INTERIM MEASURES WORK PLAN

PARCEL B13 (SLAG RECLAMATION AREA)
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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Revision 1 – July 7, 2023

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic (TPA), has prepared this Interim Measures (IM) Work Plan to address naphthalene impacted fill material (i.e. slag) within the eastern portion of Parcel B13 (Slag Reclamation Area) (the Site) located on the TPA property. This includes approximately 18,000 cubic yards (CY) of stockpiled material as well as additional existing in-situ impacted material. The impacted slag was initially encountered during reclamation activities conducted by MCM Management Corp. (MCM) under contract to DXI Construction (DXI). The material was placed into four stockpiles on Parcel B13 during the reclamation activities. Sampling was conducted to further characterize the material. Additional material was also subsequently encountered during grading operations by Maryland Materials Management (MMM) at Parcel B13.

This IM Work Plan summarizes the results of the slag characterization sampling; identifies and evaluates potential IM alternatives; and proposes an IM to remediate naphthalene impacts at the Site.

1.1 PROJECT BACKGROUND

In 2019, MCM under contract to DXI performed slag reclamation activities in the northeastern portion of Parcel B13, shown on **Figure 1**, which then progressed toward the south. Slag reclamation activities included removing approximately 15 feet of slag from the ground surface to be processed and then repurposed in ongoing and future construction projects throughout the TPA property. In mid-May 2019, MCM operators uncovered a vein of slag within the face of a cut that exhibited elevated olfactory indications of naphthalene contamination. Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA), herein referred to as the Agencies throughout this Work Plan, were notified and MCM immediately ceased slag reclamation activities in this area pending further investigation of the potential impacts. Four slag stockpiles had been created from the impacted material prior to the identification of odor (approximately 18,000 CY) during the reclamation activities at the locations shown on **Figure 2**.

On November 18, 2021, odors were observed by MMM personnel during grading operations on Parcel B13 immediately south of Sub-Parcel B13-1 (**Appendix A**). An Environmental Professional (EP) inspected the area. Surficial soils exhibited photoionization detector (PID) measurements of greater than 10 parts per million (ppm) as well as an odor consistent with the previously identified slag noted above. The approximate boundaries of the area are shown in **Appendix A**. On November 19, 2021, the impacted area was capped with a minimum of 12 inches of unimpacted slag material. After capping, the EP inspected the area for evidence of odors or elevated PID readings. No evidence of odors or elevated PID reading were detected following the capping operation. In February 2023, the area was inspected again with hand borings dug below the unimpacted cover and no PID or odors were identified.

While slag reclamation work has continued elsewhere within Parcel B13, the impacted slag stockpiles remain onsite and both in situ materials remain undisturbed. The slag stockpiles were covered using Posi-Shell® environmental coating mix to suppress odor. A Corrective Measures Study (CMS) Report (Revision 2 dated November 16, 2021) was submitted to the Agencies to evaluate and propose corrective measures alternatives for the Site. However, due to project constraints including odor concerns relative to adjacent communities, the CMS is withdrawn in favor of this IM Work Plan to expedite remediation of the naphthalene impacted material.

1.2 OBJECTIVE

The objectives for the IM described below are to:

- Eliminate any unacceptable risks to human health from the hazardous constituents in the contaminated slag,
- ensure nuisance odors that may be generated during remedial activities do not impact neighboring communities,
- minimize releases of constituents of potential concern (COPCs) to the atmosphere and groundwater, and
- ensure that slag containing elevated concentrations of COPCs will not adversely impact off-site ecological receptors nor adjacent surface water and pore water quality.

2.0 SITE CHARACTERIZATION SUMMARY

2.1 SLAG STOCKPILE CHARACTERIZATION

As originally summarized in the Stockpile Reuse Plan (Revision 0, dated October 9, 2019), samples were collected by Hillis-Carnes Engineering Associates (HCEA) on May 20, 2019, from the slag stockpiles generated from impacted material. HCEA's sampling included collection of a total of five composite samples and seven grab samples. One composite sample and one grab sample were collected from each slag stockpile, with the exception of Stockpile 1 (SP-1), from which two sets of samples were collected its based. Two additional grab samples, identified as samples C-1 and C-2, were taken from the exposed vein of contaminated slag at the southern edge of the reclamation area to characterize the in-situ material. Sample locations for the grab samples were chosen based on elevated PID readings. The composite samples in each set were analyzed for metals and polychlorinated biphenyls (PCBs) while the grab samples were analyzed for total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). Naphthalene was analyzed as both a VOC and an SVOC, so two values are reported for each set of grab samples and cut face samples.

A summary of organic and inorganic detections from the slag stockpile and cut face samples is provided in **Table 1**. Analytical results which exceeded the established Project Action Limits (PALs) are shown on **Figure 3**. The analytes that exceed the PAL among the samples included one VOC/SVOC (naphthalene), one metal (arsenic), and DRO. The highest stockpile naphthalene concentration (1,200 milligrams per kilogram [mg/kg]) was detected in Stockpile 4 (SP-4-A). The highest naphthalene concentration from the cut face was at C-2 (7,400 mg/kg). Arsenic was only detected above the PAL in one pile (Stockpile SP-1) with concentrations ranging from 3.2 (SP-1-S) to 12 mg/kg (SP-1-N). The only DRO PAL exceedance was observed at C-2, at 30,000 mg/kg. The laboratory reports for the stockpile and cut face characterization samples are provided as **Appendix B**.

Therefore, based on the results of analytical sampling, naphthalene is the primary COPC for the stockpiles and remaining in-situ material.

2.2 2020 SLAG CHARACTERIZATION

Based on results from the above sampling, additional characterization of the slag was completed in June 2020, as included in the Slag Characterization Completion Report (Revision 1, submitted September 20, 2020). Borings were advanced at eight locations (B13-095-SB through B13-102-SB), and three test pits were advanced at locations where the borings did not achieve their target depth. Note that topography slopes downward on the eastern part of the characterization area so that even though borings B13-098-SB and B13-099-SB only extended to 8 feet below ground

surface (bgs) and 10 feet bgs respectively, these borings successfully characterized the full extent of future slag reclamation to 14 ft above mean sea level (amsl). As shown on **Figure 4**, several polycyclic aromatic hydrocarbon (PAH) PAL exceedances were identified among the completed boring samples. Naphthalene exceedances were identified at boring locations B13-096-SB and B13-100-SB. Minimal non-aqueous phase liquid (NAPL) was also observed at B13-096-SB from 15.7 to 16 feet amsl, and moth ball -like odors were observed in the same boring from 15 to 20 feet amsl. Notable odors were observed while excavating the test pit that extended south from boring location B13-100-SB. This test pit was extended to the south until odors dissipated. Samples were collected at the southern edge after olfactory evidence of naphthalene contamination was no longer observed. Analytical results from the test pit samples at B13-100T-SB indicated no PAL exceedances, suggesting that the limit of suspected contamination was reached.

Based on the extent of PAL exceedances and observation of odors and NAPL, an area of contamination was defined and is shown on **Figure 5**. This area was designated for special management, separate from the surrounding slag reclamation activities, to ensure potentially contaminated materials are screened and appropriately managed.

2.3 2021 SLAG CHARACTERIZATION

A Corrective Measures Study Investigation Work Plan (Revision 0 dated March 15, 2021) proposed additional slag and groundwater sampling to further characterize conditions at the Site. Specifically, additional sampling was conducted for the following reasons:

- The previous Phase II included samples in the vicinity that have since been removed (or will be removed in the future) due to slag reclamation. Therefore, additional slag sampling was proposed as follows:
    - Collect shallow slag samples in areas where slag reclamation has been completed; and
    - Collect deep slag samples in areas where slag reclamation is proposed. All soil results will be used to support Screening Level Risk Assessments (SLRAs) to be completed for future Response and Development Work Plans (RADWPs).
- Further characterize and/or delineate known impacts in groundwater; and
- Delineate NAPL impacts around B13-078-PZ.

As shown on **Figure 6**, 11 investigation piezometers and three NAPL delineation piezometers were installed in April 2021 at the Site to a maximum depth of 40 feet bgs. During the borehole logging associated with piezometer installation, if significant visual or olfactory evidence of impacts or elevated PID readings above 10 ppm were encountered, samples were collected from corresponding intervals and analyzed for VOCs and SVOCs. A maximum of one sample was collected from each applicable 10-foot interval. Groundwater samples were collected in May 2021 and analyzed for VOCs and SVOCs. The analytical results for the detected organics are summarized and compared to the PALs in **Table 2** (slag) and **Table 3** (groundwater).

In order to evaluate a potential location for the Waste Consolidation and Capping, seven test pits were completed in July 2021, as shown on **Figure 7**. The test pits were either completed to a depth of 4 feet above mean sea level (amsl) for soil sampling, or to a depth of 0 feet amsl for soil and groundwater sampling. Soil was screened using a PID and also screened for odors, NAPL presence, staining, and other visual evidence of contamination. At each test pit location, no odors or other forms of contamination were observed, so soil samples from 6 feet bgs (approximately 4 feet amsl) were submitted and analyzed for naphthalene. The analytical results for the detected organics are summarized and compared to the PALs in **Table 2** (slag) and **Table 3** (groundwater). A complete summary of test pit completion activities is included in the Parcel B13 Corrective Measures Study (Revision 2 dated November 16, 2021).

Figure 6 summarizes the benzene and naphthalene groundwater sample results (collected in May 2021), data from previous Phase II Investigations, and test pit locations where groundwater samples were analyzed for naphthalene. Overall, benzene and naphthalene groundwater impacts are greatest to the south of the cut face. These impacts likely predate the excavation and placement of the impacted stockpiles. **Figure 7** summarizes benzene and naphthalene PAL exceedances, elevated VOC concentrations (above 10 ppm measured via PID), and NAPL observations. Boring and piezometer logs are included as **Appendix C**. Groundwater elevation data are shown on **Figure 8**, which indicates that the potentiometric surface in the area is generally flat, at an elevation of approximately 0.7 feet amsl.

3.0 EVALUATION OF INTERIM MEASURES

3.1 GENERAL

Based on the results and conclusions of previous characterization activities, this section presents a summary of the identification and evaluation of IM alternatives for the stockpiled slag material and the in-situ impacted area in general accordance with USEPA guidance under the Resource Conservation and Recovery Act (RCRA).

The IM alternatives were evaluated for consistency with the RCRA Threshold Criteria and Balancing Criteria. The Threshold Criteria assess the overall protection of human health and the environment, as well as achievement of IM objectives and control of sources of releases. The Balancing Criteria assess long-term effectiveness and permanence; reduction of toxicity, mobility or volume; short-term effectiveness; implementability; cost effectiveness; and community and State acceptance.

Threshold Criteria

- Protection of Human Health and the Environment: This criterion provides a final check to assess whether each alternative provides adequate protection of human health and the environment, focusing on how each risk and associated pathway are eliminated, reduced, or controlled.

- Attainment of IM Objectives: The assessment against this criterion describes how the remedy meets the IM objectives, which include:

    - Eliminate any unacceptable risks to human health from the hazardous constituents in the contaminated slag,
    - ensure nuisance odors that may be generated during remedial activities do not impact neighboring communities,
    - minimize releases of COPCs to the atmosphere and groundwater, and
    - ensure that slag containing elevated concentrations of COPCs will not adversely impact off-site ecological receptors nor adjacent surface water and pore water quality.

- Control of Sources of Releases: In its RCRA IM proposed remedies, USEPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the extent practicable, further releases. This includes odor control related to the volatilization

of naphthalene from the impacted slag, and how odor control will be addressed during material handling to minimize community nuisance odor risk.

Balancing Criteria

- Long-Term Effectiveness: This criterion addresses the risk remaining at the site associated with each alternative after remedial action has taken place and objectives have been met.

- Reduction in Toxicity, Mobility, or Volume of Wastes: This criterion addresses the statutory preference for remedial actions involving treatment technologies that permanently and significantly reduces toxicity, mobility, or volume of the principal hazardous substances at a site.

- Short-Term Effectiveness: This criterion generally refers to potential short-term risks to on-site workers, the community, and the environment in association with implementation of the IM alternatives, such as might be associated with the construction and implementation of the remedial action, and the time required to achieve the IM objectives.

- Implementability: This criterion refers to the relative ease of alternative implementation (construction), including duration, administrative and technical feasibility, and availability of the required services and materials. Technical feasibility assesses the ability to construct, operate, monitor and, if needed, expand an alternative. Administrative feasibility assesses the activities needed to coordinate with other agencies or obtain permits. Availability of services and materials considers locally available resources and availability of technologies.

- Cost: This criterion addresses the anticipated short- and long-term costs associated with implementation of the IM alternatives. For this initial screening, only the cost relative to other alternatives has been considered.

- State Acceptance: This criterion refers to how the IM alternatives will comply with applicable Federal and State regulations (e.g., permit requirements), and acceptance of the proposed IM alternatives by the Agencies.

- Community Acceptance: This criterion refers to the known or anticipated community acceptance associated with the IM alternatives.

3.2 IDENTIFICATION OF REMEDIAL ALTERNATIVES

This section presents the identification of potential remedial alternatives to be evaluated against the IM objectives. The potential remedial alternatives were developed based on the media clean-up objectives, communications with TPA, and professional experience with the identification and screening of remedial alternatives and consist of the following.

- Alternative 1 – No Action: This alternative does not include the implementation of any IM, and represents leaving the Site in its existing condition. This alternative does not address the IM objectives, but is presented as a baseline condition for comparison purposes.

- Alternative 2a and b – Removal and (a) On-Site Disposal or (b) Off-Site Disposal: These alternatives involve the excavation and disposal of all naphthalene impacted material (including both stockpiled material, in-situ material, and future identified material, if encountered) either (2a) on-site at Greys Landfill or (2b) to an off-site disposal facility. For Alternative 2a, slag material would be loaded and transported approximately four miles to the top of Greys Landfill, a facility owned and operated by TPA. For Alternative 2b, the slag material would be loaded and transported off-site to a landfill; for this sub-alternative an estimated distance of 25 miles from the property was used for assessment purposes. Based on the volume of material that would be transported, it would likely take approximately 24 days for either option to transport the material, assuming 17 CY (30 tons) of material per truck and 48 truck trips per day.

- Alternative 3 – Consolidation and Capping: This alternative generally involves the following major activities: consolidating impacted slag material as backfill above the water table; placement of an impermeable cap (including a 10-mil polyethylene liner and a minimum of 4-inches of fill) above the impacted material to minimize precipitation infiltration, cross media transfer to groundwater, contaminant mobility in groundwater, and direct contact exposures; establishment of long-term property use restrictions including a requirement for further evaluation of vapor controls for any future building built over this fill; and downgradient groundwater monitoring to ensure that the controls remain effective. Additionally, post-consolidation treatment may be necessary based on the results of groundwater monitoring.

- Alternative 4 – Slag Treatment: This alternative involves direct treatment of the naphthalene impacted material by chemical oxidation through a highly controlled application of hydrogen peroxide (H_2O_2). H_2O_2 is a strong oxidizing reagent that, in the presence of iron generates free radicals which then oxidize organic compounds such as naphthalene and benzene in an exothermic process called Fenton's Reaction. Organic compounds are destroyed during the chemical reaction thereby eliminating the odor through source degradation. Following material treatment and sampling to confirm elimination of COPCs, the slag may be eligible for beneficial reuse at Sparrows Point. This treatment program could also be used for additional material displaying similar characteristics during reclamation operations, if necessary.

3.3 INITIAL SCREENING OF REMEDIAL ALTERNATIVES.

This section presents an initial screening of the identified remedial alternatives against the CERCLA threshold criteria (i.e., protection of human health and the environment; attainment of IM objectives; and controlling the sources). The screening is summarized as follows:

- Protection of Human Health and the Environment: Alternative 1 (No Action) would not be protective of human health or the environment. Alternatives 2a and b would provide protection of human health and the environment in the long-term by removing the impacted slag from the Site. Alternative 3 would provide protection of human health by consolidating the impacted slag and limiting access to the site (i.e., property use restrictions) and eliminating risk to current and future workers by preventing exposure to on-site media (i.e., impermeable cap). Alternative 4 would eliminate the source of contamination, providing protection of human health and the environment.

- Attainment of IM Objectives: Alternative 1 would not meet any of the established IM Objectives. Alternatives 2a and b removes the impacted slag from the Site, eliminating releases of COPCs and risks to human health. Alternative 3 includes a cap that will reduce infiltration therefore minimizing risk of cross media transfer to groundwater, and provides protection of human health by limiting access to the impacted material. Alternative 4 chemically treats the slag so that it is no longer a risk to human health or ecological receptors.

- Control of Sources of Releases: Alternative 1 would not provide any additional control of potential release of the existing COPCs. Alternatives 2 through 4 would control the potential release from the impacted slag. Alternatives 2 and 4 would remove the impacted slag (source) from Parcel B13 and would meet the criteria. Alternative 3 would consolidate the source material to reduce the potential for migration of impacted groundwater (via reduced infiltration and groundwater gradients) and reduce potential exposure to the source (via capping and institutional controls).

Based on this initial screening, Alternative 1 (No Action) does not meet the threshold screening criteria for the stated IM objectives and has not been included in the detailed evaluation of alternatives section. Alternatives 2a/b, 3, and 4 would meet the IM objectives and will be retained for detailed evaluation in the following section of this report.

3.4 DETAILED EVALUATION OF ALTERNATIVES

This section presents a detailed evaluation of the remedial Alternatives 2a/b, 3, and 4 that were identified and screened in the previous section. This detailed evaluation has been conducted with respect to the following evaluation/balancing criteria: long-term effectiveness; toxicity, mobility

and volume reduction; short-term effectiveness; implementability; community acceptance; state acceptance; and cost.

- Long-Term Effectiveness: Alternatives 2 through 4 would be effective in the long-term.
- Reduction in Toxicity, Mobility, or Volume of Wastes: Alternative 2a and b involves complete reduction in toxicity, mobility, and volume of the waste at the Site, however, this toxicity and volume is transferred to either (2a) Greys Landfill or (2b) to an off-site disposal facility. Alternative 3 does not provide reduction in toxicity or volume at the Site. The cap will help reduce long-term contaminant mobility through infiltration reduction. Alternative 4 would reduce toxicity, mobility, and volume of the waste through chemical treatment that degrades the source of impact (naphthalene).
- Short-term Effectiveness: Alternatives 2a, 2b, and 3 present a slightly increased risk of short-term direct contact exposures to the contaminated sediments in association with the handling and movement of the impacted material. These risks can be controlled through the implementation of conventional best management practices for waste handling, dust control, and worker health and safety. All three Alternatives would likely cause significant nuisance odors and chemical emissions during material handling and transport (which would cause potential exposure to workers and impacts to the community), as well as mechanical safety hazards posed by increased trucking. In addition, Alternative 2a would require material be transported to the top of Greys Landfill (approximately 140 feet amsl), exposing the material to high winds in the vicinity of residential areas. Air emission and odor controls would be required to mitigate this potential risk. Alternative 4 (Slag Treatment) would require minimal handling of impacted material prior to treatment and is expected to have the lowest potential short-term risks to on-site workers, the community, and the environment when compared to the other alternatives. These risks can be controlled through the implementation of highly controlled application procedures and best management practices for treatment, waste handling, dust control, and worker health and safety.
- Implementability: Alternatives 2a, 2b, 3, and 4 are readily implementable in terms of equipment and manpower requirements. However, Alternatives 2 and 3 present significant implementation concerns because of potential short-term exposure risks, required air-emission and odor controls, and the handling and transportation of a relatively large volume of waste materials.
- Cost: Alternative 2a, 2b, and Alternative 3 have increased costs in comparison to Alternative 4, due to the costs associated with transport of slag (Alternatives 2a, 2b, and 3), consolidation efforts (Alternative 3), odor suppression (Alternatives 2a and 2b), and off-site landfill disposal (Alternative 2b). In addition, post-consolidation monitoring may

indicate that additional unknown in situ treatment costs may become necessary for Alternative 3. Preliminary estimated costs for each alternative are as follows:

- Alternative 2a – $2,378,242
- Alternative 2b – $2,762,464
- Alternative 3 – $876,497
- Alternative 4 – $330,055

A table summarizing the costs based on current market rates for chemicals, labor, equipment, and disposal is included as **Appendix D**.

- State Acceptance: For Alternatives 2a, 2b, and 3, the nuisance odor risks associated with material handling and transport must be considered when applying for state acceptance. Alternate 4 reduces the risk that neighboring communities will be impacted during the implementation of the remedy due to the very controlled manner of the material handling and application procedure. Alternatives 2a, 2b,, 3, and 4 can be implemented in a manner consistent with applicable State permitting requirements, and are expected to be acceptable to the State because they address applicable requirements of the MDE-VCP. The Agencies have been involved throughout the investigation process; comments and guidance are expected concerning the various Alternatives.
- Community Acceptance: Alternatives 2 through 4 were presented to the local community group representing this area. Alternative 4 was presented as the chosen option and no objections were noted by the group.

3.5 JUSTIFICATION AND RECOMMENDATION OF REMEDIAL ALTERNATIVE

Based on the evaluation of remedial alternatives as presented in the preceding section(s), Alternative 4 – Slag Treatment, is recommended for the stockpiled slag material and the in-situ impacted material. This alternative clearly satisfies the evaluation criteria, while avoiding short term hazards that are created by the other potential alternatives. Alternative 4 is an appropriate remedy for the identified contamination. Supporting rational for selection of Alternative 4 are summarized below.

Alternate 4– Slag Treatment:

- satisfies the threshold and balancing criteria;
- meets the IM objectives;
- can be readily implemented with proven and reliable technologies;

- has the lowest potential to negatively impact workers on the Tradepoint property and nearby residents and minimizes mechanical safety hazards posed by increased trucking distance and duration;
- minimizes likelihood of community impact by nuisance odor during the remedy implementation;
- provides for protection of human health and the environment; and
- can be conducted in accordance with applicable regulations.

4.0 PROPOSED INTERIM MEASURE ALTERNATIVES

Based on the evaluation of remedial alternatives as presented in the preceding section(s), Alternative 4 – Slag Treatment, is recommended to address naphthalene impacted fill material. This includes the remaining stockpiled and in-situ materials.

4.1 COMPLETED PILOT TEST

In order to beneficially reuse the naphthalene impacted slag, TPA investigated the use of H_2O_2 to chemically oxidize the naphthalene. H_2O_2 is a strong oxidizing reagent with a long history of use treating organic compounds in the presence of iron. Based on the concentration of iron in slag, H_2O_2 reacts rapidly generating free radicals which oxidize organic compounds in the slag in an exothermic process called Fenton's Reaction. Naphthalene is destroyed during this chemical reaction, thereby eliminating odors through source degradation.

A pilot study was conducted from June 22 to 28, 2022 by TPA to assess the effectiveness of H_2O_2 application on the naphthalene-impacted slag at the Site. Below is a summary of the pilot study, which is detailed in the Hydrogen Peroxide Pilot Test Summary at Area B: Parcel B13 letter dated July 27, 2022.

An approximately 10 feet by 10 feet by 3 feet deep test pit was excavated in Stockpile 1 (**Figure 2**) with material removed stockpiled alongside the open excavation. Two 5-gallon buckets of untreated material were segregated to serve as an untreated control for the pilot test. There was a notable moth ball odor from the open excavation.

Approximately 140 gallons of a 10% by volume mixture of H_2O_2 in water was then introduced into the open excavation. This concentration was chosen to balance the safety and effectiveness of the mixture. The H_2O_2 mixture was allowed to percolate within the excavation. During the application of the H_2O_2 mixture the surface temperature of the treated material was monitored with an infrared thermometer, as reported in **Table 4**. Approximately 10 minutes following soaking the surface with the H_2O_2 mixture, a sample was collected from the open excavation for SVOCs. Additionally, treated material was also segregated into six 5-gallon buckets to serve as duplicates for post-treatment samples. No odors were observed from the excavation following treatment.

The excavation was then covered with a layer of plastic to prevent the release of odors. The excavated soil was then added back to the hole. On June 23, 24, 27, and 28, 2022, samples were collected from the surface of the open excavation and from the segregated, treated buckets of slag. All samples from the excavation were taken from within the top 10 inches of mixed material and from approximately same location within the excavation each time. All samples were analyzed for SVOCs. Two additional in-situ samples were collected on June 28, 2022, from 60 and 67 inches bgs (or 24 and 31 inches below the treated slag and excavation bottom) to confirm vertical extent

of H_2O_2 percolation. An untreated control slag sample from the segregated bucket of slag was also collected on June 28, 2022 and analyzed for SVOCs. The sample results are included on **Table 4**.

The pilot study found that H_2O_2 treatment was successful at reducing odors and PID levels as well as initiating the in-situ degradation of naphthalene. Immediately following treatment, field staff observed a reduction in the odor of the material. Additionally, PID measurements of the slag were reduced by an order of magnitude post-treatment. Based on the results of the study, there was an approximately 75-80% reduction in concentration of naphthalene seven days post-treatment.

4.2 PROPOSED TREATMENT PROCEDURES

Based on the successful results described above, pilot testing was expanded to determine implementability of this alternative as an IM beginning on August 29, 2022. Details of the expanded pilot testing protocols were presented in the Hydrogen Peroxide Treatment Procedures for Area B: Parcel B13 (Revision 1), dated September 22, 2022. H_2O_2 treatment began with segregated stockpiles and will continue upon completion to include remaining in-situ material. Additionally, if other material is identified during reclamation activities on Parcel B13 with olfactory indications of naphthalene and elevated PID measurements above 10 ppm, the material will be considered for treatment through this same protocol. Further details of the treatment procedures are as follows.

Prior to the start of work, the crew will confirm the wind direction. If the wind direction is coming from the east/northeast/southeast, work may proceed. Wind direction will be confirmed both by checking regional weather predictions as well as locally confirming via a windsock maintained on Parcel B13 that visually observable from the work zone. In previous pilot test activities, TPA has not seen wind direction shift radically over the course of the approximately 2-3 hours it takes to prepare and treat a batch slag. However, if this were to occur and wind direction shifts dramatically during treatment, work will be stopped, and the pile immediately covered. Additionally, to avoid the potential for leachate generation, work will not be conducted during significant precipitation events.

Once wind direction is confirmed to be favorable, a layer of no more than 2 feet of slag will be spread out within the treatment area, approximately shown on **Figure 9**. After spreading out the material, the crew will begin treatment by saturating the surface with a 10% H_2O_2 in water solution. The crew will follow all manufacturer recommended safety guidelines for the application of the H_2O_2 solution. A Safety Data Sheet for hydrogen peroxide is provided as **Appendix E**.

During removal and spraying operations, a technician will periodically monitor the atmospheric conditions within the area of operations and downwind for odors and potential volatile organics in the air with a PID. If a mothball odor or PID measurements above 10 ppm are sustained in the breathing zone, work will be stopped until odors have dissipated and/or PID levels are reduced.

The technician will also observe the spraying operations for potential leaching of H_2O_2 solution onto the ground surface around the treatment area. If visibly wet surfaces are observed, material will be taken from the surface in that location and screened with a PID. If the PID measurements are above 10 ppm, that material will be added to the current treatment batch. If PID measurements are below 10 ppm, no action will be taken, and work will continue. This same screening will be conducted on the ground surface under the treated material after it has been moved from the treatment site.

Following treatment, a layer of approximately 1 foot of non-impacted material will be used to cover the treatment area in order to minimize contact with the material and prevent the spread of residual odors. Additionally, a layer of approximately 1 foot of non-impacted material will be used to cover the face of the working impacted slag pile after removing the material to be treated.

After approximately 6 hours following treatment, a technician will grid out the treated material every 100 CY. The technician will bore with a hand auger through the non-impacted cover material to the middle of the treated slag layer, in order to screen the treated slag with a PID. If the PID measurements are less than 10 ppm, the material will be segregated. Additional batches screened below 10 ppm will be consolidated to a total volume of no more than 1,000 CY. Upon approaching that total volume, a representative 10-point composite sample of the pile will be collected for SVOCs via USEPA Method 8270.

If the PID measurements are above 10 ppm following treatment, the material may be re-treated as above with the goal of achieving less than 10 ppm. If following additional treatment(s) the PID measurements of the batch remain above 10 ppm, a representative 10-point composite sample of the pile may be collected for SVOCs via USEPA Method 8270 to confirm suitability for reuse.

Treated slag with concentrations below the USEPA Regional Screening Limit (RSL) for Naphthalene (86 ppm) will be reused on-site based on Agency approval. The naphthalene RSL has been set at 1×10^{-5}, which results in a hazard index of 0.1. If TPA wishes to reuse the treated slag at other industrial sites beneath an environmental cap, the receiving site and post-treatment results will be reviewed and approved by the Agencies prior to movement. TPA is proposing to reuse at least a portion of the treated slag to the north of the treatment area, as shown in **Appendix F**. Any receiving site would be within the Sparrows Point property and no material will be moved off-site. Treated slag with concentrations above the RSL will be segregated. The material may then be assessed with TPA and the Agencies for potential re-use, additional sampling, or further treatment.

