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CORRECTIVE ACTION PLAN IMPLEMENTATION REPORT

Ridgely Manor Park, Towson, Maryland
MDE Case No. 1991-2100BA

January 9, 2015

WSP Project No. 1401020

CORRECTIVE ACTION PLAN IMPLEMENTATION REPORT
RIDGELY MANOR PARK, TOWSON, MARYLAND

January 9, 2015

Client

Hess Corporation

Consultant

WSP USA Corp.
11190 Sunrise Valley Drive
Suite 300
Reston, Virginia
+1 703 709 6500

WSP Contacts

Keith Green
Keith.Green@WSPGroup.com

David Sarr, P.E.
David.Sarr@WSPGroup.com

David Rykaczewski
Dave.Rykaczewski@WSPGroup.com

ENGINEER'S CERTIFICATION

I hereby certify that this Corrective Action Plan Implementation Report has been prepared by me, or under my supervision, and meets the standards of the Maryland Department of the Environment, Office of Oil Pollution Control. The Corrective Action; surface development; and operations, maintenance and monitoring are intended to complete the actions associated with Maryland MDE Case No. 1991-2100BA.

Signed:

Print Name: David H. Sarr

Date: January 9, 2015

License No.: 37128

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1 Introduction

WSP USA Corp. has completed the actions described in the Corrective Action Plan (CAP) for the properties located at 1612 through 1642 Yakona Road (even side) in Towson, Maryland (Figure 1). Following corrective action, the contiguous properties were redeveloped as a community park and named Ridgely Manor Park.

WSP prepared the CAP for the site and submitted the plan to the Maryland Department of Environment Oil Control Program (MDE OCP) on August 14, 2013. Based on design changes and MDE OCP comments, WSP prepared and submitted a CAP Addendum to the MDE OCP on October 11, 2013. The MDE OCP conditionally approved the CAP Addendum in a letter dated November 22, 2013.

This CAP Implementation Report describes the activities performed to meet the goals and objectives described in the CAP. The work began in July 2013 with the abatement of hazardous materials (e.g., asbestos, refrigerants), demolition of the residential structures, and tree removal as prescribed by a Maryland licensed arborist. Work on the site was suspended during the County permitting process. Work continued in the spring of 2014 with the installation of the groundwater management system. During the installation of the groundwater management system, analytical results of groundwater samples showed that the water required treatment to meet discharge criteria. A temporary treatment system was installed during the completion of the groundwater management system as well as during the installation of the park amenities. Park amenities and landscape installation were performed in the summer of 2014 and culminated with the opening of Ridgely Manor Park to the public on August 30, 2014. Installation of a permanent groundwater treatment system began in August 2014 and was completed in December 2014. The project is currently in the operation and maintenance (O&M) phase.

The remaining sections of this CAP Implementation Report include:

- Section 2 – Site Description
- Section 3 – Corrective Action Plan Overview
- Section 4 - Pre-Construction Planning
- Section 5 – Corrective Action Plan Activities
- Section 6 – Groundwater Treatment System
- Section 7 - Operation, Maintenance and Monitoring

Drawings showing the as-built site conditions are included in this CAP Implementation Report.

2 Site Description

Ridgely Manor Park is located on 16 contiguous properties formerly occupied by 8 duplex residential structures at 1612 through 1642 Yakona Road (Sheet 2 of the as-built drawings), on the even side of street in Towson, Baltimore County, Maryland. The properties were designated residential use since at least the late 1940's. For the purposes of this CAP Implementation Report, these properties will be referred to as "the site" or "the property". The redeveloped site is topographically lower and hydraulically downgradient of several commercial properties along East Joppa Road (Sheet 2 of the as-built drawings) including Hess Station 20204[1]. The property slopes from a high of 454 feet above mean sea level (MSL) in the northern-most corner of the site to a low point of 430 feet above MSL in the southernmost portion of the site along the sidewalk at Yakona Road. Releases of gasoline constituents from the Hess station were determined to be a source of petroleum contamination in groundwater beneath the former homes onsite. The Site Number associated with the release of gasoline constituents is Hess Station No. 20204, 1613 East Joppa Road, Towson, Baltimore County, Maryland MDE Case No. 1991-2100BA.

2.1 Site Location

The Hess station is located at 1613 East Joppa Road in a mixed-use commercial/residential area of Towson. The station is geologically underlain by highly metamorphosed bedrock (i.e., Baltimore Gneiss) at depths of 20 to 40 feet. The overburden consists of coarse-grained sediments, sands and gravels, which are the remnants of a paleo river channel that existed in the area. Topographically, the station is upgradient of several residential homes in the 1600 block of Yakona Road. There are no drinking water receptors in the area. Municipal water and sanitary sewer services are provided to both the Hess gas station and the surrounding commercial and residential areas.

