.8	13.7	13.5
2. WEIGHT OF MOLD	9.4	9.4	9.4	9.4
3. WT. OF WET SOIL IN MOLD(LINE 1 - LINE 2)	4.5	4.4	4.3	4.1
4. DENSITY OF SOIL IN MOLD(LINE 3 X 30)	135	132	129	123
5. DRY DENSITY OF SOIL IN MOLD LINE 4/(100 + LINE 12) X 100	125.58	120.11	116.11	109.43
6. MAXIMUM DRY DENSITY				

MOISTURE DETERMINATION

7. WEIGHT OF PAN	200	200	200	200
8. WT. WET SOIL & PAN	700	700	700	700
9. WT. DRY SOIL & PAN	665	655	650	645
10. WT. OF MOISTURE (LINE 8 - LINE 9)	35	45	50	55
11. WT. OF DRY SOIL - PAN (LINE 9 - LINE 7)	465	455	450	445
12. % MOISTURE (LINE 10 /LINE 11) X 100	7.5	9.9	11.1	12.4

GAUGE NUMBER:

DENSITY COUNT:

MOISTURE COUNT:

REMARKS:

V3.0

APPENDIX G

Monitoring Well Information

APPENDIX G-1

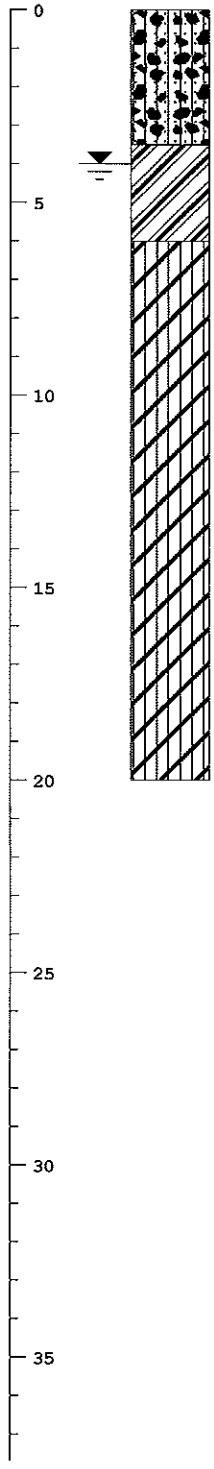
Advanced GeoServices Boring Logs

LOG OF TEST BORING

TEST BORING RW-01-MW(S)

DATE: 12/7/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward



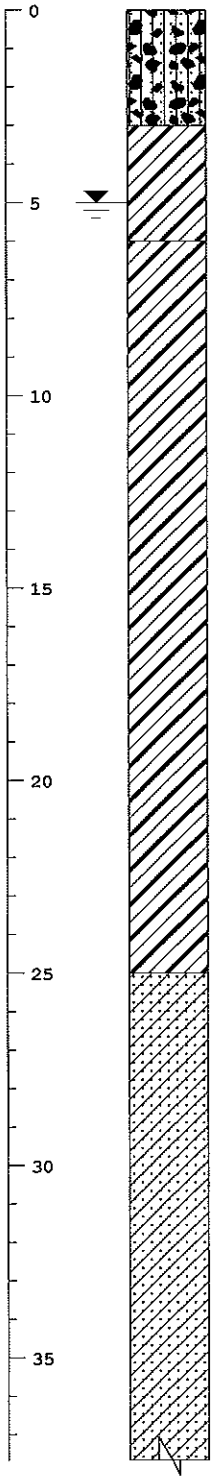
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description		SPT (N)	Moisture (%)	Other Tests
		Roots, gravel, sand, top fill, dark brown, moist, medium stiff.	0			
			3.5			
		Light brown sandy clay with trace gravel, stiff, wet.	-3.5			
			6.0			
		Light brown clay with trace sand, wet, medium stiff.	-6			
			20.0			
		Completion Depth = 20 feet END OF BORING @ 20.0 FT.	-20			

LOG OF TEST BORING

TEST BORING RW-01-MW(I)

DATE: 12/7/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 5.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Craig Petko



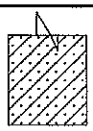
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Gravel and sand top fill, dark brown to black, moist and stiff, lots of drill chatter/grinding. 0			
		3.0 Tan to brown clay, trace fine gravel, wet, medium stiff. -3			
		6.0 Light brown clay, trace silt, wet medium stiff. -6			
		25.0 Medium tan, fine to medium sand, trace clay, wet. -25			

LOG OF TEST BORING

TEST BORING RW-01-MW(I)

DATE: 12/7/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 5.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Craig Petko

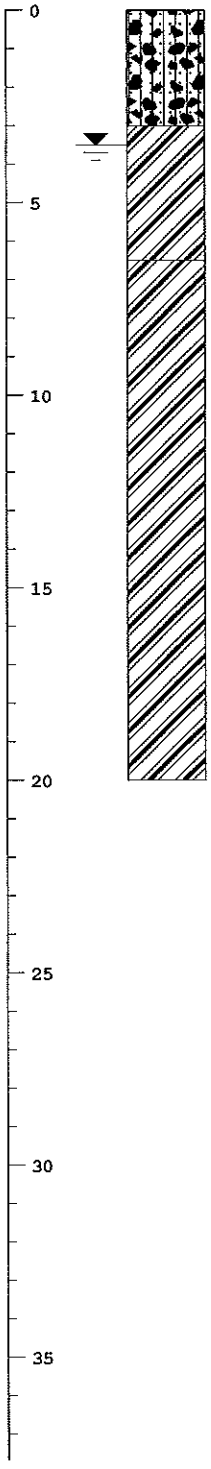
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0			
		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-02-MW(S)

DATE: 12/8/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 3.5 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward



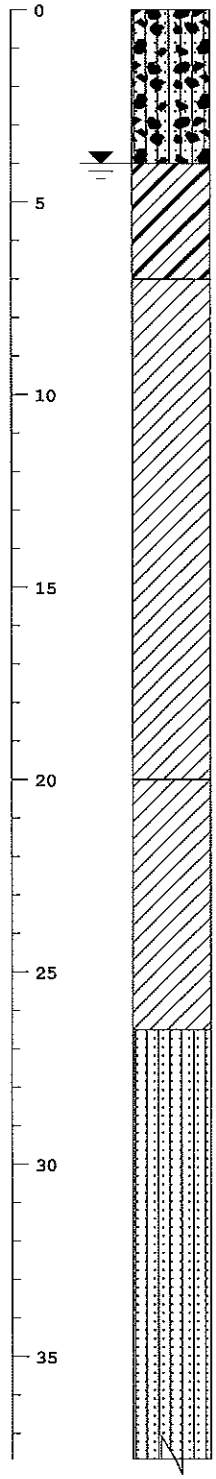
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description		SPT (N)	Moisture (%)	Other Tests
		Top fill gravel, sand, brown to dark brown, moist, medium stiff.	0			
			3.0			
		Light brown, gray clay with trace gravel and sand, wet, medium stiff.	-3			
			6.5			
		Tan brown clay with trace silt/sand, wet, medium stiff.	-6.5			
			20.0			
		Completion Depth = 20 feet END OF BORING @ 20.0 FT.	-20			

LOG OF TEST BORING

TEST BORING RW-02-MW(I)

DATE: 12/8/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward



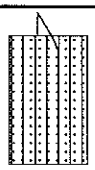
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
0		Fill, gravel, sand, roots, dark brown, moist.			
4.0 / -4		Light brown/tan clay with some gravel and medium sand.			
7.0 / -7		Yellow/brown clay, moist, stiff.			
20.0 / -20		Orange/brown clay with trace gravel, stiff, moist.			
26.5 / -26.5		Brown sand, fine to medium, very wet, trace silt, clay.			

LOG OF TEST BORING

TEST BORING RW-02-MW(I)

DATE: 12/8/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward

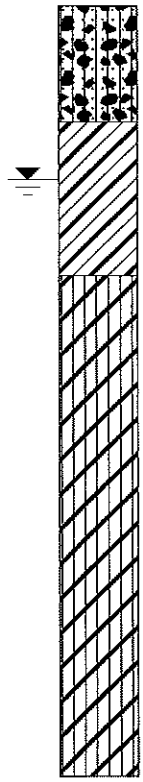
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		41.0			
		Completion Depth = 41 feet -41 END OF BORING @ 41.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-03-MW(S)

DATE: 12/9/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.5 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
0		Fill, gravel, sand, dark brown gray, moist, medium stiff clay. 0			
		3.0			
5		Light brown clay with medium sand and trace gravel, wet, medium stiff. -3			
		7.0			
10		Light brown clay with trace silt, medium stiff. -7			
15					
20		20.0			
		Completion Depth = 20 feet -20 END OF BORING @ 20.0 FT.			
25					
30					
35					

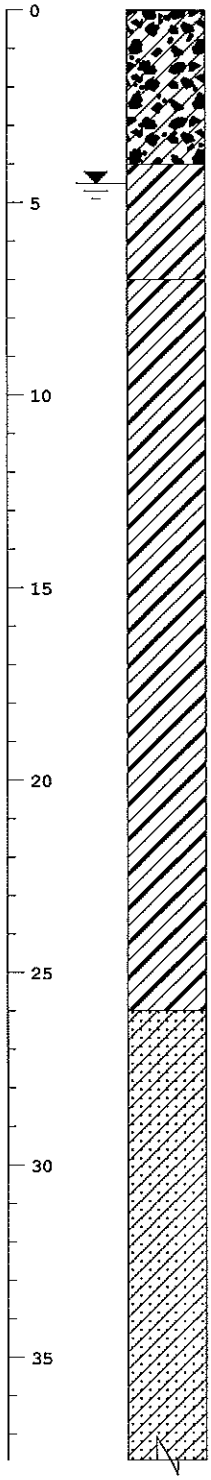
LOG OF TEST BORING

TEST BORING RW-03-MW(I)

DATE: 12/9/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.5 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
0		Fill, gravel, sand, dark brown/gray clay, moist, medium stiff. 0			
		4.0			
-4		Orange/brown clay with fine to medium sand, wet, medium stiff.			
		7.0			
-7		Light brown clay with trace silt and sand, wet, medium stiff.			
		26.0			
-26		Tan/brown sand, fine to medium, wet with trace clay and silt.			

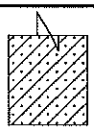


LOG OF TEST BORING

TEST BORING RW-03-MW(I)

DATE: 12/9/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.5 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward

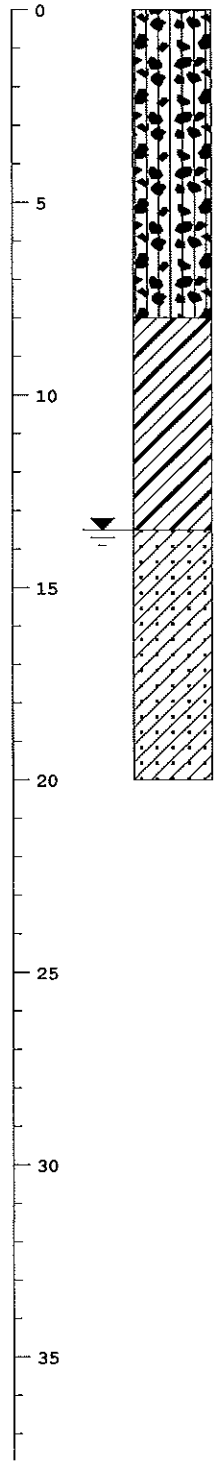
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0			
		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-07-MW(S)

DATE: 12/14/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 13.5 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



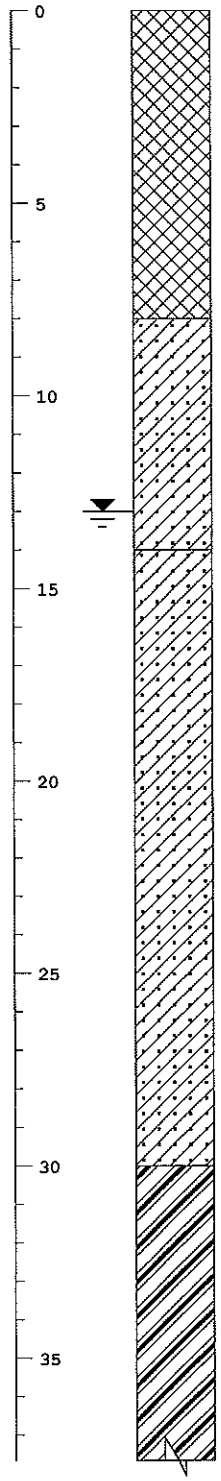
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Dark brown/black fill/silty gravel with slag. 0			
		8.0 -8 Dark brown, moist sandy clay with trace gravel, medium stiff.			
		13.5 -13.5 Dark gray sand with trace clay, wet.			
		20.0 -20 Completion Depth = 20 feet END OF BORING @ 20.0 FT.			

LOG OF TEST BORING

TEST BORING RW-07-MW(I)

DATE: 12/13/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 13.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: C. Petko



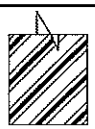
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Fill, black to dark brown silty gravel, moist, grinding noise. 0			
		Very hard augering @ 4.0 ft.			
		8.0 -8 Tan to brown clayey sand, moist, loose.			
		14.0 -14 Dark gray clayey sand, loose.			
		30.0 -30 Clay with fine to medium sand.			

LOG OF TEST BORING

TEST BORING RW-07-MW(I)

DATE: 12/13/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 13.0 ft.

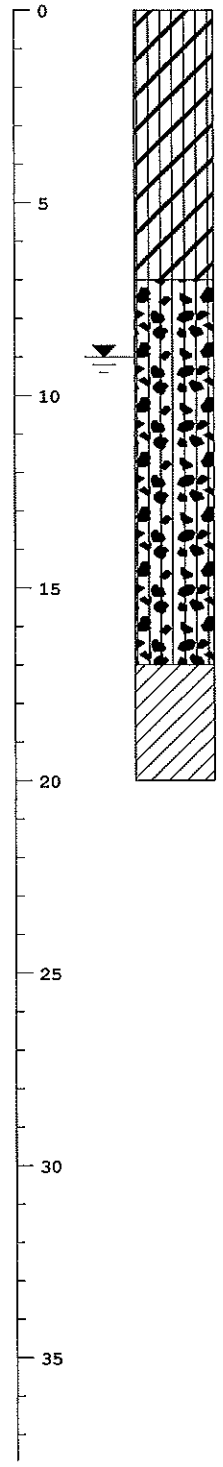
PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: C. Petko

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0			
		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING
TEST BORING RW-08-MW(S)

DATE: 12/13/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 9.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Craig Petko

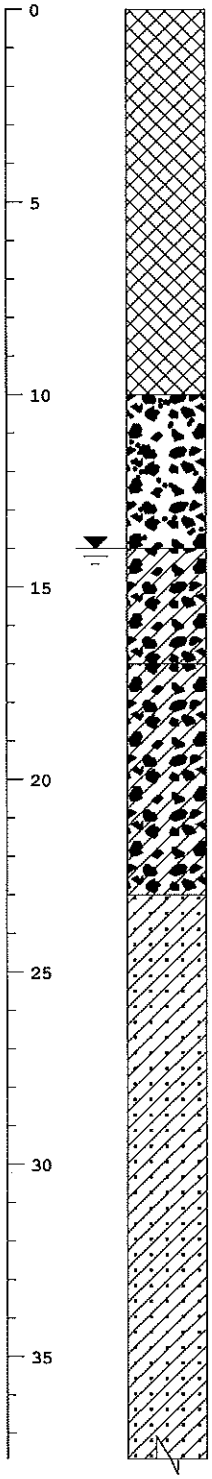


ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Fill, dark brown silty clay, moist, stiff, some roots and gravel. 0			
		Hard drilling.			
		7.0 -7 Dark brown, gravel and silt, stiff to medium stiff, moist.			
		Wet @ 9.0 ft.			
		17.0 -17 Tan to light brown sand, some silt, wet, loose.			
		20.0 -20 Completion Depth = 20 feet END OF BORING @ 20.0 FT.			

LOG OF TEST BORING
TEST BORING RW-08-MW(I)

DATE: 12/9/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 14.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward



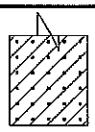
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Fill, dark brown/gray clay, moist, stiff with roots, gravel, slag. 0			
		Dark gray gravel, slag, very hard. 10.0 -10			
		Gray/brown clay with slag, gravel, moist. 14.0 -14			
		Wet, clayey gravel with medium sand, dark gray. 17.0 -17			
		Dark gray, wet clay with medium sand and gravel. 23.0 -23			

LOG OF TEST BORING

TEST BORING RW-08-MW(I)

DATE: 12/9/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 14.0 ft.