4.3 MONITORING

Following slag treatment, confirmation samples will be collected from the exposed surficial slag material underneath each of the former stockpiles, from underneath the cut face, and from beneath the treatment area. These samples will be analyzed for SVOCs via USEPA Method 8270. If the

confirmation soil samples exceed the naphthalene RSL referenced above in Section 4.2 (86 ppm), a temporary piezometer will be installed at that location to monitor groundwater conditions.

Additionally, a temporary piezometer will be installed in the shallow zone to monitoring groundwater conditions directly beneath the treatment area. The proposed location of this piezometer is included on **Figure 9**. This piezometer will be sampled for SVOCs via USEPA Method 8270. The results will be reported to the Agencies.

4.4 REPORTING

Once this IM Work Plan is approved, the results of each batch will be submitted to the Agencies for review and approval. The submittal will include the final destination of the treated material. Additionally, quarterly letters will be submitted to the Agencies summarizing progress and will include the following information:

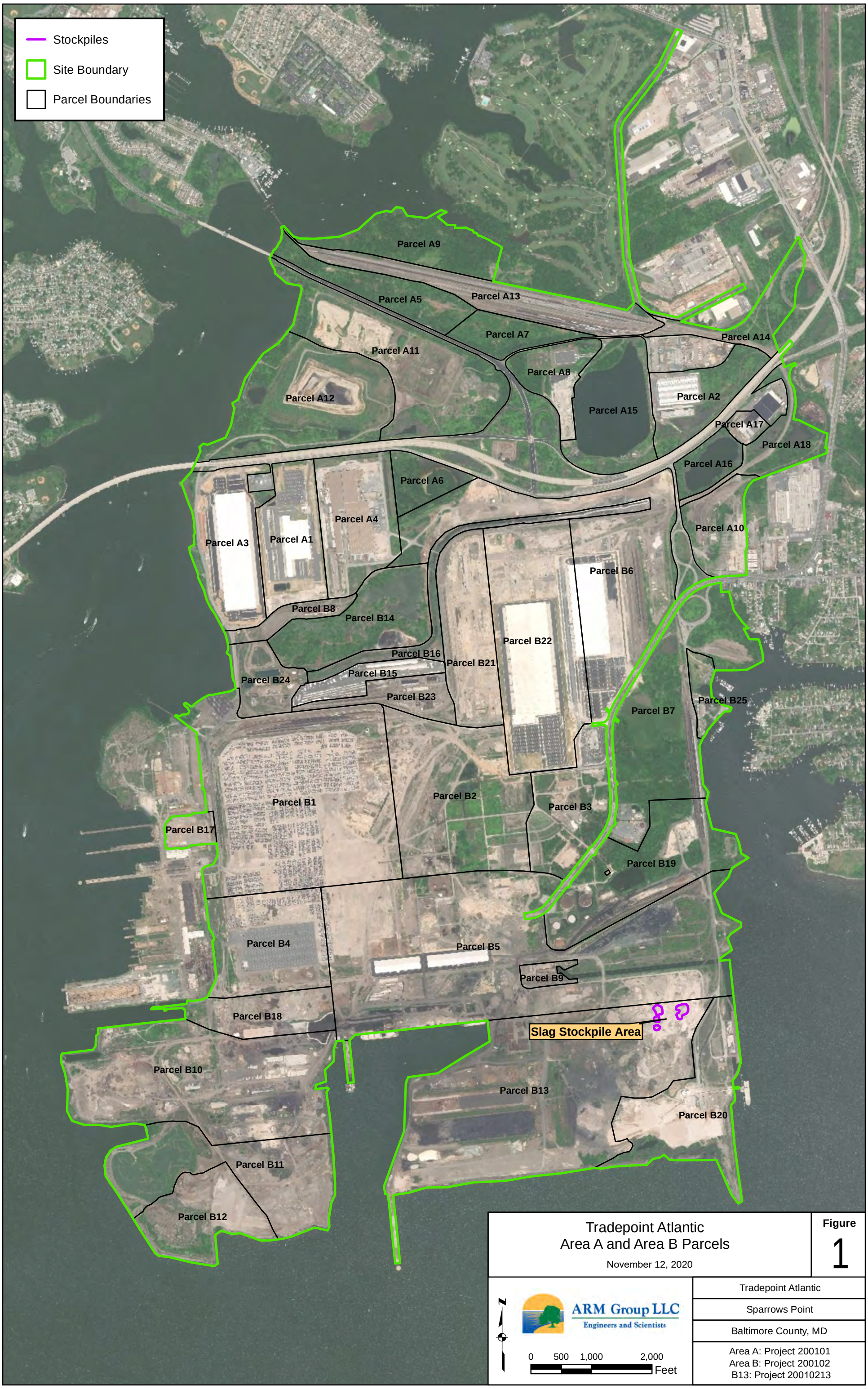
- Number of batches treated;
- Summary of analytical data and PID measurements from each batch; and
- Tracking of the movement of the treated slag.

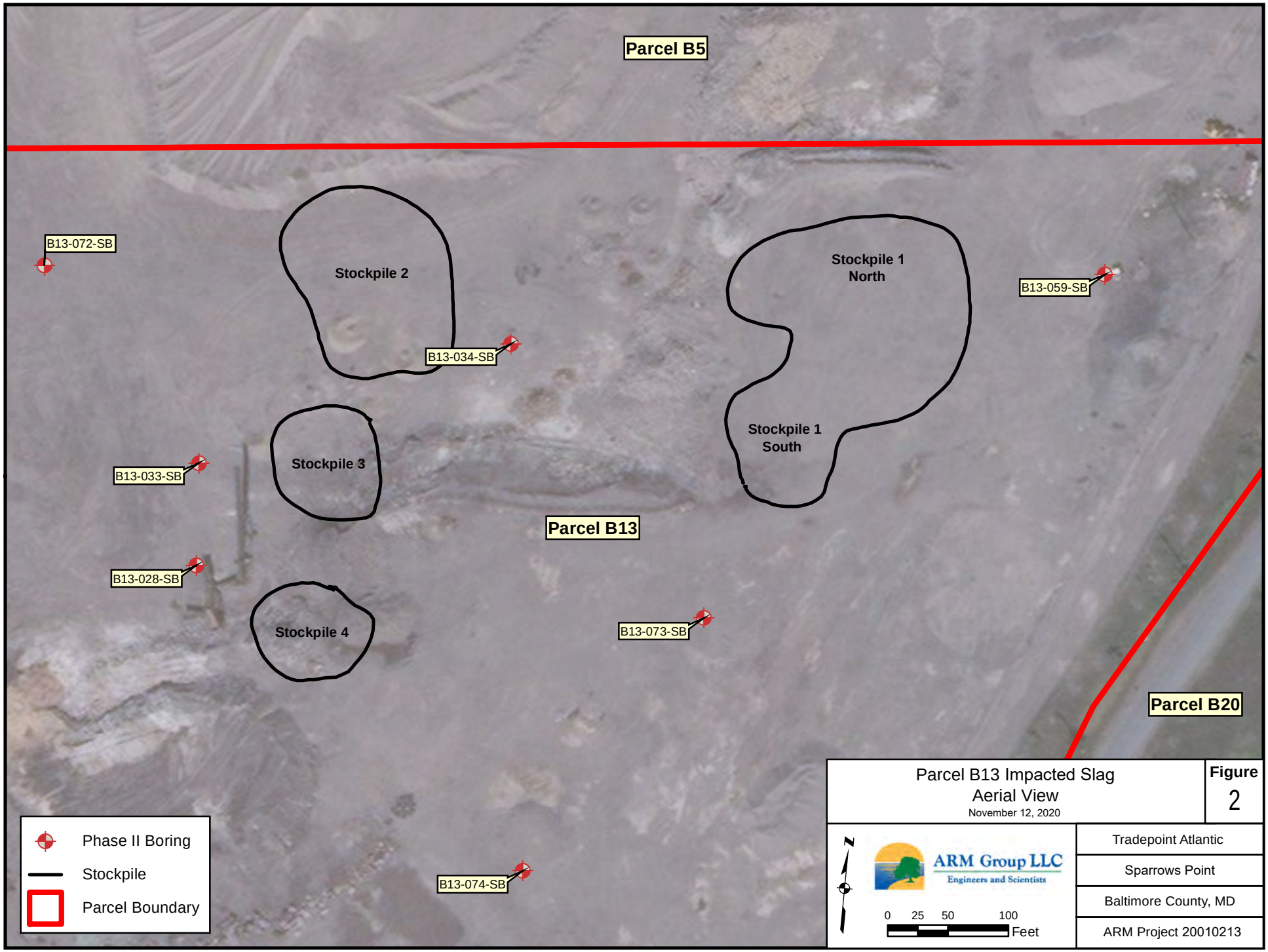
4.5 SCHEDULE

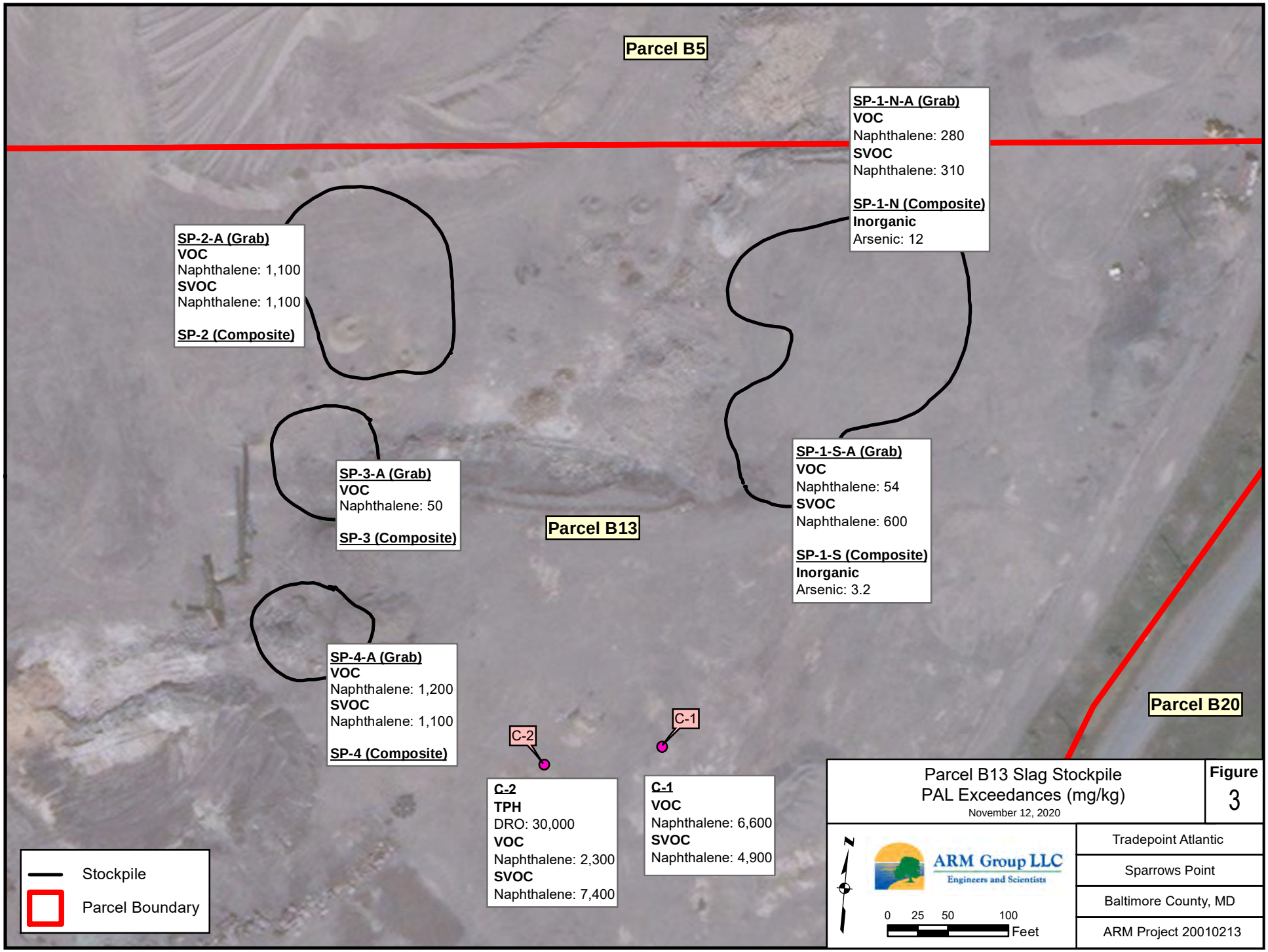
The proposed implementation schedule is shown below:

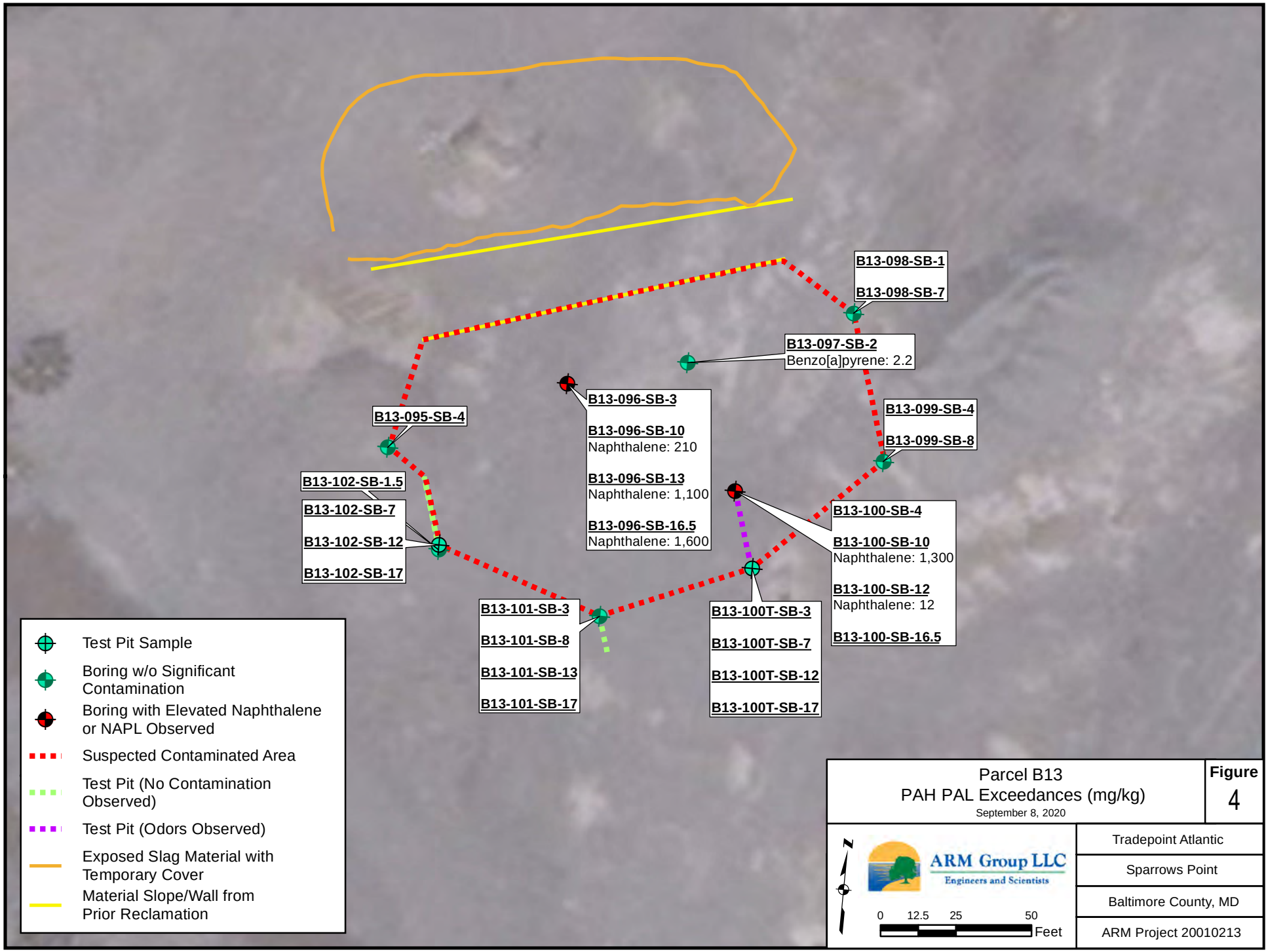
Task	Proposed Date
Anticipated IM Work Plan Approval	July 2023
Stockpile Treatment (Beginning)	July 2023
Stockpile Treatment (Ending)	End of December 2023
GW Monitoring Point Installation at Stockpiles	Quarter 1, 2024
In-Situ Material Treatment (Beginning)	Quarter 1, 2024
In-Situ Material Treatment (Ending)	Quarter 2, 2024
GW Monitoring Point Installations at Cut Face	Quarter 1, 2024

FIGURES


Stockpiles
Site Boundary
Parcel Boundaries
Parcel A9
Parcel A5
Parcel A13
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A4
Parcel A3
Parcel A1
Parcel A10
Parcel B6
Parcel B8
Parcel B14
Parcel B22
Parcel B16
Parcel B21
Parcel B15
Parcel B24
Parcel B23
Parcel B25
Parcel B7
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Slag Stockpile Area
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Tradepoint Atlantic
Area A and Area B Parcels
November 12, 2020
Figure
1
N
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 200101
Area B: Project 200102
B13: Project 20010213


Parcel B5
B13-072-SB
Stockpile 2
B13-034-SB
Stockpile 1
North
B13-059-SB
Stockpile 1
South
Stockpile 3
B13-033-SB
Parcel B13
B13-028-SB
Stockpile 4
B13-073-SB
Parcel B20
B13-074-SB
Phase II Boring
Stockpile
Parcel Boundary
Parcel B13 Impacted Slag
Aerial View
November 12, 2020
Figure
2
ARM Group LLC
Engineers and Scientists
0 25 50 100
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010213


Parcel B5
SP-1-N-A (Grab)
VOC
Naphthalene: 280
SVOC
Naphthalene: 310
SP-1-N (Composite)
Inorganic
Arsenic: 12
SP-2-A (Grab)
VOC
Naphthalene: 1,100
SVOC
Naphthalene: 1,100
SP-2 (Composite)
SP-3-A (Grab)
VOC
Naphthalene: 50
SP-3 (Composite)
Parcel B13
SP-1-S-A (Grab)
VOC
Naphthalene: 54
SVOC
Naphthalene: 600
SP-1-S (Composite)
Inorganic
Arsenic: 3.2
SP-4-A (Grab)
VOC
Naphthalene: 1,200
SVOC
Naphthalene: 1,100
SP-4 (Composite)
Parcel B20
C-2
C-1
C-2
TPH
DRO: 30,000
VOC
Naphthalene: 2,300
SVOC
Naphthalene: 7,400
C-1
VOC
Naphthalene: 6,600
SVOC
Naphthalene: 4,900
Stockpile
Parcel Boundary
Parcel B13 Slag Stockpile
PAL Exceedances (mg/kg)
November 12, 2020
Figure
3
N
ARM Group LLC
Engineers and Scientists
0 25 50 100
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010213


B13-098-SB-1
B13-098-SB-7
B13-097-SB-2
Benzo[a]pyrene: 2.2
B13-096-SB-3
B13-096-SB-10
Naphthalene: 210
B13-096-SB-13
Naphthalene: 1,100
B13-096-SB-16.5
Naphthalene: 1,600
B13-095-SB-4
B13-099-SB-4
B13-099-SB-8
B13-102-SB-1.5
B13-102-SB-7
B13-102-SB-12
B13-102-SB-17
B13-100-SB-4
B13-100-SB-10
Naphthalene: 1,300
B13-100-SB-12
Naphthalene: 12
B13-100-SB-16.5
B13-101-SB-3
B13-101-SB-8
B13-101-SB-13
B13-101-SB-17
B13-100T-SB-3
B13-100T-SB-7
B13-100T-SB-12
B13-100T-SB-17
Test Pit Sample
Boring w/o Significant Contamination
Boring with Elevated Naphthalene or NAPL Observed
Suspected Contaminated Area
Test Pit (No Contamination Observed)
Test Pit (Odors Observed)
Exposed Slag Material with Temporary Cover
Material Slope/Wall from Prior Reclamation
Parcel B13
PAH PAL Exceedances (mg/kg)
September 8, 2020
Figure
4
ARM Group LLC
Engineers and Scientists
0 12.5 25 50
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010213

Risk Characterization Sample

Slag Stockpile

Suspected Contaminated Area

Exposed Slag Material with Temporary Cover

Parcel Boundary

Parcel B5

SP-2
SP-2-A

SP-3
SP-3-A

SP-4
SP-4-A

SP-1-N
SP-1-N-A

SP-1-S
SP-1-S-A

Parcel B13

C-1

C-2

B13-096-SB

B13-097-SB

B13-110-SB

B13-100-SB

Parcel B20

Parcel B13
Areas of Impacts

August 24, 2021

Figure
5

ARM Group LLC
Engineers and Scientists

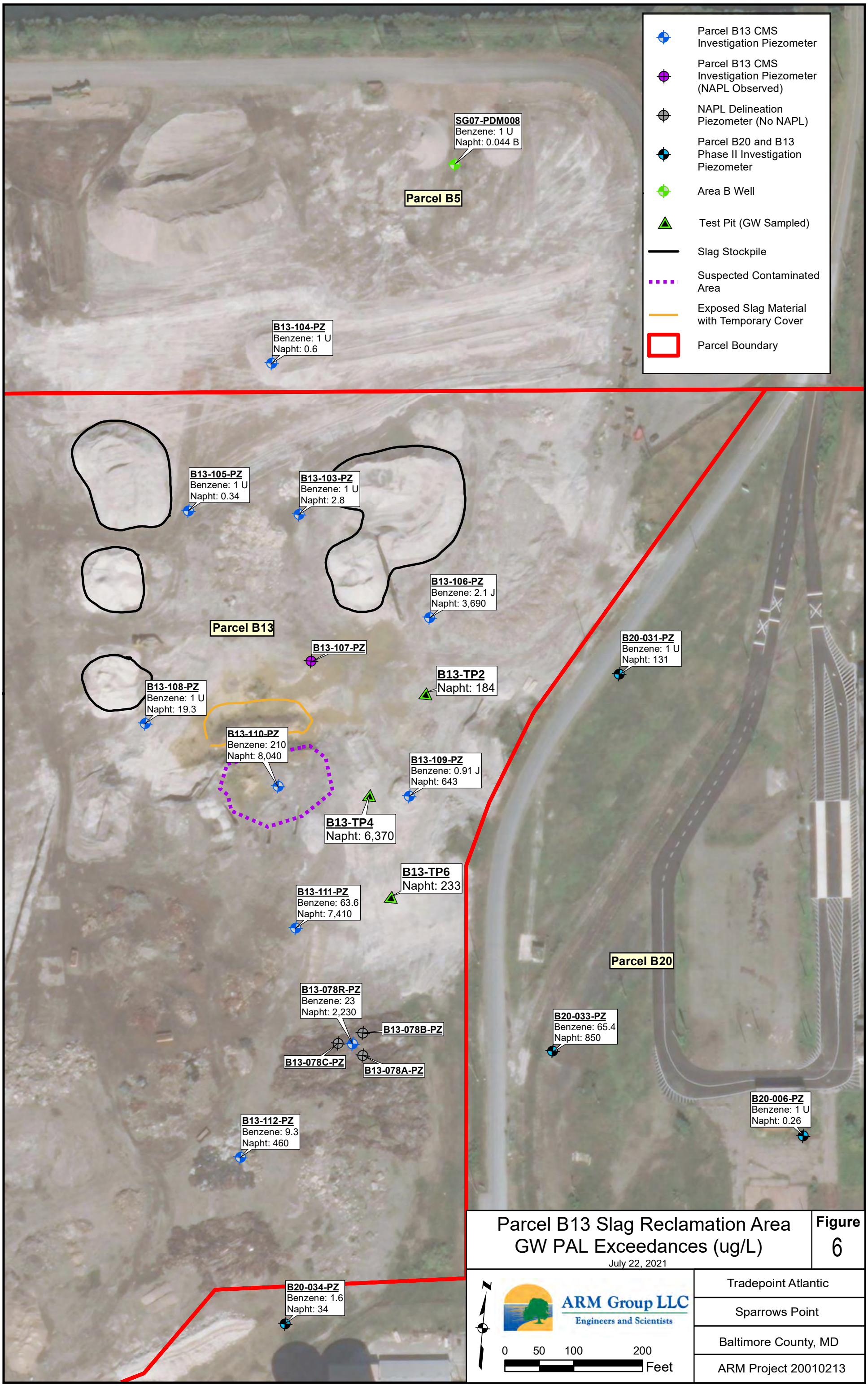
0 25 50 100
Feet

Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010213



Parcel B13 Slag Reclamation Area
GW PAL Exceedances (ug/L)