Gasoline retail activities have been ongoing at the Hess station since December 1982. This gas station was operated by a series of independent dealers, but the station was owned by Hess Corporation (formerly Amerada Hess Corporation). In April and May 1991, the diesel fuel and heating oil underground storage tanks (USTs) were removed and replaced. Currently, four active USTs are in operation: three 10,000-gallon gasoline and one 10,000-gallon diesel. The current USTs are comprised of fiberglass reinforced plastic with double-walled piping and are equipped with Stage I and II vapor recovery systems. The station was inspected in July 2012 and was found to be in significant operational compliance.

2.2 Site History

Since 1987, Hess, in cooperation with the MDE and the Baltimore County Department of Environmental Protection and Sustainability (DEPS), has been evaluating groundwater and surface water quality downgradient of the station. In January 1990, the MDE OCP took over coordination of the investigation. The MDE's investigation determined that petroleum contaminated groundwater migrated from the station and was potentially impacting residences along the 1600 block of Yakona Road. The MDE OCP identified this Hess station as a source of the petroleum contamination and Hess has taken responsibility for the investigation and cleanup activities associated with petroleum contaminants.

2.3 Historical Site Investigations and Actions

Hess designed and implemented corrective actions to treat the impacted groundwater. Historically, these corrective measures have included the installation of a groundwater pump-and-treat system, a soil vapor extraction system, enhanced fluid recovery events, and air-sparging. The petroleum contamination in the groundwater was a

[1] In 2014, Hess Corporation sold the retail business including all interests in filling stations. Therefore, Hess Station 20204 is no longer owned by Hess Corporation. However, for project consistency, the site located at 1613 East Joppa Road, Towson, Baltimore County, Maryland will be referred to as the "Hess station" for this CAP implementation report.

reported source of gasoline odors entering residential building structures (e.g., basements, French drains). The pump-and-treat system utilized a low profile air stripper for groundwater treatment prior to discharge to the public storm sewer system located behind the station. Groundwater was recovered from nine wells, located both on the gas station property and on the residential properties of 1624 through 1640 Yakona Road. Based on a decreasing trend in dissolved phase petroleum concentrations, the MDE agreed the treatment had been successful and approved the shutdown of the remediation system in July 2010. Liquid phase hydrocarbons (LPH) have not been detected in any on or offsite groundwater monitoring well since July 1995.

In late 2009, groundwater and storm water caused flooding in the residences at several homes between 1612 and 1640 Yakona Road. A French drain system was installed behind the duplex residences along Yakona Road during the construction of these residences in the late 1940's or early 1950's. The residences were connected to the French drain system through floor drains, located in outdoor basement stairwells in each of the duplex structures. However, over time and through work conducted by homeowners, the French drain system became blocked which caused groundwater and storm water to back up and flood residential basements. At times it was reported that the water in the drain discharges had "a petroleum odor". Hess installed a by-pass drain and a new interceptor sump at the 1614 Yakona Road property. Water from the drain flowed into the interceptor sump and was then pumped back to the Hess station for treatment prior to discharge to an onsite storm drain. On several occasions the interceptor sump pump was not able to prevent backup of water to occur along the drain and subsequently groundwater periodically flooded residential basements. An investigation of the drain was completed in January 2011, at which time an obstruction was identified in the line at 1616 Yakona Road. In 2012, the drain was redirected around the obstruction unrelated to the interceptor sump and continued to discharge to the storm sewer.

Indoor air quality samples were collected and analyzed and a risk assessment was conducted at each home between 1618 and 1644 Yakona Road in January 2011 to determine if there was a potential inhalation risk associated with petroleum-impacted groundwater in basement sumps and from basement flooding. As a result, unacceptable risk was identified in four of the assessed homes on Yakona Road: 1620, 1622, 1632, and 1636. Hess proposed to install vapor abatement systems at the residences. In February 2012, MDE approved the installation of vapor abatement systems and the collection of additional indoor air samples at these residences.

Although all potential risks would have been abated by the installation of vapor mitigation systems, Hess decided that reliance on mechanical systems was not a sustainable permanent solution. As a result, Hess purchased the properties from 1610 through 1642 Yakona Road (even numbered properties) and developed a corrective action approach that involved groundwater collection, site monitoring, and site development as a green space.