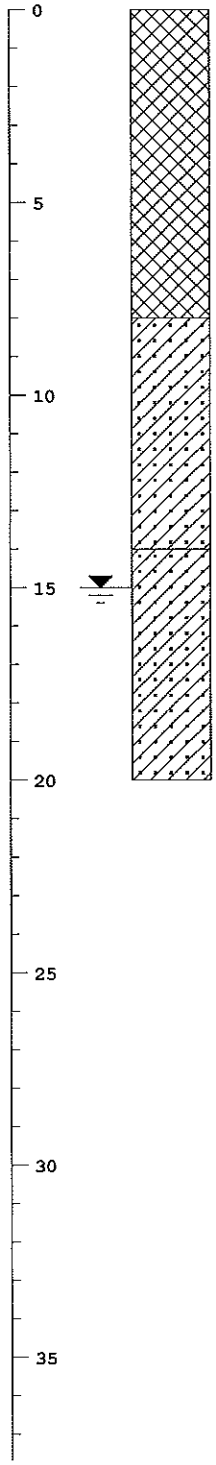
PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: Scott Ward

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0			
		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING
TEST BORING RW-09-MW(S)

DATE: 12/16/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 15.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



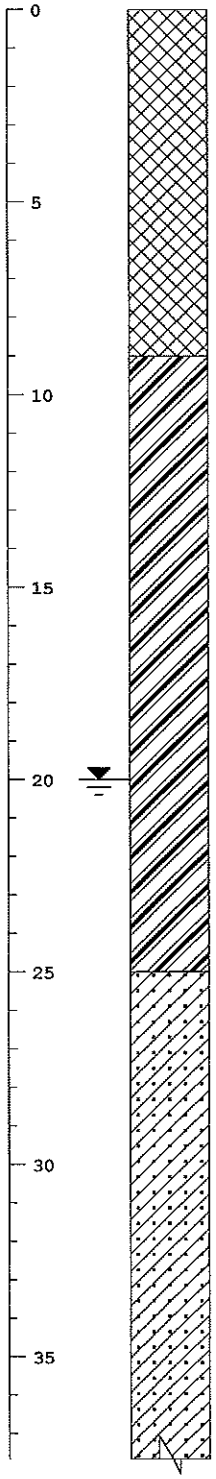
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Dark brown/black fill, silty gravel, slag, debris. 0			
		8.0 -8 Gray/brown clay with medium sand, medium stiff.			
		14.0 -14 Brown, wet, medium stiff clay with medium sand.			
		20.0 -20 Completion Depth = 20 feet END OF BORING @ 20.0 FT.			

LOG OF TEST BORING

TEST BORING RW-09-MW(I)

DATE: 12/15/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 20.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



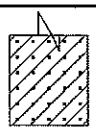
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Gray/black slag with gravel and clay. 0			
		9.0 -9 Becoming more wet @ 9.0 ft. Brown, medium stiff, wet clay with trace sand and gravel.			
		More wet @ 20.0 ft.			
		25.0 -25 Becoming more sandy, fine to medium sand, trace clay.			

LOG OF TEST BORING

TEST BORING RW-09-MW(I)

DATE: 12/15/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 20.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

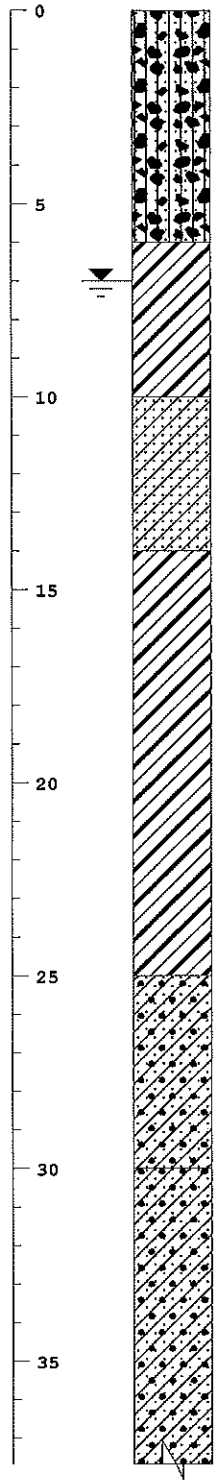
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0 -40 Completion Depth = 40 feet END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-10-MW(I)

DATE: 12/21/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 7.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Gravel and sand, slag top fill, dark brown, stiff. 0			
		Auger chattering @ 3.0 ft.			
		6.0			
		Dark gray/black clay, trace sand and gravel, wet, medium dense. -6 Becoming more wet.			
		10.0			
		Light brown sandy clay, moist, medium dense. -10			
		14.0			
		Light brown/gray clay, moist, medium dense with trace gravel. -14			
		Becoming more wet @ 20.0 ft.			
		25.0			
		Brown/yellow sand, wet with trace clay, medium to fine sand. -25			
		30.0			
		Sand, more brown in color, more medium sand. -30			

LOG OF TEST BORING

TEST BORING RW-10-MW(I)

DATE: 12/21/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 7.0 ft.

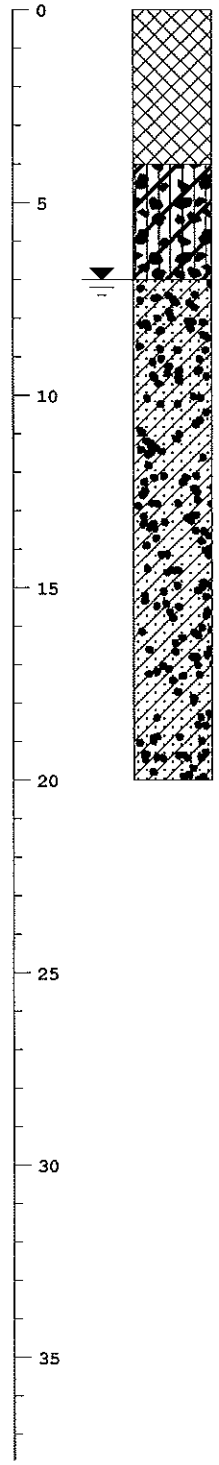
PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		40.0			
40		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING
TEST BORING RW-11-MW(S)

DATE: 12/19/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 7.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



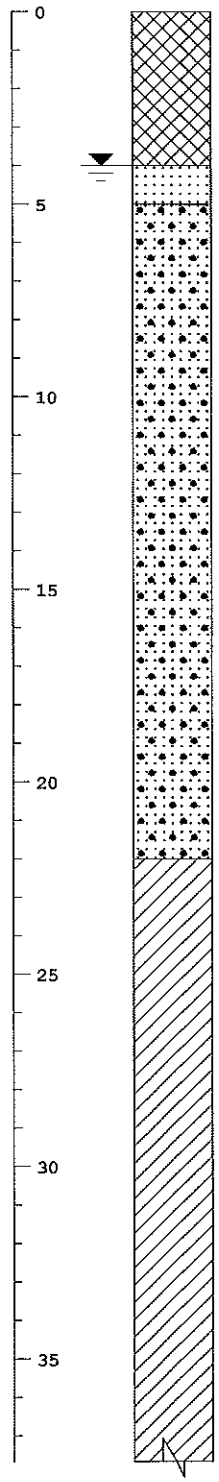
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Dark brown fill, clay, medium stiff with gravel, slag. 0			
		4.0			
		Gray/black silty clay with gravel, stiff. -4			
		7.0			
		Brown, medium stiff, wet, clay with trace sand and gravel. -7			
		More wet.			
		20.0			
		Completion Depth = 20 feet -20 END OF BORING @ 20.0 FT.			

LOG OF TEST BORING

TEST BORING RW-13-MW(I)

DATE: 12/22/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike Waller
INSPECTOR: E. Ewald



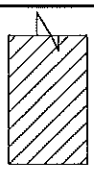
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Fill. 0			
		4.0			
		Light brown sand with gravel, wet. -4			
		5.0			
		Light brown/orange sand, coarse grained, no gravel, wet. -5			
		22.0			
		Light gray clay with coarse grained sand and some gravel, wet, stiff. -22			

LOG OF TEST BORING

TEST BORING RW-13-MW(I)

DATE: 12/22/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 4.0 ft.

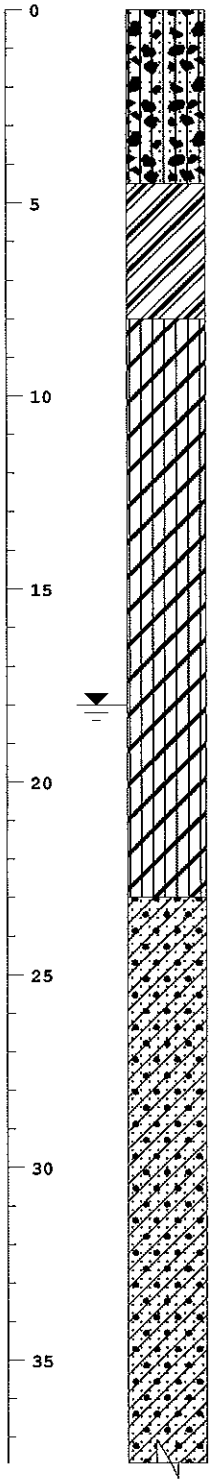
PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike Waller
INSPECTOR: E. Ewald

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		41.0			
		Completion Depth = 41 feet -41 END OF BORING @ 41.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING
TEST BORING RW-15-MW(I)

DATE: 12/21/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 18.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



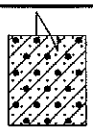
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Dark gray/black top fill, slag and gravel with coarse sand and trace clay. Auger chattering at 1.5 to 2.0 ft. 0 / 4.5			
		Brown firm clay with firm gravel and trace sand. -4.5 / 8.0			
		Light brown sandy clay with trace silt, moist, medium dense/stiff. -8			
		Wet @ 13.0 ft.			
		23.0			
		Tan sand, fine, wet, trace clay. -23			
		More wet @ 30.0 ft.			

LOG OF TEST BORING

TEST BORING RW-15-MW(I)

DATE: 12/21/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 18.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

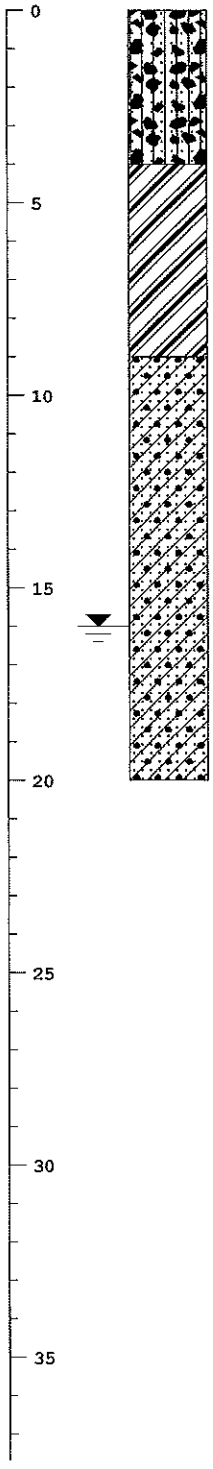
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0 -40 Completion Depth = 40 feet END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-16-MW(S)

DATE: 12/20/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 16.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

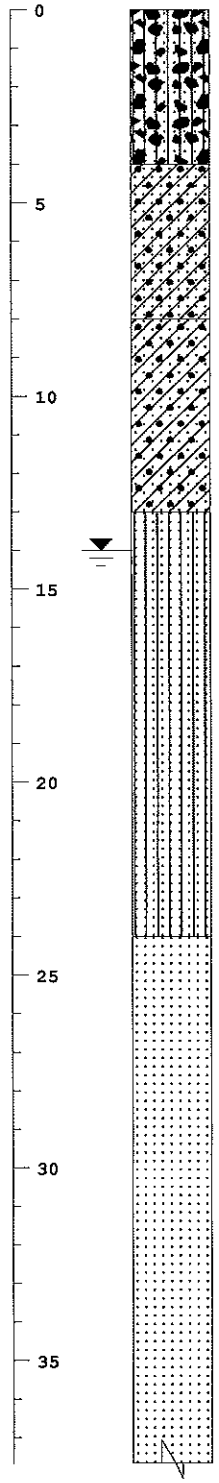


ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Gravel and sand with slag, top fill, dark brown to black, moist, stiff. Auger chattering @ 1.5 ft. 0 / 4.0			
		Tan to brown firm clay and trace gravel, wet, medium stiff. -4 / 9.0			
		Gray/black medium sand with trace silt and clay. -9 / 20.0			
		Completion Depth = 20 feet -20 END OF BORING @ 20.0 FT.			

LOG OF TEST BORING
TEST BORING RW-16-MW(I)

DATE: 12/20/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 14.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Dark brown/black fill, gravel and sand, moist. 0			
		4.0			
		Dark brown/black medium sand with clay and gravel, moist. -4			
		8.0			
		Brown/yellow clayey sand, wet with some gravel. -8			
		13.0			
		Gray/brown sand with trace silt. -13			
		24.0			
		Tan sand, fine to medium, wet. -24			

LOG OF TEST BORING

TEST BORING RW-16-MW(I)

DATE: 12/20/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 14.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

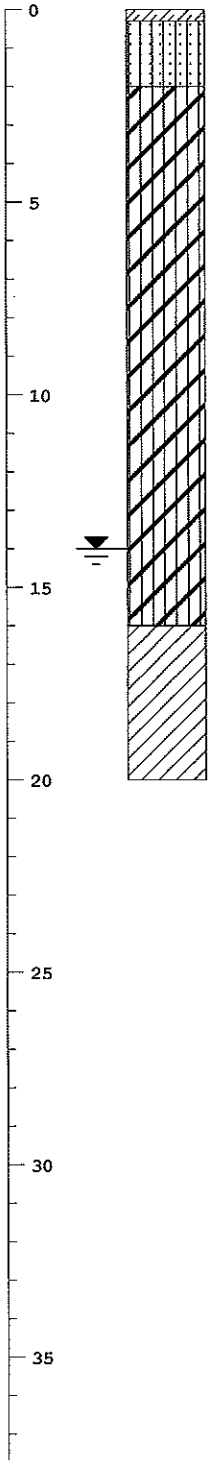
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		40.0			
40		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

LOG OF TEST BORING

TEST BORING RW-19-MW(S)

DATE: 12/20/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 14.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

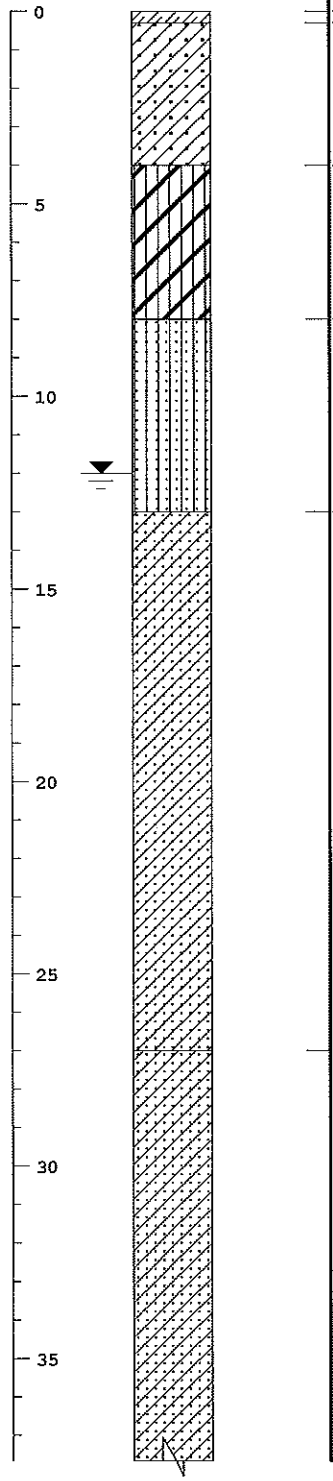


ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description		SPT (N)	Moisture (%)	Other Tests
		Dark brown clay with roots and organic matter.	0			
		Reddish brown, sandy silt, medium dense.	0.3 -0.3			
		Yellow/brown, silty clay, medium stiff.	2.0 -2			
			16.0			
		Brown, wet sand with trace silt.	-16			
			20.0			
		Completion Depth = 20 feet END OF BORING @ 20.0 FT.	-20			

LOG OF TEST BORING
TEST BORING RW-19-MW(I)

DATE: 12/19/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 12.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward



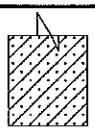
ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
		Tan/brown clay with roots. 0			
		Light brown sandy clay. 0.3 -0.3			
		Medium stiff, yellow/brown silty clay. 4.0 -4			
		Gray/brown sandy silt with some clay, medium dense. 8.0 -8			
		Light brown sand with clay and trace silt, medium to fine sand. 13.0 -13			
		Medium to fine sand, wet, trace clay/silt, yellow/tan. 27.0 -27			

LOG OF TEST BORING

TEST BORING RW-19-MW(I)

DATE: 12/19/16
PROJECT: Sparrows Point
BORING LOCATION:
DRILLING METHOD: Hollow Stem Auger
DRILLING COMPANY: Allied Well Drilling
WATER ENCOUNTERED AT: 12.0 ft.