July 22, 2021

Figure 6

ARM Group LLC
Engineers and Scientists

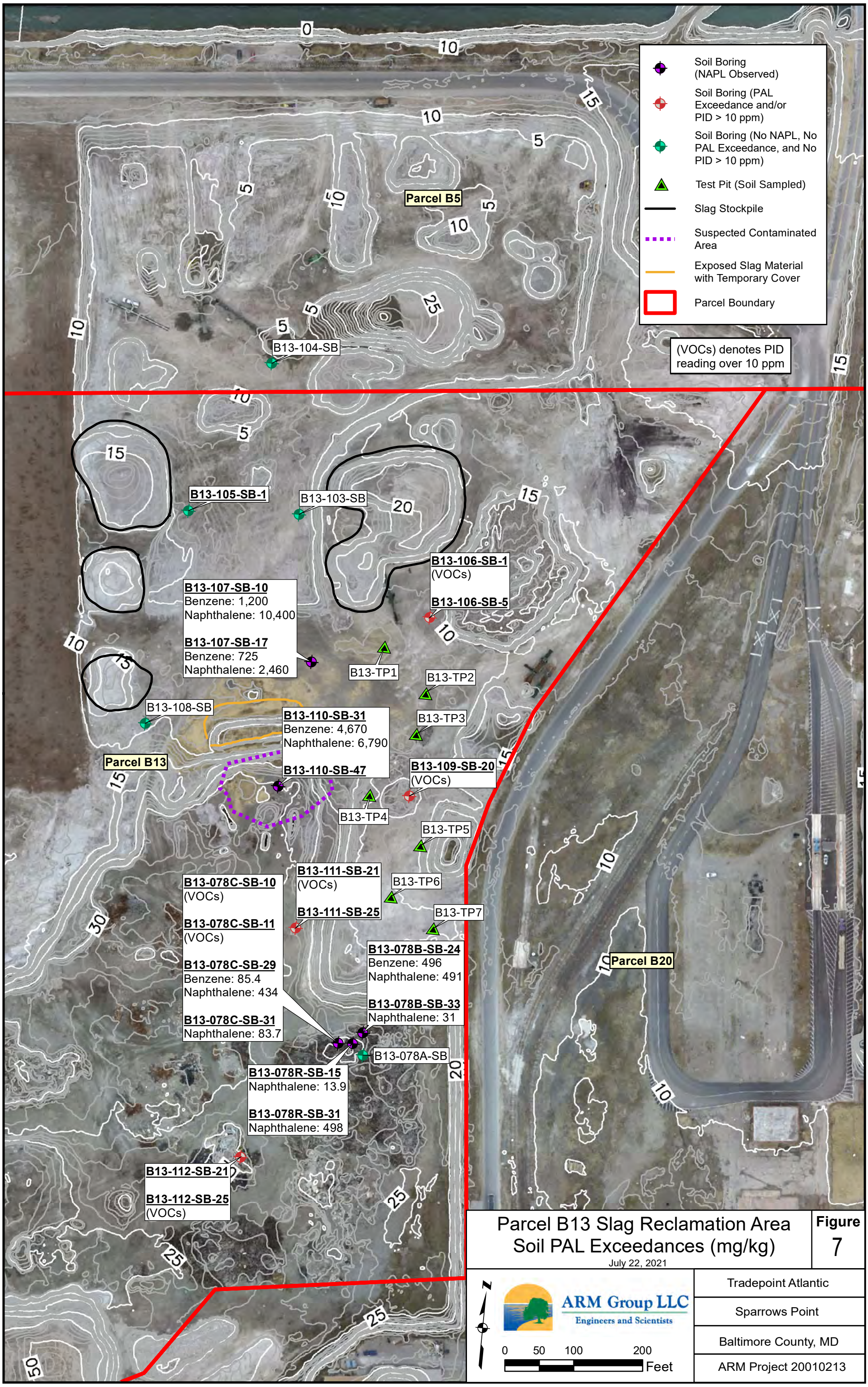
0 50 100 200 Feet

Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010213

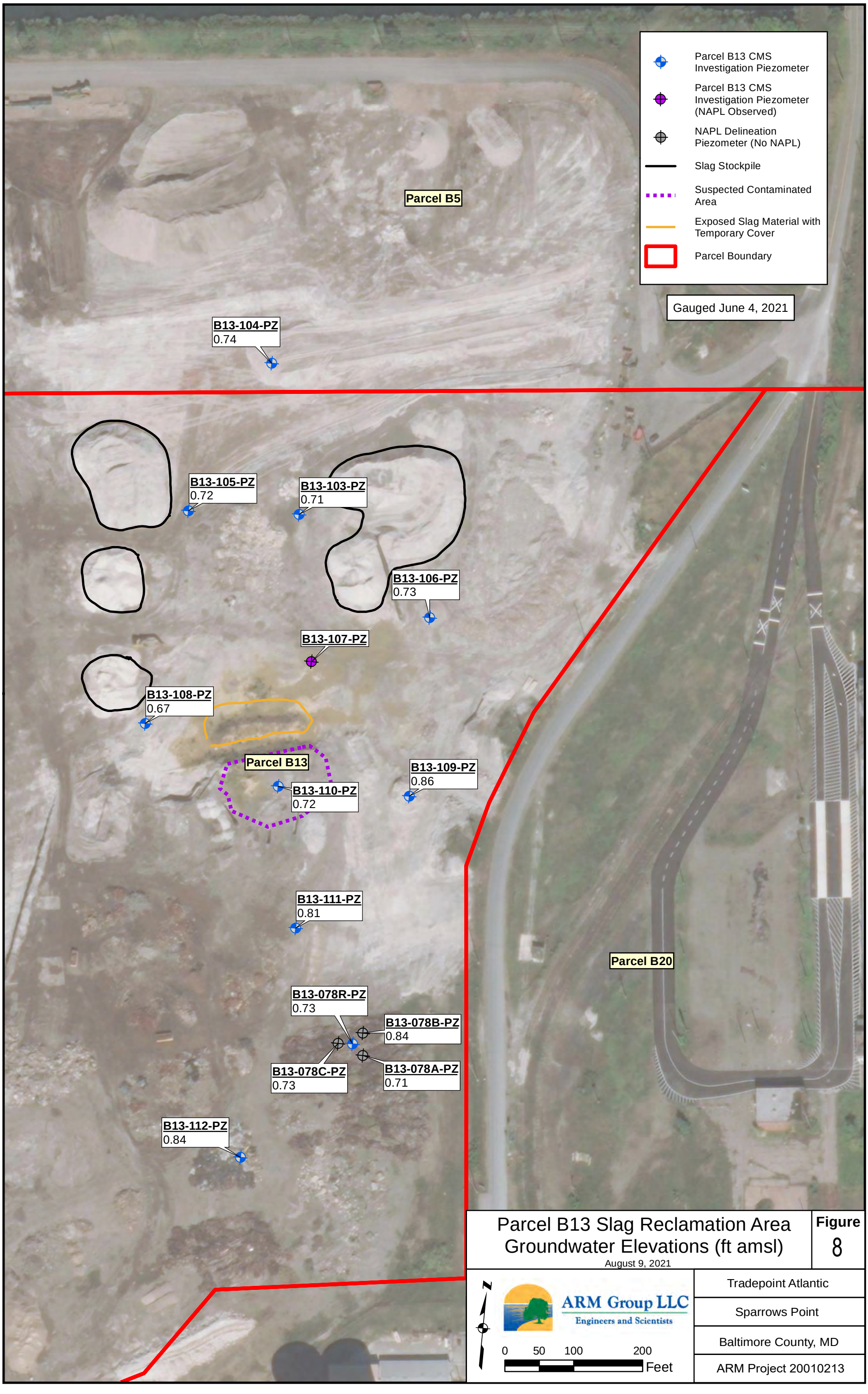


Parcel B13 Slag Reclamation Area Soil PAL Exceedances (mg/kg)

July 22, 2021

Figure 7

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010213



Parcel B13 Slag Reclamation Area Groundwater Elevations (ft amsl)

August 9, 2021

Figure 8

ARM Group LLC
Engineers and Scientists

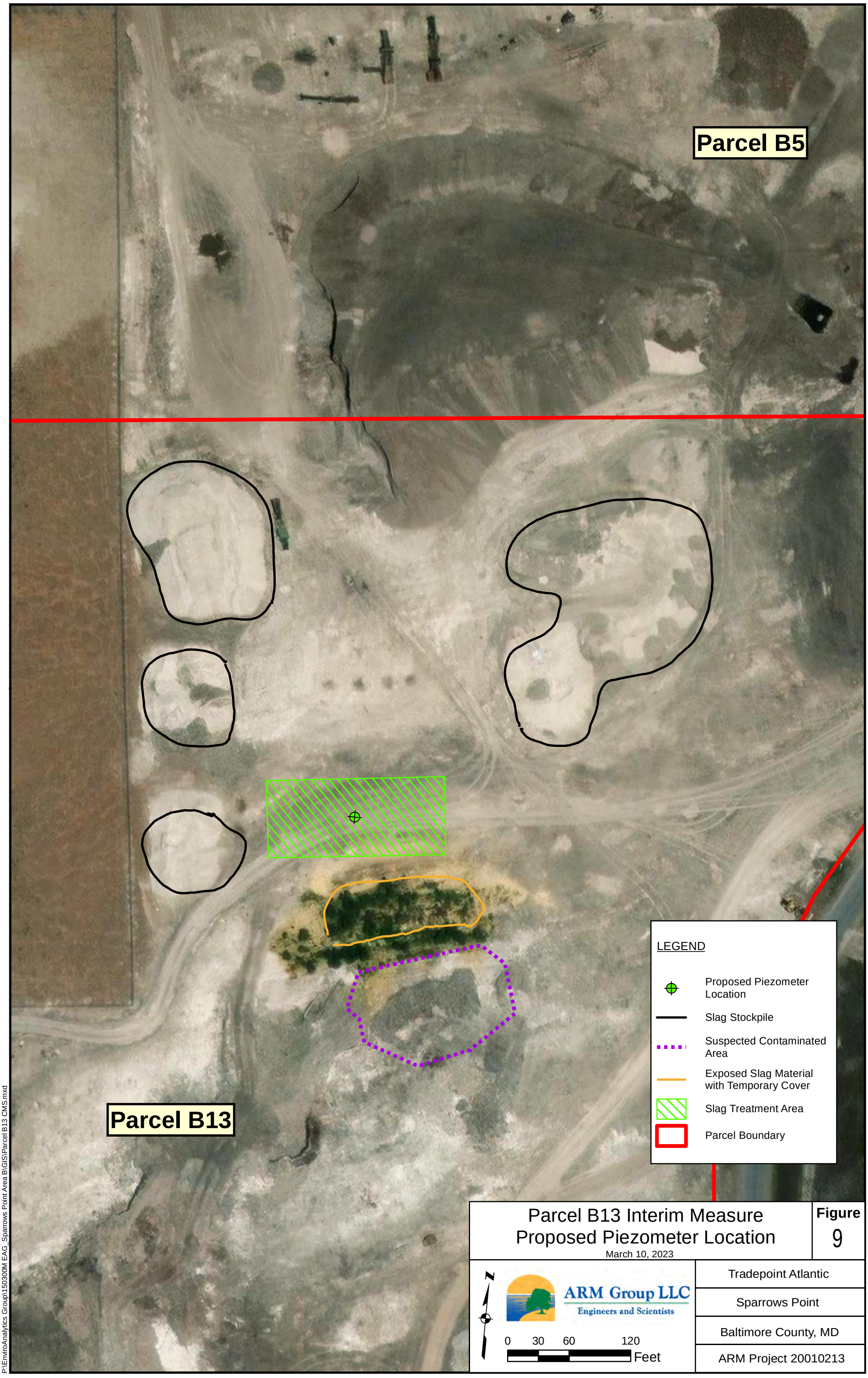
0 50 100 200 Feet

Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010213



Parcel B13 Interim Measure
Proposed Piezometer Location

March 10, 2023

Figure 9

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010213

P:\EnviroAnalytics Group\150300M EAG_Sparrows Point Area B\GIS\Parcel B13 CMS.mxd

TABLES

Table 1
Summary of Organics and Inorganics Detected in Slag
Parcel B13 - Slag Characterization Samples
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SP-1-N	SP-1-N-A	SP-1-S	SP-1-S-A	SP-2	SP-2-A	SP-3	SP-3-A	SP-4	SP-4-A	C-1	C-2
Metals														
Antimony	mg/kg	470	**4.6**	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	ND
Arsenic	mg/kg	3.0	**12**	N/A	**3.2**	N/A	**1.6**	N/A	**1.7**	N/A	**1.6**	N/A	**1.8**	**0.97**
Berylium	mg/kg	2,300	**3.9**	N/A	**4**	N/A	**3.2**	N/A	**5.1**	N/A	**3.8**	N/A	**3.3**	ND
Chromium	mg/kg	120,000	**200**	N/A	**100**	N/A	**140**	N/A	**89**	N/A	**130**	N/A	**80**	**420**
Copper	mg/kg	47,000	**86**	N/A	**25**	N/A	**23**	N/A	**26**	N/A	**20**	N/A	**34**	**17**
Lead	mg/kg	800	**140**	N/A	**260**	N/A	**160**	N/A	**130**	N/A	**380**	N/A	**110**	**94**
Manganese	mg/kg	26,000	**5,500**	N/A	**3,500**	N/A	**5,000**	N/A	**4,800**	N/A	**5,500**	N/A	**2,700**	**13,000**
Nickel	mg/kg	22,000	**24**	N/A	**8.8**	N/A	**6.4**	N/A	**12**	N/A	**8.1**	N/A	**15**	**3.8**
Selenium	mg/kg	5,800	**3.9**	N/A	**4.1**	N/A	**4.1**	N/A	**3.9**	N/A	**3.8**	N/A	**3.7**	**3.1**
Zinc	mg/kg	350,000	**92**	N/A	**140**	N/A	**82**	N/A	**75**	N/A	**91**	N/A	**28**	ND
Total Petroleum Hydrocarbons														
DRO	mg/kg	6,200	N/A	**3,400**	N/A	**3,800**	N/A	**4,500**	N/A	**100**	N/A	**3,300**	**100**	**30,000**
GRO	mg/kg	6,200	N/A	**0.55**	N/A	**0.24**	N/A	ND	N/A	ND	N/A	**0.25**	ND	**1,800**
Volatile Organic Compounds														
m&p-Xylene	mg/kg	8.6	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	ND	**3.1**
Naphthalene	mg/kg	8.6	N/A	**280**	N/A	**54**	N/A	**1,100**	N/A	**50**	N/A	**1,200**	**6,600**	**2,300**
o-Xylene	mg/kg	8.6	N/A	ND	N/A	ND	N/A	ND	N/A	ND	N/A	ND	ND	**1.7**
Semivolatile Organic Compounds														
Fluoranthene	mg/kg	30,000	N/A	**3.9**	N/A	ND	N/A	**2.1**	N/A	ND	N/A	**3.5**	ND	ND
Fluorene	mg/kg	30,000	N/A	ND	N/A	ND	N/A	**2.3**	N/A	ND	N/A	ND	ND	ND
2-Methylnaphthalene	mg/kg	3,000	N/A	**29**	N/A	**38**	N/A	**36**	N/A	ND	N/A	**23**	ND	**390**
Naphthalene	mg/kg	8.6	N/A	**310**	N/A	**600**	N/A	**1,100**	N/A	**5.8**	N/A	**1,100**	**4,900**	**7,400**
Phenanthrene	mg/kg		N/A	**3.6**	N/A	ND	N/A	**3.0**	N/A	ND	N/A	**3.7**	ND	ND
Pyrene	mg/kg	23,000	N/A	**3.1**	N/A	ND	N/A	ND	N/A	ND	N/A	**2.6**	ND	ND

Bold indicates detection
N/A: this parameter was not analyzed for this sample
ND indicates that the analyte was not detected in the sample
Highlighted cells indicate an exceedance of the Project Action Limit (PAL)

Table 2 - Parcel B13
Summary of Organics Detected in Soil

Parameter	Units	PAL	B13-078B-SB-24*~	B13-078B-SB-33*~	B13-078C-SB-10*~	B13-078C-SB-11*~	B13-078C-SB-29*~	B13-078C-SB-31*~	B13-078R-SB-15*~	B13-078R-SB-31*~	B13-105-SB-1*	B13-106-SB-1*
			4/22/2021	4/22/2021	4/23/2021	4/23/2021	4/23/2021	4/23/2021	4/22/2021	4/22/2021	4/28/2021	4/27/2021
Volatile Organic Compounds												
2-Butanone (MEK)	mg/kg	190,000	0.992 U	0.016 U	**0.022**	**0.0054 J**	0.882 U	0.016 U	0.011 U	0.022 U	N/A	0.015 U
Acetone	mg/kg	670,000	0.992 U	0.0087 B	**0.081**	**0.033**	0.882 U	0.011 B	**0.22**	**0.027**	N/A	0.015 U
Benzene	mg/kg	5.1	0.496 U	**0.04**	**0.0053 J**	**0.0039 J**	**0.0854 J**	**0.024**	0.0055 U	**0.015**	N/A	0.0074 U
Carbon disulfide	mg/kg	3,500	0.496 U	**0.039**	**0.04**	**0.024**	**0.135 J**	**0.089**	**0.012**	**0.1**	N/A	**0.0033 J**
Ethylbenzene	mg/kg	25	**0.577**	**0.039**	**0.01**	**0.011**	**5.85**	**0.058**	**0.007**	**0.089**	N/A	0.0074 U
Isopropylbenzene	mg/kg	9,900	**0.589**	**0.022**	**0.0028 J**	**0.0093**	**6.45**	**0.17**	**0.0059**	**0.22**	N/A	0.0074 U
Methyl Acetate	mg/kg	1,200,000	4.96 U	0.079 U	0.061 U	0.058 U	**0.132 J**	0.078 U	0.055 U	0.11 U	N/A	0.074 U
Methylene Chloride	mg/kg	1,000	0.496 U	0.0079 U	0.0061 U	0.0058 U	0.441 U	0.0078 U	**0.64**	0.011 U	N/A	0.0074 U
Styrene	mg/kg	35,000	**0.811**	**0.068**	**0.06**	**0.025**	0.441 U	**0.15**	**0.0089**	**0.12**	N/A	0.0074 U
Toluene	mg/kg	47,000	**3.95**	**2.15**	**0.014**	**0.0095**	**3**	**0.2**	**0.076**	**0.27**	N/A	0.0074 U
Xylenes	mg/kg	2,800	**53.8**	**12.5**	**0.067**	**8.74**	**573**	**12.4**	**0.3**	**21.2**	N/A	0.022 U
Semi-Volatile Organic Compounds^												
1,1-Biphenyl	mg/kg	200	**9.4**	**0.44**	**0.58 J**	**0.1**	**8.4**	**1.3**	**0.86**	**7.5**	0.093 U	0.093 U
2,4-Dichlorophenol	mg/kg	2,500	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
2,4-Dimethylphenol	mg/kg	16,000	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	**0.023 J**	0.77 U	0.093 U	0.093 U
2,4-Dinitrophenol	mg/kg	1,600	2.1 U	0.2 U	1.9 U	0.21 U	2 U	0.24 U	0.19 U	1.9 U	0.23 U	0.23 U
2-Chloronaphthalene	mg/kg	60,000	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
2-Methylnaphthalene	mg/kg	3,000	**69.1**	**3.3**	**2.2**	**0.76**	**80.7**	**13.2**	**5.3**	**80**	**0.012**	**0.016**
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	1.6 U	0.16 U	1.5 U	0.17 U	1.6 U	0.19 U	**0.024 J**	1.5 U	0.19 U	0.19 U
3,3'-Dichlorobenzidine	mg/kg	5.1	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
4-Chloroaniline	mg/kg	11	0.82 U	**0.05 J**	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
Acenaphthene	mg/kg	45,000	**1.8**	**0.085**	0.75 U	0.083 U	**1.8**	**0.29**	**0.24**	**1.5**	0.0095 U	**0.0022 J**
Acenaphthylene	mg/kg	45,000	**3.8**	**0.26**	**0.41 J**	**0.071 J**	**3.4**	**0.41**	**0.25**	**3.8**	0.0095 U	**0.01**
Acetophenone	mg/kg	120,000	0.82 U	0.079 U	**1.1**	**0.13**	0.79 U	**0.07 J**	**0.26**	0.77 U	0.093 U	0.093 U
Anthracene	mg/kg	230,000	0.82 U	0.079 U	**0.66 J**	**0.048 J**	0.79 U	**0.68**	0.074 U	**1**	**0.0011 J**	**0.027**
Benz[a]anthracene	mg/kg	21	**0.44 J**	**0.022 J**	**0.3 J**	**0.039 J**	**0.64 J**	**0.68**	**0.23**	**0.73 J**	**0.0032 J**	**0.11**
Benzaldehyde	mg/kg	120,000	**1.3**	**0.042 J**	**0.23 J**	**0.058 J**	**4**	**0.46**	**0.094**	**2.3**	0.093 U	0.093 U
Benzo[a]pyrene	mg/kg	2.1	**0.29 J**	**0.014 J**	0.75 U	**0.037 J**	**0.42 J**	**0.49**	**0.16**	**0.5 J**	0.0095 U	**0.12**
Benzo[b]fluoranthene	mg/kg	21	**0.52 J**	**0.028 J**	**0.4 J**	**0.049 J**	**0.54 J**	**0.67**	**0.47**	**1**	0.0095 U	**0.23**
Benzo[g,h,i]perylene	mg/kg		0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	**0.083 J**	**0.041 J**	0.77 U	0.0095 U	**0.08**
Benzo[k]fluoranthene	mg/kg	210	**0.54 J**	**0.027 J**	**0.53 J**	**0.068 J**	**0.55 J**	**0.66**	**0.49**	**1**	0.0095 U	**0.23**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.82 U	0.079 U	0.75 U	**0.042 J**	0.79 U	**0.047 J**	**0.024 J**	0.77 U	0.093 U	0.093 U
Caprolactam	mg/kg	400,000	2.1 U	0.2 U	1.9 U	0.21 U	**0.62 J**	0.24 U	0.19 U	1.9 U	0.23 U	0.23 U
Carbazole	mg/kg		0.82 U	0.079 U	0.75 U	0.083 U	**0.39 J**	**0.095 J**	**0.11**	0.77 U	0.093 U	0.093 U
Chrysene	mg/kg	2,100	**0.41 J**	**0.02 J**	**0.37 J**	**0.04 J**	**0.54 J**	**0.56**	**0.22**	**0.62 J**	**0.0028 J**	**0.11**
Dibenz[a,h]anthracene	mg/kg	2.1	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.0095 U	**0.023**
Fluoranthene	mg/kg	30,000	**2.5**	**0.12**	**1.6**	**0.16**	**2.9**	**2.2**	**1.2**	**3.2**	**0.006 J**	**0.19**
Fluorene	mg/kg	30,000	**194**	**11**	**52.6**	**4.7**	**149**	**30.2**	**29.6**	**199**	0.0095 U	**0.0073 J**
Hexachloroethane	mg/kg	8	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	**0.11**	**0.047 J**	0.77 U	0.0095 U	**0.073**
Isophorone	mg/kg	2,400	0.82 U	0.079 U	0.75 U	0.083 U	0.79 U	0.096 U	0.074 U	0.77 U	0.093 U	0.093 U
Naphthalene	mg/kg	8.6	**491**	**31**	**6**	**5.2**	**434**	**83.7**	**13.9**	**498**	**0.038**	**0.17**
N-Nitrosodiphenylamine	mg/kg	470	0.82 U	0.079 U	**1.8**	0.083 U	0.79 U	**0.4**	0.074 U	0.77 U	0.093 U	0.093 U
Phenanthrene	mg/kg		**15.2**	**0.81**	**2.9**	**0.41**	**18.3**	**5.2**	**3.2**	**18.6**	**0.0045 J**	**0.1**
Phenol	mg/kg	250,000	0.82 U	0.079 U	**0.25 J**	**0.026 J**	0.79 U	0.096 U	**0.053 J**	0.77 U	0.093 U	0.093 U
Pyrene	mg/kg	23,000	**1.3**	**0.069 J**	**1.9**	**0.2**	**2.7**	**1.9**	**0.98**	**2.2**	**0.0072 J**	**0.14**
TPH/Oil & Grease												
Diesel Range Organics	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**15.3 J**	**17.1 J**
Oil & Grease	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	553 U	560 U

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

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

Table 2 - Parcel B13
Summary of Organics Detected in Soil

Parameter	Units	PAL	B13-106-SB-5*	B13-107-SB-10*~	B13-107-SB-17*~	B13-109-SB-20*~	B13-110-SB-31*~	B13-110-SB-47*~	B13-111-SB-21*	B13-111-SB-25*	B13-112-SB-21*	B13-112-SB-25*
			4/27/2021	4/20/2021	4/20/2021	4/20/2021	4/26/2021	4/26/2021	4/27/2021	4/27/2021	4/26/2021	4/26/2021
Volatile Organic Compounds												
2-Butanone (MEK)	mg/kg	190,000	N/A	1.16 U	1.45 U	0.019 U	1.13 U	**0.0023 J**	N/A	N/A	N/A	0.0093 U
Acetone	mg/kg	670,000	N/A	**0.726 J**	1.45 U	0.0085 B	**1.64**	0.025 B	N/A	N/A	N/A	0.0093 U
Benzene	mg/kg	5.1	N/A	**1.2**	0.725 U	**0.012**	**4.67**	**0.12**	N/A	N/A	N/A	0.0047 U
Carbon disulfide	mg/kg	3,500	N/A	0.581 U	0.725 U	**0.0063 J**	0.566 U	**0.014**	N/A	N/A	N/A	**0.0042 J**
Ethylbenzene	mg/kg	25	N/A	**2.41**	0.725 U	**0.0022 J**	**2.04**	**0.0043 J**	N/A	N/A	N/A	0.0047 U
Isopropylbenzene	mg/kg	9,900	N/A	**0.55 J**	0.725 U	0.0093 U	**0.416 J**	0.0051 U	N/A	N/A	N/A	0.0047 U
Methyl Acetate	mg/kg	1,200,000	N/A	5.81 U	7.25 U	0.093 U	**0.173 J**	0.051 U	N/A	N/A	N/A	0.047 U
Methylene Chloride	mg/kg	1,000	N/A	0.581 U	0.725 U	0.0093 U	0.566 U	0.0051 U	N/A	N/A	N/A	0.0047 U
Styrene	mg/kg	35,000	N/A	**28.6**	**0.455 J**	**0.028**	**14.8**	0.0051 U	N/A	N/A	N/A	0.0047 U
Toluene	mg/kg	47,000	N/A	**6.54**	0.725 U	**0.015**	**12.8**	**0.0089**	N/A	N/A	N/A	0.0047 U
Xylenes	mg/kg	2,800	N/A	**102**	**5.06**	**0.094**	**66.9**	**0.021**	N/A	N/A	N/A	**0.0064 J**
Semi-Volatile Organic Compounds^												
1,1-Biphenyl	mg/kg	200	0.092 U	**94.1**	**18.4**	0.11 U	**57.4**	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
2,4-Dichlorophenol	mg/kg	2,500	0.092 U	**0.46 J**	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
2,4-Dimethylphenol	mg/kg	16,000	0.092 U	0.97 U	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
2,4-Dinitrophenol	mg/kg	1,600	0.23 U	**9.3**	5.2 U	0.28 U	25.5 U	0.21 U	0.19 U	0.22 U	0.18 U	0.18 U
2-Chloronaphthalene	mg/kg	60,000	0.092 U	0.97 U	**4**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
2-Methylnaphthalene	mg/kg	3,000	0.0095 U	**1,140**	**225**	**0.15**	**616**	**0.088**	0.0077 U	**0.0026 J**	0.0074 U	0.007 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.18 U	1.9 U	4.1 U	0.22 U	20.3 U	0.16 U	0.15 U	0.17 U	0.14 U	0.14 U
3,3'-Dichlorobenzidine	mg/kg	5.1	0.092 U	0.97 U	**0.82 J**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
4-Chloroaniline	mg/kg	11	0.092 U	0.97 U	**14.5**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Acenaphthene	mg/kg	45,000	0.0095 U	**5.3**	**2 J**	0.11 U	**7.5 J**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Acenaphthylene	mg/kg	45,000	0.0095 U	**35.7**	**7.2**	0.11 U	**25.1**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Acetophenone	mg/kg	120,000	0.092 U	0.97 U	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Anthracene	mg/kg	230,000	0.0095 U	0.97 U	**1.2 J**	0.11 U	**4.4 J**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Benz[a]anthracene	mg/kg	21	0.0095 U	**1.5**	**0.69 J**	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Benzaldehyde	mg/kg	120,000	0.092 U	**13**	**0.71 J**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Benzo[a]pyrene	mg/kg	2.1	0.0095 U	**1.1**	**0.3 J**	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Benzo[b]fluoranthene	mg/kg	21	0.0095 U	**2**	**0.57 J**	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Benzo[g,h,i]perylene	mg/kg		0.0095 U	**0.39 J**	2.1 U	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Benzo[k]fluoranthene	mg/kg	210	0.0095 U	**1.9**	**0.55 J**	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.019 J**	0.97 U	2.1 U	**0.025 J**	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Caprolactam	mg/kg	400,000	0.23 U	**17.9 J**	**6.7**	0.28 U	25.5 U	0.21 U	0.19 U	0.22 U	0.18 U	0.18 U
Carbazole	mg/kg		0.092 U	0.97 U	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Chrysene	mg/kg	2,100	0.0095 U	**1.5**	**0.53 J**	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Dibenz[a,h]anthracene	mg/kg	2.1	0.0095 U	0.97 U	2.1 U	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Fluoranthene	mg/kg	30,000	0.0095 U	**6.5**	**3**	0.11 U	**3.7 J**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Fluorene	mg/kg	30,000	0.0095 U	**56**	**16.3**	0.11 U	**53.4**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Hexachloroethane	mg/kg	8	0.092 U	0.97 U	**7.1**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	0.0095 U	**0.47 J**	2.1 U	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Isophorone	mg/kg	2,400	0.092 U	**2.5**	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Naphthalene	mg/kg	8.6	0.0095 U	**10,400**	**2,460**	**2.1**	**6,790**	**1.8**	**0.0018 J**	**0.019**	**0.0031 J**	**0.0016 J**
N-Nitrosodiphenylamine	mg/kg	470	0.092 U	**9.5**	**5.1**	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Phenanthrene	mg/kg		**0.0016 J**	**30.8**	**10**	0.11 U	**30.5**	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
Phenol	mg/kg	250,000	0.092 U	0.97 U	2.1 U	0.11 U	10.2 U	0.082 U	0.076 U	0.088 U	0.072 U	0.071 U
Pyrene	mg/kg	23,000	0.0095 U	**3**	2.1 U	0.11 U	10.2 U	0.082 U	0.0077 U	0.009 U	0.0074 U	0.007 U
TPH/Oil & Grease												
Diesel Range Organics	mg/kg	6,200	**16 J**	N/A	N/A	N/A	N/A	N/A	**11.5 J**	**16.1 J**	**9.9 J**	**8.9 J**
Oil & Grease	mg/kg	6,200	547 U	N/A	N/A	N/A	N/A	N/A	453 U	529 U	**231 J**	**796**

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

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

Table 2 - Parcel B13
Summary of Organics Detected in Soil

Parameter	Units	PAL	B13-TP1-SB-6*~ 7/28/2021	B13-TP2-SB-6*~ 7/28/2021	B13-TP3-SB-6*~ 7/28/2021	B13-TP4-SB-6*~ 7/28/2021	B13-TP5-SB-6*~ 7/28/2021	B13-TP6-SB-6*~ 7/28/2021	B13-TP7-SB-6*~ 7/28/2021
Volatile Organic Compounds									
2-Butanone (MEK)	mg/kg	190,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	mg/kg	5.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbon disulfide	mg/kg	3,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Isopropylbenzene	mg/kg	9,900	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methyl Acetate	mg/kg	1,200,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methylene Chloride	mg/kg	1,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Styrene	mg/kg	35,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	mg/kg	47,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	mg/kg	2,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^									
1,1-Biphenyl	mg/kg	200	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dichlorophenol	mg/kg	2,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dimethylphenol	mg/kg	16,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dinitrophenol	mg/kg	1,600	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-Chloronaphthalene	mg/kg	60,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-Methylnaphthalene	mg/kg	3,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	mg/kg	5.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4-Chloroaniline	mg/kg	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthene	mg/kg	45,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthylene	mg/kg	45,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Acetophenone	mg/kg	120,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Anthracene	mg/kg	230,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benz[a]anthracene	mg/kg	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzaldehyde	mg/kg	120,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo[a]pyrene	mg/kg	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo[b]fluoranthene	mg/kg	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo[g,h,i]perylene	mg/kg		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo[k]fluoranthene	mg/kg	210	N/A	N/A	N/A	N/A	N/A	N/A	N/A
bis(2-Ethylhexyl)phthalate	mg/kg	160	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Caprolactam	mg/kg	400,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Carbazole	mg/kg		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chrysene	mg/kg	2,100	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dibenz[a,h]anthracene	mg/kg	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fluoranthene	mg/kg	30,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fluorene	mg/kg	30,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	mg/kg	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indeno[1,2,3-c,d]pyrene	mg/kg	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Isophorone	mg/kg	2,400	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	mg/kg	8.6	**0.011**	**0.015**	**0.008**	**0.0025 J**	**0.002 J**	**0.0056 J**	**0.066 J**
N-Nitrosodiphenylamine	mg/kg	470	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phenanthrene	mg/kg		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Phenol	mg/kg	250,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pyrene	mg/kg	23,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPH/Oil & Grease									
Diesel Range Organics	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil & Grease	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