2.4 Groundwater Quality

Groundwater quality sampling to assess residual impacts from petroleum releases were conducted at the Hess station on East Joppa Road and surrounding properties since at least 1991. The monitoring program involved the quarterly sampling of selected wells in the residential area along Yakona Road together with wells installed at the gas station and the adjoining La-Z-Boy Furniture store property. The sampling results from the quarterly groundwater monitoring activities were evaluated to assess the nature and distribution of gasoline-related constituents in the groundwater system. Based on the historical monitoring activities, the primary remaining constituents of concern (COCs) related to the petroleum release included the following:

- volatile aromatic compounds – benzene, toluene, ethylbenzene and xylenes (BTEX)
- gasoline and diesel-range total petroleum hydrocarbons (TPH-GRO and TPH-DRO)
- naphthalene

Groundwater in the northeast portion of the site, nearest to the Hess station, contained concentrations of TPH-DRO and GRO as well as naphthalene above the generic numeric cleanup standards for groundwater (GNCSG) developed by the MDE. The highest COC concentrations are found on the residential properties 1636 through 1640 Yakona Road, which are situated directly hydraulically downgradient of the western portion of the gas station.

COC concentrations are comparatively lower toward the central and southwest portion of the site. Groundwater flow is generally toward the south.

The goal of the corrective action was to eliminate the uncontrolled discharges of impacted groundwater to Yakona Road through seeps along the roadway. To achieve this groundwater management objective, the CAP specified a design to intercept groundwater containing COCs and collect the groundwater from a depth greater than the old French drains and roadbed elevations behind the former residences. The main trunk line of the collection system was installed closer to Yakona Road, effectively lowering the water table along the roadway.

3 Corrective Action Plan Overview

The CAP was prepared based on the results of site assessment activities and historical remedial actions at the site. The CAP included a summary of past sampling activities, planned remediation activities, design of remedial systems, and the operation and maintenance of the systems. The following sections provide an overview of the approved CAP for the site.

3.1 Goals and Objectives

The Corrective Action was developed to achieve the following goals and objectives:

- Complete all active remediation/corrective action requirements for the site
- Ensure that the seven risk factors identified in the Maryland Environmental Assessment Technology for Leaking Underground Storage Tanks (MEAT Guidance) are eliminated
- Accelerate the attenuation of residual concentrations of gasoline constituents (i.e., hydrocarbons) in the groundwater at the site
- Eliminate the potential for direct contact with groundwater both on the 1612 through 1642 Yakona Road properties and below the sidewalk and Yakona Road
- Develop a sustainable green space for the community
- Design a system that requires minimum maintenance while remaining protective and operational
- Design a green space that has clear sight lines from the road to ensure safety and proper utilization.

3.2 Conceptual Site Model

WSP developed a conceptual site model (CSM) for the site that was included with the CAP. The CSM provided the basis for the design of the groundwater collection systems, the monitoring network, and the grading plan. As a result of detailed evaluation of the ongoing groundwater monitoring and the pre-design investigation data, the following model was developed for each type of media:

- Groundwater
  - Groundwater flows from below East Joppa Road under the site and then under Yakona Road
  - The gradient from East Joppa Road under the site is approximately 0.015 feet per foot
  - The groundwater flow into the site is estimated to be 7,000 gallons per day (gpd) which is approximately 5 gallons per minute (gpm)
  - The groundwater affected by hydrocarbons flows primarily in a Clayey Sand to Sand unit that underlies the near surface Silt and Clay unit
  - The groundwater surface periodically rose above the residential basement slab elevation and to within one foot of the ground surface near Yakona Road
  - The mass of gasoline range organics migrating to the site is less than 0.25 pounds per day
  - The groundwater concentrations are attenuating due to multiple mechanisms, most notably biodegradation, phase transformation (liquid to vapor), and dispersion.

- Soil Vapor
  - Gasoline odors had been reported in the confined spaces of the former residences
  - Odor is a qualitative measure of vapor transport from the groundwater to air
  - Samples of soil vapor have been collected throughout the site and have shown petroleum hydrocarbon transformation from liquid to vapor was occurring at the time of sampling

- Absent normal circulation, the accumulation of soil vapor within the site posed potential risk in some of the closed structures
- Ambient air samples showed no potential risk.

- Surface Water
  - The surface water "watershed" for the site covers 2.5 acres
  - The near surface Silt and Clay unit and slope of the site limit infiltration
  - The heavy vegetative cover and irregular surface allows sufficient moisture retention for sustained growth of vegetation
  - The 100-year, 24-hour precipitation event for the site is 9 inches of rainfall
  - The peak runoff from the site during a 100-year, 24-hour event is approximately 20 cubic feet per second (cfs) under pre-CAP conditions.