PROJECT NO.: 2016-3421
SURFACE ELEVATION:
CHECKED BY:
DRILLER: Mike
INSPECTOR: S. Ward

ELEVATION / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS BLOWS PER 6 INCHES	Soil Description	SPT (N)	Moisture (%)	Other Tests
40		40.0			
		Completion Depth = 40 feet -40 END OF BORING @ 40.0 FT.			
45					
50					
55					
60					
65					
70					
75					

APPENDIX G-2

ARM Group Boring Logs

ARM Group Inc.
Earth Resource Engineers and Consultants

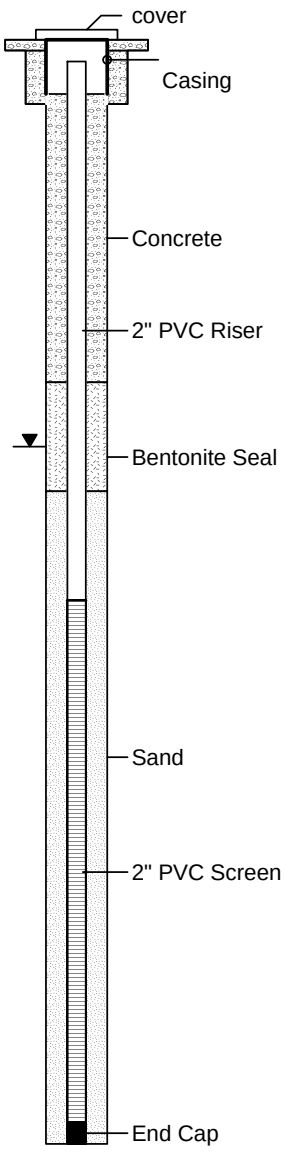
Well ID: RW01-MWS

(page 1 of 1)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,519.11
Easting (ft)	: 1,455,952.45
Date/Time Started	: 7/28/17 / 0840
Date/Time Completed	: 7/28/17 / 1125
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 20.0' (TOC)
Depth to Water (ft)	: 8.23' (TOC) / 7/28/17
Depth to Water (ft)	: 7.48' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	-	-	-	(0-0.5') ASPHALT	NA
	1-67	0.1	25 27 15	(0.5-4.5') SLAG GRAVEL with SAND, dense, dark brown to brownish gray with trace yellow, dry then moist, non plastic, non cohesive	GW/SW
2	2-75	1.1	11 18 27 25		
4	3-50	1.7	15 19 7 4	(4.5-6.5') SLAG GRAVEL with SAND and trace CLAY lenses, dense, dark brown to brownish gray with trave yellow, moist, non plastic, non cohesive	GW/SW
6	4-55	0.1	3 4 5 5	(6.5-8.6') CLAY, very firm, reddish yellow grading to light brownish grey with reddish yellow mottling, moist to dry, low placticity, cohesive	CL
8	5-70	0.0	2 4 5 6	(8.6-12') CLAY, hard grading to soft, light gray to light brown with reddish yellow mottling, dry grading to moist, low placticity, cohesive	CL
10	6-100	0.0	5 7 5 5		
12	7-100	0.0	3 4 4 6	(12-13.8') CLAY with trace SAND, hard grading to soft, light gray to light brown with reddish yellow mottling, dry grading to very moist, medium plasticity, cohesive	CL
14	8-100	3.3	W W 1 3	(13.8-17.5') SAND with trace CLAY, very fine to medium grained with trace coarse grained, medium dense, light brown with reddish yellow and trace light gray, moist, non plastic, non cohesive	SW
16	9-100	1.2	1 2 2 3		
18	10-90	6.7	2 1 1 2	(17.5-19.5') SAND with trace CLAY, very fine to medium grained with trace coarse grained, medium dense, brownish gray, moist, non plastic, non cohesive	SW
20				(19.5-20') CLAY, hard, gray, moist, low placticity, cohesive	CL
22				END OF BORING	



COMPLETION DETAILS

10" Protective Steel Casing w/Locking Lid
1' x 1' concrete pad
2" expandable-type cap

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -0.3'

Bentonite Seal:
Top: 6.3' bgs Bottom: 8.3' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 10.3' bgs
Bottom: 20.3' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 8.3' bgs
Bottom: 20.3' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 27 gal.
Well Volumes Removed: 13.44

ARM Group Inc.
Earth Resource Engineers and Consultants

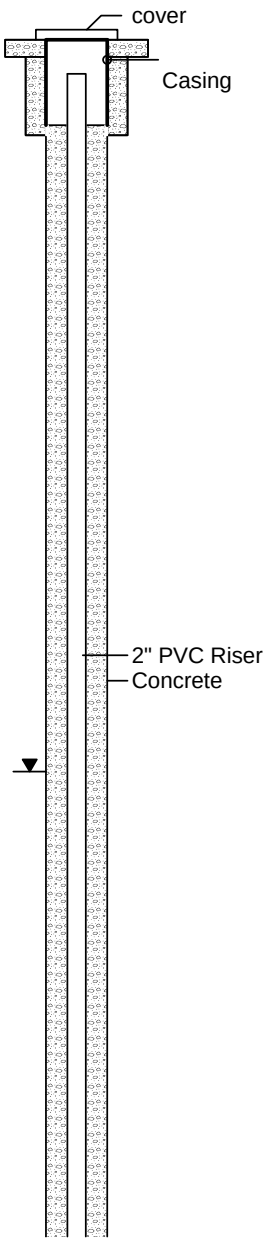
Well ID: RW01-MWI

(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,516.28
Easting (ft)	: 1,455,951.98
Date/Time Started	: 8/1/17 / 0900
Date/Time Completed	: 8/1/17 / 1704
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 7.76' (TOC) / 8/1/17
Depth to Water (ft)	: 7.42' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	-	-	-	(0-0.5') ASPHALT, dry, non plastic, non cohesive	NA
	1-73	4.8	27 37 50	(0.5-4.6') SLAG, SAND and GRAVEL-sized, with trace BRICK GRAVEL, fine to coarse grained, dense, brown, gray, and dark brown with traces of yellow, dry, non plastic, non cohsive	SW/GW
2	2-80	2.2	14 23 24		
4	3-60	0.4	13 25 10 3	(4.6-6.2') CLAY, very firm, light gray to reddish yellow mottling, moist, low plasticity, cohesive	CL
6	4-60	0.1	3 2 5 5	(6.2-9.2') Non-native SAND with SLAG GRAVEL and trace SILT, fine to coarse grained SLAG GRAVEL, medium dense to dense, dark brown to very dark gray, wet, non plastic, non cohesive	SW/GW
8	5-25	0.1	2 5 7 6	(9.2-14') CLAY, firm grading to soft, light gray with reddish yellow mottling, moist grading to very moist, medium plasticity, cohesive	
10	6-75	0.2	5 6 6 5		CL
12	7-80	0.3	3 3 4 4		
14					



COMPLETION DETAILS

10" Protective Steel Casing
w/Locking Lid
1' x 1' concrete pad
2" expandable-type cap

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -0.4'

Bentonite Seal:
Top: 26.3' bgs
Bottom: 28.3' bgs

Sand Blotter: Size 000
Top: 28.3' bgs
Bottom: 28.8' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 30.8' bgs
Bottom: 40.8' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 28.8' bgs
Bottom: 40.8' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 9.24

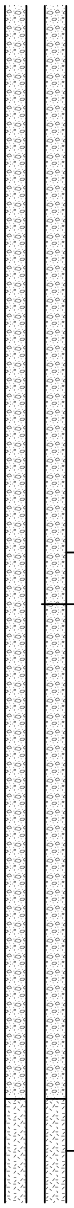
ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW01-MWI

(page 2 of 3)

Project Name	: A3 Well Installation	Northing (ft)	: 571,516.28
Project Number	: 170285M-4-1	Easting (ft)	: 1,455,951.98
Client	: EnviroAnalytics Group	Date/Time Started	: 8/1/17 / 0900
Site	: Sparrow's Point	Date/Time Completed	: 8/1/17 / 1704
Borehole Location	: Parcel A3	Surf. Elev. (ft AMSL)	:
ARM Representative	: L. Perrin	TOC Elev. (ft AMSL)	:
Checked by	: M. Replogle	Total Well Depth (ft)	: 40.4' (TOC)
Drilling Company	: Allied Well Drilling	Depth to Water (ft)	: 7.76' (TOC) / 8/1/17
Driller	: M. Waller	Depth to Water (ft)	: 7.42' (TOC) / 8/3/17
Drilling Equipment	: Diedrich-D120	Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
14	8-75	65.6	W 1 1 2	(14-17.5') SAND, fine to medium grained, medium dense, very pale brown to reddish yellow, wet, non plastic, non cohesive	SW
16	9-100	15000	1 2 3 3		
18	10-80	15000	W W 1 2	(17.5-18.3') SAND with SILT, fine to medium grained, medium dense, gray, wet, non plastic, non cohesive	SW-SM
				(18.3-18.6') CLAYEY SAND, medium dense, gray, wet, non plastic, non cohesive	SC
				(18.6-20.5') CLAY, firm, gray, moist, low placticity, cohesive	CL
20	11-45	146.6	2 2 3 2	(20.5-22') CLAY, firm o very firm, grayish brown, moist, low plasticity, cohesive	CL
22	12-65	122.6	2 2 5 8	(22-33.7') SAND with GRAVEL, medium to very coarse grained SAND and fine grained GRAVEL, medium dense to loose, very pale brown with traces of white grading to reddish yellow at 32.5' bgs, wet, non plastic, non cohesive	SW/GW
24	13-65	5.1	W W 1 3		
26	14-100	4.3	4 4 8 11		
28					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 9.24

ARM Group Inc.
Earth Resource Engineers and Consultants

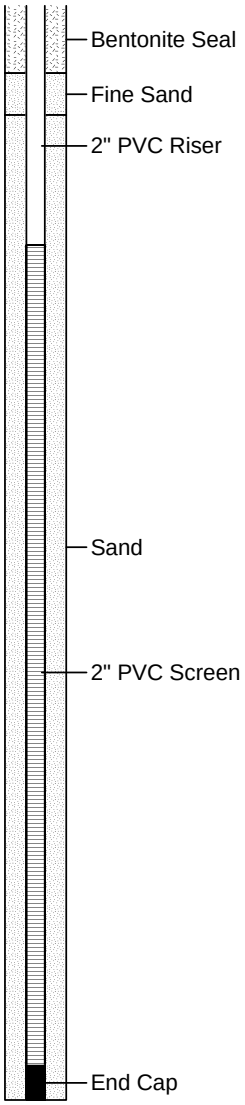
Well ID: RW01-MWI

(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,516.28
Easting (ft)	: 1,455,951.98
Date/Time Started	: 8/1/17 / 0900
Date/Time Completed	: 8/1/17 / 1704
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 7.76' (TOC) / 8/1/17
Depth to Water (ft)	: 7.42' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
28					
	15-50	12.8	2 4 9 12		
30					
	16-75	2.5	6 10 5 5		SW/GW
32					
	17-90	2.0	2 4 3 4		
34				(33.7-34') SILTY CLAY with trace SAND, firm, gray, moist, low placticity, cohesive	CL
	18-100	1.6	2 2 1 4	(34-35') SANDY SILT, firm, gray, very moist, low plasticity, cohesive (35-38') SILT alternating with SANDY SILT, soft to firm, gray, very moist, low placticity, cohesive	ML
36					
	19-100	0.0	3 5 4 7		ML
38					
	20-100	0.0	8 12 15 13	(38-40') SAND, fine to medium grained, medium density, light brown, wet, non plastic, non cohesive	SW
40				END OF BORING	
42					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 9.24

ARM Group Inc.
Earth Resource Engineers and Consultants

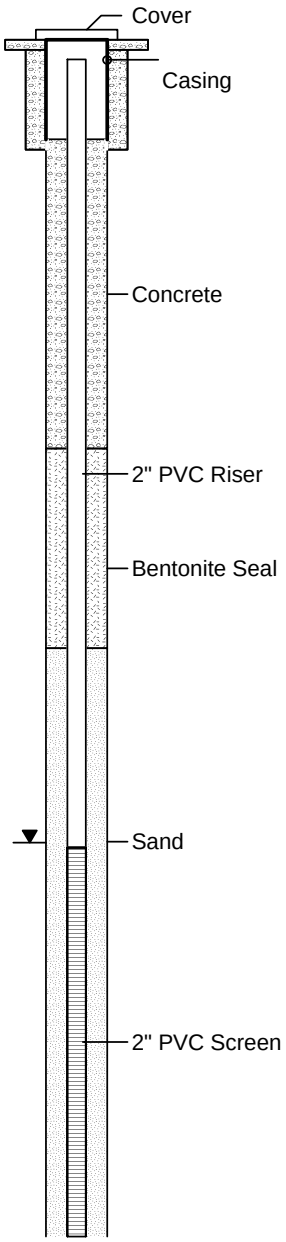
Well ID: RW02-MWS

(page 1 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,673.09
Easting (ft)	: 1,455,933.62
Date/Time Started	: 7/27/17 / 1238
Date/Time Completed	: 7/27/17 / 1550
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 17.9' (TOC)
Depth to Water (ft)	: 3.70' (TOC) / 7/27/17
Depth to Water (ft)	: 8.00' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-100	26.1	37 50/3	(0-5.8') SAND with SLAG GRAVEL, fine to medium grained SAND and fine grained SLAG GRAVEL, dense, grayish brown and gray with traces of red, dry, non plastic, non cohesive	SW/GW
2	2-100	8.1	30 5/1		
4	3-40	0.0	13 5 5 4		
6	4-100	0.0	3 7 7 8	(5.8-8') CLAY, very firm to hard, yellowish red with gray streaks grading to gray with trace yellowish red, dry, low plasticity, cohesive	CL
8	5-100	0.0	2 3 5 4	(8-13.7') CLAY with SANDY CLAY 13.5-13.7', firm grading to soft, brownish gray grading to grayish brown, moist grading to very moist, low plasticity grading to medium plasticity, cohesve	CL
10	6-100	0.0	4 5 4 4		
12					



COMPLETION DETAILS

10" Protective Steel Casing
w/Locking Lid
1' x 1' concrete pad
2" expandable-type cap

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -0.2'

Bentonite Seal:
Top: 4.1' bgs
Bottom: 6.1' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 8.1' bgs
Bottom: 18.1' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 6.1' bgs
Bottom: 18.1' bgs

Bore hold collapsed from 18.1' bgs to 20' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 11.5 gal.
Well Volumes Removed: 7.11

ARM Group Inc.
Earth Resource Engineers and Consultants

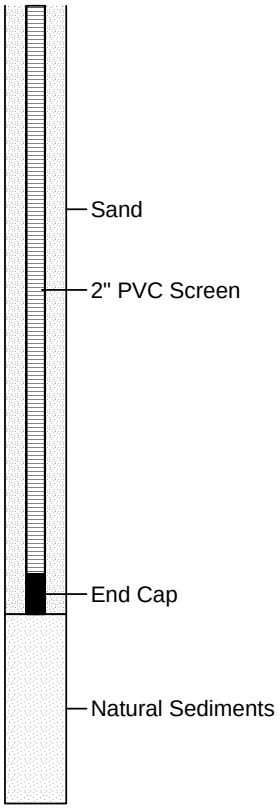
Well ID: RW02-MWS

(page 2 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,673.09
Easting (ft)	: 1,455,933.62
Date/Time Started	: 7/27/17 / 1238
Date/Time Completed	: 7/27/17 / 1550
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 17.9' (TOC)
Depth to Water (ft)	: 3.70' (TOC) / 7/27/17
Depth to Water (ft)	: 8.00' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
12	7-100	0.0	2 5 7 8		CL
14	8-100	0.0	W W 2 3	(13.7-17.6') SAND, fine to medium grained, medium dense, very pale brown with reddish yellow mottling, wet, non plastic, non cohesive	SW
16	9-100	0.0	3 3 4 6		
18	10-100	0.0	4 4 2 2	(17.6-18') SAND, fine to coarse grained, dense, light brownish gray, wet, non plastic, non cohesive	SW
				(18-19.1) SAND, fine to medium grained, medium dense, very pale brown with reddish yellow mottling, wet, no plasticity, no cohesion	SW
				(19.1-20') SAND, dense, fine to coarse, dense, light brownish gray, wet, non plastic, non cohesive	SW
20				END OF BORING	
22					
24					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 11.5 gal.
Well Volumes Removed: 7.11

ARM Group Inc.
Earth Resource Engineers and Consultants

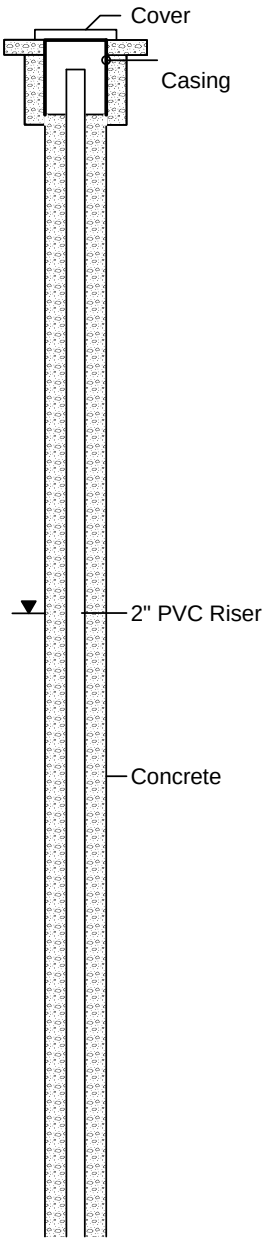
Well ID: RW02-MWI

(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,668.99
Easting (ft)	: 1,455,933.21
Date/Time Started	: 7/31/17 / 0850
Date/Time Completed	: 7/31/17 / 1753
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 36.3' (TOC)
Depth to Water (ft)	: 7.44' (TOC) / 7/28/17
Depth to Water (ft)	: 7.67' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	-	-	-	(0-0.5') ASPAHLT	NA
	1-80	0.0	27 23 22	(0.5-4.8') SAND with SLAG GRAVEL, medium to very coarse grained, dense, brown and gray, dry, non plastic, non cohesive	SW/GW
2	2-75	0.0	13 23 39 21		
4	3-60	0.0	8 3 4 4	(4.8-5.3') SLAG GRAVEL with SAND, medium dense, dark brown with trace yellowish red, very moist, non plastic, non cohesive, light sweet odor	GW/SW
6	4-90	0.0	7 6 8 10	(5.3-8') CLAY, hard, light gray with trace reddish yellow, moist, low plasticty, cohesive	CL
8	5-100	0.0	2 4 4 3	(8-13') CLAY, hard to firm, light gray and reddish yellow mottling, dry to very moist, medium plasticity, cohesive	
10	6-100	0.0	4 5 4 4		CL
12	7-100	0.0	5 7 7 7	(13-13.6') SANDY CLAY, soft, light gray, very moist, low plasticity, cohesive	CL
14	8-100	0.0	1 2 3 3	(13.6-17') SAND, fine to medium grained, medium dense. light gray, pale brown and reddish yellow, wet, non plastic, non cohesive	SW
16					