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

Table 3 - Parcel B13
Summary of Organics Detected in Groundwater

Parameter	Units	PAL	B13-078R-PZ* 5/18/2021	B13-103-PZ* 5/17/2021	B13-104-PZ* 5/17/2021	B13-105-PZ* 5/17/2021	B13-106-PZ* 5/18/2021	B13-108-PZ* 5/17/2021	B13-109-PZ* 5/17/2021	B13-110-PZ* 5/18/2021	B13-111-PZ* 5/18/2021	B13-112-PZ* 5/18/2021	B13-TP2-GW*~ 7/28/2021	B13-TP4-GW*~ 7/28/2021	B13-TP6-GW*~ 7/28/2021
Volatile Organic Compounds															
1,1-Dichloroethane	µg/L	2.7	1 U	1 U	**0.25 J**	1 U	5 U	1 U	1 U	5 U	5 U	1 U	N/A	N/A	N/A
2-Butanone (MEK)	µg/L	5,600	10 U	10 U	10 U	10 U	50 U	10 U	10 U	**20.4 J**	50 U	10 U	N/A	N/A	N/A
Acetone	µg/L	14,000	10 U	10 U	10 U	10 U	**44.8 J**	**13**	10 U	**247**	**73.7**	10 U	N/A	N/A	N/A
Benzene	µg/L	5	**23**	1 U	1 U	1 U	**2.1 J**	1 U	**0.91 J**	**210**	**63.6**	**9.3**	N/A	N/A	N/A
Carbon disulfide	µg/L	810	**0.71 J**	**1.2**	**1.6**	1 U	5 U	1 U	1 U	5 U	5 U	1 U	N/A	N/A	N/A
Chloroform	µg/L	0.22	1 U	1 U	1 U	1 U	5 U	**1.4**	1 U	**2.7 J**	5 U	1 U	N/A	N/A	N/A
Ethylbenzene	µg/L	700	**8.4**	1 U	1 U	1 U	5 U	1 U	**0.54 J**	**5.7**	**3.4 J**	**0.46 J**	N/A	N/A	N/A
Isopropylbenzene	µg/L	450	**4.9**	1 U	1 U	1 U	5 U	1 U	1 U	5 U	5 U	1 U	N/A	N/A	N/A
Styrene	µg/L	100	**11.3**	1 U	1 U	1 U	**14.7**	1 U	**4.4**	**63.6**	**43.2**	**4.8**	N/A	N/A	N/A
Toluene	µg/L	1,000	**146**	1 U	**1**	1 U	**6.1**	1 U	**2.4**	**178**	**69.4**	**11.1**	N/A	N/A	N/A
Trichloroethene	µg/L	5	1 U	1 U	**15.8**	**0.76 J**	5 U	1 U	1 U	5 U	5 U	1 U	N/A	N/A	N/A
Xylenes	µg/L	10,000	**1,060**	3 U	3 U	3 U	**59.7**	3 U	**19**	**190**	**127**	**17.5**	N/A	N/A	N/A
Semi-Volatile Organic Compounds^															
1,1-Biphenyl	µg/L	0.83	**8.2**	2.8 U	2.8 U	2.8 U	**15.8**	**0.37 J**	**2.8 J**	**6.9**	**8.8**	**1.3 J**	N/A	N/A	N/A
1,4-Dioxane	µg/L	0.46	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	N/A	N/A	N/A
2,4-Dimethylphenol	µg/L	360	**3.7**	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	N/A	N/A	N/A
2-Methylnaphthalene	µg/L	36	**99.3**	**0.33**	**0.38**	**0.11**	**198**	**3.9**	**35.8**	**126**	**122**	**14.8**	N/A	N/A	N/A
2-Methylphenol	µg/L	930	**2.9**	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	**1.5 J**	**0.67 J**	2.8 U	N/A	N/A	N/A
Acenaphthene	µg/L	530	**1**	**0.08 J**	**0.39**	**0.085 J**	**0.9**	**0.035 J**	**0.28**	**0.8 J**	**0.57**	**0.17**	N/A	N/A	N/A
Acenaphthylene	µg/L	530	**4.6 J**	**0.066 J**	**0.035 J**	**0.031 J**	**6.6**	**0.016 J**	**0.98**	**5**	**1.8**	**0.38**	N/A	N/A	N/A
Acetophenone	µg/L	1,900	**18.3**	**0.77 J**	**0.49 J**	**0.68 J**	**139**	**0.77 J**	**13**	**552**	**258 J**	**22.6**	N/A	N/A	N/A
Anthracene	µg/L	1,800	**0.37**	**0.25**	**0.057 J**	**0.034 J**	0.094 U	**0.031 J**	**0.11**	0.094 U	0.095 U	**0.074 J**	N/A	N/A	N/A
Benz[a]anthracene	µg/L	0.03	**0.17**	**0.06 J**	**0.011 J**	**0.017 J**	0.094 U	0.095 U	**0.058 J**	0.094 U	0.095 U	0.094 U	N/A	N/A	N/A
Benzaldehyde	µg/L	1,900	2.8 U	**0.38 J**	2.8 U	**0.34 J**	2.8 U	**0.76 J**	2.8 U	**14.9**	**8**	**0.75 J**	N/A	N/A	N/A
Benzo[a]pyrene	µg/L	0.2	**0.13**	**0.016 J**	0.095 U	0.095 U	0.094 U	0.095 U	**0.017 J**	0.094 U	0.095 U	0.094 U	N/A	N/A	N/A
Benzo[b]fluoranthene	µg/L	0.25	**0.15**	**0.024 J**	0.095 U	0.095 U	**0.023 J**	**0.01 J**	**0.028 J**	0.094 U	**0.092 J**	0.094 U	N/A	N/A	N/A
Benzo[g,h,i]perylene	µg/L		**0.062 J**	**0.013 J**	0.095 U	0.095 U	0.094 U	0.095 U	**0.016 J**	0.094 U	0.095 U	**0.0099 J**	N/A	N/A	N/A
Benzo[k]fluoranthene	µg/L	2.5	**0.15**	**0.019 J**	0.095 U	0.095 U	0.094 U	0.095 U	**0.023 J**	0.094 U	0.095 U	0.094 U	N/A	N/A	N/A
bis(2-Ethylhexyl)phthalate	µg/L	6	**0.79 J**	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	N/A	N/A	N/A
Carbazole	µg/L		**2.2 J**	**0.29 J**	2.8 U	2.8 U	**0.3 J**	2.8 U	**0.27 J**	**0.35 J**	**0.38 J**	2.8 U	N/A	N/A	N/A
Chrysene	µg/L	25	**0.19**	**0.057 J**	**0.011 J**	**0.015 J**	0.094 U	0.095 U	**0.062 J**	0.094 U	0.095 U	0.094 U	N/A	N/A	N/A
Dibenz[a,h]anthracene	µg/L	0.025	**0.024 J**	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	0.066 U	N/A	N/A	N/A
Fluoranthene	µg/L	800	**0.67**	**0.59**	**0.25**	**0.06 J**	**0.096**	**0.28**	**0.4**	**4.8**	**1.6**	**0.12**	N/A	N/A	N/A
Fluorene	µg/L	290	**45.9**	**0.4**	**0.15**	**0.037 J**	**2.7**	**0.2**	**0.95**	**2.6 J**	**3.6**	**0.89**	N/A	N/A	N/A
Indeno[1,2,3-c,d]pyrene	µg/L	0.25	**0.079 J**	**0.0099 J**	0.095 U	0.095 U	0.094 U	0.095 U	**0.014 J**	0.094 U	0.095 U	0.094 U	N/A	N/A	N/A
Naphthalene	µg/L	0.12	**2,230**	**2.8**	**0.6**	**0.34**	**3,690**	**19.3**	**643**	**8,040**	**7,410**	**460**	**184**	**6,370**	**233**
Pentachlorophenol	µg/L	1	**0.65 J**	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	N/A	N/A	N/A
Phenanthrene	µg/L		**4.5 J**	**1.5**	**0.46**	**0.083 J**	**1.2**	**0.13**	**0.68**	**0.63**	**1.3**	**0.47**	N/A	N/A	N/A
Phenol	µg/L	5,800	**6.3 J**	7.6 U	7.6 U	7.6 U	**6 J**	**0.5 J**	**2.4 J**	**24.5**	**14.3**	**1.6 J**	N/A	N/A	N/A
Pyrene	µg/L	120	**0.41**	**0.35**	**0.2**	**0.065 J**	0.094 U	0.095 U	**0.29**	0.094 U	**0.29**	**0.089 J**	N/A	N/A	N/A

Detections in bold
Values in red indicate exceedances of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*Indicates non-validated data
^PAH compounds were analyzed via SIM
~Sample not analyzed via SIM
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.

Table 4 - Parcel B13
Pilot Study Sample Results

Date	Sample ID	Depth of Sample	Naphthalene Concentration (mg/kg)	PID Reading (PPM)	Temerature (°F)
6/22/2022	PT-1	10”	110	2.2	145
6/23/2022	PT-2	10”	47.5	0.2	67.2
6/24/2022	PT-3	10”	277	16	70
6/27/2022	PT-6	10”	460	97	75.2
6/28/2022	PT-7-1	12”	40	5.2	71.3
6/28/2022	PT-7-2	60”	56	8.4	68.5
6/28/2022	PT-7-3	67”	65.6	21	67.3

Treated Bucket Samples					
Date	**Sample ID**	**Depth of Sample**	**Naphthalene Concentration (mg/kg)**	**PID Reading (PPM)**	**Temerature (°F)**
6/23/2022	CS-2	From Bucket	828	11.5	64.9
6/24/2022	CS-3	From Bucket	83.4	14	81
6/27/2022	CS-6	From Bucket	70.2	3.4	84.2
6/28/2022	CS-7	From Bucket	54.3	26	101

Untreated Samples					
Date	**Sample ID**	**Depth of Sample**	**Naphthalene Concentration (mg/kg)**	**PID Reading (PPM)**	**Temerature (°F)**
6/22/2022	BT-1	From Excavation	206	72	69
6/28/2022	BT-7	From Bucket	139	31	100

BT = Before Treatment
PT = Post Treatment (Excavation)
CS = Control Sample (Bucket)

APPENDIX A

LEGEND

390 ft

TRADEPOINT ATLANTIC

Site: SE-Blast Furnace Slag/ Marine Terminal
Survey: 20211130 SE Peninsula
File Created: Dec 14, 2021

propeller

APPENDIX B

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 19052018

Project Manager: Keith Progin
Project Name : Slag Processing Area
Project Location: TPA
Project ID : 18019A

May 23, 2019

Phase Separation Science, Inc.
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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

May 23, 2019

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **19052018**
Project Name: Slag Processing Area
Project Location: TPA
Project ID.: 18019A

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **19052018**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on June 24, 2019, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: Slag Processing Area

Work Order Number(s): 19052018

Project ID: 18019A

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/20/2019 at 05:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
19052018-001	SP-1-N	SOIL	05/20/19 14:15
19052018-002	SP-1-N-A	SOIL	05/20/19 14:15
19052018-003	SP-1-S	SOIL	05/20/19 14:25
19052018-004	SP-1-S-A	SOIL	05/20/19 14:25
19052018-005	SP-2	SOIL	05/20/19 14:45
19052018-006	SP-2-A	SOIL	05/20/19 14:45
19052018-007	SP-3	SOIL	05/20/19 15:00
19052018-008	SP-3-A	SOIL	05/20/19 15:00
19052018-009	SP-4	SOIL	05/20/19 15:15
19052018-010	SP-4-A	SOIL	05/20/19 15:15
19052018-011	C-1	SOIL	05/20/19 15:30
19052018-012	C-2	SOIL	05/20/19 15:40

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: Slag Processing Area

Work Order Number(s): 19052018

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-001**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 82**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	**4.6**	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Arsenic	**12**	mg/kg	0.44		1	05/21/19	05/21/19 22:04	1064
Beryllium	**3.9**	mg/kg	2.2		1	05/21/19	05/22/19 19:11	1064
Cadmium	ND	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Chromium	**200**	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Copper	**86**	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Lead	**140**	mg/kg	2.2		1	05/21/19	05/22/19 19:11	1064
Manganese	**5,500**	mg/kg	220		100	05/21/19	05/23/19 13:44	1064
Mercury	ND	mg/kg	0.087		1	05/21/19	05/21/19 22:04	1064
Nickel	**24**	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Selenium	**3.9**	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Silver	ND	mg/kg	2.2		1	05/21/19	05/21/19 22:04	1064
Thallium	ND	mg/kg	1.7		1	05/21/19	05/21/19 22:04	1064
Zinc	**92**	mg/kg	8.7		1	05/21/19	05/21/19 22:04	1064

Polychlorinated Biphenyls Analytical Method: SW-846 8082 A Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1221	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1232	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1242	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1248	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1254	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029
PCB-1260	ND	mg/kg	0.062		1	05/21/19	05/21/19 17:25	1029

Surrogate(s)	*Recovery*		*Limits*				
Tetrachloro-m-xylene	*64*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 17:25*	*1029*
Decachlorobiphenyl	*101*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 17:25*	*1029*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**3,400**	mg/kg	42	DF	10	05/21/19	05/22/19 02:22	1059
Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*88*	*%*	*37-120*		*10*	*05/21/19*	*05/22/19 02:22*	*1059*

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**550**	ug/kg	120		1	05/21/19	05/21/19 23:51	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*98*	*%*	*56-114*		*1*	*05/21/19*	*05/21/19 23:51*	*1045*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	13,000		1000	05/21/19	05/21/19 15:19	1011
Benzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Bromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Bromodichloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Bromoform	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Bromomethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
2-Butanone (MEK)	ND	ug/kg	6,300		1000	05/21/19	05/21/19 15:19	1011
Carbon Disulfide	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Carbon tetrachloride	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Chlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Chloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Chloroform	ND	ug/kg	6,300		1000	05/21/19	05/21/19 15:19	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Cyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Dibromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2-Dibromoethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,3-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,4-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Dichlorodifluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2-Dichloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Ethylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
2-Hexanone (MBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Isopropylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Methyl Acetate	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Methylcyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Methylene chloride	ND	ug/kg	6,300		1000	05/21/19	05/21/19 15:19	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Naphthalene	**280,000**	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Styrene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Tetrachloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Toluene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1,1-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1,2-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Trichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Trichlorofluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011
Vinyl chloride	ND	ug/kg	6,300		1000	05/21/19	05/21/19 15:19	1011
m&p-Xylene	ND	ug/kg	2,500		1000	05/21/19	05/21/19 15:19	1011
o-Xylene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 15:19	1011

Surrogate(s)	*Recovery*		*Limits*				
4-Bromofluorobenzene	*100*	*%*	*81-146*		*1000*	*05/21/19*	*05/21/19 15:19*	*1011*
Dibromofluoromethane	*102*	*%*	*89-120*		*1000*	*05/21/19*	*05/21/19 15:19*	*1011*
Toluene-D8	*106*	*%*	*86-116*		*1000*	*05/21/19*	*05/21/19 15:19*	*1011*

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Acenaphthylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Acetophenone	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Atrazine	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Benzo(a)anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Benzo(a)pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Benzo(b)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Benzo(g,h,i)perylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzo(k)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Biphenyl (Diphenyl)	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Butyl benzyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
bis(2-chloroethoxy) methane	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
bis(2-chloroethyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Bromophenylphenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Di-n-butyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Carbazole	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Caprolactam	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Chloro-3-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Chloroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2-Chloronaphthalene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2-Chlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Chrysene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Dibenz(a,h)Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Dibenzofuran	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
3,3-Dichlorobenzidine	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,4-Dichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Diethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Dimethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,4-Dimethylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,4-Dinitrophenol	ND	ug/kg	42,000		100	05/21/19	05/21/19 18:25	1014
2,4-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,6-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Fluoranthene	**3,900**	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluorene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Hexachlorobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Hexachlorobutadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Hexachlorocyclopentadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Hexachloroethane	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Isophorone	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2-Methylnaphthalene	**29,000**	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
2-Methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
3&4-Methylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Naphthalene	**310,000**	ug/kg	21,000		1000	05/21/19	05/21/19 17:01	1014
2-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
3-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Nitrobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
4-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
N-Nitrosodiphenylamine	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Di-n-octyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Pentachlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Phenanthrene	**3,600**	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
Pyrene	**3,100**	ug/kg	2,100		100	05/21/19	05/21/19 18:25	1014
Pyridine	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,4,5-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014
2,4,6-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 18:25	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-N-A **Date/Time Sampled: 05/20/2019 14:15** **PSS Sample ID: 19052018-002**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

Surrogate(s)	*Recovery*		*Limits*					
2-Fluorobiphenyl	*0*	*%*	*32-107*	*	*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
Nitrobenzene-d5	*0*	*%*	*35-123*	*	*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
Phenol-d6	*0*	*%*	*34-120*	*	*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
Terphenyl-D14	*50*	*%*	*46-154*		*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*1000*	*05/21/19*	*05/21/19 17:01*	*1014*
2-Fluorobiphenyl	*65*	*%*	*32-107*		*100*	*05/21/19*	*05/21/19 18:25*	*1014*
2-Fluorophenol	*8*	*%*	*34-113*	*	*100*	*05/21/19*	*05/21/19 18:25*	*1014*
Nitrobenzene-d5	*50*	*%*	*35-123*		*100*	*05/21/19*	*05/21/19 18:25*	*1014*
Phenol-d6	*20*	*%*	*34-120*	*	*100*	*05/21/19*	*05/21/19 18:25*	*1014*
Terphenyl-D14	*90*	*%*	*46-154*		*100*	*05/21/19*	*05/21/19 18:25*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*100*	*05/21/19*	*05/21/19 18:25*	*1014*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-003**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Arsenic	**3.2**	mg/kg	0.54		1	05/21/19	05/21/19 22:10	1064
Beryllium	**4.0**	mg/kg	2.7		1	05/21/19	05/22/19 19:17	1064
Cadmium	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Chromium	**100**	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Copper	**25**	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Lead	**260**	mg/kg	2.7		1	05/21/19	05/22/19 19:17	1064
Manganese	**3,500**	mg/kg	27		10	05/21/19	05/22/19 17:53	1064
Mercury	ND	mg/kg	0.11		1	05/21/19	05/21/19 22:10	1064
Nickel	**8.8**	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Selenium	**4.1**	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Silver	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:10	1064
Thallium	ND	mg/kg	2.1		1	05/21/19	05/21/19 22:10	1064
Zinc	**140**	mg/kg	11		1	05/21/19	05/21/19 22:10	1064

Polychlorinated Biphenyls Analytical Method: SW-846 8082 A Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1221	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1232	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1242	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1248	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1254	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029
PCB-1260	ND	mg/kg	0.063		1	05/21/19	05/21/19 17:53	1029

Surrogate(s)	*Recovery*		*Limits*				
Tetrachloro-m-xylene	*66*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 17:53*	*1029*
Decachlorobiphenyl	*100*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 17:53*	*1029*

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164528 on Case Narrative.

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**3,800**	mg/kg	43	DF	10	05/21/19	05/22/19 01:31	1059
Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*88*	*%*	*37-120*		*10*	*05/21/19*	*05/22/19 01:31*	*1059*

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**240**	ug/kg	130		1	05/21/19	05/22/19 00:22	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*99*	*%*	*56-114*		*1*	*05/21/19*	*05/22/19 00:22*	*1045*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	13,000		1000	05/21/19	05/21/19 18:24	1011
Benzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Bromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Bromodichloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Bromoform	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Bromomethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
2-Butanone (MEK)	ND	ug/kg	6,400		1000	05/21/19	05/21/19 18:24	1011
Carbon Disulfide	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Carbon tetrachloride	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Chlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Chloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Chloroform	ND	ug/kg	6,400		1000	05/21/19	05/21/19 18:24	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Cyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Dibromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2-Dibromoethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,3-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,4-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Dichlorodifluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2-Dichloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Ethylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
2-Hexanone (MBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Isopropylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Methyl Acetate	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Methylcyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Methylene chloride	ND	ug/kg	6,400		1000	05/21/19	05/21/19 18:24	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Naphthalene	**54,000**	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Styrene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Tetrachloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Toluene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1,1-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1,2-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Trichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Trichlorofluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011
Vinyl chloride	ND	ug/kg	6,400		1000	05/21/19	05/21/19 18:24	1011
m&p-Xylene	ND	ug/kg	2,600		1000	05/21/19	05/21/19 18:24	1011
o-Xylene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 18:24	1011

Surrogate(s)	*Recovery*		*Limits*				
4-Bromofluorobenzene	*98*	*%*	*81-146*		*1000*	*05/21/19*	*05/21/19 18:24*	*1011*
Dibromofluoromethane	*98*	*%*	*89-120*		*1000*	*05/21/19*	*05/21/19 18:24*	*1011*
Toluene-D8	*106*	*%*	*86-116*		*1000*	*05/21/19*	*05/21/19 18:24*	*1011*

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Acenaphthylene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Acetophenone	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Anthracene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Atrazine	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Benzo(a)anthracene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Benzo(a)pyrene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Benzo(b)fluoranthene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Benzo(g,h,i)perylene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzo(k)fluoranthene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Biphenyl (Diphenyl)	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Butyl benzyl phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
bis(2-chloroethoxy) methane	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
bis(2-chloroethyl) ether	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Bromophenylphenyl ether	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Di-n-butyl phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Carbazole	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Caprolactam	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Chloro-3-methyl phenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Chloroaniline	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2-Chloronaphthalene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2-Chlorophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Chrysene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Dibenz(a,h)Anthracene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Dibenzofuran	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
3,3-Dichlorobenzidine	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,4-Dichlorophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Diethyl phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Dimethyl phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,4-Dimethylphenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,4-Dinitrophenol	ND	ug/kg	85,000		200	05/21/19	05/21/19 18:53	1014
2,4-Dinitrotoluene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,6-Dinitrotoluene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Fluoranthene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluorene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Hexachlorobenzene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Hexachlorobutadiene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Hexachlorocyclopentadiene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Hexachloroethane	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Isophorone	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2-Methylnaphthalene	**38,000**	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
2-Methyl phenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
3&4-Methylphenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Naphthalene	**600,000**	ug/kg	21,000		1000	05/21/19	05/21/19 17:29	1014
2-Nitroaniline	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
3-Nitroaniline	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Nitroaniline	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Nitrobenzene	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2-Nitrophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
4-Nitrophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
N-Nitrosodiphenylamine	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Di-n-octyl phthalate	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Pentachlorophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Phenanthrene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Phenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
Pyrene	ND	ug/kg	4,300		200	05/21/19	05/21/19 18:53	1014
Pyridine	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,4,5-Trichlorophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014
2,4,6-Trichlorophenol	ND	ug/kg	43,000		200	05/21/19	05/21/19 18:53	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-1-S-A **Date/Time Sampled: 05/20/2019 14:25** **PSS Sample ID: 19052018-004**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 78**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

Surrogate(s)	*Recovery*		*Limits*					
2-Fluorobiphenyl	*0*	*%*	*32-107*	*	*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
Nitrobenzene-d5	*0*	*%*	*35-123*	*	*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
Phenol-d6	*0*	*%*	*34-120*	*	*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
Terphenyl-D14	*50*	*%*	*46-154*		*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*1000*	*05/21/19*	*05/21/19 17:29*	*1014*
2-Fluorobiphenyl	*60*	*%*	*32-107*		*200*	*05/21/19*	*05/21/19 18:53*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*200*	*05/21/19*	*05/21/19 18:53*	*1014*
Nitrobenzene-d5	*10*	*%*	*35-123*	*	*200*	*05/21/19*	*05/21/19 18:53*	*1014*
Phenol-d6	*5*	*%*	*34-120*	*	*200*	*05/21/19*	*05/21/19 18:53*	*1014*
Terphenyl-D14	*80*	*%*	*46-154*		*200*	*05/21/19*	*05/21/19 18:53*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*200*	*05/21/19*	*05/21/19 18:53*	*1014*

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2 **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-005**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 82**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Arsenic	**1.6**	mg/kg	0.54		1	05/21/19	05/21/19 22:15	1064
Beryllium	**3.2**	mg/kg	2.7		1	05/21/19	05/22/19 19:22	1064
Cadmium	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Chromium	**140**	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Copper	**23**	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Lead	**160**	mg/kg	2.7		1	05/21/19	05/22/19 19:22	1064
Manganese	**5,000**	mg/kg	27		10	05/21/19	05/22/19 17:58	1064
Mercury	ND	mg/kg	0.11		1	05/21/19	05/21/19 22:15	1064
Nickel	**6.4**	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Selenium	**4.1**	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Silver	ND	mg/kg	2.7		1	05/21/19	05/21/19 22:15	1064
Thallium	ND	mg/kg	2.2		1	05/21/19	05/21/19 22:15	1064
Zinc	**82**	mg/kg	11		1	05/21/19	05/21/19 22:15	1064

Polychlorinated Biphenyls Analytical Method: SW-846 8082 A Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1221	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1232	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1242	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1248	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1254	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029
PCB-1260	ND	mg/kg	0.062		1	05/21/19	05/21/19 18:21	1029

Surrogate(s)	*Recovery*		*Limits*				
Tetrachloro-m-xylene	*76*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 18:21*	*1029*
Decachlorobiphenyl	*109*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 18:21*	*1029*

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164544 on Case Narrative.

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**4,500**	mg/kg	210	DF	50	05/21/19	05/22/19 09:38	1059
Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*106*	*%*	*37-120*		*50*	*05/21/19*	*05/22/19 09:38*	*1059*

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	05/21/19	05/22/19 00:53	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*95*	*%*	*56-114*		*1*	*05/21/19*	*05/22/19 00:53*	*1045*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	12,000		1000	05/21/19	05/21/19 18:46	1011
Benzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Bromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Bromodichloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Bromoform	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Bromomethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
2-Butanone (MEK)	ND	ug/kg	6,200		1000	05/21/19	05/21/19 18:46	1011
Carbon Disulfide	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Carbon tetrachloride	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Chlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Chloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Chloroform	ND	ug/kg	6,200		1000	05/21/19	05/21/19 18:46	1011

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Cyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Dibromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2-Dibromoethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,3-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,4-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Dichlorodifluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2-Dichloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Ethylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
2-Hexanone (MBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Isopropylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Methyl Acetate	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Methylcyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Methylene chloride	ND	ug/kg	6,200		1000	05/21/19	05/21/19 18:46	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Naphthalene	**1,100,000**	ug/kg	6,200		5000	05/21/19	05/22/19 10:46	1011
Styrene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Tetrachloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Toluene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1,1-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1,2-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Trichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Trichlorofluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011
Vinyl chloride	ND	ug/kg	6,200		1000	05/21/19	05/21/19 18:46	1011
m&p-Xylene	ND	ug/kg	2,500		1000	05/21/19	05/21/19 18:46	1011
o-Xylene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 18:46	1011

Surrogate(s)	*Recovery*		*Limits*				
4-Bromofluorobenzene	*98*	*%*	*81-146*	*1000*	*05/21/19*	*05/21/19 18:46*	*1011*
Dibromofluoromethane	*98*	*%*	*89-120*	*1000*	*05/21/19*	*05/21/19 18:46*	*1011*
Toluene-D8	*102*	*%*	*86-116*	*1000*	*05/21/19*	*05/21/19 18:46*	*1011*
4-Bromofluorobenzene	*102*	*%*	*81-146*	*5000*	*05/22/19*	*05/22/19 10:46*	*1011*
Dibromofluoromethane	*100*	*%*	*89-120*	*5000*	*05/22/19*	*05/22/19 10:46*	*1011*
Toluene-D8	*104*	*%*	*86-116*	*5000*	*05/22/19*	*05/22/19 10:46*	*1011*

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Acenaphthylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Acetophenone	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Atrazine	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Benzo(a)anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzo(a)pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Benzo(b)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Benzo(g,h,i)perylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Benzo(k)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Biphenyl (Diphenyl)	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Butyl benzyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
bis(2-chloroethoxy) methane	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
bis(2-chloroethyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Bromophenylphenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Di-n-butyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Carbazole	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Caprolactam	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Chloro-3-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Chloroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2-Chloronaphthalene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2-Chlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Chrysene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Dibenz(a,h)Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Dibenzofuran	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
3,3-Dichlorobenzidine	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2,4-Dichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Diethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Dimethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2,4-Dimethylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2,4-Dinitrophenol	ND	ug/kg	41,000		100	05/21/19	05/21/19 14:42	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2,6-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Fluoranthene	**2,100**	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Fluorene	**2,300**	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Hexachlorobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Hexachlorobutadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Hexachlorocyclopentadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Hexachloroethane	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Isophorone	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2-Methylnaphthalene	**36,000**	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
2-Methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
3&4-Methylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Naphthalene	**1,100,000**	ug/kg	21,000		1000	05/21/19	05/21/19 15:10	1014
2-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
3-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Nitrobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
4-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
N-Nitrosodiphenylamine	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Di-n-octyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Pentachlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Phenanthrene	**3,000**	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 14:42	1014
Pyridine	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
2,4,5-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-2-A **Date/Time Sampled: 05/20/2019 14:45** **PSS Sample ID: 19052018-006**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4,6-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 14:42	1014
Surrogate(s)	***Recovery***		***Limits***					
2-Fluorobiphenyl	*80*	*%*	*32-107*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
2-Fluorophenol	*62*	*%*	*34-113*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
Nitrobenzene-d5	*80*	*%*	*35-123*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
Phenol-d6	*52*	*%*	*34-120*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
Terphenyl-D14	*105*	*%*	*46-154*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
2,4,6-Tribromophenol	*65*	*%*	*31-113*		*100*	*05/21/19*	*05/21/19 14:42*	*1014*
2-Fluorobiphenyl	*0*	*%*	*32-107*	*	*1000*	*05/21/19*	*05/21/19 15:10*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*1000*	*05/21/19*	*05/21/19 15:10*	*1014*
Nitrobenzene-d5	*0*	*%*	*35-123*	*	*1000*	*05/21/19*	*05/21/19 15:10*	*1014*
Phenol-d6	*0*	*%*	*34-120*	*	*1000*	*05/21/19*	*05/21/19 15:10*	*1014*
Terphenyl-D14	*150*	*%*	*46-154*		*1000*	*05/21/19*	*05/21/19 15:10*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*1000*	*05/21/19*	*05/21/19 15:10*	*1014*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3 **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-007**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 82**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Arsenic	**1.7**	mg/kg	0.49		1	05/21/19	05/21/19 22:21	1064
Beryllium	**5.1**	mg/kg	2.5		1	05/21/19	05/22/19 19:28	1064
Cadmium	ND	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Chromium	**89**	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Copper	**26**	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Lead	**130**	mg/kg	2.5		1	05/21/19	05/22/19 19:28	1064
Manganese	**4,800**	mg/kg	25		10	05/21/19	05/22/19 18:04	1064
Mercury	ND	mg/kg	0.099		1	05/21/19	05/21/19 22:21	1064
Nickel	**12**	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Selenium	**3.9**	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Silver	ND	mg/kg	2.5		1	05/21/19	05/21/19 22:21	1064
Thallium	ND	mg/kg	2.0		1	05/21/19	05/21/19 22:21	1064
Zinc	**75**	mg/kg	9.9		1	05/21/19	05/21/19 22:21	1064

Polychlorinated Biphenyls Analytical Method: SW-846 8082 A Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1221	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1232	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1242	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1248	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1254	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029
PCB-1260	ND	mg/kg	0.061		1	05/21/19	05/21/19 18:49	1029

Surrogate(s)	***Recovery***		***Limits***				
Tetrachloro-m-xylene	*69*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 18:49*	*1029*
Decachlorobiphenyl	*94*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 18:49*	*1029*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**100**	mg/kg	40		10	05/21/19	05/22/19 00:40	1059
Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*102*	*%*	*37-120*		*10*	*05/21/19*	*05/22/19 00:40*	*1059*

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	05/21/19	05/22/19 09:38	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*100*	*%*	*56-114*		*1*	*05/21/19*	*05/22/19 09:38*	*1045*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	12,000		1000	05/21/19	05/21/19 15:53	1011
Benzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Bromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Bromodichloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Bromoform	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Bromomethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
2-Butanone (MEK)	ND	ug/kg	6,000		1000	05/21/19	05/21/19 15:53	1011
Carbon Disulfide	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Carbon tetrachloride	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Chlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Chloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Chloroform	ND	ug/kg	6,000		1000	05/21/19	05/21/19 15:53	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Cyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Dibromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2-Dibromoethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,3-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,4-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Dichlorodifluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2-Dichloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Ethylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
2-Hexanone (MBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Isopropylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Methyl Acetate	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Methylcyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Methylene chloride	ND	ug/kg	6,000		1000	05/21/19	05/21/19 15:53	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Naphthalene	**50,000**	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Styrene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Tetrachloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Toluene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1,1-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1,2-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Trichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Trichlorofluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011
Vinyl chloride	ND	ug/kg	6,000		1000	05/21/19	05/21/19 15:53	1011
m&p-Xylene	ND	ug/kg	2,400		1000	05/21/19	05/21/19 15:53	1011
o-Xylene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 15:53	1011

Surrogate(s)	*Recovery*		*Limits*				
4-Bromofluorobenzene	*96*	*%*	*81-146*		*1000*	*05/21/19*	*05/21/19 15:53*	*1011*
Dibromofluoromethane	*96*	*%*	*89-120*		*1000*	*05/21/19*	*05/21/19 15:53*	*1011*
Toluene-D8	*100*	*%*	*86-116*		*1000*	*05/21/19*	*05/21/19 15:53*	*1011*

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Acenaphthylene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Acetophenone	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Atrazine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Benzo(a)anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Benzo(a)pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Benzo(b)fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Benzo(g,h,i)perylene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzo(k)fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Biphenyl (Diphenyl)	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Butyl benzyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
bis(2-chloroethoxy) methane	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
bis(2-chloroethyl) ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Bromophenylphenyl ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Di-n-butyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Carbazole	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Caprolactam	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Chloro-3-methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Chloroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2-Chloronaphthalene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2-Chlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Chrysene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Dibenz(a,h)Anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Dibenzofuran	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
3,3-Dichlorobenzidine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,4-Dichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Diethyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Dimethyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,4-Dimethylphenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,4-Dinitrophenol	ND	ug/kg	40,000		100	05/21/19	05/21/19 19:21	1014
2,4-Dinitrotoluene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,6-Dinitrotoluene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Fluorene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Hexachlorobenzene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Hexachlorobutadiene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Hexachlorocyclopentadiene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Hexachloroethane	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Isophorone	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2-Methylnaphthalene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
2-Methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
3&4-Methylphenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Naphthalene	**5,800**	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
2-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
3-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Nitrobenzene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2-Nitrophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
4-Nitrophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
N-Nitrosodiphenylamine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Di-n-octyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Pentachlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Phenanthrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
Pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:21	1014
Pyridine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,4,5-Trichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014
2,4,6-Trichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:21	1014

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-3-A **Date/Time Sampled: 05/20/2019 15:00** **PSS Sample ID: 19052018-008**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 83**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

Surrogate(s)	*Recovery*		*Limits*					
2-Fluorobiphenyl	*55*	*%*	*32-107*		*100*	*05/21/19*	*05/21/19 19:21*	*1014*
2-Fluorophenol	*10*	*%*	*34-113*	*	*100*	*05/21/19*	*05/21/19 19:21*	*1014*
Nitrobenzene-d5	*25*	*%*	*35-123*	*	*100*	*05/21/19*	*05/21/19 19:21*	*1014*
Phenol-d6	*20*	*%*	*34-120*	*	*100*	*05/21/19*	*05/21/19 19:21*	*1014*
Terphenyl-D14	*95*	*%*	*46-154*		*100*	*05/21/19*	*05/21/19 19:21*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*100*	*05/21/19*	*05/21/19 19:21*	*1014*

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Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4 **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-009**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 82**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Arsenic	**1.6**	mg/kg	0.57		1	05/21/19	05/21/19 22:26	1064
Beryllium	**3.8**	mg/kg	2.8		1	05/21/19	05/22/19 19:34	1064
Cadmium	ND	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Chromium	**130**	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Copper	**20**	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Lead	**380**	mg/kg	2.8		1	05/21/19	05/22/19 19:34	1064
Manganese	**5,500**	mg/kg	28		10	05/21/19	05/22/19 18:09	1064
Mercury	ND	mg/kg	0.11		1	05/21/19	05/21/19 22:26	1064
Nickel	**8.1**	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Selenium	**3.8**	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Silver	ND	mg/kg	2.8		1	05/21/19	05/21/19 22:26	1064
Thallium	ND	mg/kg	2.3		1	05/21/19	05/21/19 22:26	1064
Zinc	**91**	mg/kg	11		1	05/21/19	05/21/19 22:26	1064

Polychlorinated Biphenyls Analytical Method: SW-846 8082 A Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1221	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1232	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1242	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1248	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1254	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029
PCB-1260	ND	mg/kg	0.060		1	05/21/19	05/21/19 19:17	1029

Surrogate(s)	*Recovery*		*Limits*				
Decachlorobiphenyl	*88*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 19:17*	*1029*
Tetrachloro-m-xylene	*70*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 19:17*	*1029*

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May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164544 on Case Narrative.

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**3,300**	mg/kg	210	DF	50	05/21/19	05/22/19 10:04	1059
Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*99*	*%*	*37-120*		*50*	*05/21/19*	*05/22/19 10:04*	*1059*

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**250**	ug/kg	120		1	05/21/19	05/22/19 10:09	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*94*	*%*	*56-114*		*1*	*05/21/19*	*05/22/19 10:09*	*1045*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	13,000		1000	05/21/19	05/21/19 19:07	1011
Benzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Bromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Bromodichloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Bromoform	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Bromomethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
2-Butanone (MEK)	ND	ug/kg	6,300		1000	05/21/19	05/21/19 19:07	1011
Carbon Disulfide	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Carbon tetrachloride	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Chlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Chloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Chloroform	ND	ug/kg	6,300		1000	05/21/19	05/21/19 19:07	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Chloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Cyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Dibromochloromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2-Dibromoethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,3-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,4-Dichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Dichlorodifluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2-Dichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2-Dichloropropane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Ethylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
2-Hexanone (MBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Isopropylbenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Methyl Acetate	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Methylcyclohexane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Methylene chloride	ND	ug/kg	6,300		1000	05/21/19	05/21/19 19:07	1011
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Naphthalene	**1,200,000**	ug/kg	6,300		5000	05/21/19	05/22/19 11:09	1011
Styrene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Tetrachloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Toluene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1,1-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1,2-Trichloroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Trichloroethene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Trichlorofluoromethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011
Vinyl chloride	ND	ug/kg	6,300		1000	05/21/19	05/21/19 19:07	1011
m&p-Xylene	ND	ug/kg	2,500		1000	05/21/19	05/21/19 19:07	1011
o-Xylene	ND	ug/kg	1,300		1000	05/21/19	05/21/19 19:07	1011

Surrogate(s)	*Recovery*		*Limits*					
4-Bromofluorobenzene	*104*	*%*	*81-146*		*1000*	*05/21/19*	*05/21/19 19:07*	*1011*
Dibromofluoromethane	*96*	*%*	*89-120*		*1000*	*05/21/19*	*05/21/19 19:07*	*1011*
Toluene-D8	*106*	*%*	*86-116*		*1000*	*05/21/19*	*05/21/19 19:07*	*1011*
4-Bromofluorobenzene	*98*	*%*	*81-146*		*5000*	*05/22/19*	*05/22/19 11:09*	*1011*
Dibromofluoromethane	*100*	*%*	*89-120*		*5000*	*05/22/19*	*05/22/19 11:09*	*1011*
Toluene-D8	*84*	*%*	*86-116*	*	*5000*	*05/22/19*	*05/22/19 11:09*	*1011*

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Acenaphthylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Acetophenone	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Atrazine	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Benzo(a)anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzo(a)pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Benzo(b)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Benzo(g,h,i)perylene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Benzo(k)fluoranthene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Biphenyl (Diphenyl)	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Butyl benzyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
bis(2-chloroethoxy) methane	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
bis(2-chloroethyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Bromophenylphenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Di-n-butyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Carbazole	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Caprolactam	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Chloro-3-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Chloroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2-Chloronaphthalene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2-Chlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Chrysene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Dibenz(a,h)Anthracene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Dibenzofuran	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
3,3-Dichlorobenzidine	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2,4-Dichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Diethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Dimethyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2,4-Dimethylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2,4-Dinitrophenol	ND	ug/kg	42,000		100	05/21/19	05/21/19 20:17	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2,6-Dinitrotoluene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Fluoranthene	**3,500**	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Fluorene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Hexachlorobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Hexachlorobutadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Hexachlorocyclopentadiene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Hexachloroethane	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Isophorone	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2-Methylnaphthalene	**23,000**	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
2-Methyl phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
3&4-Methylphenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Naphthalene	**1,100,000**	ug/kg	21,000		1000	05/21/19	05/21/19 16:06	1014
2-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
3-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Nitroaniline	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Nitrobenzene	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
4-Nitrophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
N-Nitrosodiphenylamine	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Di-n-octyl phthalate	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Pentachlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Phenanthrene	**3,700**	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Phenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Pyrene	**2,600**	ug/kg	2,100		100	05/21/19	05/21/19 20:17	1014
Pyridine	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
2,4,5-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: SP-4-A **Date/Time Sampled: 05/20/2019 15:15** **PSS Sample ID: 19052018-010**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 80**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4,6-Trichlorophenol	ND	ug/kg	21,000		100	05/21/19	05/21/19 20:17	1014
Surrogate(s)	***Recovery***		***Limits***					
2-Fluorobiphenyl	*0*	*%*	*32-107*	*	*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
Nitrobenzene-d5	*0*	*%*	*35-123*	*	*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
Phenol-d6	*0*	*%*	*34-120*	*	*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
Terphenyl-D14	*50*	*%*	*46-154*		*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*1000*	*05/21/19*	*05/21/19 16:06*	*1014*
2-Fluorobiphenyl	*75*	*%*	*32-107*		*100*	*05/21/19*	*05/21/19 20:17*	*1014*
2-Fluorophenol	*8*	*%*	*34-113*	*	*100*	*05/21/19*	*05/21/19 20:17*	*1014*
Nitrobenzene-d5	*55*	*%*	*35-123*		*100*	*05/21/19*	*05/21/19 20:17*	*1014*
Phenol-d6	*20*	*%*	*34-120*	*	*100*	*05/21/19*	*05/21/19 20:17*	*1014*
Terphenyl-D14	*85*	*%*	*46-154*		*100*	*05/21/19*	*05/21/19 20:17*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*100*	*05/21/19*	*05/21/19 20:17*	*1014*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Arsenic	**1.8**	mg/kg	0.48		1	05/21/19	05/21/19 22:32	1064
Beryllium	**3.3**	mg/kg	2.4		1	05/21/19	05/22/19 19:39	1064
Cadmium	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Chromium	**80**	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Copper	**34**	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Lead	**110**	mg/kg	2.4		1	05/21/19	05/22/19 19:39	1064
Manganese	**2,700**	mg/kg	24		10	05/21/19	05/22/19 18:15	1064
Mercury	ND	mg/kg	0.095		1	05/21/19	05/21/19 22:32	1064
Nickel	**15**	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Selenium	**3.7**	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Silver	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:32	1064
Thallium	ND	mg/kg	1.9		1	05/21/19	05/21/19 22:32	1064
Zinc	**28**	mg/kg	9.5		1	05/21/19	05/21/19 22:32	1064

Total Petroleum Hydrocarbons - DRO Analytical Method: SW-846 8015 C Preparation Method: SW3550C

Qualifier(s): See Batch 164528 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**100**	mg/kg	41		10	05/21/19	05/22/19 00:40	1059

Surrogate(s)	*Recovery*		*Limits*				
o-Terphenyl	*82*	*%*	*37-120*	*10*	*05/21/19*	*05/22/19 00:40*	*1059*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	05/21/19	05/21/19 22:50	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*88*	*%*	*56-114*		*1*	*05/21/19*	*05/21/19 22:50*	*1045*

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1221	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1232	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1242	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1248	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1254	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
PCB-1260	ND	mg/kg	0.063		1	05/21/19	05/21/19 19:46	1029
Surrogate(s)	***Recovery***		***Limits***					
Decachlorobiphenyl	*88*	*%*	*61-150*		*1*	*05/21/19*	*05/21/19 19:46*	*1029*
Tetrachloro-m-xylene	*68*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 19:46*	*1029*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

Qualifier(s): See Batch 164549 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	140		1	05/22/19	05/22/19 12:08	1011
Benzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Bromochloromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Bromodichloromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Bromoform	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Bromomethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds Analytical Method: SW-846 8260 B Preparation Method: 5030

Qualifier(s): See Batch 164549 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Butanone (MEK)	ND	ug/kg	69		1	05/22/19	05/22/19 12:08	1011
Carbon Disulfide	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Carbon tetrachloride	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Chlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Chloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Chloroform	ND	ug/kg	69		1	05/22/19	05/22/19 12:08	1011
Chloromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Cyclohexane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Dibromochloromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2-Dibromoethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2-Dichlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,3-Dichlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,4-Dichlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Dichlorodifluoromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1-Dichloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2-Dichloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1-Dichloroethene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
cis-1,2-Dichloroethene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2-Dichloropropane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
cis-1,3-Dichloropropene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
trans-1,2-Dichloroethene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
trans-1,3-Dichloropropene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Ethylbenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
2-Hexanone (MBK)	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Isopropylbenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Methyl Acetate	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Methylcyclohexane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Methylene chloride	ND	ug/kg	69		1	05/22/19	05/22/19 12:08	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

Qualifier(s): See Batch 164549 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Methyl-t-Butyl Ether	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Naphthalene	**6,600**	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Styrene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Tetrachloroethene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Toluene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2,3-Trichlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,2,4-Trichlorobenzene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1,1-Trichloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1,2-Trichloroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Trichloroethene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Trichlorofluoromethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011
Vinyl chloride	ND	ug/kg	69		1	05/22/19	05/22/19 12:08	1011
m&p-Xylene	ND	ug/kg	27		1	05/22/19	05/22/19 12:08	1011
o-Xylene	ND	ug/kg	14		1	05/22/19	05/22/19 12:08	1011

Surrogate(s)	*Recovery*		*Limits*				
4-Bromofluorobenzene	*102*	*%*	*81-146*		*1*	*05/22/19*	*05/22/19 12:08*	*1011*
Dibromofluoromethane	*98*	*%*	*89-120*		*1*	*05/22/19*	*05/22/19 12:08*	*1011*
Toluene-D8	*88*	*%*	*86-116*		*1*	*05/22/19*	*05/22/19 12:08*	*1011*

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Acenaphthylene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Acetophenone	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Atrazine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Benzo(a)anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Benzo(a)pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Benzo(b)fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Benzo(g,h,i)perylene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Benzo(k)fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Biphenyl (Diphenyl)	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Butyl benzyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
bis(2-chloroethoxy) methane	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
bis(2-chloroethyl) ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Bromophenylphenyl ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Di-n-butyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Carbazole	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Caprolactam	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Chloro-3-methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Chloroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2-Chloronaphthalene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2-Chlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Chrysene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Dibenz(a,h)Anthracene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Dibenzofuran	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
3,3-Dichlorobenzidine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4-Dichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Diethyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Dimethyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2,4-Dimethylphenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2,4-Dinitrophenol	ND	ug/kg	41,000		100	05/21/19	05/21/19 19:49	1014
2,4-Dinitrotoluene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2,6-Dinitrotoluene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Fluoranthene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Fluorene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Hexachlorobenzene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Hexachlorobutadiene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Hexachlorocyclopentadiene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Hexachloroethane	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Isophorone	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2-Methylnaphthalene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
2-Methyl phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
3&4-Methylphenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Naphthalene	**4,900**	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
2-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
3-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Nitroaniline	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Nitrobenzene	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2-Nitrophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
4-Nitrophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
N-Nitrosodiphenylamine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Di-n-octyl phthalate	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-1 **Date/Time Sampled: 05/20/2019 15:30** **PSS Sample ID: 19052018-011**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Pentachlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Phenanthrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Phenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
Pyrene	ND	ug/kg	2,000		100	05/21/19	05/21/19 19:49	1014
Pyridine	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2,4,5-Trichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014
2,4,6-Trichlorophenol	ND	ug/kg	20,000		100	05/21/19	05/21/19 19:49	1014

Surrogate(s)	*Recovery*		*Limits*					
2-Fluorobiphenyl	*10*	*%*	*32-107*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*
Nitrobenzene-d5	*10*	*%*	*35-123*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*
Phenol-d6	*3*	*%*	*34-120*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*
Terphenyl-D14	*45*	*%*	*46-154*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*100*	*05/21/19*	*05/21/19 19:49*	*1014*

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

PP Metals (plus Mn) Analytical Method: SW-846 6020 A Preparation Method: 3050B

Qualifier(s): See Batch 164540 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Arsenic	**0.97**	mg/kg	0.48		1	05/21/19	05/21/19 22:37	1064
Beryllium	ND	mg/kg	2.4		1	05/21/19	05/22/19 19:45	1064
Cadmium	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Chromium	**420**	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Copper	**17**	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Lead	**94**	mg/kg	2.4		1	05/21/19	05/22/19 19:45	1064
Manganese	**13,000**	mg/kg	240		100	05/21/19	05/23/19 13:49	1064
Mercury	ND	mg/kg	0.097		1	05/21/19	05/21/19 22:37	1064
Nickel	**3.8**	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Selenium	**3.1**	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Silver	ND	mg/kg	2.4		1	05/21/19	05/21/19 22:37	1064
Thallium	ND	mg/kg	1.9		1	05/21/19	05/21/19 22:37	1064
Zinc	ND	mg/kg	9.7		1	05/21/19	05/21/19 22:37	1064

Total Petroleum Hydrocarbons - DRO Analytical Method: SW-846 8015 C Preparation Method: SW3550C

Qualifier(s): See Batch 164544 on Case Narrative.

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**30,000**	mg/kg	830	DF	100	05/21/19	05/22/19 10:29	1059

Surrogate(s)	***Recovery***		***Limits***					
o-Terphenyl	*0*	*%*	*37-120*	*	*100*	*05/21/19*	*05/22/19 10:29*	*1059*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**
Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

Qualifier(s): See Batch 164555 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	**1,800**	ug/kg	120		1	05/22/19	05/22/19 14:56	1045
Surrogate(s)	***Recovery***		***Limits***					
a,a,a-Trifluorotoluene	*35*	*%*	*56-114*	*	*1*	*05/22/19*	*05/22/19 14:56*	*1045*

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1221	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1232	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1242	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1248	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1254	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
PCB-1260	ND	mg/kg	0.061		1	05/21/19	05/21/19 20:14	1029
Surrogate(s)	***Recovery***		***Limits***					
Tetrachloro-m-xylene	*53*	*%*	*42-142*		*1*	*05/21/19*	*05/21/19 20:14*	*1029*
Decachlorobiphenyl	*48*	*%*	*61-150*	*	*1*	*05/21/19*	*05/21/19 20:14*	*1029*

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	ND	ug/kg	12,000		1000	05/21/19	05/21/19 19:29	1011
Benzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Bromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Bromodichloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Bromoform	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Bromomethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Butanone (MEK)	ND	ug/kg	6,200		1000	05/21/19	05/21/19 19:29	1011
Carbon Disulfide	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Carbon tetrachloride	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Chlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Chloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Chloroform	ND	ug/kg	6,200		1000	05/21/19	05/21/19 19:29	1011
Chloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Cyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2-Dibromo-3-chloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Dibromochloromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2-Dibromoethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,3-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,4-Dichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Dichlorodifluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2-Dichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2-Dichloropropane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
cis-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
cis-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
trans-1,2-Dichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
trans-1,3-Dichloropropene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Ethylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
2-Hexanone (MBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Isopropylbenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Methyl Acetate	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Methylcyclohexane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Methylene chloride	ND	ug/kg	6,200		1000	05/21/19	05/21/19 19:29	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
4-Methyl-2-Pentanone (MIBK)	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Methyl-t-Butyl Ether	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Naphthalene	**2,300,000**	ug/kg	120,000		100000	05/21/19	05/22/19 13:45	1011
Styrene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Tetrachloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Toluene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2,3-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,2,4-Trichlorobenzene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1,1-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1,2-Trichloroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Trichloroethene	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Trichlorofluoromethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
1,1,2-Trichlorotrifluoroethane	ND	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011
Vinyl chloride	ND	ug/kg	6,200		1000	05/21/19	05/21/19 19:29	1011
m&p-Xylene	**3,100**	ug/kg	2,500		1000	05/21/19	05/21/19 19:29	1011
o-Xylene	**1,700**	ug/kg	1,200		1000	05/21/19	05/21/19 19:29	1011

Surrogate(s)	***Recovery***		***Limits***				
4-Bromofluorobenzene	*98*	*%*	*81-146*	*1000*	*05/21/19*	*05/21/19 19:29*	*1011*
Dibromofluoromethane	*98*	*%*	*89-120*	*1000*	*05/21/19*	*05/21/19 19:29*	*1011*
Toluene-D8	*102*	*%*	*86-116*	*1000*	*05/21/19*	*05/21/19 19:29*	*1011*
4-Bromofluorobenzene	*96*	*%*	*81-146*	*100000*	*05/22/19*	*05/22/19 13:45*	*1011*
Dibromofluoromethane	*96*	*%*	*89-120*	*100000*	*05/22/19*	*05/22/19 13:45*	*1011*
Toluene-D8	*98*	*%*	*86-116*	*100000*	*05/22/19*	*05/22/19 13:45*	*1011*

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Acenaphthylene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Acetophenone	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Anthracene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Atrazine	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Benzo(a)anthracene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Benzo(a)pyrene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Benzo(b)fluoranthene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Benzo(g,h,i)perylene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Benzo(k)fluoranthene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Biphenyl (Diphenyl)	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Butyl benzyl phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
bis(2-chloroethoxy) methane	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
bis(2-chloroethyl) ether	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Bromophenylphenyl ether	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Di-n-butyl phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Carbazole	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Caprolactam	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Chloro-3-methyl phenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Chloroaniline	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2-Chloronaphthalene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2-Chlorophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Chrysene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Dibenz(a,h)Anthracene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Dibenzofuran	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
3,3-Dichlorobenzidine	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2,4-Dichlorophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Diethyl phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Dimethyl phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2,4-Dimethylphenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2,4-Dinitrophenol	ND	ug/kg	1,700,000		2000	05/21/19	05/21/19 17:57	1014
2,4-Dinitrotoluene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2,6-Dinitrotoluene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Fluoranthene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Fluorene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Hexachlorobenzene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Hexachlorobutadiene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Hexachlorocyclopentadiene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Hexachloroethane	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Isophorone	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2-Methylnaphthalene	**390,000**	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
2-Methyl phenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
3&4-Methylphenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Naphthalene	**7,400,000**	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
2-Nitroaniline	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
3-Nitroaniline	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Nitroaniline	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Nitrobenzene	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2-Nitrophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
4-Nitrophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
N-Nitrosodiphenylamine	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Di-n-octyl phthalate	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014

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CERTIFICATE OF ANALYSIS

No: 19052018

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 23, 2019

Project Name: Slag Processing Area
Project Location: TPA
Project ID: 18019A

Sample ID: C-2 **Date/Time Sampled: 05/20/2019 15:40** **PSS Sample ID: 19052018-012**

Matrix: SOIL **Date/Time Received: 05/20/2019 17:15** **% Solids SM2540G-11: 81**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: SW3550C

Qualifier(s): See Batch 164534 on Case Narrative.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Pentachlorophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Phenanthrene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Phenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
Pyrene	ND	ug/kg	83,000		2000	05/21/19	05/21/19 17:57	1014
Pyridine	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2,4,5-Trichlorophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014
2,4,6-Trichlorophenol	ND	ug/kg	830,000		2000	05/21/19	05/21/19 17:57	1014

Surrogate(s)	*Recovery*		*Limits*					
2-Fluorobiphenyl	*0*	*%*	*32-107*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*
2-Fluorophenol	*0*	*%*	*34-113*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*
Nitrobenzene-d5	*0*	*%*	*35-123*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*
Phenol-d6	*0*	*%*	*34-120*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*
Terphenyl-D14	*0*	*%*	*46-154*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*
2,4,6-Tribromophenol	*0*	*%*	*31-113*	*	*2000*	*05/21/19*	*05/21/19 17:57*	*1014*

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: Slag Processing Area

Work Order Number(s): 19052018

Project ID: 18019A

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

RCRA Metals

Batch: 164540

Continuing Calibration Verification (CCV) #5 exceeded acceptance limits (90% - 110%) for thallium at 111% recovery. Samples are non-detect for this analyte and all low level calibration verifications (LLCCV) pass.