COMPLETION DETAILS

10" Protective Steel Casing
with Locking Lid
0.83' x 0.83' Concrete Pad
2" expandable-type cap

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -0.4'

Bentonite Seal:
Top: 22.2' bgs
Bottom: 24.2' bgs

Sand Blotter: Size 000
Top: 24.2' bgs
Bottom: 24.7' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 26.7' bgs
Bottom: 36.7' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 24.7' bgs
Bottom: 36.7' bgs

Bore hole collapsed from 36.7' bgs to 40' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.77

ARM Group Inc.
Earth Resource Engineers and Consultants

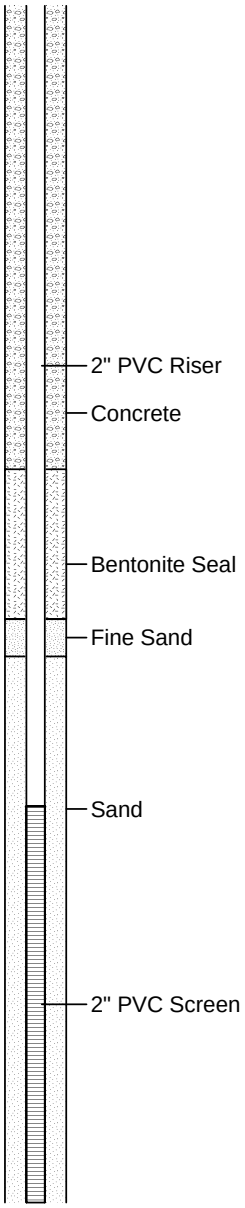
Well ID: RW02-MWI

(page 2 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,668.99
Easting (ft)	: 1,455,933.21
Date/Time Started	: 7/31/17 / 0850
Date/Time Completed	: 7/31/17 / 1753
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 36.3' (TOC)
Depth to Water (ft)	: 7.44' (TOC) / 7/28/17
Depth to Water (ft)	: 7.67' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
16	9-100	0.0	3 3 4 4		SW
18	10-100	0.0	1 1 1 2	(17-21.8') SAND with SILTY SAND from 19.5 to 20' bgs, fine to medium grained, medium dense, grayish brown, wet, non plastic, non cohesive	SW
20	11-100	0.0	2 3 2 3		
22	12-100	0.0	2 4 2 3	(21.8-25.6') CLAY, very firm, grayish brown, moist, low plasticity, cohesive	CL
24	13-100	0.0	1 5 5 9		
26	14-100	0.0	3 6 6 7	(25.6-27.1') SAND, fine to coarse grained, medium dense, pale brown and reddish yellow, wet, non plastic, non cohesive	SW
28	15-100	0.0	1 4 5 6	(27.1-28') SAND with GRAVEL, fine to very coarse grained SAND and fine grained GRAVEL, dense, very pale brown, wet, non plastic, non cohesive	SW/GW
30	16-100	0.0	6 5 3 5	(28-34') SAND and GRAVEL, fine to coarse grained SAND with trace fine grained GRAVEL, pale brown with trace reddish yellow then light gray and reddish brown from 31.3 to 32' bgs and light brown from 32 to 34' bgs, wet, non plastic, non cohesive	SW
32					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.77

ARM Group Inc.
Earth Resource Engineers and Consultants

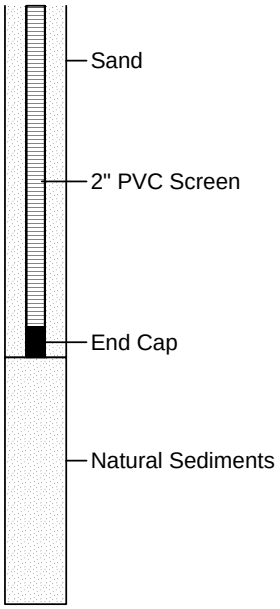
Well ID: RW02-MWI

(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,668.99
Easting (ft)	: 1,455,933.21
Date/Time Started	: 7/31/17 / 0850
Date/Time Completed	: 7/31/17 / 1753
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 36.3' (TOC)
Depth to Water (ft)	: 7.44' (TOC) / 7/28/17
Depth to Water (ft)	: 7.67' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
32	17-100	0.0	5 5 4 4		SW
34	18-100	0.0	2 8 10 12	(34-35') SAND, fine to medium grained, medium dense, grayish brown, wet, non plastic, non cohesive	SW
				(35-35.5') SANDY SILT, soft, gray, wet, low plasticity, cohesive	ML
36	19-100	0.0	7 10 6 8	(35.5-37') SAND with SILT, fine to medium grained, dense, gray and brown from 36' to 37' bgs, wet, non plastic, non cohesive	SW-SM
				(37-37.5') SANDY SILT, soft, gray, low plasticity, cohesive	ML
38	20-100	0.0	1 2 5 5	(37.5-40') SAND with SILT and trace coarse grained GRAVEL, medium dense to dense, gray, wet, non plastic, non cohesive	SW-SM
40				END OF BORING	
42					
44					
46					
48					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.77

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW13-MWI

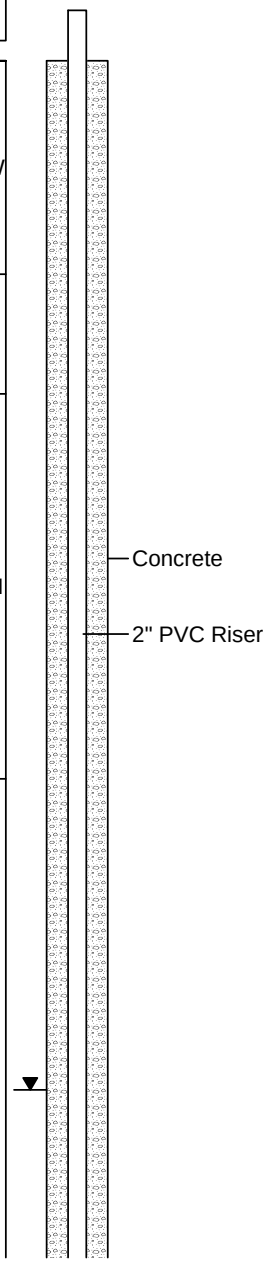
(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,111.23
Easting (ft)	: 1,456,415.26
Date/Time Started	: 7/19/17 / 1545
Date/Time Completed	: 7/21/17 / 1115
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 42' (TOC)
Depth to Water (ft)	: 11.10' (TOC) / 7/21/17
Depth to Water (ft)	: 10.74' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-40	0.0	2 3 4 5	(0-2.5') SLAG, SAND and GRAVEL-sized, medium dense, light gray to gray, dry, non plastic, non cohesive	SW/GW
2	2-100	0.0	4 4 6 6	(2.5-3.9') SILTY SAND, very fine to medium grained, dense, yellowish red, moist, non plastic, non cohesive	SM
4	3-100	0.0	5 9 9 9	(3.9-8.4') SAND with SILT, very fine to medium grained, medium dense to dense, yellowish red, moist, non plastic, non cohesive	SW-SM
6	4-100	0.0	7 10 7 8		
8	5-80	0.0	7 8 9 10	(8.4-15.5') SAND, fine to coarse grained, medium dense, reddish yellow and very pale brown from 11.8' to 12' bgs, wet, non plastic, non cohesive	SW
10	6-100	0.0	7 6 9 10		
12	7-100	0.0	5 3 3 4		
14					

Well: Elev.:



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 6 in
Riser Stickup (ags): 3.7'

Bentonite Seal:
Top: 21.8' bgs
Bottom: 23.8' bgs

Sand Blotter: Size 000
Top: 23.8' bgs
Bottom: 24.3' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 28.3' bgs
Bottom: 38.3' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 24.3' bgs
Bottom: 38.3' bgs

Bore hold collapsed from 38.3' bgs to 40' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: unknown gal.
Well Volumes Removed: unknown

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW13-MWI

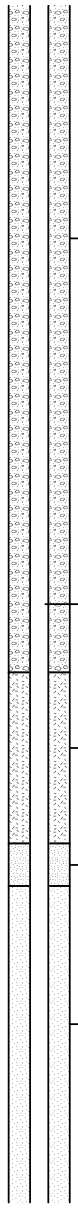
(page 2 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,111.23
Easting (ft)	: 1,456,415.26
Date/Time Started	: 7/19/17 / 1545
Date/Time Completed	: 7/21/17 / 1115
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 42' (TOC)
Depth to Water (ft)	: 11.10' (TOC) / 7/21/17
Depth to Water (ft)	: 10.74' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
14	8-65	9.1	W W W W		SW
				(15.5-17.5') SANDY SILT, firm, gray, wet, low plasticity, cohesive	ML
16	9-50	0.0	4 3 5 10		
				(17.5-18.5') SILTY SAND, medium dense to dense, gray, wet, non plastic, non cohesive	SM
18	10-60	0.0	6 6 7 7	(18.5-19.2') SANDY SILT, firm, gray, wet, low plasticity, cohesive	ML
				(19.2-22') SILTY SAND with trace mica flakes and fine grained GRAVEL, medium dense to dense, gray, wet, non plastic, non cohesive	SM
20	11-100	0.0	2 2 1 2		
22	12-100	0.0	2 2 3 5	(22-24') SAND with SILT and trace GRAVEL, dense, brownish gray with reddish yellow streaks, wet, non plastic, non cohesive	SW-SM
24	13-100	0.0	1 1 1 1	(24-26') SAND with SILT, fine to coarse grained, medium dense, grayish brown, wet, non plastic, non cohesive	SW-SM
26	14-100	0.0	5 4 5 6	(26-26.8') SANDY CLAY, soft, grayish brown, very moist, low plasticity, cohesive	CL
				(26.8-28') CLAY, firm, dark grayish brown, moist, medium plasticity, cohesive	CL
28					

Well: Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: unknown gal.
Well Volumes Removed: unknown

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW13-MWI

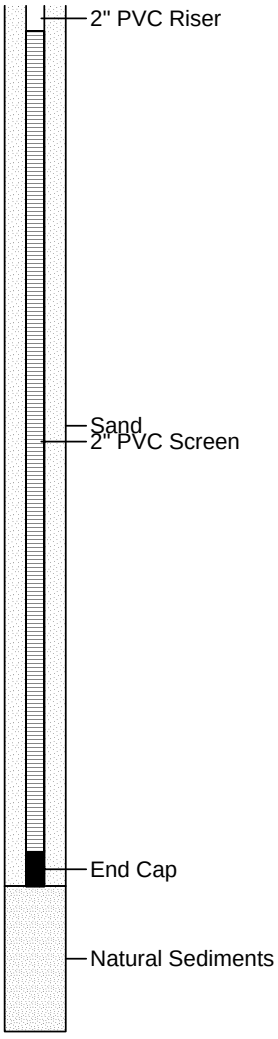
(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,111.23
Easting (ft)	: 1,456,415.26
Date/Time Started	: 7/19/17 / 1545
Date/Time Completed	: 7/21/17 / 1115
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 42' (TOC)
Depth to Water (ft)	: 11.10' (TOC) / 7/21/17
Depth to Water (ft)	: 10.74' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
28					
	15-85	3.0	4 10 4 4	(28-30.5') SAND with SILT, fine to coarse grained, dense, grayish brown, wet, non plastic, non cohesive	SW-SM
30					
	16-40	0.0	2 7 10 10	(30.5-32') SAND with GRAVEL, very fine grained GRAVEL and fine to very coarse grained SAND, medium dense, reddish yellow, wet, non plastic, non cohesive	SW
32					
	17-100	0.0	8 9 19 13	(32-34') GRAVEL and SAND, very fine grained GRAVEL and fine to very coarse grained SAND, dense to medium dense, reddish yellow and yellow, wet, non plastic, non cohesive	GP/SW
34					
	18-100	0.0	4 6 12 15	(34-40') SAND, fine to very coarse grained, medium dense, reddish yellow with yellow, wet, non plastic, non cohesive	
36					
	19-100	0.0	5 8 6 4		SW
38					
	20-100	0.0	4 10 9 13		
40				END OF BORING	
42					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: unknown gal.
Well Volumes Removed: unknown

ARM Group Inc.
Earth Resource Engineers and Consultants

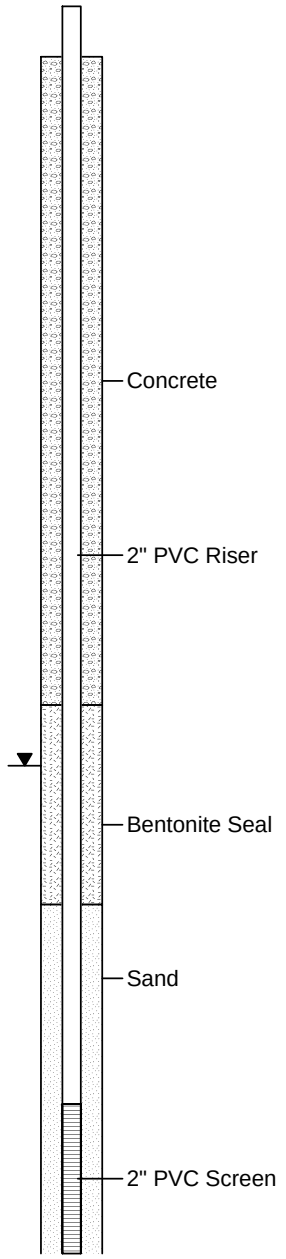
Well ID: RW14-MWS

(page 1 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,175.94
Easting (ft)	: 1,456,419.18
Date/Time Started	: 7/27/17 / 0918
Date/Time Completed	: 7/27/17 / 1150
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 23.2' (TOC)
Depth to Water (ft)	: 9.29' (TOC) / 7/27/17
Depth to Water (ft)	: 7.11' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-75	0.0	9 14 5 4	(0-0.5') ORGANIC SILT, soft, brown, moist, non plastic, non cohesive	OL
				(0.5-1.3') GRAVEL with SAND, dense, brown and gray, dry, non plastic, non cohesive	GW
2	2-70	0.0	2 2 2 2	(1.3-3.2') SANDY SILT, fine grained, dense to soft, reddish brown, dry to moist, non plastic, non cohesive	ML
4	3-80	0.0	1 1 1 5	(3.2-5.5') SILTY SAND, fine to medium grained, dense, light brown, very moist, non plastic, non cohesive	SM
6	4-75	0.0	7 7 4 4	(5.5-7.6') SAND with SILT, fine to medium grained, medium dense, reddish yellow, very moist, non plastic, non cohesive	SW-SM
				(7.6-8') SILT, very firm, light gray with reddish yellow mottling, moist, low plasticity, cohesive	ML
8	5-75	0.0	3 5 6 4	(8-9.6') SAND with SILT, fine to medium grained, medium dense, reddish yellow, very moist, non plastic, non cohesive	SW-SM
				(9.6-10') SILTY SAND, fine to medium grained, medium dense, light gray, wet, non plastic, non cohesive	SM
10	6-100	0.0	6 8 12 9	(10-14') SAND, fine to medium grained with some coarse grained, medium dense, reddish yellow to very pale brown, wet, non plastic, non cohesive	SW
12					



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 2.7'

Bentonite Seal:
Top: 6.5' bgs
Bottom: 8.5' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 10.5' bgs
Bottom: 20.5' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 8.5' bgs
Bottom: 20.5' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 15 gal.
Well Volumes Removed: 5.64

ARM Group Inc.
Earth Resource Engineers and Consultants

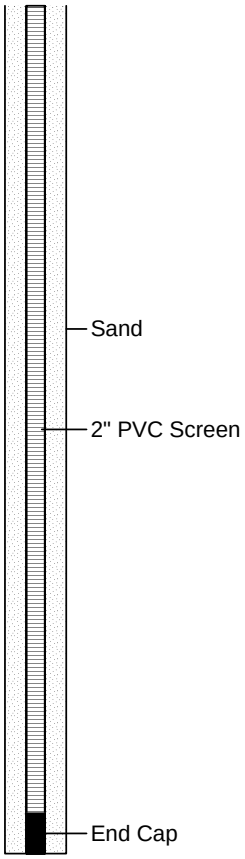
Well ID: RW14-MWS

(page 2 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,175.94
Easting (ft)	: 1,456,419.18
Date/Time Started	: 7/27/17 / 0918
Date/Time Completed	: 7/27/17 / 1150
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 23.2' (TOC)
Depth to Water (ft)	: 9.29' (TOC) / 7/27/17
Depth to Water (ft)	: 7.11' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
12	7-100	0.0	9 11 11 8		SW
14	8-100	0.0	W 1 1 2	(14-17.8') SAND with SILT and some SILT lenses, fine to coarse grained, medium dense, reddish yellow with some yellowish red, wet, non plastic, non cohesive	SW-SM
16	9-100	0.0	2 2 3 4		
18	10-100	0.0	1 2 1 3	(17.8-18.8') SAND, fine to coarse grained, medium dense, light grayish brown to reddish yellow, wet, non plastic, non cohesive	SW
				(18.8-19.4') SILTY SAND, fine to medium grained, dense, light grayish brown, wet, non plastic, non cohesive	SM
20				(19.4-20') SAND, fine to coarse grained, medium dense, light grayish brown, wet, non plastic, non cohesive	SW
				End of Boring	
22					
24					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 15 gal.
Well Volumes Removed: 5.64