Analytical:

Total Petroleum Hydrocarbons - DRO

Batch: 164528

The opening calibration verification (CCV-R1) had a surrogate recovery above the control limit of 120% at 123%.

Batch: 164544

Sample 19052018-012 showed a 0% surrogate recovery due to dilutions.

Analytical:

Total Petroleum Hydrocarbons-GRO

Batch: 164555

Surrogate exceedance identified, see QC summary. 19052018-012 was analyzed twice with low surrogate recovery both times.

Analytical:

TCL Volatile Organic Compounds

Batch: 164549

Laboratory control sample exceedances identified, matrix spike/ matrix spike duplicate samples meet LCS criteria; see LCS summary form.

Analytical:

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: Slag Processing Area

Work Order Number(s): 19052018

Project ID: 18019A

TCL Semivolatile Organic Compounds

Batch: 164534

Surrogates recoveries are outside the QC limits because the samples are diluted by 100X to 1000X.

Laboratory control sample/laboratory control sample duplicate (LCS/LCSD); see LCS summary form.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

SW-846 5030

Analytical Data Package Information Summary

Work Order(s): 19052018
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: Slag Processing Area
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM2540G	SP-1-N	Initial	19052018-001	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-1-N-A	Initial	19052018-002	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-1-S	Initial	19052018-003	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-1-S-A	Initial	19052018-004	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-2	Initial	19052018-005	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-2-A	Initial	19052018-006	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-3	Initial	19052018-007	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-3-A	Initial	19052018-008	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-4	Initial	19052018-009	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-4-A	Initial	19052018-010	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	C-1	Initial	19052018-011	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	C-2	Initial	19052018-012	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
	164489-1-BLK	BLK	164489-1-BLK	1061	S	164489	164489	--------	05/21/2019 11:59	05/21/2019 11:59
	B7S4 D	MD	19051716-009 D	1061	S	164489	164489	05/16/2019	05/21/2019 11:59	05/21/2019 11:59
	SP-2 D	MD	19052018-005 D	1061	S	164489	164489	05/20/2019	05/21/2019 11:59	05/21/2019 11:59
SW-846 6020 A	SP-1-N	Initial	19052018-001	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:04
	SP-1-S	Initial	19052018-003	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:10
	SP-2	Initial	19052018-005	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:15
	SP-3	Initial	19052018-007	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:21
	SP-4	Initial	19052018-009	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:26
	C-1	Initial	19052018-011	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:32
	C-2	Initial	19052018-012	1064	S	76902	164540	05/20/2019	05/21/2019 11:18	05/21/2019 22:37
	76902-1-BKS	BKS	76902-1-BKS	1064	S	76902	164540	--------	05/21/2019 11:18	05/21/2019 21:08
	76902-1-BLK	BLK	76902-1-BLK	1064	S	76902	164540	--------	05/21/2019 11:18	05/21/2019 21:02
	D001 S	MS	19052011-001 S	1064	S	76902	164540	05/17/2019	05/21/2019 11:18	05/21/2019 21:19
	D001 SD	MSD	19052011-001 SD	1064	S	76902	164540	05/17/2019	05/21/2019 11:18	05/21/2019 21:47
	SP-1-N	Reanalysis	19052018-001	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:11
	SP-1-S	Reanalysis	19052018-003	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:17
	SP-2	Reanalysis	19052018-005	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:22

Analytical Data Package Information Summary

Work Order(s): 19052018
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: Slag Processing Area
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 6020 A	SP-3	Reanalysis	19052018-007	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:28
	SP-4	Reanalysis	19052018-009	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:34
	C-1	Reanalysis	19052018-011	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:39
	C-2	Reanalysis	19052018-012	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 19:45
	SP-1-S	Reanalysis	19052018-003	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 17:53
	SP-2	Reanalysis	19052018-005	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 17:58
	SP-3	Reanalysis	19052018-007	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 18:04
	SP-4	Reanalysis	19052018-009	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 18:09
	C-1	Reanalysis	19052018-011	1064	S	76902	164578	05/20/2019	05/21/2019 11:18	05/22/2019 18:15
	SP-1-N	Reanalysis	19052018-001	1064	S	76902	164592	05/20/2019	05/21/2019 11:18	05/23/2019 13:44
	C-2	Reanalysis	19052018-012	1064	S	76902	164592	05/20/2019	05/21/2019 11:18	05/23/2019 13:49
SW-846 8015 C	SP-1-N-A	Initial	19052018-002	1059	S	76910	164526	05/20/2019	05/21/2019 13:30	05/22/2019 02:22
	SP-3-A	Initial	19052018-008	1059	S	76910	164526	05/20/2019	05/21/2019 13:30	05/22/2019 00:40
	T-1G S	MS	19051714-001 S	1059	S	76910	164526	05/13/2019	05/21/2019 13:30	05/21/2019 22:34
	T-1G SD	MSD	19051714-001 SD	1059	S	76910	164526	05/13/2019	05/21/2019 13:30	05/21/2019 22:59
	SP-1-S-A	Initial	19052018-004	1059	S	76910	164528	05/20/2019	05/21/2019 13:30	05/22/2019 01:31
	C-1	Initial	19052018-011	1059	S	76910	164528	05/20/2019	05/21/2019 13:30	05/22/2019 00:40
	76910-1-BKS	BKS	76910-1-BKS	1059	S	76910	164528	--------	05/21/2019 13:30	05/21/2019 22:34
	76910-1-BLK	BLK	76910-1-BLK	1059	S	76910	164528	--------	05/21/2019 13:30	05/21/2019 22:08
	76910-1-BSD	BSD	76910-1-BSD	1059	S	76910	164528	--------	05/21/2019 13:30	05/21/2019 22:59
	SP-2-A	Initial	19052018-006	1059	S	76910	164544	05/20/2019	05/21/2019 13:30	05/22/2019 09:38
	SP-4-A	Initial	19052018-010	1059	S	76910	164544	05/20/2019	05/21/2019 13:30	05/22/2019 10:04
	C-2	Initial	19052018-012	1059	S	76910	164544	05/20/2019	05/21/2019 13:30	05/22/2019 10:29
SW-846 8015C	SP-1-N-A	Initial	19052018-002	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/21/2019 23:51
	SP-1-S-A	Initial	19052018-004	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/22/2019 00:22
	SP-2-A	Initial	19052018-006	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/22/2019 00:53
	SP-3-A	Initial	19052018-008	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/22/2019 09:38
	SP-4-A	Initial	19052018-010	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/22/2019 10:09

Analytical Data Package Information Summary

Work Order(s): 19052018
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: Slag Processing Area
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8015C	C-1	Initial	19052018-011	1045	S	76930	164550	05/20/2019	05/21/2019 16:15	05/21/2019 22:50
	76930-2-BKS	BKS	76930-2-BKS	1045	S	76930	164550	--------	05/21/2019 16:15	05/21/2019 16:46
	76930-2-BLK	BLK	76930-2-BLK	1045	S	76930	164550	--------	05/21/2019 16:15	05/21/2019 19:17
	76930-2-BSD	BSD	76930-2-BSD	1045	S	76930	164550	--------	05/21/2019 16:15	05/21/2019 17:16
	C-2	Initial	19052018-012	1045	S	76935	164555	05/20/2019	05/22/2019 11:09	05/22/2019 14:56
	76935-2-BKS	BKS	76935-2-BKS	1045	S	76935	164555	--------	05/22/2019 11:09	05/22/2019 13:55
	76935-2-BLK	BLK	76935-2-BLK	1045	S	76935	164555	--------	05/22/2019 11:09	05/22/2019 14:25
	76935-2-BSD	BSD	76935-2-BSD	1045	S	76935	164555	--------	05/22/2019 11:09	05/22/2019 15:57
	1A, 1B, 1C S	MS	19051701-001 S	1045	S	76935	164555	05/17/2019	05/22/2019 11:09	05/22/2019 16:28
	1A, 1B, 1C SD	MSD	19051701-001 SD	1045	S	76935	164555	05/17/2019	05/22/2019 11:09	05/22/2019 16:57
SW-846 8082 A	SP-1-N	Initial	19052018-001	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 17:25
	SP-1-S	Initial	19052018-003	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 17:53
	SP-2	Initial	19052018-005	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 18:21
	SP-3	Initial	19052018-007	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 18:49
	SP-4	Initial	19052018-009	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 19:17
	C-1	Initial	19052018-011	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 19:46
	C-2	Initial	19052018-012	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 20:14
	76893-1-BKS	BKS	76893-1-BKS	1029	S	76893	164523	--------	05/21/2019 08:21	05/21/2019 14:07
	76893-1-BLK	BLK	76893-1-BLK	1029	S	76893	164523	--------	05/21/2019 08:21	05/21/2019 13:39
	76893-1-BSD	BSD	76893-1-BSD	1029	S	76893	164523	--------	05/21/2019 08:21	05/21/2019 14:35
	SP-1-N S	MS	19052018-001 S	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 15:04
	SP-1-N SD	MSD	19052018-001 SD	1029	S	76893	164523	05/20/2019	05/21/2019 08:21	05/21/2019 15:32
SW-846 8260 B	SP-1-N-A	Initial	19052018-002	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 15:19
	SP-1-S-A	Initial	19052018-004	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 18:24
	SP-2-A	Initial	19052018-006	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 18:46
	SP-3-A	Initial	19052018-008	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 15:53
	SP-4-A	Initial	19052018-010	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 19:07
	C-2	Initial	19052018-012	1011	S	76923	164538	05/20/2019	05/21/2019 08:02	05/21/2019 19:29

Analytical Data Package Information Summary

Work Order(s): 19052018
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: Slag Processing Area
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	76923-1-BKS	BKS	76923-1-BKS	1011	S	76923	164538	--------	05/21/2019 08:02	05/21/2019 09:49
	76923-1-BLK	BLK	76923-1-BLK	1011	S	76923	164538	--------	05/21/2019 08:02	05/21/2019 11:25
	B5S3 S	MS	19051716-006 S	1011	S	76923	164538	05/16/2019	05/21/2019 08:02	05/21/2019 16:14
	B5S3 SD	MSD	19051716-006 SD	1011	S	76923	164538	05/16/2019	05/21/2019 08:02	05/21/2019 16:37
	C-1	Initial	19052018-011	1011	S	76931	164549	05/20/2019	05/22/2019 07:54	05/22/2019 12:08
	76931-1-BKS	BKS	76931-1-BKS	1011	S	76931	164549	--------	05/22/2019 07:54	05/22/2019 08:59
	76931-1-BLK	BLK	76931-1-BLK	1011	S	76931	164549	--------	05/22/2019 07:54	05/22/2019 10:14
	SP-2-A	Reanalysis	19052018-006	1011	S	76923	164549	05/20/2019	05/21/2019 08:02	05/22/2019 10:46
	SP-4-A	Reanalysis	19052018-010	1011	S	76923	164549	05/20/2019	05/21/2019 08:02	05/22/2019 11:09
	C-2	Reanalysis	19052018-012	1011	S	76923	164549	05/20/2019	05/21/2019 08:02	05/22/2019 13:45
SW-846 8270 C	SP-1-N-A	Initial	19052018-002	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 18:25
	SP-1-S-A	Initial	19052018-004	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 18:53
	SP-2-A	Initial	19052018-006	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 14:42
	SP-3-A	Initial	19052018-008	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 19:21
	SP-4-A	Initial	19052018-010	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 20:17
	C-1	Initial	19052018-011	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 19:49
	C-2	Initial	19052018-012	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 17:57
	76895-1-BKS	BKS	76895-1-BKS	1014	S	76895	164534	--------	05/21/2019 09:05	05/21/2019 10:59
	76895-1-BLK	BLK	76895-1-BLK	1014	S	76895	164534	--------	05/21/2019 09:05	05/21/2019 10:31
	76895-1-BSD	BSD	76895-1-BSD	1014	S	76895	164534	--------	05/21/2019 09:05	05/21/2019 11:27
	13163-Directive 4-20ft S	MS	19051715-004 S	1014	S	76895	164534	05/16/2019	05/21/2019 09:05	05/21/2019 12:23
	13163-Directive 4-20ft SD	MSD	19051715-004 SD	1014	S	76895	164534	05/16/2019	05/21/2019 09:05	05/21/2019 12:50
	SP-1-N-A	Reanalysis	19052018-002	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 17:01
	SP-1-S-A	Reanalysis	19052018-004	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 17:29
	SP-2-A	Reanalysis	19052018-006	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 15:10
	SP-4-A	Reanalysis	19052018-010	1014	S	76895	164534	05/20/2019	05/21/2019 09:05	05/21/2019 16:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 6020 A Prep Method: SW3050B
Seq Number: 164540 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76902-1-BLK LCS Sample Id: 76902-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Antimony	<2.000	16.00	16.80	105	80-120	mg/kg	
Arsenic	<0.4000	16.00	16.54	103	80-120	mg/kg	
Beryllium	<2.000	16.00	17.17	107	80-120	mg/kg	
Cadmium	<2.000	16.00	16.41	103	80-120	mg/kg	
Chromium	<2.000	16.00	17.58	110	80-120	mg/kg	
Copper	<2.000	16.00	16.98	106	80-120	mg/kg	
Lead	<2.000	16.00	16.60	104	80-120	mg/kg	
Manganese	<2.000	16.00	17.08	107	80-120	mg/kg	
Mercury	<0.08001	0.4000	0.3940	99	80-120	mg/kg	
Nickel	<2.000	16.00	16.75	105	80-120	mg/kg	
Selenium	<2.000	16.00	14.84	93	80-120	mg/kg	
Silver	<2.000	16.00	16.26	102	80-120	mg/kg	
Thallium	<1.600	16.00	15.64	98	80-120	mg/kg	
Zinc	<8.001	80.01	83.71	105	80-120	mg/kg	

Analytical Method: SM2540G
Seq Number: 164489 Matrix: Soil
Parent Sample Id: 19052018-005 MD Sample Id: 19052018-005 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Flag
Percent Moisture	18.00	18.00	0	20	%	

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 164523 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76893-1-BLK LCS Sample Id: 76893-1-BKS LCSD Sample Id: 76893-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
PCB-1016	<0.04995	0.4995	0.4310	86	0.4200	85	60-110	3	25	mg/kg	
PCB-1260	<0.04995	0.4995	0.4370	87	0.4307	87	60-98	1	25	mg/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units
Decachlorobiphenyl	89		89		87		61-150	%
Tetrachloro-m-xylene	86		91		88		42-142	%

PHASE SEPARATION SCIENCE, INC.

QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 164523 Matrix: Soil Date Prep: 05/21/19
Parent Sample Id: 19052018-001 MS Sample Id: 19052018-001 S MSD Sample Id: 19052018-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
PCB-1016	<0.06002	0.6002	0.4334	72	0.4121	68	45-130	5	30	mg/kg	
PCB-1260	<0.06002	0.6002	0.4840	81	0.4780	79	30-125	1	30	mg/kg	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units
Decachlorobiphenyl	97		123		61-150	%
Tetrachloro-m-xylene	66		64		42-142	%

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 164528 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76910-1-BLK LCS Sample Id: 76910-1-BKS LCSD Sample Id: 76910-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
TPH-DRO (Diesel Range Organics)	<3.337	33.37	35.08	105	34.30	103	60-108	2	22	mg/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units
o-Terphenyl	86		112		108		37-120	%

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QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 164534 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76895-1-BLK LCS Sample Id: 76895-1-BKS LCSD Sample Id: 76895-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
Acenaphthene	<16.58	1326	1173	88	1148	87	60-116	2	25	ug/kg	
Acenaphthylene	<16.58	1326	1166	88	1141	86	61-112	2	25	ug/kg	
Acetophenone	<165.8	1326	1111	84	1088	82	57-114	2	25	ug/kg	
Anthracene	<16.58	1326	1144	86	1159	88	66-115	1	25	ug/kg	
Atrazine	<165.8	1326	576.3	43	591	45	7-109	3	25	ug/kg	
Benzo(a)anthracene	<16.58	1326	1241	94	1228	93	71-113	1	25	ug/kg	
Benzo(a)pyrene	<16.58	1326	1204	91	1179	89	69-118	2	25	ug/kg	
Benzo(b)fluoranthene	<16.58	1326	1209	91	1156	87	65-126	4	25	ug/kg	
Benzo(g,h,i)perylene	<16.58	1326	1164	88	1148	87	69-112	1	25	ug/kg	
Benzo(k)fluoranthene	<16.58	1326	1127	85	1167	88	57-129	3	25	ug/kg	
Biphenyl (Diphenyl)	<165.8	1326	1183	89	1161	88	62-117	2	25	ug/kg	
Butyl benzyl phthalate	<165.8	1326	1311	99	1313	99	81-111	0	25	ug/kg	
bis(2-chloroethoxy) methane	<165.8	1326	1137	86	1136	86	56-119	0	25	ug/kg	
bis(2-chloroethyl) ether	<165.8	1326	1088	82	1053	80	55-107	3	25	ug/kg	
bis(2-chloroisopropyl) ether	<165.8	1326	1054	79	1068	81	44-103	1	25	ug/kg	
bis(2-ethylhexyl) phthalate	<165.8	1326	1322	100	1324	100	84-109	0	25	ug/kg	
4-Bromophenylphenyl ether	<165.8	1326	1194	90	1172	89	63-125	2	25	ug/kg	
Di-n-butyl phthalate	<165.8	1326	1143	86	1157	87	76-110	1	25	ug/kg	
Carbazole	<165.8	1326	1261	95	1200	91	58-133	5	25	ug/kg	
Caprolactam	<165.8	1326	1679	127	1656	125	51-122	1	25	ug/kg	H
4-Chloro-3-methyl phenol	<165.8	1326	1208	91	1182	89	74-119	2	25	ug/kg	
4-Chloroaniline	<165.8	1326	1192	90	1187	90	45-107	0	25	ug/kg	
2-Chloronaphthalene	<165.8	1326	1132	85	1116	84	56-113	1	25	ug/kg	
2-Chlorophenol	<165.8	1326	1098	83	1074	81	59-113	2	25	ug/kg	
4-Chlorophenyl Phenyl ether	<165.8	1326	1169	88	1151	87	62-111	2	25	ug/kg	
Chrysene	<16.58	1326	1288	97	1298	98	72-114	1	25	ug/kg	
Dibenz(a,h)Anthracene	<16.58	1326	1160	87	1132	85	72-110	2	25	ug/kg	
Dibenzofuran	<165.8	1326	1186	89	1168	88	62-118	2	25	ug/kg	
3,3-Dichlorobenzidine	<165.8	1326	1479	112	1490	113	66-141	1	25	ug/kg	
2,4-Dichlorophenol	<165.8	1326	1176	89	1166	88	68-118	1	25	ug/kg	
Diethyl phthalate	<165.8	1326	1208	91	1196	90	61-113	1	25	ug/kg	
Dimethyl phthalate	<165.8	1326	1171	88	1157	87	69-109	1	25	ug/kg	
2,4-Dimethylphenol	<165.8	1326	1138	86	1096	83	57-122	4	25	ug/kg	
4,6-Dinitro-2-methyl phenol	<165.8	1326	1284	97	1265	96	50-134	1	25	ug/kg	
2,4-Dinitrophenol	<331.6	1326	1421	107	1325	100	24-144	7	25	ug/kg	
2,4-Dinitrotoluene	<165.8	1326	1256	95	1215	92	61-124	3	25	ug/kg	
2,6-Dinitrotoluene	<165.8	1326	1198	90	1206	91	59-124	1	25	ug/kg	
Fluoranthene	<16.58	1326	1183	89	1173	89	69-119	1	25	ug/kg	
Fluorene	<16.58	1326	1179	89	1167	88	65-115	1	25	ug/kg	
Hexachlorobenzene	<165.8	1326	1209	91	1225	93	63-118	1	25	ug/kg	
Hexachlorobutadiene	<165.8	1326	1142	86	1129	85	55-120	1	25	ug/kg	
Hexachlorocyclopentadiene	<165.8	1326	1277	96	1179	89	29-138	8	25	ug/kg	
Hexachloroethane	<165.8	1326	1098	83	1097	83	54-110	0	25	ug/kg	
Indeno(1,2,3-c,d)Pyrene	<16.58	1326	1210	91	1174	89	60-127	3	25	ug/kg	
Isophorone	<165.8	1326	1363	103	1370	103	57-116	1	25	ug/kg	
2-Methylnaphthalene	<16.58	1326	1176	89	1165	88	70-109	1	25	ug/kg	
2-Methyl phenol	<165.8	1326	1119	84	1088	82	59-118	3	25	ug/kg	
3&4-Methylphenol	<165.8	1326	1131	85	1100	83	59-113	3	25	ug/kg	
Naphthalene	<16.58	1326	1102	83	1100	83	59-108	0	25	ug/kg	
2-Nitroaniline	<165.8	1326	1174	89	1139	86	51-116	3	25	ug/kg	
3-Nitroaniline	<165.8	1326	1210	91	1183	89	57-111	2	25	ug/kg	

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QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 164534 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76895-1-BLK LCS Sample Id: 76895-1-BKS LCSD Sample Id: 76895-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
4-Nitroaniline	<165.8	1326	1192	90	1165	88	55-125	2	25	ug/kg	
Nitrobenzene	<165.8	1326	1104	83	1112	84	53-110	1	25	ug/kg	
2-Nitrophenol	<165.8	1326	1166	88	1147	87	58-124	2	25	ug/kg	
4-Nitrophenol	<165.8	1326	1294	98	1260	95	51-116	3	25	ug/kg	
N-Nitrosodi-n-propyl amine	<165.8	1326	1167	88	1077	81	60-98	8	25	ug/kg	
N-Nitrosodiphenylamine	<165.8	1326	1184	89	1175	89	65-111	1	25	ug/kg	
Di-n-octyl phthalate	<165.8	1326	1203	91	1203	91	69-120	0	25	ug/kg	
Pentachlorophenol	<165.8	1326	1203	91	1153	87	56-124	4	25	ug/kg	
Phenanthrene	<16.58	1326	1167	88	1147	87	67-117	2	25	ug/kg	
Phenol	<165.8	1326	1027	77	989.1	75	58-114	4	25	ug/kg	
Pyrene	<16.58	1326	1280	97	1290	97	77-111	1	25	ug/kg	
Pyridine	<165.8	1326	986.7	74	1017	77	37-110	3	25	ug/kg	
2,4,5-Trichlorophenol	<165.8	1326	1218	92	1179	89	64-114	3	25	ug/kg	
2,4,6-Trichlorophenol	<165.8	1326	1140	86	1114	84	60-125	2	25	ug/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units
2-Fluorobiphenyl	81		91		90		32-107	%
2-Fluorophenol	73		81		80		34-113	%
Nitrobenzene-d5	78		87		88		35-123	%
Phenol-d6	73		81		79		34-120	%
Terphenyl-D14	89		93		94		46-154	%
2,4,6-Tribromophenol	86		99		95		31-113	%

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 164550 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76930-2-BLK LCS Sample Id: 76930-2-BKS LCSD Sample Id: 76930-2-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
TPH-GRO (Gasoline Range Organics	<99.60	4980	5320	107	5245	105	65-139	1	25	ug/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units
a,a,a-Trifluorotoluene	97		110		110		56-114	%

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 164555 Matrix: Solid Date Prep: 05/22/19
MB Sample Id: 76935-2-BLK LCS Sample Id: 76935-2-BKS LCSD Sample Id: 76935-2-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Flag
TPH-GRO (Gasoline Range Organics	<100	5000	5448	109	4842	97	65-139	12	25	ug/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units
a,a,a-Trifluorotoluene	100		110		110		56-114	%

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QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8260 B Prep Method: SW5035
Seq Number: 164538 Matrix: Solid Date Prep: 05/21/19
MB Sample Id: 76923-1-BLK LCS Sample Id: 76923-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Acetone	16	61	60	98	66-136	ug/kg	
Benzene	<1.0	61	57	93	79-131	ug/kg	
Bromochloromethane	<1.0	61	58	95	82-124	ug/kg	
Bromodichloromethane	<1.0	61	57	93	81-128	ug/kg	
Bromoform	<1.0	61	70	115	75-128	ug/kg	
Bromomethane	<1.0	61	55	90	71-135	ug/kg	
2-Butanone (MEK)	<5.1	61	64	105	63-135	ug/kg	
Carbon Disulfide	<1.0	61	58	95	73-134	ug/kg	
Carbon tetrachloride	<1.0	61	58	95	73-130	ug/kg	
Chlorobenzene	<1.0	61	59	97	80-126	ug/kg	
Chloroethane	<1.0	61	52	85	77-133	ug/kg	
Chloroform	<5.1	61	53	87	79-125	ug/kg	
Chloromethane	<1.0	61	56	92	73-127	ug/kg	
Cyclohexane	<1.0	61	54	89	70-126	ug/kg	
1,2-Dibromo-3-chloropropane	<1.0	61	67	110	61-127	ug/kg	
Dibromochloromethane	<1.0	61	73	120	82-123	ug/kg	
1,2-Dibromoethane	<1.0	61	64	105	73-122	ug/kg	
1,2-Dichlorobenzene	<1.0	61	62	102	64-125	ug/kg	
1,3-Dichlorobenzene	<1.0	61	65	107	65-125	ug/kg	
1,4-Dichlorobenzene	<1.0	61	63	103	81-122	ug/kg	
Dichlorodifluoromethane	<1.0	61	67	110	62-134	ug/kg	
1,1-Dichloroethane	<1.0	61	54	89	80-128	ug/kg	
1,2-Dichloroethane	<1.0	61	54	89	81-124	ug/kg	
1,1-Dichloroethene	<1.0	61	56	92	75-124	ug/kg	
1,2-Dichloropropane	<1.0	61	54	89	77-134	ug/kg	
cis-1,2-Dichloroethene	<1.0	61	56	92	79-122	ug/kg	
cis-1,3-Dichloropropene	<1.0	61	54	89	71-123	ug/kg	
trans-1,2-Dichloroethene	<1.0	61	57	93	79-127	ug/kg	
trans-1,3-Dichloropropene	<1.0	61	57	93	68-126	ug/kg	
Ethylbenzene	<1.0	61	58	95	77-123	ug/kg	
2-Hexanone (MBK)	<1.0	61	63	103	58-136	ug/kg	
Isopropylbenzene	<1.0	61	61	100	78-134	ug/kg	
Methyl Acetate	<1.0	61	56	92	76-127	ug/kg	
Methylcyclohexane	<1.0	61	57	93	73-124	ug/kg	
Methylene chloride	<5.1	61	53	87	75-117	ug/kg	
4-Methyl-2-Pentanone (MIBK)	<1.0	61	60	98	67-130	ug/kg	
Methyl-t-Butyl Ether	<1.0	61	48	79	72-124	ug/kg	
Naphthalene	<1.0	61	61	100	27-128	ug/kg	
Styrene	<1.0	61	62	102	71-125	ug/kg	
1,1,2,2-Tetrachloroethane	<1.0	61	68	111	76-130	ug/kg	
Tetrachloroethene	<1.0	61	60	98	72-129	ug/kg	
Toluene	<1.0	61	56	92	76-132	ug/kg	
1,2,3-Trichlorobenzene	<1.0	61	69	113	35-131	ug/kg	
1,2,4-Trichlorobenzene	<1.0	61	67	110	67-114	ug/kg	
1,1,1-Trichloroethane	<1.0	61	54	89	77-129	ug/kg	
1,1,2-Trichloroethane	<1.0	61	62	102	77-132	ug/kg	
Trichloroethene	<1.0	61	55	90	78-129	ug/kg	
Trichlorofluoromethane	<1.0	61	57	93	73-135	ug/kg	
1,1,2-Trichlorotrifluoroethane	<1.0	61	54	89	73-129	ug/kg	
Vinyl chloride	<5.1	61	68	111	76-138	ug/kg	
m&p-Xylene	<2.0	120	110	92	79-121	ug/kg	

PHASE SEPARATION SCIENCE, INC.

QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8260 B Prep Method: SW5035

Seq Number: 164538 Matrix: Solid Date Prep: 05/21/19

MB Sample Id: 76923-1-BLK LCS Sample Id: 76923-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
o-Xylene	<1.0	61	60	98	75-124	ug/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
4-Bromofluorobenzene	100		96		81-146	%
Dibromofluoromethane	100		102		89-120	%
Toluene-D8	104		106		86-116	%

PHASE SEPARATION SCIENCE, INC.

QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8260 B Prep Method: SW5035
Seq Number: 164549 Matrix: Solid Date Prep: 05/22/19
MB Sample Id: 76931-1-BLK LCS Sample Id: 76931-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
Acetone	10	61	63	103	66-136	ug/kg	
Benzene	<1.0	61	68	111	79-131	ug/kg	
Bromochloromethane	<1.0	61	70	115	82-124	ug/kg	
Bromodichloromethane	<1.0	61	71	116	81-128	ug/kg	
Bromoform	<1.0	61	70	115	75-128	ug/kg	
Bromomethane	<1.0	61	67	110	71-135	ug/kg	
2-Butanone (MEK)	<5.1	61	62	102	63-135	ug/kg	
Carbon Disulfide	<1.0	61	71	116	73-134	ug/kg	
Carbon tetrachloride	<1.0	61	70	115	73-130	ug/kg	
Chlorobenzene	<1.0	61	68	111	80-126	ug/kg	
Chloroethane	<1.0	61	67	110	77-133	ug/kg	
Chloroform	<5.1	61	65	107	79-125	ug/kg	
Chloromethane	<1.0	61	65	107	73-127	ug/kg	
Cyclohexane	<1.0	61	66	108	70-126	ug/kg	
1,2-Dibromo-3-chloropropane	<1.0	61	70	115	61-127	ug/kg	
Dibromochloromethane	<1.0	61	81	133	82-123	ug/kg	H
1,2-Dibromoethane	<1.0	61	74	121	73-122	ug/kg	
1,2-Dichlorobenzene	<1.0	61	66	108	64-125	ug/kg	
1,3-Dichlorobenzene	<1.0	61	71	116	65-125	ug/kg	
1,4-Dichlorobenzene	<1.0	61	71	116	81-122	ug/kg	
Dichlorodifluoromethane	<1.0	61	75	123	62-134	ug/kg	
1,1-Dichloroethane	<1.0	61	66	108	80-128	ug/kg	
1,2-Dichloroethane	<1.0	61	64	105	81-124	ug/kg	
1,1-Dichloroethene	<1.0	61	72	118	75-124	ug/kg	
1,2-Dichloropropane	<1.0	61	66	108	77-134	ug/kg	
cis-1,2-Dichloroethene	<1.0	61	68	111	79-122	ug/kg	
cis-1,3-Dichloropropene	<1.0	61	63	103	71-123	ug/kg	
trans-1,2-Dichloroethene	<1.0	61	72	118	79-127	ug/kg	
trans-1,3-Dichloropropene	<1.0	61	67	110	68-126	ug/kg	
Ethylbenzene	<1.0	61	68	111	77-123	ug/kg	
2-Hexanone (MBK)	<1.0	61	57	93	58-136	ug/kg	
Isopropylbenzene	<1.0	61	73	120	78-134	ug/kg	
Methyl Acetate	<1.0	61	66	108	76-127	ug/kg	
Methylcyclohexane	<1.0	61	67	110	73-124	ug/kg	
Methylene chloride	<5.1	61	64	105	75-117	ug/kg	
4-Methyl-2-Pentanone (MIBK)	<1.0	61	57	93	67-130	ug/kg	
Methyl-t-Butyl Ether	<1.0	61	52	85	72-124	ug/kg	
Naphthalene	<1.0	61	70	115	27-128	ug/kg	
Styrene	<1.0	61	69	113	71-125	ug/kg	
1,1,2,2-Tetrachloroethane	<1.0	61	69	113	76-130	ug/kg	
Tetrachloroethene	<1.0	61	80	131	72-129	ug/kg	H
Toluene	<1.0	61	71	116	76-132	ug/kg	
1,2,3-Trichlorobenzene	<1.0	61	73	120	35-131	ug/kg	
1,2,4-Trichlorobenzene	<1.0	61	69	113	67-114	ug/kg	
1,1,1-Trichloroethane	<1.0	61	72	118	77-129	ug/kg	
1,1,2-Trichloroethane	<1.0	61	68	111	77-132	ug/kg	
Trichloroethene	<1.0	61	69	113	78-129	ug/kg	
Trichlorofluoromethane	<1.0	61	67	110	73-135	ug/kg	
1,1,2-Trichlorotrifluoroethane	<1.0	61	72	118	73-129	ug/kg	
Vinyl chloride	<5.1	61	84	138	76-138	ug/kg	
m&p-Xylene	<2.0	120	150	125	79-121	ug/kg	H

PHASE SEPARATION SCIENCE, INC.

QC Summary 19052018

Hillis Carnes Engineering Associates
Slag Processing Area

Analytical Method: SW-846 8260 B Prep Method: SW5035
Seq Number: 164549 Matrix: Solid Date Prep: 05/22/19
MB Sample Id: 76931-1-BLK LCS Sample Id: 76931-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Flag
o-Xylene	<1.0	61	71	116	75-124	ug/kg	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units
4-Bromofluorobenzene	100		100		81-146	%
Dibromofluoromethane	102		96		89-120	%
Toluene-D8	90		98		86-116	%

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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(1) *CLIENT: Hills Cames (HCEA) *OFFICE LOC. AJ

*PROJECT MGR: Keith Progin *PHONE NO.: (410) 880 4788

EMAIL: kprogin@HCEA.com FAX NO.: ( )

*PROJECT NAME: Slag Processing Area PROJECT NO.: 1801 9A

SITE LOCATION: TPA P.O. NO.:

SAMPLER(S): Nick Stella DW CERT NO.:

PSS Work Order #: 1905 2018 PAGE 1 OF 2

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * PCBs	PP Metals	Manganese	TPH-DRO	TPH-GRO	VOCs	SVOCs	REMARKS
1	SP-1-N	5/20/19	2:15p	Slag	2	C		✓	✓	✓					
2	SP-1-N-A	5/20/19	2:15p	Slag	2	G					✓	✓	✓	✓	
3	SP-1-S	5/20/19	2:25p	Slag	2	C		✓	✓	✓					
4	SP-1-S-A	5/20/19	2:25p	Slag	2	G					✓	✓	✓	✓	
5	SP-2	5/20/19	2:45p	Slag	2	C		✓	✓	✓					
6	SP-2-A	5/20/19	2:45p	Slag	2	G					✓	✓	✓	✓	
7	SP-3	5/20/19	3:00p	Slag	2	C		✓	✓	✓					
8	SP-3-A	5/20/19	3:00p	Slag	2	G					✓	✓	✓	✓	
9	SP-4	5/20/19	3:15p	Slag	2	C		✓	✓	✓					
10	SP-4-A	5/20/19	3:15p	Slag	2	G					✓	✓	✓	✓	

(5)

Relinquished By: (1)	Date	Time	Received By:
Nick Stella	5/20/19	5:15p	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☐ 3-Day ☑ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 5.8-11.2C
Shipping Carrier: C1M2

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1) *CLIENT: | *OFFICE LOC.

*PROJECT MGR: | *PHONE NO.:( )

EMAIL: | FAX NO.: ( )

*PROJECT NAME: | PROJECT NO.:

SITE LOCATION: | P.O. NO.:

SAMPLER(S): | DW CERT NO.:

PSS Work Order #: 1905018 | PAGE 2 OF 2

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * PCBs	PP Metals	Manganese	TPH-DRO	TPH-GRO	VOCs	SVOCs	REMARKS
	C-1	5/20/19	3:30p	Slag	4	G		✓	✓	✓	✓	✓	✓	✓	
	C-2	5/20/19	3:40p	Slag	4	G		✓	✓	✓	✓	✓	✓	✓	

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	5/20/19	5:15p	[signature]
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER _____

# of Coolers: 1

Custody Seal: ABJ

Ice Present: PRES Temp: 8.8-11.2°

Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE _____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER _____

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	19052018	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	05/20/2019 05:15:00 PM
Project Name	Slag Processing Area	**Delivered By**	Client
Project Number	18019A	**Tracking No**	Not Applicable
Disposal Date	06/24/2019	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	11.2
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Nick Stella
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 12 Total No. of Containers Received 28

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 05/20/2019

Thomas Wingate

PM Review and Approval: Amber Confer Date: 05/21/2019

Amber Confer

APPENDIX C

ARM Group LLC
Engineers and Scientists

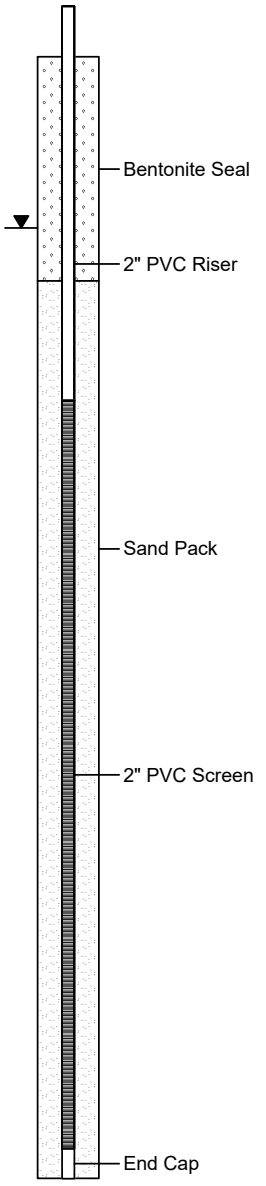
Boring ID: B13-103-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/19/2021
Piezometer Installation Date	: 4/19/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563491.74
Easting (US ft)	: 1463801.39
48-Hr DTW	: 5.21' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 3.30	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	3	100	0.0 0.0 0.0 0.1 0.3	None	(0-10') SLAG, SAND and GRAVEL-sized, with SLAG, SILT-sized, medium dense, greenish gray grading to grayish green, moist then wet at 3' bgs, non-plastic, non-cohesive	GW/SW	Wet at 3' bgs
5	-2	100	1.3 2.7 4.4 4.9 4.4				
10	-7	100	0.0 0.0 0.0 2.1 3.9		(10-10.5') FILL, SILTY SAND-sized, with trace CLAY, medium dense, grayish brown, wet, non-plastic, non-cohesive (10.5-11.5') FILL, SAND and GRAVEL-sized, loose, pale brown with gray and red, wet, non-plastic, non-cohesive (11.5-12') SLAG, GRAVEL-sized, loose, gray, wet, non-plastic, non-cohesive (12-15') FILL, SILTY SAND-sized, medium dense, grayish brown, wet, non-plastic, non-cohesive	SM SW/GW GW SM	
15					End of Boring		



Boring terminated at 15' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.92' ags
Riser: 0 - 5' bgs
Screen: 5 - 15' bgs [Slot Size: 0.020"]
Sand Pack: 3- 15' bgs [Grain Size: WG #2]
Bentonite Seal: 0 - 3' bgs [Grain Size: bentonite chips]

ARM Group LLC
Engineers and Scientists

Boring ID: B13-104-SB PZ

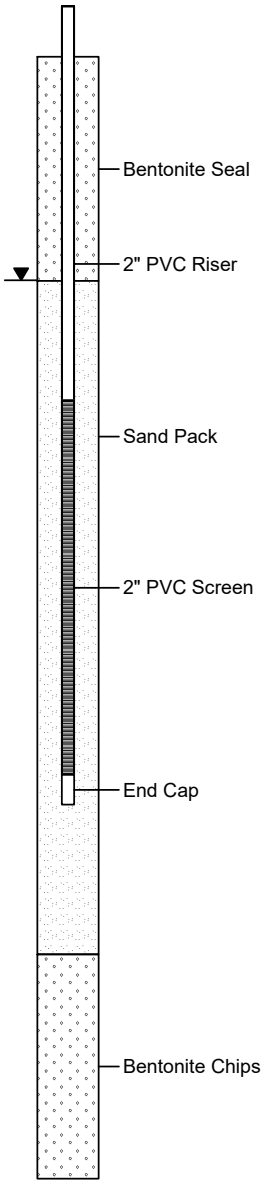
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/19/2021
Piezometer Installation Date	: 4/19/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563703.81
Easting (US ft)	: 1463754.98
48-Hr DTW	: 5.89' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 4.06	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	4	100	1.8, 1.0, 0.9, 1.1, 1.2	None	(0-8') SLAG, GRAVEL-sized, with trace SLAG, SAND-sized, fine to coarse, loose to medium dense, pale brown and white then light brownish gray at 4' bgs, grayish green from 5-8' bgs, very moist then wet at 3' bgs, non-plastic, non-cohesive	GW	Wet at 3' bgs
5	-1	100	0.0, 0.1, 1.1, 1.2, 3.0		(8-10') SLAG, SAND and GRAVEL-sized, with SLAG, SILT-sized, medium dense, grayish green, wet, non-plastic, non-cohesive	SW/GW	
10	-6	100	0.1, 0.0, 0.0, 0.1, 0.0		(10-15') CLAY with trace GRAVEL, coarse, soft, grayish brown with trace reddish yellow, moist to very moist, low plasticity, cohesive	CL	
15					End of Boring		



Boring terminated at 15' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.90' ags
Riser: 0 - 5' bgs
Screen: 5 - 10' bgs [Slot Size: 0.020"]
Sand Pack: 3- 12' bgs [Grain Size: WG #2]
Bentonite Seal: 0 - 3' and 12-15' bgs [Grain Size: bentonite chips]

ARM Group LLC
Engineers and Scientists

Boring ID: B13-105-SB PZ

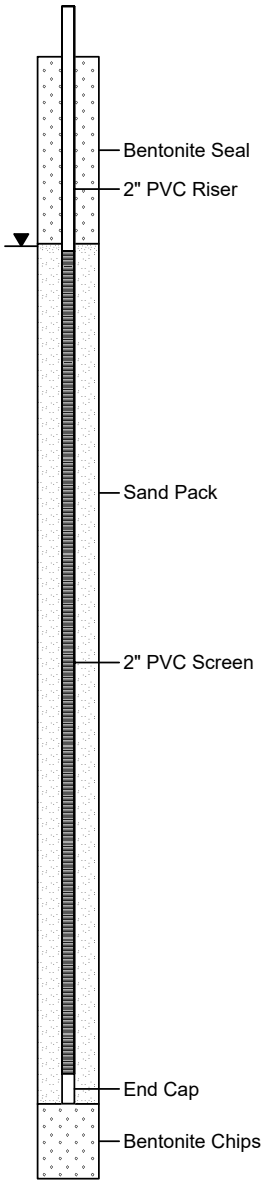
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/28/2021
Piezometer Installation Date	: 4/28/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563482.45
Easting (US ft)	: 1463644.04
48-Hr DTW	: 5.03' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 2.80	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0			0.0	B13-105-SB-1	(0-4') FiLL, SAND and GRAVEL-sized, with SILT, loose, pale brown, very moist then wet at 3' bgs, non-plastic, non-cohesive	GW/SW	Wet at 3' bgs
	2		4.7				
		100	0.0				
			0.0				
			0.0		(4-10') SLAG, GRAVEL-sized, with some SLAG, SAND-sized, and SILT, medium dense, greenish gray grading to grayish green, wet, non-plastic, non-cohesive	GW	
5			0.0				
	-3		0.0				
			0.0				
		100	0.0				
			0.0				
			0.0				
10			0.0		(10-13') SAND FILL with SILT, fine, medium dense, greenish gray, wet, non-plastic, non-cohesive	SP-SM	
	-8		0.0				
		100	0.0				
			0.0		(13-15') CLAY, soft, greenish gray, very moist, low plasticity, cohesive	CL	
			0.0				
15					End of Boring		



Boring terminated at 15' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.50' ags
Riser: 0 - 3' bgs
Screen: 3 - 14' bgs [Slot Size: 0.020"]
Sand Pack: 2.5 - 14' bgs [Grain Size: WG #2]
Bentonite Seal: 0 - 2.5' and 14-15' bgs [Grain Size: bentonite chips]

ARM Group LLC
Engineers and Scientists

Boring ID: B13-106-SB PZ

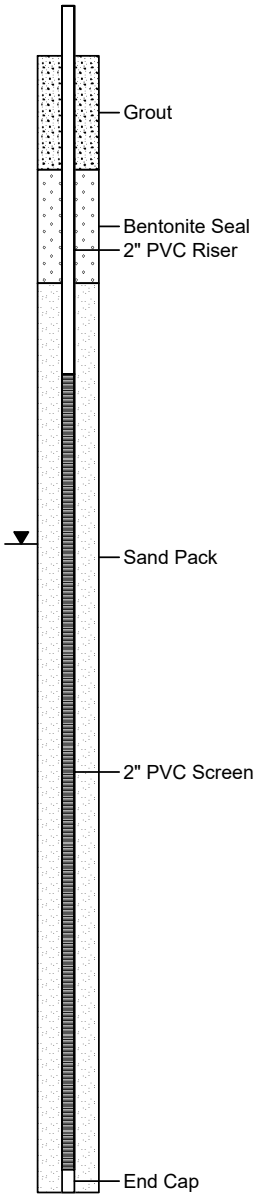
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/27/2021
Piezometer Installation Date	: 4/27/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563359.20
Easting (US ft)	: 1464007.46
48-Hr DTW	: 11.57' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 8.85	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS
0	8	100	11.0	B13-106-SB-1	(0-10') SLAG, SAND and GRAVEL-sized, with some SILT, medium dense, light gray, white and grayish brown, dry to moist then wet at 9' bgs, non-plastic, non-cohesive	GW/SW
			3.6			
			0.9			
			0.0			
			9.0	B13-106-SB-5		
5	3	100	0.0			
			0.0			
			0.4			
			2.2			
			5.0			
10	-2	100	5.2		(10-14') SLAG, GRAVEL-sized, fine to coarse, with some SLAG, SAND-sized, medium dense, grayish green, wet, non-plastic, non-cohesive	GW
			4.7			
			5.0			
			6.1			
15	-7	100	106.1		(14-18') SLAG, SAND-sized with some SLAG, GRAVEL-sized, medium dense, grayish green, wet, non-plastic, non-cohesive	SW
			4.8			
			2.7			
			0.9			
			3.0		(18-20') FILL, SAND-sized, fine, medium dense, grayish brown, wet, non-plastic, non-cohesive	SP
20			25.0		End of Boring	



REMARKS: Wet at 9' bgs

Boring terminated at 20' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.98' ags
Riser: 0 - 6' bgs
Screen: 6 - 20' bgs [Slot Size: 0.020"]
Sand Pack: 4 - 20' bgs [Grain Size: WG #2]
Bentonite Seal: 2 - 4' bgs [Grain Size: bentonite chips]
Grout: 0 - 2' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-107-SB PZ

(page 1 of 1)

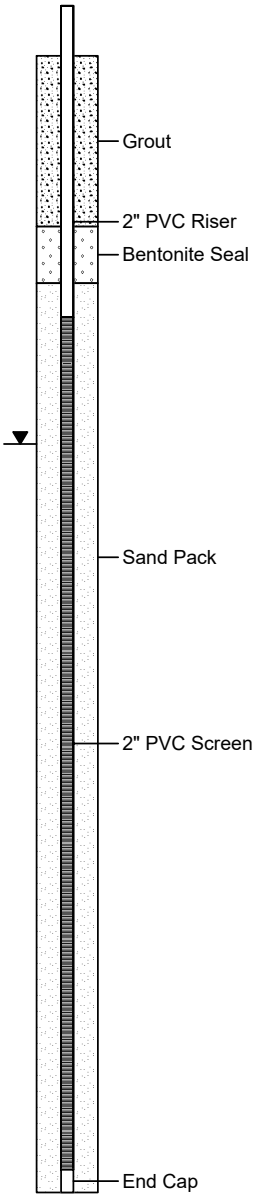
Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/20/2021
Piezometer Installation Date	: 4/21/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563278.60
Easting (US ft)	: 1463840.97
48-Hr DTW	: 9.78' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 7.53	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0							
	7	100	1503 15000 2250 1693 735.6		(0-5') SLAG, GRAVEL-sized, coarse, loose, yellowish red and gray, very moist, non-plastic, non-cohesive	GP	
5	2	100	669.0 734.4 1672 1329		(5-10') SLAG, SAND and GRAVEL-sized, medium dense to loose, brown with yellowish red, very moist then wet at 8' bgs, non-plastic, non-cohesive	GW/SW	Wet at 8' bgs
			1800	B13-107-SB-10			
10	-3	100	71.3 65.5 62.4 58.6 60.2		(10-18') SLAG, SAND and GRAVEL-sized, with some SLAG, SILT-sized, trace COBBLES from 10-15' bgs, medium dense, light gray and dark gray from 15-18' bgs, wet, non-plastic, non-cohesive, gravel size decreases with depth	SW/GW	Yellowish red tinge to water with trace to very light amount of NAPL from 0-10' bgs and light amount of NAPL and strong sheen from 15-18' bgs Strong odor from 0-20' bgs
15	-8		378.1				
			572.4	B13-107-SB-17			
		100	405.3				
			352.7		(18-20') FILL, SAND-sized, fine, medium dense, light brownish gray, wet, non-plastic, non-cohesive	SP	
20			485.6				

End of Boring



Boring terminated at 20' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.95' ags
Riser: 0 - 5' bgs
Screen: 5 - 20' bgs [Slot Size: 0.020"]
Sand Pack: 4 - 20' bgs [Grain Size: WG #2]
Bentonite Seal: 3 - 4' bgs [Grain Size: bentonite chips]
Grout: 0 - 3' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-108-SB PZ

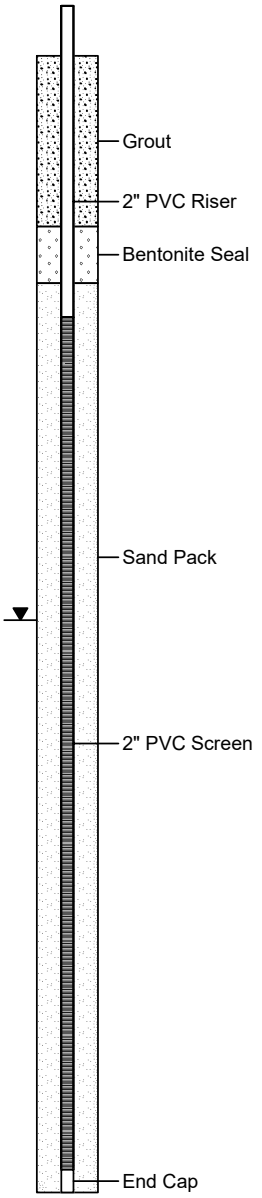
Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/20/2021
Piezometer Installation Date	: 4/20/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563167.93
Easting (US ft)	: 1463610.91
48-Hr DTW	: 13.20' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 10.82	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS
0	10	100	0.5	None	(0-11.5') SLAG, GRAVEL-sized, with trace SLAG, SAND-sized, and SILT, light grayish brown then brown grading to dark brown from 5-10' bgs, then light gray at 10' bgs, very moist then wet at 8' bgs, non-plastic, non-cohesive	GW
			0.5			
			0.6			
			0.8			
5	5	100	3.2			
			0.7			
			0.7			
			0.7			
10	0	100	1.2			
			3.2			
			1.6			
			1.4		(11.5-20') SLAG, SAND and GRAVEL-sized, with trace SILT, medium dense to dense, grayish green, wet, non-plastic, non-cohesive	SW/GW
			1.5			
			1.9			
15	-5	100	3.7			
			1.9			
			1.5			
			1.8			
			1.4			
20			2.6			

End of Boring



REMARKS

Wet at 8' bgs

Boring terminated at 20' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 3.27' ags
Riser: 0 - 5' bgs
Screen: 5 - 20' bgs [Slot Size: 0.020"]
Sand Pack: 4 - 20' bgs [Grain Size: WG #2]
Bentonite Seal: 3 - 4' bgs [Grain Size: bentonite chips]
Grout: 0 - 3' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-109-SB PZ

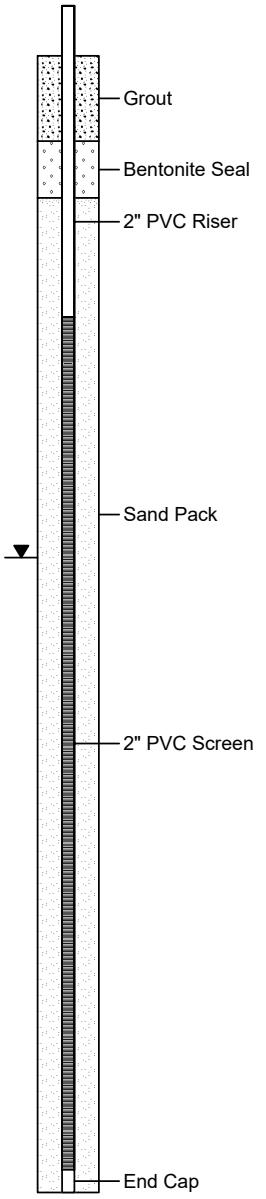
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/20/2021
Piezometer Installation Date	: 4/20/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563088.46
Easting (US ft)	: 1464007.49
48-Hr DTW	: 11.97' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 9.60	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0			0.0		(0-20') SLAG, GRAVEL-sized, with trace SLAG, SAND-sized, and SILT, loose to medium dense, light gray, gray, and white, then grayish green from 10-20' bgs, very moist then wet at 3' bgs, non-plastic, non-cohesive		
	9		0.0				
		100	0.0				
			5.4				
			0.0				
5			0.0				
	4		0.0				
		100	0.0				
			0.0				
			0.0				
10			8.6			GW	
	-1		9.9				
		100	10.5				
			16.7				
			22.4				
15			28.3				
	-6		26.0				
		100	24.4				
			26.4				
			40.1	B13-109-SB-20			
20					End of Boring		



Boring terminated at 20' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 3.14' ags
Riser: 0 - 5' bgs
Screen: 5 - 20' bgs [Slot Size: 0.020"]
Sand Pack: 2.5 - 20' bgs [Grain Size: WG #2]
Bentonite Seal: 1.5 - 2.5' bgs [Grain Size: bentonite chips]
Grout: 0 - 1.5' bgs

ARM Group LLC
Engineers and Scientists

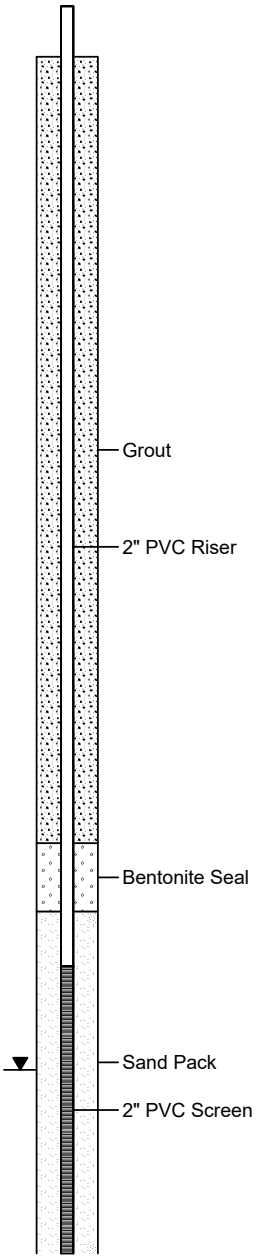
Boring ID: B13-110-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/26/2021
Piezometer Installation Date	: 4/27/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563098.75
Easting (US ft)	: 1463810.51
48-Hr DTW	: 32.48' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 30.08	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	30		0.0		(0-10') SLAG, SAND and GRAVEL-sized with FILL, SAND-sized, loose to medium dense, light gray and brown, dry, non-plastic, non-cohesive	SW/GW	
		100	0.0				
			0.0				
			0.0				
5	25		0.0				
			0.0				
		100	0.0				
			0.0				
			0.0				
10	20		0.0		(10-15') SLAG, GRAVEL-sized, and FILL, GRAVEL-sized, loose, black and gray, very moist, non-plastic, non-cohesive	GW	
			0.0				
		100	0.0				
			0.0				
			0.0				
15	15		0.0		(15-20') SLAG, SAND and GRAVEL-sized, fine, with SILT, medium dense, light gray, very moist, non-plastic, non-cohesive	SW/GP	
			0.0				
		100	0.0				
			0.0				
			0.0				
20	10		0.0		(20-35') SLAG, SAND and GRAVEL-sized, medium dense, light gray with trace white and brown, very moist to moist then wet at 27' bgs, non-plastic, non-cohesive	SW/GW	
			0.0				
		100	0.0				
			0.0				
			0.0				
25	5		0.0				
			0.0				
		100	0.0				Wet at 27' bgs
			0.0				
			0.0				
30	0		13561	B13-110-SB-31			Moderate amount of thin, reddish yellow product from 30-32' bgs
			539.5				
		100	939.4				
			159.0				
35			112.9				



Boring terminated at 60' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.85' ags
Riser: 0 - 27' bgs
Screen: 27 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 25 - 43' bgs [Grain Size: WG #2]
Bentonite Seal: 23 - 25' and 43-45' bgs [Grain Size: bentonite chips]
Grout: 0 - 23' and 45-60' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-110-SB PZ