ARM Group Inc.
Earth Resource Engineers and Consultants

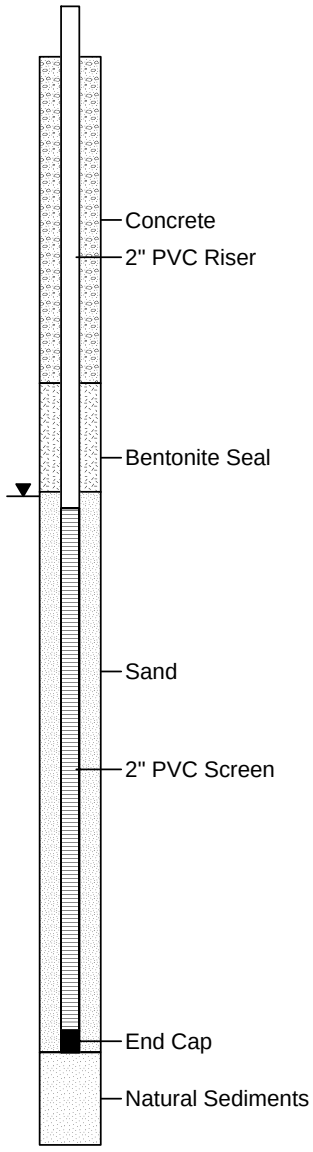
Well ID: RW15-MWS

(page 1 of 1)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,194.49
Easting (ft)	: 1,456,510.13
Date/Time Started	: 7/21/17 / 1215
Date/Time Completed	: 7/21/17 / 1438
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 21.3' (TOC)
Depth to Water (ft)	: 10.73' (TOC) / 7/27/17
Depth to Water (ft)	: 8.11' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-60	0.0	8 10 12 15	(0-1.5') SAND with SLAG GRAVEL, very fine to coarse grained, medium dense, light brown, dry, non plastic, non cohesive	SW/GW
				(1.5-2.5') SAND with SILT, dense, brown, dry, non plastic, non cohesive	SW-SM
2	2-75	0.0	4 4 4 4	(2.5-3.5') CLAYEY SAND, dense, yellowish red, dry, non plastic, non cohesive	SW
				(3.5-4.3') SAND with CLAY, very fine to medium grained SAND, medium dense, yellowish red, dry, non plastic, non cohesive	SW-SC
4	3-65	0.0	7 5 5 5		SW/SM
				(4.3-6.3') SAND to SILTY SAND, very fine to medium grained, medium dense to dense, yellowish red, moist, non plastic, non cohesive	
6	4-100	0.0	6 7 8 5		
				(6.3-15.4') SAND, very fine to medium grained, medium dense to dense, yellowish red, moist then wet at 7' bgs, non plastic, non cohesive.	
8	5-100	0.0	2 2 2 2		
10	6-100	0.0	2 5 6 4		SW
12	7-100	0.0	2 4 3 3		
14	8-100	0.0	1 2 2 2		
16	9-100	0.0	2 3 4 4	(15.4-16') SANDY SILT grading to SILT with SAND, very firm, yellowish red, very moist, low plasticity, cohesive	ML
				(16-18.2') SAND, very fine to medium grained, medium dense to dense, yellowish red, wet, non plastic, non cohesive.	SW
18	10-90	0.0	W 2 6 7	(18.2-19.5') SILT, very firm, light reddish brown, moist, low plasticity, cohesive	ML
20				(19.5-20') SAND, very fine to medium grained, medium dense to dense, yellowish red, wet, non plastic, non cohesive.	SW
				END OF BORING	
22					



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 3.1'

Bentonite Seal:
Top: 4.3' bgs
Bottom: 6.3' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 8.3' bgs
Bottom: 18.3' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 6.3' bgs
Bottom: 18.3' bgs

Bore hold collapsed from 18.3' bgs to 20' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 15 gal.
Well Volumes Removed: 6.24

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW15-MWI

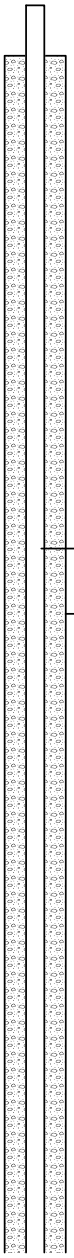
(page 1 of 4)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,188.60
Easting (ft)	: 1,456,511.76
Date/Time Started	: 7/24/17 / 0908
Date/Time Completed	: 7/24/17 / 1650
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 7/27/17
Depth to Water (ft)	: 10.99' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-60	0.0	10 20 12 5	(0-1.5') Non-native SAND with SLAG GRAVEL and SILT, fine grained SLAG, dense, brown with gray, dry, non plastic, non cohesive	SW
2	2-100	0.0	6 4 4 4	(1.5-4.8') SILTY SAND, fine grained, medium dense, yellowish red, moist, non plastic, non cohesive	SM
4	3-80	0.0	3 3 5 2	(4.8-7') SAND with some SILT, fine to medium grained, medium dense, reddish yellow, moist, non plastic, non cohesive	SW
6	4-100	0.0	6 3 5 4	(7-8') SILTY SAND, fine grained, dense to very firm at depth, reddish yellow with gray at depth, moist, non plastic with trace low plasticity at depth, non cohesive with cohesion at depth	SM
8	5-100	0.0	1 2 3 2	(8-13.7') SAND with some SILT, fine to medium grained, medium density, reddish yellow, wet, non plastic, non cohesive	SW
10					

Well:
Elev.:



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 3.7'

Bentonite Seal:
Top: 21.5' bgs
Bottom: 23.5' bgs

Sand blotter: Size 000
Top: 23.5' bgs
Bottom: 24' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 26.7' bgs
Bottom: 36.7' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 24' bgs
Bottom: 36.5' bgs

Bore hold collapsed from 36.7' bgs to 40' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.19

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW15-MWI

(page 2 of 4)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,188.60
Easting (ft)	: 1,456,511.76
Date/Time Started	: 7/24/17 / 0908
Date/Time Completed	: 7/24/17 / 1650
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 7/27/17
Depth to Water (ft)	: 10.99' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS	Well: Elev.:	COMPLETION DETAILS
10	6-100	0.0	1 5 7 7		SW		
12	7-100	0.0	4 4 5 4				
14	8-100	0.0	1 2 2 2	(13.7-15.3') SAND with SILT, fine to medium grained, dense, yellowish red, wet, non plastic, non cohesive	SW-SM	2" PVC Riser Concrete	
16	9-185	0.0	4 4 5 5	(15.5-18.8') CLAY, hard, reddish brown, moist, low plasticity, cohesive	CL		
18	10-100	0.0	W 3 4 2	(18.8-20') SAND with SILT, dense, reddish yellow with yellowish red, wet, non plastic, non cohesive	SW-SM		
20							

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.19

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW15-MWI

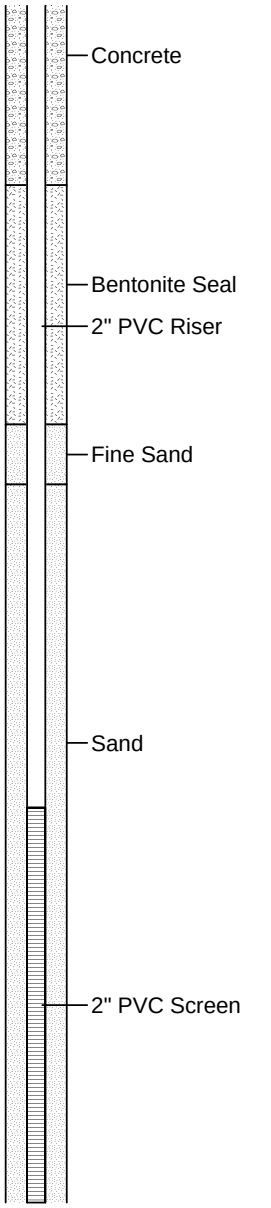
(page 3 of 4)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,188.60
Easting (ft)	: 1,456,511.76
Date/Time Started	: 7/24/17 / 0908
Date/Time Completed	: 7/24/17 / 1650
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 7/27/17
Depth to Water (ft)	: 10.99' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
20					
	11-100	0.0	W 1 4 5	(20-23') GRAVEL with SAND, very fine grained GRAVEL and coarse to very coarse grained SAND, medium dense, reddish yellow, wet, non plastic, non cohesive	GP
22	12-0	0.0	3 4 7 9	(23-26') SAND with some GRAVEL, medium to very coarse grained SAND and very fine grained GRAVEL, medium dense, reddish yellow, wet, non plastic, non cohesive	SW
24	13-100	0.0	1 2 4 6		
26	14-100	0.0	3 4 5 4	(26-28') SAND, medium to coarse grained, medium dense, reddish yellow, wet, non plastic, non cohesive	SW
28	15-100	0.0	4 6 5	(28-29.6') GRAVEL, fine grained, loose to medium dense, pale brown and yellow, wet, non plastic, non cohesive	GW
			6	(29.6-30') CLAY, very firm, light gray, moist, medium plasticity, cohesive	CL
30					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.19

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW15-MWI

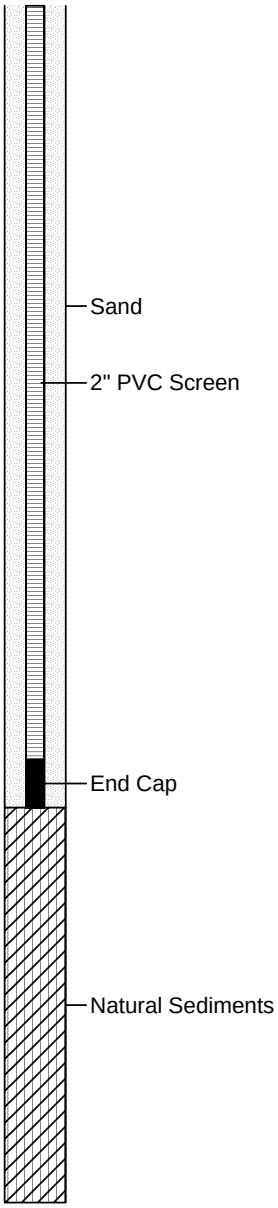
(page 4 of 4)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,188.60
Easting (ft)	: 1,456,511.76
Date/Time Started	: 7/24/17 / 0908
Date/Time Completed	: 7/24/17 / 1650
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 7/27/17
Depth to Water (ft)	: 10.99' (TOC) / 8/2/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
30					
	16-100	0.0	4 6 4 6	(30-31.3') GRAVEL, fine grained, loose to medium dense, pale brown and yellow, wet, non plastic, non cohesive	GW
				(31.3-32') CLAY, very firm, light gray, moist, medium plasticity, cohesive	CL
32					
	17-100	0.0	3 3 3 3	(32-33.3') GRAVEL, fine grained, loose to medium dense, pale brown and yellow, wet, non plastic, non cohesive,	GW
				(33.3-33.7') CLAY, very firm, light gray, moist, medium plasticity, cohesive	CL
34				(33.7-34.3') GRAVEL, fine grained, loose to medium dense, pale brown and yellow, wet, non plastic, non cohesive	GW
	18-85	0.0	1 1 3 4	(34.3-40') SILTY CLAY, very firm, gray, dry to moist, low plasticity, cohesive	
36					
	19-75	0.0	1 3 4 4		CL
38					
	20-60	0.0	4 4 3 3		
40					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/2/17
Purged Amount: 50 gal.
Well Volumes Removed: 11.19

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW05-MWS

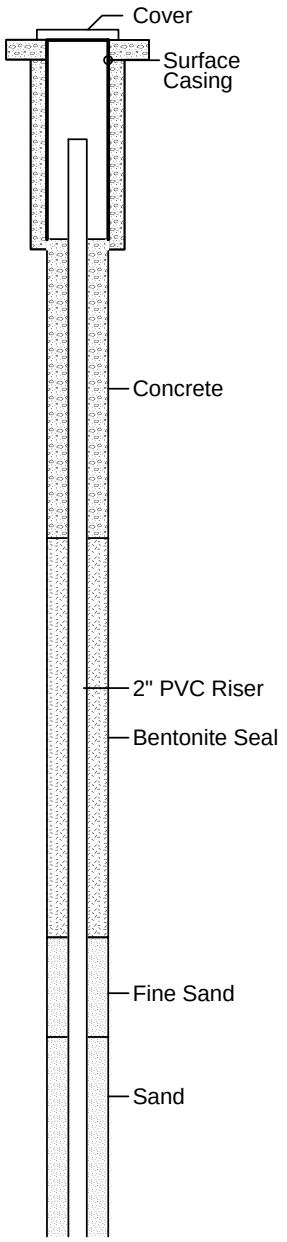
(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,708.86
Easting (ft)	: 1,455,890.53
Date/Time Started	: 7/11/17 / 0845
Date/Time Completed	: 7/11/17 / 1438
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 16.5' (TOC)
Depth to Water (ft)	: 8.89' (TOC) / 7/11/17
Depth to Water (ft)	: 7.39' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	-	-	-	(0-0.5') ASPHALT, gray, dry	NA
	1-65	0.0	38 28 16	(0.5-2.6') SILTY SAND with some fine grained GRAVEL, medium dense, brown, dry, non plastic, non cohesive	SM
2	2-70	0.2	16 27 23 16	(2.6-4.2') GRAVELLY SAND with trace SILT and BRICK GRAVEl, fine grained, loose, dark brown and brown with trace yellow and red, dry, non plastic, non cohesive	SW/GW
4	3-100	0.5	37 47 41	(4.2-4.4') SANDY CLAY with some GRAVEL, firm, brown and grayish brown, dry, low plasticity, cohesive (4.4-5.5') GRAVELLY SAND with trace SILT, fine to coarse grained, medium dense to dense, brown with grayish brown and trace yellowish red, dry, non plastic, non cohesive	CL SW/GW
			44	(5.5-6') SILTY SAND with SLAG GRAVEL, dense, dark brown, dry, non plastic, non cohesive	SM
6					

Well:
Elev.:



COMPLETION DETAILS

10' Protective Steel Casing with Locking LId
1.2' x 1.2' concrete pad
2" expandable-type cap

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -0.5'

Bentonite Seal:
Top: 2.5' Bottom: 4.5'

Sand Blotter: Very fine; size 000
Top: 4.5' Bottom: 5'

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 7' Bottom: 17'
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 5' Bottom: 17'

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/2017
Purged Amount: 22 gal.
Well Volumes Removed: 14.87

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW05-MWS

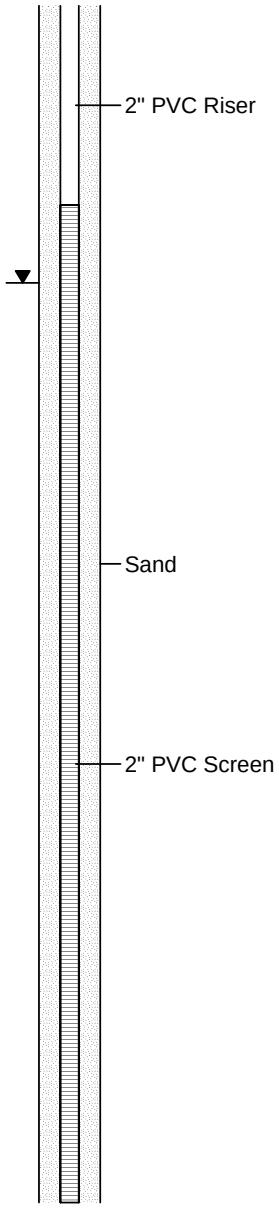
(page 2 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,708.86
Easting (ft)	: 1,455,890.53
Date/Time Started	: 7/11/17 / 0845
Date/Time Completed	: 7/11/17 / 1438
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 16.5' (TOC)
Depth to Water (ft)	: 8.89' (TOC) / 7/11/17
Depth to Water (ft)	: 7.39' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
6					
			16	(6-6.8') SAND with some fine grained GRAVEL, BRICK SAND with some BRICK GRAVEL at 6.7' bgs, medium dense, dark brown with trace yellow, dry, non plastic, non cohesive	SW
			26		
	4-100	0.6		(6.8-8.5') SILTY SAND, medium dense, dark brown, moist, non plastic, non cohesive	
			14		
			8		SM
8					
			1		
			1	(8.5-10.1') SAND with SILT and fine to coarse grained GRAVEL, medium dense, dark brown, wet, non plastic, non cohesive	
	5-20	0.1			
			2		SW-SM
			1		
10					
			3	(10.1-10.6') SILT, soft, light gray, very moist to wet, low plasticity, cohesive	ML
			3	(10.6-11') SAND with CLAY, very fine to medium grained, dense, reddish yellow, wet, non plastic, non cohesive	SW-SC
	6-100	0.0			
			5	(11-12.5') CLAY with SAND grading to CLAY, dense, light brownish gray with reddish yellow mottling, moist grading to dry, low plasticity, cohesive	CL
			7		
12					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/2017
Purged Amount: 22 gal.
Well Volumes Removed: 14.87