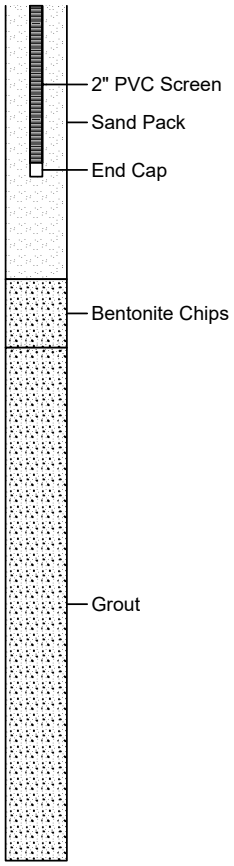
(page 2 of 2)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/26/2021
Piezometer Installation Date	: 4/27/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 563098.75
Easting (US ft)	: 1463810.51
48-Hr DTW	: 32.48' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 30.08	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS
35	-5		87.0		(35-40') SLAG, SAND and GRAVEL-sized, fine, with trace FILL, GRAVEL-sized, coarse, medium dense, grayish green, wet, non-plastic, non-cohesive	SW/GP
		100	86.4			
			56.7			
			49.5			
40	-10		38.5			
			14.1		(40-43.5') CLAY, soft, grayish brown, moist to very moist, low plasticity, cohesive	CL
		100	17.7			
			18.6			
			11.4			
			9.7		(43.5-44') SAND, fine, with trace GRAVEL, grayish brown, wet, non-plastic, non-cohesive	SP
45	-15		26.4			CL
			35.8	B13-110-SB-47	(44-45') CLAY, soft, grayish brown, moist to very moist, low plasticity, cohesive	SP
		100	22.3			
			16.9		(45-48.5') SAND, fine, grayish brown, wet, non-plastic, non-cohesive	
			20.1			
50	-20		0.0		(48.5-60') CLAY, soft, grayish brown, moist to very moist, low plasticity, cohesive	
			0.0			
		100	0.0			
			0.0			
			0.0			CL
55	-25		0.0			
			0.0			
		100	0.0			
			0.0			
			0.0			
60	-30				End of Boring	
65	-35					
70						



REMARKS

Boring terminated at 60' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.85' ags
Riser: 0 - 27' bgs
Screen: 27 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 25 - 43' bgs [Grain Size: WG #2]
Bentonite Seal: 23 - 25' and 43-45' bgs [Grain Size: bentonite chips]
Grout: 0 - 23' and 45-60' bgs

ARM Group LLC
Engineers and Scientists

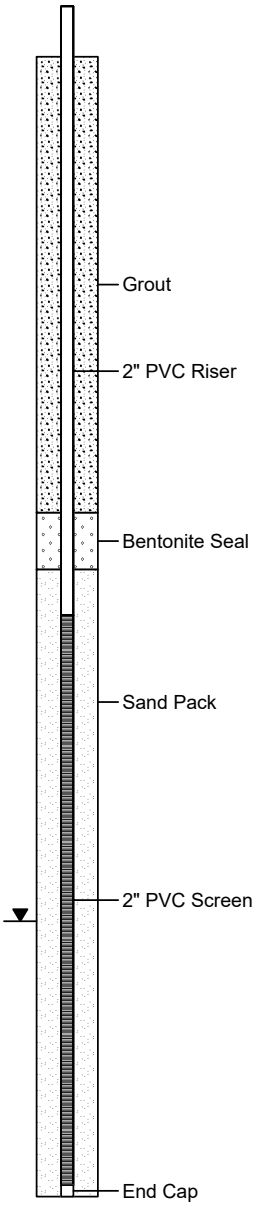
Boring ID: B13-111-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/27/2021
Piezometer Installation Date	: 4/27/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562887.93
Easting (US ft)	: 1463867.36
48-Hr DTW	: 33.27' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 29.69	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	29	100	0.0, 0.0, 0.0, 0.0, 0.0		(0-9') FILL, SAND-sized and SLAG, SAND and GRAVEL-sized, loose to medium dense, brown, very moist then dry from 4-9' bgs, non-plastic, non-cohesive	SW/GW	
5	24	100	0.0, 0.0, 0.0, 7.3, 8.1				
10	19	100	0.0, 0.0, 0.0, 0.0, 4.9		(9-10') SLAG, SAND and GRAVEL-sized with trace COBBLES and METAL, medium dense, light gray and gray, dry, non-plastic, non-cohesive	SW/GW	
15	14	100	4.0, 0.0, 0.9, 0.0, 11.8		(10-18.5') FILL, SAND-sized, and SLAG, SAND and GRAVEL-sized, loose to medium dense, brown, dry then very moist from 12-13.5' bgs, then dry 13.5-18.5' bgs, non-plastic, non-cohesive	SW/GW	
20	9	100	0.0, 0.0, 0.0, 0.0, 3.8	B13-111-SB-21	(18.5-24') SLAG, SAND and GRAVEL-sized, with SILT, loose, light gray and white, dry, non-plastic, non-cohesive	SW/GW	
25	4	100	0.0, 0.0, 0.0, 4.8, 65.7	B13-111-SB-25	(24-30') SLAG, SAND and GRAVEL-sized, with SILT, loose, moist to dry then wet at 27' bgs, light brown, light gray, grayish brown, and gray, non-plastic, non-cohesive	SW/GW	Wet at 27' bgs
30	-1	100	383.1, 1119, 1193, 526.2, 1086		(30-32') FILL, GRAVEL-sized, fine to coarse, loose, light brown and grayish brown, wet, non-plastic, non-cohesive	GW	
35	-6	100	78.7, 43.2, 30.3, 1223, 149.3		(32-35') SLAG, GRAVEL-sized, fine to coarse, with trace SAND-sized, medium dense, brownish gray, wet, non-plastic, non-cohesive	GW	
40					(35-40') SLAG, SAND-sized with trace GRAVEL and COBBLES, grayish green, wet, non-plastic, non-cohesive	SW	
					End of Boring		



Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.93' ags
Riser: 0 - 20' bgs
Screen: 20 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 18 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 16 - 18' bgs [Grain Size: bentonite chips]
Grout: 0 - 16' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-112-SB PZ

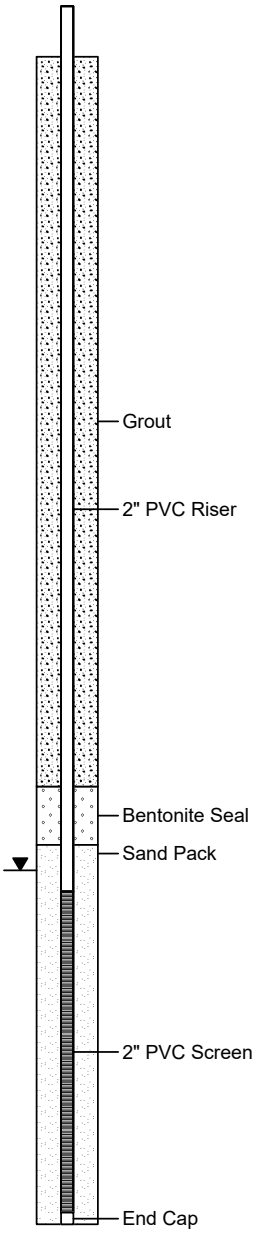
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/26/2021
Piezometer Installation Date	: 4/26/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562519.99
Easting (US ft)	: 1463814.18
48-Hr DTW	: 30.88' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 28.09	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS
0	28	100	0.0, 0.0, 0.0, 0.0, 4.3		(0-2.5') FILL, SAND-sized with some GRAVEL-sized, loose to medium dense, light brown, dry, non-plastic, non-cohesive	SW
					(2.5-3') CONCRETE	NA
5	23	100	0.0, 3.9, 8.7, 7.7, 7.6		(3-12') FILL, SAND-sized with some GRAVEL-sized, loose to medium dense, light brown then brown from 10-12' bgs, dry, non-plastic, non-cohesive	SW
10	18	100	0.0, 0.0, 0.0, 0.9, 8.0		(12-19') SLAG, SAND and GRAVEL-sized, with some FILL, SAND-sized, medium dense, light gray and brown, dry, non-plastic, non-cohesive	SW/GW
15	13	100	8.5, 11.7, 17.4, 26.9, 115.8			
20	8	100	1.9, 2.5, 6.1, 3.6, 37.5	B13-112-SB-21, B13-112-SB-25	(19-20') FILL, SAND and GRAVEL-sized, medium dense, grayish brown and brown, dry, non-plastic, non-cohesive	SW/GW
					(20-36') SLAG, SAND and GRAVEL-sized, trace SILT, medium dense, light gray, dry to moist, then wet at 29' bgs, non-plastic, non-cohesive	SW/GW
25	3	100	9.7, 0.0, 0.0, 0.5, 15.6			
30	-2	100	0.0, 0.0, 0.0, 0.0, 3.9			
35	-7	100	0.0, 0.0, 0.0, 0.0, 0.1		(36-40') SLAG, SAND-sized with trace GRAVEL, fine, and SILT, medium dense to dense, grayish green, wet, non-plastic, non-cohesive	SW
40			3.5		End of Boring	



REMARKS: Wet at 29' bgs

Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 3.01' ags
Riser: 0 - 29' bgs
Screen: 29 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 27 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 25 - 27' bgs [Grain Size: bentonite chips]
Grout: 0 - 25' bgs

06-30-2021 \\armgroup.lcl\CorpData\Projects\EnviroAnalytics Group\20010213 EAG Parcel B13\B13 CMS\Boring Logs\2_bor Logs\B13-112-SB PZ.bor

ARM Group LLC
Engineers and Scientists

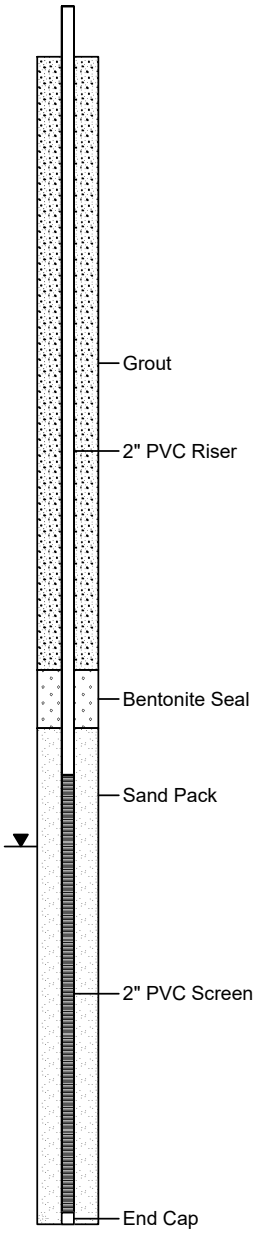
Boring ID: B13-078A-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/21/2021
Piezometer Installation Date	: 4/21/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562719.13
Easting (US ft)	: 1463971.37
48-Hr DTW	: 29.87' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 27.28	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	27	100	9.5, 7.4, 6.8, 5.9, 1.5	None	(0-10') FILL, SAND-sized and SLAG, SAND and GRAVEL-sized, medium dense, light gray grading to brown and dark brown, dry, non-plastic, non-cohesive	SW/GW	
5	22	100	2.7, 1.2, 0.9, 2.5, 5.0				
10	17	100	3.9, 3.1, 2.8, 7.2, 2.8		(10-40') SLAG, GRAVEL-sized with some SAND-sized, loose to medium dense, light gray and brown, light gray from 25-40' bgs, dry then very moist at 20' bgs, then wet at 25' bgs, non-plastic, non-cohesive		
15	12	100	2.6, 2.5, 2.3, 3.0, 7.4				
20	7	100	3.7, 3.6, 5.0, 5.8, 3.5			GW/SW	Wet at 25' bgs
25	2	100	3.7, 3.9, 4.1, 4.5, 8.6				
30	-3	100	9.2, 5.1, 4.4, 4.0, 3.4				
35	-8	100	2.4, 3.8, 3.5, 3.1, 6.1				
40					End of Boring		



Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.81' ags
Riser: 0 - 25' bgs
Screen: 25 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 23 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 21 - 23' bgs [Grain Size: bentonite chips]
Grout: 0 - 21' bgs

ARM Group LLC
Engineers and Scientists

Boring ID: B13-078B-SB PZ

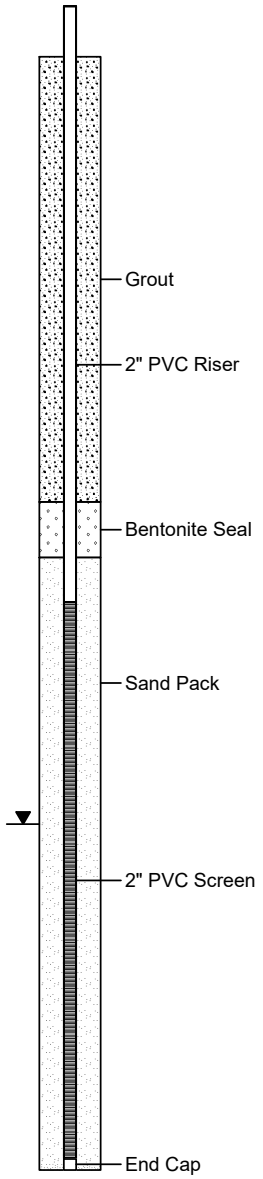
(page 1 of 1)

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/22/2021
Piezometer Installation Date	: 4/22/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562752.06
Easting (US ft)	: 1463966.97
48-Hr DTW	: 30.55' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 27.56	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	27	100	0.8, 3.2, 7.8, 9.7, 8.1		(0-38') SLAG, GRAVEL-sized, with some SLAG, SAND-sized, trace SILT, loose to medium dense, grayish brown and light gray, dry then very moist at 10' bgs, wet at 23' bgs, non-plastic, non-cohesive	GW	
5	22	100	5.9, 5.4, 6.3, 6.2, 9.5				
10	17	100	0.9, 1.1, 8.8, 9.1, 9.5				
15	12	100	0.4, 2.8, 6.7, 9.2, 9.8				
20	7	100	21.5, 49.7, -				Light odor 20-40' bgs
			125.5	B13-078B-SB-24			Wet at 23' bgs
25	2	100	89.6, 0.7, 1.4, 2.0, 3.3				Moderate amount sheen 23-25' bgs
30	-3	100	5.0, 249.5, 2600, 3506	B13-078B-SB-33			Light amount to trace sheen 30-35' bgs
35	-8	100	881.2, 394.4, 58.7, 41.4, 33.8				
40			30.1, 22.6		(38-40') SLAG, SAND and GRAVEL-sized, medium dense, grayish green, wet, non-plastic, non-cohesive	SW/GW	
					End of Boring		



Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.98' ags
Riser: 0 - 20' bgs
Screen: 20 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 18 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 16 - 18' bgs [Grain Size: bentonite chips]
Grout: 0 - 16' bgs

ARM Group LLC
Engineers and Scientists

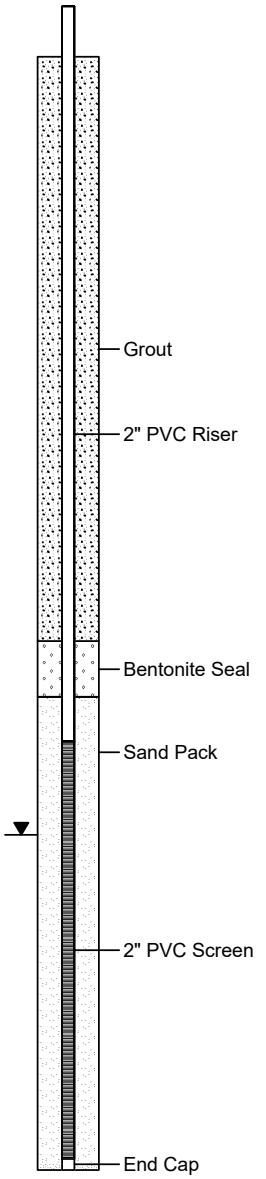
Boring ID: B13-078C-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/23/2021
Piezometer Installation Date	: 4/23/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562732.95
Easting (US ft)	: 1463933.72
48-Hr DTW	: 30.86' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 27.83	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	27	100	23.3, 32.4, 38.9, 61.1, 90.2		(0-5') FILL, SAND-sized and SLAG, SAND and GRAVEL-sized, medium dense, brown with gray, dry, non-plastic, non-cohesive	SW/GW	
5	22	100	13.3, 26.7, 48.3, 101.4, 348.9	B13-078C-SB-10	(5-25') SLAG, SAND and GRAVEL-sized, loose, light brown then light gray from 6-10' bgs, then gray and brown from 10-25' bgs, very moist then dry at 7' bgs, then moist to very moist from 10-25' bgs, non-plastic, non-cohesive		
10	17	100	2489, 191.5, 50.9, 88.0, 160.1	B13-078C-SB-11			Odor at 11' bgs
15	12	100	76.3, 106.6, 238.8, 155.2, 116.3			GW/SW	
20	7	100	60.3, 40.8, 30.2, 37.9, 45.4				
25	2	100	510.4, 15000, 15000, 15000, 15000	B13-078C-SB-29	(25-38') SLAG, SAND and GRAVEL-sized with SLAG, SILT-sized, very dark gray to black, then gray from 30-33' bgs, very dark gray to black from 33-38' bgs, wet, non-plastic, non-cohesive		Wet at 25' bgs
30	-3	100	1115, 421.1, 240.6, 77.5, 186.9	B13-078C-SB-31		GW/SW	Heavy sheen from 33-35' bgs
35	-8	100	38.2, 29.3, 25.6, 11.7, 8.4				
40					(38-40') SLAG, SAND-sized with trace SLAG, GRAVEL-sized, medium dense, grayish green, wet, non-plastic, non-cohesive	SW	
					End of Boring		



Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 2.90' ags
Riser: 0 - 25' bgs
Screen: 25 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 23 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 21 - 23' bgs [Grain Size: bentonite chips]
Grout: 0 - 21' bgs

ARM Group LLC
Engineers and Scientists

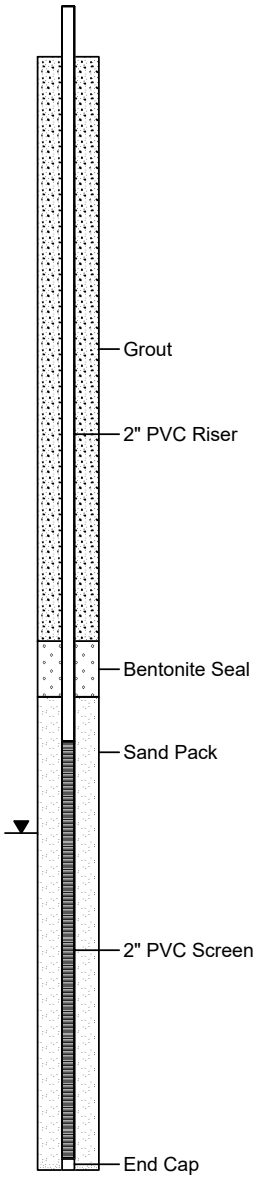
Boring ID: B13-078R-SB PZ

Client	: Tradepoint Atlantic
ARM Project No.	: 21010213
Project Description	: Sparrows Point - Parcel B13
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Hritz, E.I.T.
Drilling Company	: Connelly
Driller	: J. Townsend
Drilling Equipment	: Sonic Rig

Soil Boring Installation Date	: 4/22/2021
Piezometer Installation Date	: 4/22/2021
Casing/Riser/Screen Type	: PVC
Borehole Diameter (in.)	: 7.75 OD (4.25 ID)
Riser/Screen Diameter	: 2"
Northing (US ft)	: 562733.81
Easting (US ft)	: 1463952.51
48-Hr DTW	: 31.12' TOC

No LNAPL or DNAPL detected at 0 or 48 hours

Depth (ft.)	Surf. Elev. 27.77	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	27	100	8.9, 8.7, 9.5, 6.3, 5.8		(0-5') SLAG, GRAVEL-sized with some FILL, SAND-sized and SLAG, SAND-sized, medium dense, light gray and brown, dry, non-plastic, non-cohesive	GW	
5	22	100	0.8, 0.9, 1.1, 1.0, 0.8		(5-38.5') SLAG, SAND and GRAVEL-sized, with some FILL, SAND-sized, medium dense, brown with gray, dry then very moist at 10' bgs, then wet at 25' bgs, non-plastic, non-cohesive		
10	17	100	49.9, 58.6, 61.4, 61.9, 232.2	B13-078R-SB-15			
15	12	100	6.1, 9.3, 7.5, 10.2, 25.4				
20	7	100	2.6, 3.0, 3.1, 3.3, 3.5			SW/GW	
25	2	100	3.9, 4.6, 5.1, 7.0, 9.5				Wet at 25' bgs
30	-3	100	406.9, 211.1, 169.7, 151.4, 39.4	B13-078R-SB-31			Very light amount NAPL from 30-32' bgs Strong odor 30-35' bgs
35	-8	100	49.6, 33.5, 27.7, 19.8, 11.1		(38.5-40') SLAG, SAND-sized, with trace SLAG, GRAVEL-sized, fine, medium dense, grayish green, wet, non-plastic, non-cohesive	SW	
40					End of Boring		



Boring terminated at 40' bgs due to water and piezometer installation
Surface Elevation in feet above mean sea level (asml)
TOC: Top of PVC casing
DTW: Depth to water
bgs: Below ground surface

Riser Stickup: 3.22' ags
Riser: 0 - 25' bgs
Screen: 25 - 40' bgs [Slot Size: 0.020"]
Sand Pack: 23 - 40' bgs [Grain Size: WG #2]
Bentonite Seal: 21 - 23' bgs [Grain Size: bentonite chips]
Grout: 0 - 21' bgs

APPENDIX D

Alternative 2 - Removal and Off-Site Disposal

Cost Category	Unit Rate	Units	Total Quantity	Quantity Units	Extended Costs
Field Equipment and Labor	$12.71	NT	42,500	Tons	$540,175.00
Disposal Cost	$40.00	CY	25,000	CY	$1,000,000.00
Vapor Suppression (BioSolve)	$43.00	CY	25,000	CY	$1,075,000.00
Waste Sampling	$600.00	Per Sample	1	Samples	$600.00
Origin Area Monitoring	$15,900.00	LS	1	Lump Sum	$15,900.00
Oversight	5%				$130,788.75
			Preliminary Cost Estimate		**$2,762,463.75**

Alternative 3 - Consolidation and Capping

Cost Category	Unit Rate	Units	Total Quantity	Quantity Units	Extended Costs
Field Equipment and Labor	$13.71	NT	42,500	Tons	$582,675.00
10-Mil Poly Liner	$2.00	Sq Ft	2	Acres	$174,240.00
Perimeter Monitoring	$24,000.00	LS	1	Lump Sum	$24,000.00
Origin Area Monitoring	$15,900.00	LS	1	Lump Sum	$15,900.00
In Situ Material Treatment*	TBD				TBD
Oversight	10%				$79,681.50
			Preliminary Cost Estimate*		**$876,496.50**

Alternative 4 - Treatment and Re-Use

Cost Category	Unit Rate	Units	Total Quantity	Quantity Units	Extended Costs
Field Equipment and Labor	$4.78	NT	42,500	Tons	$203,150.00
Chemical Costs	$4,500.00	Per Container	14	Container	$63,000.00
Treatment Sampling	$600.00	Per Sample	30	Samples	$18,000.00
Origin Area Monitoring	$15,900.00	LS	1	Lump Sum	$15,900.00
Oversight	10%				$30,005.00
			Preliminary Cost Estimate		**$330,055.00**

* In Situ Material Treatment may be necessary following implentation of Alternative 3. This cost is TBD.

Notes:

Field Equipment and Labor includes that equipment necessary to complete the scope of work including loaders, pumps, and trucks as well as the cost for equipment operators.

Origin Area Monitoring includes drilling for soil / groundwater monitoring in the vicinity of the origin of the impacted slag material and treatment area as well as a single round of groundwater monitoring.

CY - Cubic Yards

LS - Lump Sum

NT - Net Tons

Sq Ft - Square Feet

TBD - To Be Determined

APPENDIX E

BRENNTAG

SAFETY DATA SHEET

1. Identification

Product identifier	**HYDROGEN PEROXIDE 35% NSF**
Other means of identification	None.
Recommended use	ALL PROPER AND LEGAL PURPOSES
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name	Brenntag Pacific Inc.	
Address	10747 Patterson Place Santa Fe Springs, CA 90670	
Telephone	562-903-9626	
E-mail	Not available.	
Emergency phone number	800-424-9300	CHEMTREC

2. Hazard(s) identification

Physical hazards	Oxidizing liquids	Category 2
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 2
Environmental hazards	Not classified.	
OSHA defined hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	May intensify fire; oxidizer. Harmful if swallowed. Causes skin irritation. Causes serious eye damage. May cause respiratory irritation. May cause damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention	Keep away from heat. Keep/Store away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear eye protection/face protection. Wear protective gloves/eye protection/face protection.
Response	If swallowed: Call a poison center/doctor if you feel unwell. If on skin: Wash with plenty of water. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Rinse mouth. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. In case of fire: Use appropriate media to extinguish.
Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
HYDROGEN PEROXIDE (H2O2)		7722-84-1	35
Other components below reportable levels			65

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation
Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact
IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion
Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

Most important symptoms/effects, acute and delayed
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Take off all contaminated clothing immediately. Contact with combustible material may cause fire. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
Greatly increases the burning rate of combustible materials. Containers may explode when heated. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. In case of fire: Stop leak if safe to do so. Move containers from fire area if you can do so without risk.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
May intensify fire; oxidizer. Contact with combustible material may cause fire.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep away from clothing and other combustible materials. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Ventilate the contaminated area. Large Spills: Stop the flow of material, if this is without risk. Use water spray to reduce vapors or divert vapor cloud drift. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Wear appropriate protective equipment and clothing during clean-up.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Provide adequate ventilation. Do not breathe mist or vapor. Do not get this material in contact with eyes. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Keep away from heat. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Do not store near combustible materials. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)	PEL	1.4 mg/m3
		1 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)	TWA	1 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)	TWA	1.4 mg/m3
		1 ppm

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection	Chemical respirator with organic vapor cartridge and full facepiece.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.
Respiratory protection	Chemical respirator with organic vapor cartridge and full facepiece.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations	Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Color	Colorless
Odor	Pungent
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	31.23 °F (-0.43 °C) estimated / -27 °F (-32.78 °C)
Initial boiling point and boiling range	244.76 °F (118.2 °C) estimated
Flash point	999.0 °F (537.2 °C)
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0.92 hPa estimated
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Density	12.04 lbs/gal estimated
Explosive properties	Not explosive.
Flammability class	Combustible IIIB estimated
Oxidizing properties	May intensify fire; oxidizer.
Percent volatile	65 % estimated
Specific gravity	1.44 estimated

10. Stability and reactivity

Reactivity	Greatly increases the burning rate of combustible materials.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat. Contact with incompatible materials.
Incompatible materials	Combustible material. Reducing agents.
Hazardous decomposition products	No hazardous decomposition products are known

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause damage to organs through prolonged or repeated exposure by inhalation. May cause irritation to the respiratory system.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye damage.
Ingestion	Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity	Harmful if swallowed. May cause respiratory irritation.
Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1) 3 Not classifiable as to carcinogenicity to humans

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Not an aspiration hazard.
Chronic effects	May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number	UN2014
UN proper shipping name	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS
Transport hazard class(es)	
Class	5.1
Subsidiary risk	8
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
ERG number	140

DOT information on packaging may be different from that listed.

DOT

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1) 1000 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity	Threshold planning quantity	Threshold planning quantity, lower value	Threshold planning quantity, upper value
HYDROGEN PEROXIDE (H2O2)	7722-84-1	1000	1000 lbs		

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)

US. New Jersey Worker and Community Right-to-Know Act

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)

US. Pennsylvania Worker and Community Right-to-Know Law

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)

US. Rhode Island RTK

HYDROGEN PEROXIDE (H2O2) (CAS 7722-84-1)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-09-2015
Revision date	05-19-2015
Version #	03
HMIS® ratings	Health: 3* Flammability: 0 Physical hazard: 2
NFPA ratings	Health: 3 Flammability: 0 Instability: 0 Special hazards: OX
Disclaimer	BNA cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

Revision Information

Hazard(s) identification: Hazard statement
Hazard(s) identification: Prevention
Hazard(s) identification: Supplemental information
First-aid measures: Skin contact
Handling and storage: Precautions for safe handling
Physical and chemical properties: Color
Physical and chemical properties: Oxidizing properties
Physical and chemical properties: Odor
Physical and chemical properties: Explosive properties
Toxicological information: Acute toxicity
Toxicological information: Skin contact
Regulatory information: US federal regulations

APPENDIX F

TRADEPOINT ATLANTIC

Site: SE-Blast Furnace Slag/ Marine Terminal
Survey: 09 May 2023 BFS
File Created: Jun 6, 2023

propeller