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW05-MWS

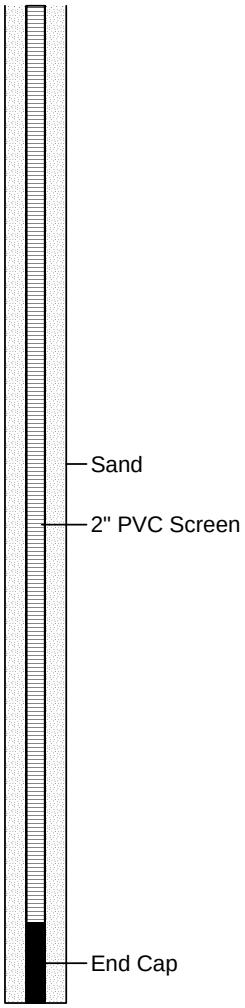
(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller, R. Sites
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 571,708.86
Easting (ft)	: 1,455,890.53
Date/Time Started	: 7/11/17 / 0845
Date/Time Completed	: 7/11/17 / 1438
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 16.5' (TOC)
Depth to Water (ft)	: 8.89' (TOC) / 7/11/17
Depth to Water (ft)	: 7.39' (TOC) / 8/3/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
12			7		CL
	7-50	0.0	7 9	(12.5-13.6') CLAY, dense, light brownish gray with reddish yellow mottling, moist, low plasticity, cohesive	CL
			9	(13.6-14.6') CLAY with trace SAND, dense, light brownish gray with reddish yellow mottling, moist, low plasticity, cohesive	CL
14			3		
	8-100	0.0	3 6 5	(14.6-16') SAND with SAND, dense, light brownish gray with reddish yellow mottling, moist, low plasticity, cohesive	SW
16	9-100	0.0	5 6	(16-17') SAND, very fine to medium grained, medium dense, yellow to very pale brown, wet, non plastic, non cohesive	SW
				END OF BORING	
18					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/3/2017
Purged Amount: 22 gal.
Well Volumes Removed: 14.87

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW20-MWS

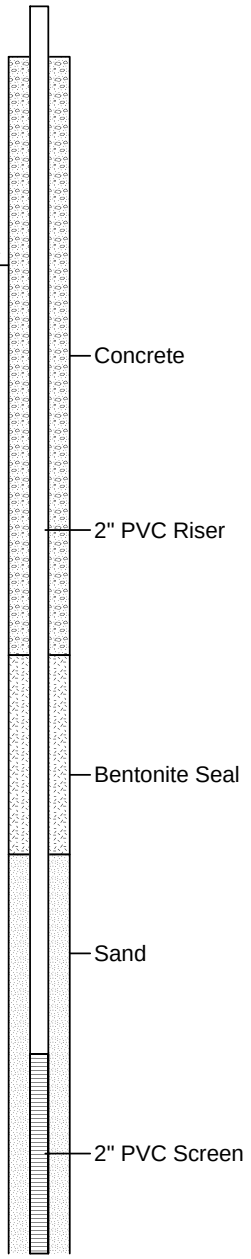
(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,403.67
Easting (ft)	: 1,456,552.37
Date/Time Started	: 8/23/17 / 1012
Date/Time Completed	: 8/23/17 / 1510
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 34.1' (TOC)
Depth to Water (ft)	: 10.32' (TOC) / 8/23/17
Depth to Water (ft)	: 10.29' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-70	0.0	6 9 18 19	(0-2.5') Non-native SAND and GRAVEL, very fine to medium grained SAND with fine to coarse grained GRAVEL, medium dense, brown and grayish yellow brown, dry, non plastic, non cohesive	SW/GW
2	2-35	0.0	12 11 10 9	(2.5-4.5') Non-native GRAVEL with SAND with trace BRICK, medium dense to loose, brown and yellow, wet, non plastic, non cohesive	GW/SW
4	3-35	0.6	6 6 8 5	(4.5-7.5') Non-native SAND and GRAVEL, very fine to medium grained SAND with fine to coarse grained GRAVEL, medium dense, brown and grayish yellow brown, wet, non plastic, non cohesive, trace NAPL and light sheen from 7-7.5' bgs	SW/GW
6	4-50	15000	8 10 6 7	(7.5-10') SANDY SILT, hard then soft from 8.5-10' bgs, dark grayish brown, very moist, non plastic, non cohesive, light dark brown viscous product with moderate sheen and strong odor	ML
8	5-75	331.8	2 1 1 2		
10	6-80	150000	9 7	(10-10.9') SAND with SILT, fine to medium grained, loose, very dark gray, wet, non plastic, non cohesive, heavy sheen and strong odor, no visible product	SW-SM
			3 5	(10.9-12') SANDY SILT, very firm, very dark gray, wet, non plastic, non cohesive, light product and sheen	ML
12					

Well: Elev.:



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 4.1'

Bentonite Seal:
Top: 6' Bottom: 8'

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 10' Bottom: 30'
Total Screen: 20'

Filter Pack: FilPro W.G. #2 Sand
Top: 8' Bottom: 30.2'

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW20-MWS

(page 2 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,403.67
Easting (ft)	: 1,456,552.37
Date/Time Started	: 8/23/17 / 1012
Date/Time Completed	: 8/23/17 / 1510
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 34.1' (TOC)
Depth to Water (ft)	: 10.32' (TOC) / 8/23/17
Depth to Water (ft)	: 10.29' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS	Well: Elev.:	COMPLETION DETAILS
12							
	7-100	15000	5 10 6 3	(12-12.6') SILTY SAND, fine to medium grained, loose to medium dense, dark brownish gray, wet, non plastic, non cohesive, very light product with trace sheen and strong odor	SM		
				(12.6-13.7') SILTY SAND with trace WOOD and GRAVEL, fine to medium grained SAND and fine grained GRAVEL, loose to medium dense, very dark gray to black, wet, non plastic, non cohesive, heavy product with a light sheen and strong odor	SM		
14	8-80	15000	W 1 1 1	(13.7-15.3') SAND, fine to medium grained, grayish brown, wet, non plastic, non cohesive, trace product and trace to light product with sheen from 14.6-15.3' bgs	SW		
16	9-15	15000	W W 1 1	(15.3-19.7') SILTY SAND with trace GRAVEL, loose to medium dense, light greenish brown grading to light brownish green, wet, non plastic, non cohesive	SM	Sand	
18	10-100	110.6	1 1 1 1			2" PVC Screen	
20	11-100	37.1	2 1 4 2	(19.7-20') SANDY SILT, firm, brown, very moist, non plastic, non cohesive, no visible product	ML		
				(20-21.6') SILTY SAND with trace GRAVEL, loose to medium dense, light greenish brown grading to light brownish green, wet, non plastic, non cohesive	SM		
22	12-50	30.5	W 4 8 8	(21.6-23.4') SILTY SAND, medium dense, brown, wet, non plastic, non cohesive	SM		
				(23.5-23.8') CLAY, soft, light gray, very moist, medium plasticity, cohesive	CL		
24							

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW20-MWS

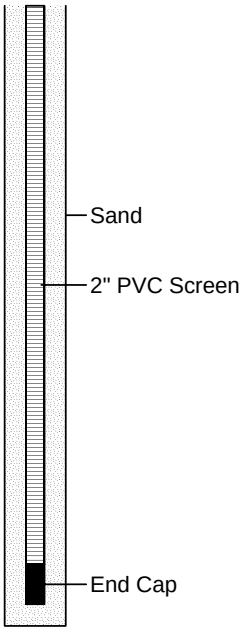
(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,403.67
Easting (ft)	: 1,456,552.37
Date/Time Started	: 8/23/17 / 1012
Date/Time Completed	: 8/23/17 / 1510
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 34.1' (TOC)
Depth to Water (ft)	: 10.32' (TOC) / 8/23/17
Depth to Water (ft)	: 10.29' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
24					
	13-100	25.6	2 4 4 4	(24-27.9') SAND and GRAVEL, fine to very coarse grained SAND with fine grained GRAVEL, medium dense, very pale brown, wet, non plastic, non cohesive	SW/GP
26					
	14-100	31.7	4 4 6 6		
28					
			2	(27.9-28.5') CLAYEY SAND, dense, very pale brown, wet, non plastic, non cohesive	SC
	15-50	0.1	3 4 4	(28.5-30') CLAY, hard, very pale brown with reddish yellow, moist, low plasticity, cohesive	CL
30				END OF BORING	
32					
34					
36					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW17-MWS

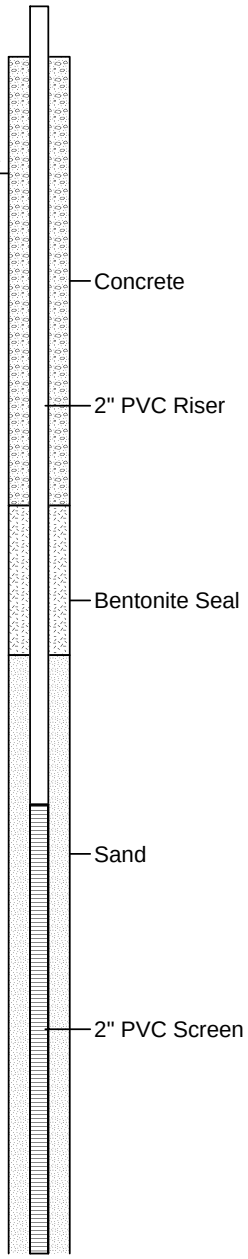
(page 1 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,382.55
Easting (ft)	: 1,456,449.23
Date/Time Started	: 8/24/17 / 0836
Date/Time Completed	: 8/24/17 / 1348
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 34.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 8/24/17
Depth to Water (ft)	: 10.36' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0					
			3	(0-0.1') ORGANIC SILT, soft, brown, dry, non plastic, non cohesive	OL
	1-70	0.2	25 17 10	(0.1-2.5') Non-native SAND and SLAG and BRICK GRAVEL, loose, brown, yellow, and gray, dry, non plastic, non cohesive	SW/GW
2			12		
	2-40	0.1	5 6 4	(2.5-4') SLAG GRAVEL with SILT, medium dense, strong brown, wet, non plastic, non cohesive	GW
4					
	3-100	3.2	W W W 1	(4-7.6') SILT with trace SAND and GRAVEL from 5 to 7.6' bgs, very soft, strong brown, wet, non plastic, non cohesive, light odor	ML
6					
	4-100	354.9	6 13 7 4		
				(7.6-8') SANDY SILT, firm, very dark gray, very moist, low plasticity, cohesive, moderate to heavy product with moderate odor	SM
8	5-25	39.9	5 9 4 3	(8-10') SILTY SAND with some GRAVEL, medium dense, light brown, wet, non plastic, non cohesive, moderate to light product with moderate odor	SM
10					
	6-80	218.6	4 6 6 4	(10-11.5') SILTY GRAVEL with SILTY SAND, loose, strong brown and dark brown, wet, non plastic, non cohesive	GM
				(11.5-12') SILTY SAND with some GRAVEL, very firm, very dark gray, wet, non plastic, non cohesive, heavy viscous product	SM
12					
	7-100	553.6	1 3 3 3	(12-14.5') SILTY SAND with some GRAVEL, soft, strong brown and very dark gray, wet, non plastic, non cohesive, heavy viscous product	SM
14					
	8-20	111.1	W W W 1	(14.5-18') SILT with SAND, soft, dark yellowish brown, very moist, low plasticity, cohesive, trace product with moderate odor	ML
16					

Well:
Elev.:



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 4.4'

Bentonite Seal:
Top: 6' Bottom: 8'

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 10' Bottom: 30'
Total Screen: 20'

Filter Pack: FilPro W.G. #2 Sand
Top: 8' Bottom: 30'

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW17-MWS

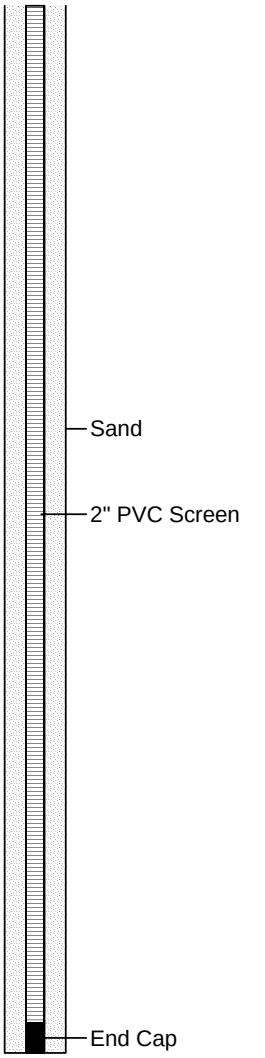
(page 2 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,382.55
Easting (ft)	: 1,456,449.23
Date/Time Started	: 8/24/17 / 0836
Date/Time Completed	: 8/24/17 / 1348
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 34.4' (TOC)
Depth to Water (ft)	: 10.95' (TOC) / 8/24/17
Depth to Water (ft)	: 10.36' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
16	9-5	23.5	2 2 2 2		ML
18	10-100	9.1	W 3 2 1	(18-19.2') SAND with SILT, fine to medium grained, medium dense, dark yellowish brown, wet, non plastic, non cohesive, trace product	SW-SM
20	11-65	5.1	2 2 2 2	(19.2-22') SILTY SAND, fine to medium grained, medium dense to dense, pale brown and reddish yellow, wet, non plastic, non cohesive, no visible product	SM
22	12-60	4.7	2 2 5 3	(22-28') SAND, fine to very coarse grained, with some fine GRAVEL from 24-25.7' bgs, medium dense, very pale brown, wet, non plastic, non cohesive; with one-inch thick layers of SAND with SILT, dense, yellowish red, wet, non plastic, non cohesive at 23.8', 25.7', and 27.8' bgs	SW
24	13-100	9.5	2 2 5 6		
26	14-100	72.9	10 11 17 13		
28	15-100	22.5	3 4 3 4	(28-29.3') SANDY GRAVEL grading to GRAVEL with SAND, fine grained, medium dense, very pale brown, wet, non plastic, non cohesive	GW
				(29.3-30') SILTY SAND, fine to medium grained, medium dense to dense, pale brown and reddish yellow, wet, non plastic, non cohesive	SM
30				END OF BORING	
32					

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW21-MWS

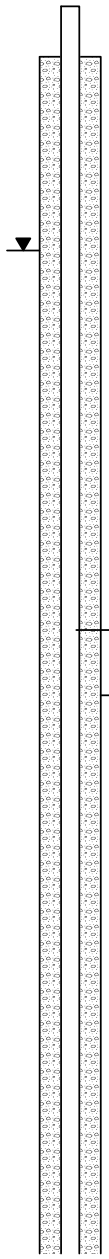
(page 1 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,366.49
Easting (ft)	: 1,456,273.39
Date/Time Started	: 8/24/17 / 1535
Date/Time Completed	: 8/25/17 / 1320
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 32.0' (TOC)
Depth to Water (ft)	: 11.40' (TOC) / 8/25/17
Depth to Water (ft)	: 10.59' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0					
	1-90	5.0	3 20 34 27	(0-0.2') ORGANIC SILT, loose, brown, dry, non plastic, non cohesive	OL
				(0.2-7.4') SLAG and BRICK GRAVEL and SAND, medium dense, brown and gray with yellow, dry then very moist from 3 to 4' bgs and wet at 5' bgs, non plastic, non cohesive, trace product with sheen from 5.2-5.5' bgs	
2	2-50	0.7	10 12 14 10		
4	3-40	18.0	6 11 1 W		GW/SW
6	4-35	0.5	W 1 3 2		
				(7.4-8') SAND with SILT, medium dense, yellowish brown, wet, non plastic, non cohesive	SW-SM
8	5-100	0.6	W 3 3 6	(8-11.8') SILTY SAND, dense, light brownish gray with very pale brown, wet, non plastic, non cohesive	SM
10	6-80	0.6	6 8 7 7		
12	7-85	1.2	3 3 5 10	(11.8-15') CLAY with trace SAND, very firm, light gray with yellowish red, moist, low plasticity, cohesive	CL
14	8-0	-	W W 3 5		
				(15-23.3') CLAY, hard to very firm, dark grayish brown, moist, low plasticity, cohesive	CL
16					

Well: Elev.:



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): 4.0'

Bentonite Seal:
Top: 19' Bottom: 21'

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 23' Bottom: 28'
Total Screen: 5'

Filter Pack: FilPro W.G. #2 Sand
Top: 21' Bottom: 28'

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

Well ID: RW21-MWS

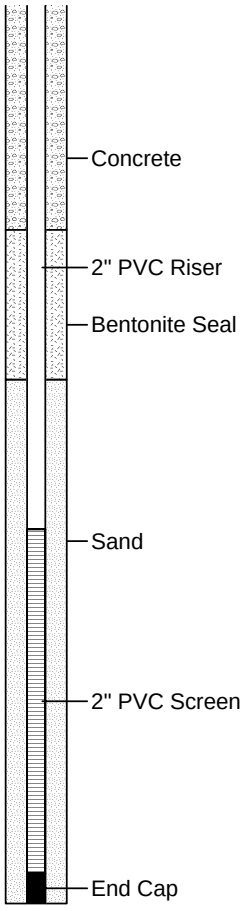
(page 2 of 2)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572,366.49
Easting (ft)	: 1,456,273.39
Date/Time Started	: 8/24/17 / 1535
Date/Time Completed	: 8/25/17 / 1320
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 32.0' (TOC)
Depth to Water (ft)	: 11.40' (TOC) / 8/25/17
Depth to Water (ft)	: 10.59' (TOC) / 8/31/17
Bit/Auger Size (in.)	: 8" OD (4.25" ID) HSA

Depth (ft.)	SS#	%Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
16						
	9-100		0.5	7 7 13 14		CL
18	10-100		0.0	W W 4 3		
20	11-100		0.0	3 4 5 9		
22	12-100		0.0	3 2 9 7		
24	13-100		0.4	1 1 2 2	(23.3-26.4') SAND with SILT, and trace firm gray CLAY and large WOOD fragments, very fine to coarse grained, yellowish red, wet, non plastic, non cohesive	SW-SM
26	14-100		0.2	4 5	(26.4-26.8') SAND with trace GRAVEL, very fine to coarse grained, brownish gray, wet, non plastic, non cohesive	SW
	15-100		0.1	6 7	(26.8-28') SAND with SILT and trace GRAVEL, very fine to coarse grained, with trace very firm gray CLAY, yellowish red, wet, non plastic, non cohesive	SW
28					END OF BORING	
30						
32						

Well:
Elev.:



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date:
Purged Amount:
Well Volumes Removed:

ARM Group Inc.
Earth Resource Engineers and Consultants

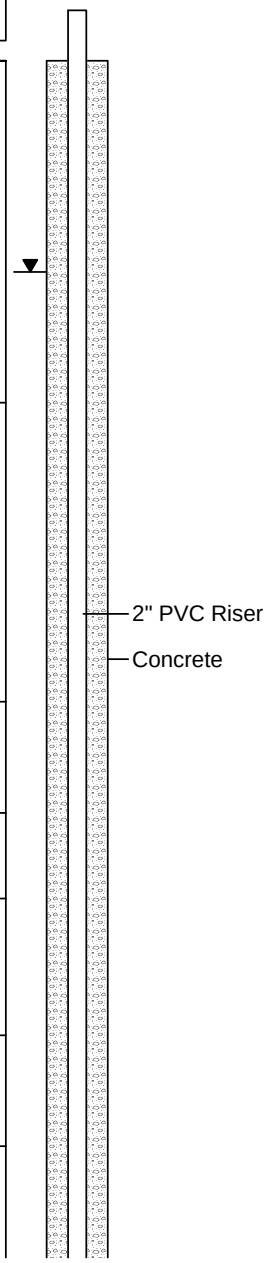
Well ID: RW16-MW(I)

(page 1 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572291.34
Easting (ft)	: 1456458.22
Date/Time Started	: 8/21/17 / 1045
Date/Time Completed	: 8/22/17 / 1130
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 6.27' (TOC) / 8/22/17
Depth to Water (ft)	: 12.22' (TOC) / 11/15/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-85	369.7	3 4 4 4	(0-4') Non-native SILTY SAND with CLAY and some GRAVEL, dense, brown and reddish yellow, dry, non plastic, non cohesive	SM
2	2-80	201.8	3 5 6 5		
4	3-100	4.3	4 4 5 5	(4-7.5') SANDY SILT with trace GRAVEL, very firm grading to soft, brown with reddish yellow to grayish brown, moist to very moist, non plastic to low plasticity, non cohesive to cohesive	ML
6	4-50	2.1	10 15 12 9	(7.5-8.8') SAND with some GRAVEL, very fine to medium, loose, brown, wet, non plastic, non cohesive	SW
8	5-10	0.0	5 7 4 3	(8.8-10') GRAVEL, fine to coarse, medium dense, brownish gray, wet, non plastic, non cohesive	GW
10	6-50	10.2	22 9 6 6	(10-11.5') GRAVEL with SAND and SILT, dense, white and pale brown, wet, non plastic, non cohesive	GW
12	7-10	0.2	4 4 5 5	(11.5-12.7') SILTY SAND, fine to medium, dense, pale brown, wet, non plastic, non cohesive	SM
14				(12.7-16.4') SANDY SILT with some GRAVEL, very soft, grayish brown and reddish yellow, wet, non plastic, non cohesive	ML



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -3.9'

Bentonite Seal:
Top: 25.5' bgs
Bottom: 27.5' bgs

Sand Blotter: Size 000
Top: 27.5' bgs
Bottom: 28' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 30' bgs
Bottom: 40' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 28' bgs
Bottom: 40' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/31/17
Purged Amount: 20 gal.
Well Volumes Removed: 3.73

ARM Group Inc.
Earth Resource Engineers and Consultants

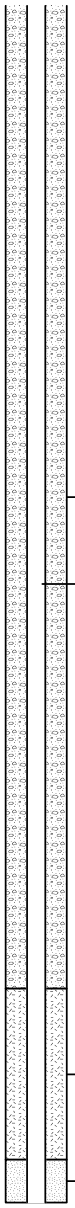
Well ID: RW16-MW(I)

(page 2 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572291.34
Easting (ft)	: 1456458.22
Date/Time Started	: 8/21/17 / 1045
Date/Time Completed	: 8/22/17 / 1130
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 6.27' (TOC) / 8/22/17
Depth to Water (ft)	: 12.22' (TOC) / 11/15/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
14					
	8-10	0.5	W W 1 1		ML
16					
	9-50	0.3	1 W W 2	(16.4-17.2') SAND with SILT, fine to medium, medium dense, reddish yellow, wet, non plastic, non cohesive	SW-SM
				(17.2-18') CLAYEY SILT, firm, dark grayish brown, moist, low plasticity, cohesive	ML
18					
	10-100	0.1	3 5 5 5	(18-19.6') SILTY SAND, loose, grayish brown, wet, non plastic, non cohesive	SM
				(19.6-21.8') CLAYEY SILT, firm, dark grayish brown, moist, low plasticity, cohesive	ML
20					
	11-50	0.5	3 3 3 2		
22					SM
	12-60	0.3	W W W W	(21.8-22') SILTY SAND, fine to medium, medium dense, grayish brown, wet, non plastic, non cohesive	
				(22-23.7') SAND, fine to coarse, light brown, wet, non plastic, non cohesive	SW
				(23.7-24') SILTY CLAY, firm, gray to dark gray, very moist, medium plasticity, cohesive	CL
24					
	13-100	0.3	W W W W	(24-26.4') SAND, fine to coarse, with some SILT, light brown, wet, non plastic, non cohesive	SW
26					
	14-65	0.2	W 3 4 5	(26.4-30') SILT with trace SAND, very firm, dark brown, moist, low plasticity, cohesive	ML
28					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/31/17
Purged Amount: 20 gal.
Well Volumes Removed: 3.73

ARM Group Inc.
Earth Resource Engineers and Consultants

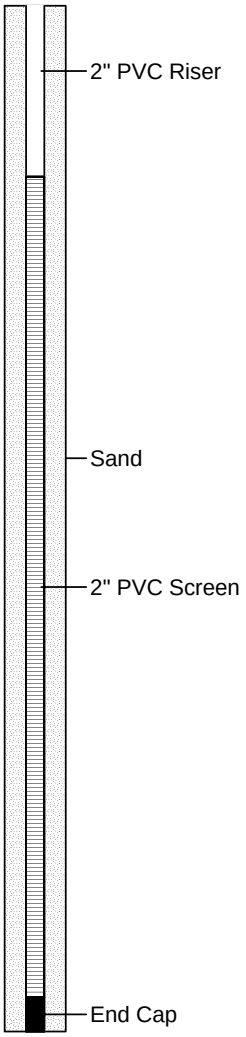
Well ID: RW16-MW(I)

(page 3 of 3)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572291.34
Easting (ft)	: 1456458.22
Date/Time Started	: 8/21/17 / 1045
Date/Time Completed	: 8/22/17 / 1130
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 6.27' (TOC) / 8/22/17
Depth to Water (ft)	: 12.22' (TOC) / 11/15/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
28					
	15-90	0.6	3 3 3 3		ML
30					
	16-90	0.4	4 3 3	(30-31.6') GRAVEL, fine, with SAND and SILT, loose, white and pale brown, wet, non plastic, non cohesive	GP
			3	(31.6-32') SANDY SILT, firm, dark grayish brown, moist, low plasticity, cohesive	ML
32					
	17-100	0.3	2 1 3	(32-33.3') SILTY SAND to SAND, fine to coarse, loose, light brown, wet, non plastic, non cohesive	SM/SW
			2	(33.3-35.6') GRAVEL with SAND, fine, and SILT, loose, white and pale brown, wet, non plastic, non cohesive	GP
34					
	18-40	0.4	W W 2 1		
			1	(35.6-36.2') CLAY, soft, gray, wet, medium plasticity, cohesive	CL
36					
	19-50	0.7	1 1 1 1	(36.2-40') GRAVEL, with SAND, fine, and SILT, loose, white and pale brown, wet, non plastic, non cohesive	GP
38					
	20-10	0.2	1 1 1 2		
40				END OF BORING	
42					



COMPLETION DETAILS

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/31/17
Purged Amount: 20 gal.
Well Volumes Removed: 3.73

ARM Group Inc.
Earth Resource Engineers and Consultants

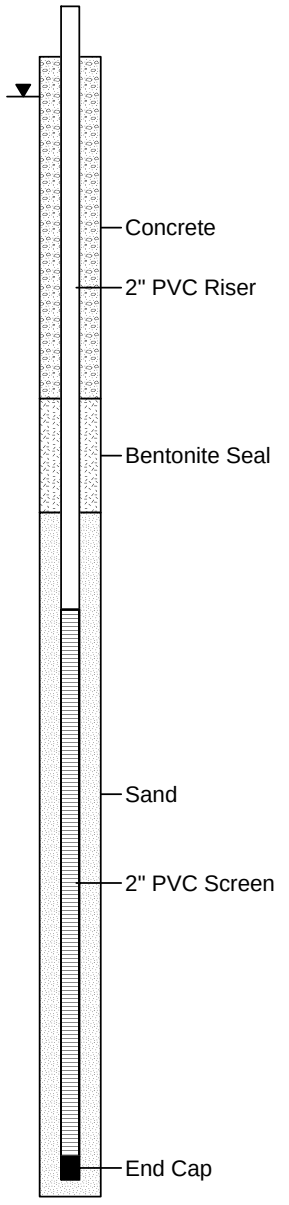
Well ID: RW16-MW(S)

(page 1 of 1)

Project Name	: A3 Well Installation
Project Number	: 170285M-4-1
Client	: EnviroAnalytics Group
Site	: Sparrow's Point
Borehole Location	: Parcel A3
ARM Representative	: L. Perrin
Checked by	: M. Replogle
Drilling Company	: Allied Well Drilling
Driller	: M. Waller
Drilling Equipment	: Diedrich-D120

Northing (ft)	: 572299.12
Easting (ft)	: 1456458.42
Date/Time Started	: 8/22/17 / 1400
Date/Time Completed	: 8/22/17 / 1715
Surf. Elev. (ft AMSL)	:
TOC Elev. (ft AMSL)	:
Total Well Depth (ft)	: 40.4' (TOC)
Depth to Water (ft)	: 4.22' (TOC) / 8/22/17
Depth to Water (ft)	: 11.03' (TOC) / 11/15/17
Bit/Auger Size (in.)	: 7.75" OD (4.25" ID) HSA

Depth (ft.)	SS# %Recovery	PID (ppm)	Blow Count	DESCRIPTION	USCS
0	1-65	0.0	4 5 4 4	(0-3.1') Non-native SANDY SILT with some GRAVEL, very firm, brown, dry to moist, non plastic, non cohesive	ML
2	2-5	0.0	4 7 4 5	(3.1-7.1') CLAY, firm, brown, dry, low plasticity, cohesive	CL
4	3-100	0.0	2 4 6 4		
6	4-75	0.0	12 21 13 9	(7.1-11.5') Non-native SANDY GRAVEL with CLAY, loose to medium dense, dark brown to brown, wet, non plastic, non cohesive	GW/SW
8	5-45	0.0	10 17 17 20		
10	6-35	0.0	7 50/2		
12	7-70	19.6	22 20 13 12	(11.5-13.8') SLAG GRAVEL with SLAG SAND, dense, gray and dark gray, moist, non plastic, non cohesive	GW/SW
14	8-90	1.1	4 4 11 9	(13.8-17.5') SAND, fine to medium with trace coarse, with some SILT from 13.8-14' bgs, medium dense, reddish yellow, wet, non plastic, non cohesive	SW
16	9-100	0.1	5 5 4 2		
18	10-100	23.7	2 2 1 2	(17.5-19.7') SAND, fine to coarse, medium dense, yellowish red to reddish yellow, wet, non plastic, non cohesive	SW
20				(19.7-20') CLAY, firm, gray, very moist, low plasticity, cohesive	CL
				END OF BORING	



COMPLETION DETAILS

Riser: Sch 40 PVC
Riser Diameter: 2 in
Riser Stickup (ags): -3.7'

Bentonite Seal:
Top: 6' bgs
Bottom: 8' bgs

Screen: Sch 40 PVC
Screen Diameter: 2 in
Slot Size: 0.020"
Top: 9.7' bgs
Bottom: 19.7' bgs
Total Screen: 10'

Filter Pack: FilPro W.G. #2 Sand
Top: 8' bgs
Bottom: 20' bgs

4" Long flush-threaded PVC end cap

TOC - Top of PVC Casing
AMSL - Above Mean Sea Level
ags - above ground surface
bgs - below ground surface
W - weight of hammer

Monitoring Well Development
Date: 8/31/17
Purged Amount: 40 gal.
Well Volumes Removed: 16.08

APPENDIX G-3

ARM Group Well Development Logs

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW16-MW5 **Well Permit No.:** _____

ARM Project No.: 430	Date/Time Started: 8/31/17 / 900	Developed by: N. Kurtz
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/31/17 / 955	Company: ARM
Well Location: Area A, Parcel A3	Weather/Site Conditions: sunny, 70s	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 10 to 20
Well riser/screen material: *PVC*	Sandpack Interval: 8 to 20
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 23.25 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.95 ft. (C)
Petroleum/Product Present? *Y* or (*N*.) Thickness (ft.): —	Height of Water Column: (B - C) 15.3 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): 0.00 ft.	Wetted Bore Volume: (A x D) 2.49 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: Monsoon

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	10-13	10	10	4.02	dark brown, very turbid, methane odor
2	13-16	10	10	4.02	"
3	16-20	10	20	8.04	light brown, Negligible
	Cumulative Totals: (Minimum of 3 Well Volumes)		40	16.08	

Final Depth to Water (from TOC): 12.94 New total depth = 24.25

Thickness of Any Sediment Remaining in Well: None

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. 930 - Decon. Water - 8/31/17 - A3
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

Run dry 3 times

F. Signatures

	Print Name	Signature	Date
Field Representative(s):	Nick Kurtz		8/31/17

All depths reported are from reference notch in top of TOC.
All measurements made in 10^{ths} of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW16-MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/31/17 / 1255	Developed by: N. Kurtz
Client: EAG **EnviroAnalytics Group**	Date/Time Completed: 8/31/17 / _____	Company: ARM
Well Location: Area A, Parcel A3	Weather/Site Conditions: Sunny, 70s	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: ~~20~~ 30 to ~~30~~ 46
Well riser/screen material: *PVC*	Sandpack Interval: ~~28~~ 28 to ~~30~~ 40
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 43.10 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 10.28 ft. (C)
Petroleum/Product Present? *Y* or (N) Thickness (ft.): —	Height of Water Column: (B - C) 32.82 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 5.35 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: Monsoon

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	30-33	10	5	0.93	dark brown, very turbid
2	33-36	10	5	0.93	"
3	36-40	10	10	1.87	"
		Cumulative Totals: (Minimum of 3 Well Volumes)	20	3.73	

Final Depth to Water (from TOC): 39.10, DTB = 44.81

Thickness of Any Sediment Remaining in Well: None

All depths reported are from reference notch in top of TOC.

Well ID: RW16-MWI
Date: 8/31/17

ID Numbers of IDW Drums Generated:

1. 930 - Decon water - 8/31/17 - AS
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

- well ran dry twice during each event
- not a good producing well
- No odor

F. Signatures

	Print Name	Signature	Date
Field Representative(s):	Nick Kurtz		8/31/17

All depths reported are from reference notch in top of TOC.
All measurements made in 10^{ths} of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW22-MW5 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 1431	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 / 1508	Company: ARM.
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 85	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 6 to 16
Well riser/screen material: *PVC*	Sandpack Interval: 4 to 16
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 16.51 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.39 ft. (C)
Petroleum/Product Present? *Y* or *N*. Thickness (ft.): _____	Height of Water Column: (B - C) 9.12 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 1.48 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	6 - 9	10	5	3.38	
2	9 - 12	10	5	3.38	
3	12 - 16	10	12	8.11	
	Cumulative Totals: (Minimum of 3 Well Volumes)				

Final Depth to Water (from TOC): 13.42

Thickness of Any Sediment Remaining in Well: 17.19

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

_____

_____

_____

_____

_____

_____

F. Signatures

Field Representative(s): _____ _____ _____
Print Name | Signature | Date

_____ _____ _____
Print Name | Signature | Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10^{ths} of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW22-MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 1302	Developed by: DEM
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 / 1421	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 15 to 25
Well riser/screen material: *PVC*	Sandpack Interval: 13 to 25
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 0.12 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 25.87 ft. (C)
Petroleum/Product Present? *Y* or (N) Thickness (ft.): _____	Height of Water Column: (B - C) 25.75 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 4.19 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	15-18	10	4	0.95	
2	18-21	10	1	0.24	
3	21-25	~			
Cumulative Totals: (Minimum of 3 Well Volumes)					

Final Depth to Water (from TOC): 22.81

Thickness of Any Sediment Remaining in Well: 24.33

All depths reported are from reference notch in top of TOC.

Well ID: RW22-01WE
Date: 8/3/17

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

No water could be DRAWN After the 2ND Purge. I sampled During low tide.

F. Signatures

Field Representative(s): DANIEL NILES — Print Name | Signature | 8/3/17 — Date

_____ — Print Name | _____ — Signature | _____ — Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW02-MW5 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 1209	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 / 1252	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 7 to 17
Well riser/screen material: *PVC*	Sandpack Interval: 5 to 17
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 17.93 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 8.00 ft. (C)
Petroleum/Product Present? Y or N Thickness (ft.): _____	Height of Water Column: (B - C) 9.93 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 1.62 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	7-10	10	5	3.09	
2	10-13	10	5	3.09	
3	13-17	10	1.5	0.93	
Cumulative Totals: (Minimum of 3 Well Volumes)					

Final Depth to Water (from TOC): 16.98

Thickness of Any Sediment Remaining in Well: 19.03

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

For the 3rd Purge Day 2 trials.

F. Signatures

Field Representative(s): DANIEL NELES — Print Name; Signature; 8/3/17 — Date

_____ Print Name; _____ Signature; _____ Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW02-MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 1031	Developed by: DEV
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 1202	Company: ARM
Well Location: Area 4, Parcel 3	Weather/Site Conditions: SUNNY 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 26 to 36
Well riser/screen material: *PVC*	Sandpack Interval: 24 to 36
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 36.33 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.67 ft. (C)
Petroleum/Product Present? Y or (N) Thickness (ft.): _____	Height of Water Column: (B - C) 28.66 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 4.67 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	26-29	10	15	3.21	Dark Brown/Gray Turbid
2	29-32	10	15	3.21	11
3	32-36	10	25	5.35	Light Brown/Gray Low Turb.
	Cumulative Totals: (Minimum of 3 Well Volumes)				

Final Depth to Water (from TOC): 7.99

Thickness of Any Sediment Remaining in Well: 37.37

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

_____

_____

_____

_____

_____

_____

F. Signatures

Field Representative(s): DANIEL NICES _____ 8/3/17

Print Name | Signature | Date

_____ _____ _____

Print Name | Signature | Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10^{ths} of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW01-MW5 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 934	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 / 1013	Company:
Well Location: Area A, Parcel 3	Weather/Site Conditions:	ARM
	Sunny 80's	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 10 to 20
Well riser/screen material: *PVC*	Sandpack Interval: 8 to 20
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 19.81 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.48 ft. (C)
Petroleum/Product Present? Y or N. Thickness (ft.): _____	Height of Water Column: (B - C) 12.33 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 2.01 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	10-13	10	6	2.99	Dark Brown/Grey Turbid
2	13-16	10	6	2.99	
3	16-20	10	15	7.46	Light Brown/clear low turbid
	Cumulative Totals: (Minimum of 3 Well Volumes)				

Final Depth to Water (from TOC): 8.28

Thickness of Any Sediment Remaining in Well: 20.44

All depths reported are from reference notch in top of TOC.

Well ID: RWA-MW5
Date: 8/3/17

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

_____

_____

_____

_____

_____

_____

F. Signatures

Field Representative(s): Daniel Niles. _____ 8/3/17

Print Name | Signature | Date

_____ _____ _____

Print Name | Signature | Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW01-MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/3/17 / 808	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/3/17 / 927	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: SUNNY 70's	Checked by: _____

A. Well Construction Details

Well Cover Type: *Stick-up* or *Flush-Mount*	PVC Screen Interval: 30 to 40
Well riser/screen material: *PVC*	Sandpack Interval: 28 to 40
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 40.56 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.42 ft. (C)
Petroleum/Product Present? *Y or N* Thickness (ft.): _____	Height of Water Column: (B - C) 33.14 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 5.40 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	30-33	10	15	2.77	Dark Grey/Brown Turbid
2	33-36	10	15	2.77	"
3	36-40	10	20	3.70	Light Grey/Brown low turbid
		Cumulative Totals: (Minimum of 3 Well Volumes)			

Final Depth to Water (from TOC): 20.21

Thickness of Any Sediment Remaining in Well: 40.88

All depths reported are from reference notch in top of TOC.

Well ID: RW01-MW1
Date: 8/3/17

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

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F. Signatures

Field Representative(s): Daniel E. Neles (Print Name) _____ (Signature) 8/3/17 (Date)

_____ (Print Name) _____ (Signature) _____ (Date)

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW13 - MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/2/17/ 1347	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17/ ~~1430~~ 1400	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 30 to 40
Well riser/screen material: *PVC*	Sandpack Interval: 28 to 40
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 43.21 ft. (B)
Well (PVC) Volume: ~~0.163~~ DN gal./ft. (A) 1.4694	Depth to Static Water Level (TOC): 10.74 ft. (C)
Petroleum/Product Present? Y or (N) Thickness (ft.): _____	Height of Water Column: (B - C) 32.47 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) ~~5.34~~ DN gal. (E) 47.71

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	30-33	10			
		Cumulative Totals: (Minimum of 3 Well Volumes)			

Final Depth to Water (from TOC): ~~12.21~~ DN 12.21 DN

Thickness of Any Sediment Remaining in Well: ~~43.12~~ 43.22

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

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F. Signatures

Field Representative(s): Daniel Niles		8/2/17
Print Name	Signature	Date
_____	_____	_____
Print Name	Signature	Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW 14 - MW5 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/2/17 / 1309	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17 / 1340	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 80s	Checked by:

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 10 to 20
Well riser/screen material: *PVC*	Sandpack Interval: 8 to 20
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 23.43 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 7.11 ft. (C)
Petroleum/Product Present? *Y* or (*N*.) Thickness (ft.): _____	Height of Water Column: (B - C) 16.32 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 2.66 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	10-13	10	10	3.76	
2	13-16	10	2	0.75	
3	16-20	10	3	1.13	
Cumulative Totals: (Minimum of 3 Well Volumes)					

Final Depth to Water (from TOC): 22.12

Thickness of Any Sediment Remaining in Well: 23.69

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

2 trials For Purge #2, #3.

F. Signatures

	Print Name	Signature	Date
Field Representative(s):	Daniel Nicks		8/2/17

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW 20 - MWS **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/2/17 / 1223	Developed by: DRN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17 / 1302	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 10 to 20
Well riser/screen material: *PVC*	Sandpack Interval: 8 to 20
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 20.63 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 8.11 ft. (C)
Petroleum/Product Present? *Y* or (*N*) Thickness (ft.): _____	Height of Water Column: (B - C) 12.52 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 2.04 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	10-13	10	5	2.08	
2	13-16	10	5	2.08	
3	16-20	10	5	2.08	
	Cumulative Totals: (Minimum of 3 Well Volumes)				

Final Depth to Water (from TOC): 9.04

Thickness of Any Sediment Remaining in Well: 20.67

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

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_____

F. Signatures

Field Representative(s): _____ _____ _____

Print Name | Signature | Date

DANIEL NICOS _____ 8/2/17

Print Name | Signature | Date

All depths reported are from reference notch in top of TOC.
All measurements made in 10^{ths} of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW20 MWI **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/2/17 / 1105	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17 / 1153	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: SUNNY 80's	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 30 to 40
Well riser/screen material: *PVC*	Sandpack Interval: 28 to 40
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 41.12 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 10.99 ft. (C)
Petroleum/Product Present? *Y* or (*N*.) Thickness (ft.): _____	Height of Water Column: (B - C) 30.13 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 4.91 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	30-33	10	15	3.05	Dark Grey Turbid
2	33-36	10	15	3.05	"
3	36-40	10	25	5.09	Light Brown/Grey Low Turbid
		Cumulative Totals: (Minimum of 3 Well Volumes)			

Final Depth to Water (from TOC): 12.59

Thickness of Any Sediment Remaining in Well: 41.23

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

F. Signatures

Field Representative(s):

Print Name	Signature	Date
DANIEL NILES		8/2/17

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW15-MW1 **Well Permit No.:** _____

ARM Project No.: 150	Date/Time Started: 8/2/17 / 941	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17 / 1045	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: Sunny/ 80s	Checked by: _____

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 30 to 40
Well riser/screen material: *PVC*	Sandpack Interval: 28 to 40
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 40.71 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 11.54 ft. (C)
Petroleum/Product Present? *Y or (N)* Thickness (ft.): —	Height of Water Column: (B - C) 29.17 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 4.75 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	30-33	10	15	3.16	dark grey, turbid
2	33-36	10	15	3.16	"
3	36-40	10	25	5.26	light brown/grey, low turbid
		Cumulative Totals: (Minimum of 3 Well Volumes)	55	11.58	

Final Depth to Water (from TOC): 11.78 ~~bgs~~ TOC

Thickness of Any Sediment Remaining in Well: 41.11 ~~bgs~~ TOC

All depths reported are from reference notch in top of TOC.

Well ID: RW15-MWT
Date: 8/2/17

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

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F. Signatures

Field Representative(s): Nick Kurtz (Print Name) _____ (Signature) 8/2/17 (Date)

Daniel Nices (Print Name) _____ (Signature) 8/2/17 (Date)

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

ARM Group Inc.

Earth Resource Engineers and Consultants

Sparrows Point

Monitoring Well Development Form – Surge and Pump Method

Well ID: RW17 - MWS **Well Permit No.:** —

ARM Project No.: 150	Date/Time Started: 8/2/17 / 848	Developed by: DEN
Client: **EnviroAnalytics Group**	Date/Time Completed: 8/2/17 / 930	Company: ARM
Well Location: Area A, Parcel 3	Weather/Site Conditions: SUNNY 80's	Checked by:

A. Well Construction Details

Well Cover Type: (*Stick-up*) or *Flush-Mount*	PVC Screen Interval: 10 to 20
Well riser/screen material: *PVC*	Sandpack Interval: 8 to 20
Difference between Ground Surface and TOC: (+ / -)	Measured Total Depth of Well When Installed (TOC) (F): (See Original Well Construction Diagram)

B. Wetted Bore Volume Determination

Well (PVC) Diameter: 2.0 in.	Well Total Depth (TOC): 25.46 ft. (B)
Well (PVC) Volume: 0.163 gal./ft. (A)	Depth to Static Water Level (TOC): 9.04 ft. (C)
Petroleum/Product Present? *Y* or (*N*) Thickness (ft.): —	Height of Water Column: (B - C) 16.42 ft. (D)
Initial Thickness of Sediment in Bottom of Well (F - B): _____ ft.	Wetted Bore Volume: (A x D) 2.68 gal. (E)

C. Surge and Pump Event Summary Data

Description of Surge Equipment: _____

Event No.	Screen Interval (ft.)	No. of Surge Strokes	Volume of Water Removed (gal.)	Bore Volumes of Water Removed	Qualitative Description of Color/Turbidity/Odors/Other
1	10-13	10	10	3.73	turbid, brown
2	13-16	10	8	2.99	"
3	16-20	10	9	3.36	light brown
	Cumulative Totals: (Minimum of 3 Well Volumes)		27	9.98	

Final Depth to Water (from TOC): 19.11

Thickness of Any Sediment Remaining in Well: 25.69

All depths reported are from reference notch in top of TOC.

ID Numbers of IDW Drums Generated:

1. _____
2. _____
3. _____

D. Checklists

Equipment Check List:

- ☐ Original Well Construction Diagram
- ☐ Well Development Form
- ☐ Clean Weighted Tape for Determining Total Well Depth and Depth to Any Sediment or Possible Blockages Within the Well
- ☐ Water Level Meter and/or Oil-Water Interface Probe
- ☐ Surge Block and 2-inch ID PVC Casing Extensions
- ☐ Appropriate Pump
- ☐ Disposable Pump Tubing
- ☐ Clean Paper Towels
- ☐ Alconox Detergent
- ☐ Clean Brushes for Decontamination Work
- ☐ Distilled Water for Rinsing Equipment
- ☐ 2 New, Clean Spray Bottles for Spray Distilled Water
- ☐ 2 to 3 Clean Five-gallon Buckets
- ☐ 55-gallon Drum(s) for Development Water; Drum Non-hazardous Waste Labeling Supplies
- ☐ Personal Protective Equipment Per Health and Safety Plan

Quality Control Procedures Include:

- ☐ Decon All Equipment that Goes Down-hole per Appropriate Standard Operating Procedure (SOP)
- ☐ Staging Down-hole Equipment, Tubing, etc. on Clean Plastic Sheeting
- ☐ _____

E. Notes/Comments

RW7 well dried out twice during event 2 & 3

F. Signatures

	Print Name	Signature	Date
Field Representative(s):	Nick Kuntz		8/2/17
	Daniel Nieves		8/2/17

All depths reported are from reference notch in top of TOC.
All measurements made in 10ths of feet

TOC = from Top of PVC Casing
Grd = Ground Surface
TD = Total Depth

APPENDIX H

Trench Excavation Procedure

Using a trench box as a shoring method in deep trenches

1. Excavate the top portion of the trench wide enough for the excavator to have a full range of motion and excavate a lower portion of the trench where the trench box will be placed.

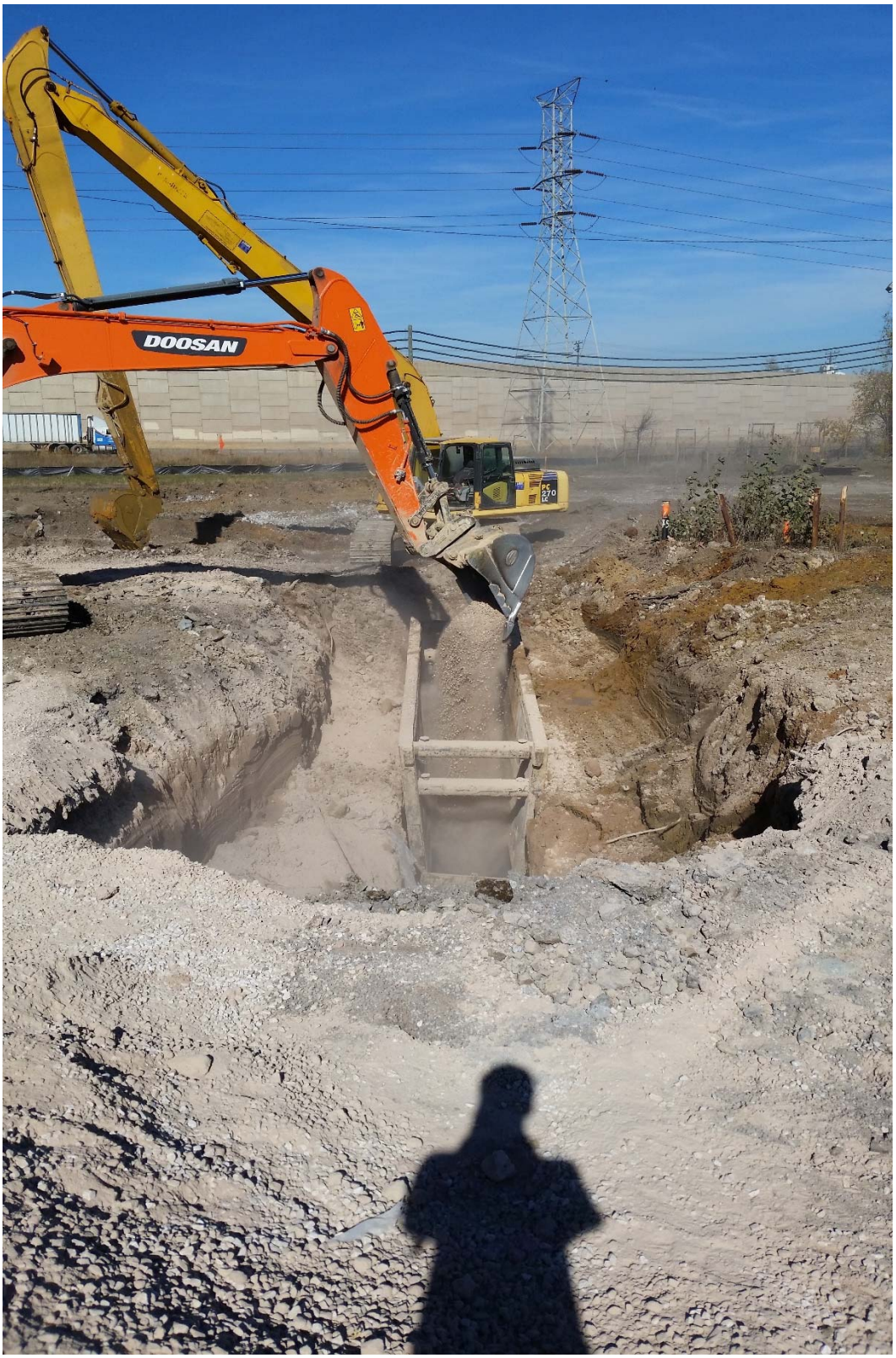
2. Use an excavator to slide the trench box into the lower portion of the trench.

3. Use an excavator and cable to lower steel plates into position at the open ends of the trench box.

4. Dig through the trench box to the desired depth using the trench box and steel plates to keep the excavation sidewalls from caving in.

5. As the excavation progresses, use an excavator to push the trench box and steel plates deeper into the excavation.

6. When the desired depth is reached, use an excavator/dump truck/loader to backfill the excavation through the top of the trench box.



7. As lifts of backfill are placed in the excavation, use an excavator to lift the trench box and steel plates up to prevent them from becoming buried or stuck.