3.3 MDE – Seven Risk Factors

The corrective action elements described in the CAP to satisfy the seven risk factors in the MEAT Guidance are described below:

- Liquid Phase Hydrocarbons – The historical remedial actions at the Hess station have addressed this risk factor, no LPHs remain at the site.
- Current and Future Use of Impacted Groundwater – The site and surrounding homes and commercial properties are supplied with municipal water and sewer services. The drainage network installed at the site ensures that the highest groundwater elevation will be two or more feet below the final surface grade to interrupt any inadvertent contact with or use of groundwater.
- Migration of Contamination – The residual concentrations of petroleum hydrocarbons currently migrate in a single water bearing unit from the area of East Joppa Road. The groundwater collection system installed at the site was designed to collect and convey no less than three times the rate of flow onto the site. The collection system was positioned to slow or reverse the direction of flow between the system and Yakona Road.
- Human Exposure – The only potential routes of human exposure that historically existed were vapor inhalation and inadvertent contact with groundwater in the basements of the residential pathways. These risks were eliminated by the demolition of the structures and backfilling of the basement cavities. Pre-CAP vapors in ambient air showed no potential risk and post-CAP vapors in the breathing space above utility vaults and manholes are not expected to pose future risk. The potential for inadvertent contact with affected groundwater was eliminated with the removal of the historical French drain system and the installation of the groundwater collection system to maintain the highest groundwater surface elevation at least two feet below the final surface elevation.
- Environmental Ecological Exposure – The pre-CAP potential environmental exposure associated with the groundwater was associated with the sump discharges and emergence of groundwater near and onto Yakona Road. The sumps have been eliminated and the groundwater discharge will be controlled by maintaining the groundwater surface at the site to no closer than two feet below the final surface elevation.
- Impact to Utilities and Other Buried Services – All onsite buried utilities associated with the residential structures were removed. The groundwater collection system was designed to discharge to the existing storm sewer in a permitted outfall. Electrical lines were installed within two feet of the ground surface. Water lines were installed at a depth of 3.5 feet to meet building codes; groundwater was not encountered during installation.
- Other Sensitive receptors – There are no known sensitive receptors at the site. The 2-foot or greater soil buffer between the affected groundwater and the green space surface will interrupt the potential for future contact with groundwater.

3.4 Design Elements

The CAP included design calculations, drawings, plans, and specifications for each major site activity required to meet the goals and objectives and to address the seven risk factors in the MEAT Guidance. The following sections summarize the design elements that were detailed in the CAP.

Pre-treatment of groundwater before discharge to the storm sewer system was recognized as a contingency action in the CAP. Based on the concentrations of TPH and BTEX found during installation of the groundwater management system and the NPDES permit discharge limits, Hess determined that pre-treatment of the groundwater would be necessary. Design documents for the groundwater treatment system were prepared subsequent to the CAP submittal. The system design is described in Section 6.

3.4.1 Demolition

The demolition of the structures located on the 1612 through 1642 Yakona Road properties addressed the two primary potential exposure pathways at the site, vapor inhalation in the basements of the homes and the discharge of groundwater from basement sumps to the ground surface along Yakona Road. Key elements of the demolition program included:

- Disconnection, capping, and removal of electrical, gas, water, cable, and other utilities to all of the demolished structures
- Removal of hazardous building materials including asbestos, universal wastes, and fuels and chemicals left by former residents
- Demolition of all above grade structures including exterior improvements
- Removal of all driveways and surface slabs including basement walls, floors, sidewalks, and retaining walls
- Backfilling basement cavities and regrading the disturbed portions of the site to allow installation of the groundwater management system and Ridgely Manor Park development.

3.4.2 Groundwater

The key elements of the groundwater design included:

- Collection of groundwater such that the shallow water-bearing unit is maintained at a minimum depth of two feet below the curb line of Yakona Road
- Collection of groundwater in a manner that increased the hydraulic gradient between the former source and the collection points
- Collection of groundwater to ensure the gradient along the eastern site boundary is inward (toward the groundwater collection system)
- Collection systems designed to convey no less than 21,000 gpd
- Discharge of groundwater from the site to the permitted outfall at the existing storm water system.

3.4.3 Surface Water

The surface water design included:

- Installing and maintaining erosion and sediment controls throughout demolition, corrective action, and Ridgely Manor Park development

- Grading to ensure no depressions or collection points remain that could alter groundwater flow or direct excess flow to the subsurface collection systems
- Ensuring post-development runoff is lower than the pre-development runoff and does not adversely affect the neighboring properties (net decrease of impervious surface area)
- Minimizing the potential for concentrations of flow that could lead to erosion
- Preventing runoff from discharging to adjacent residential properties at 1610 and 1644 Yakona Road
- Reducing surface water runoff volume through site redevelopment (rain garden to increase infiltration) and revegetation (increased evapotranspiration)
- Treating groundwater before discharge to surface water in accordance with NPDES discharge permit.

3.4.4 Park Design

The park amenities design included the following key features:

- Maintain access to the groundwater collection system for maintenance personnel
- Grade site to provide a barrier between the high groundwater elevation and the ground surface
- Provide grade suitable for planting of trees that will evapotranspire groundwater
- Maintain slope stability along the northern portions of the site
- Maintain stability between the site and the properties east and west of the site
- Grade site to provide suitable park amenities and Americans with Disabilities Act (ADA)-compliant access
- Suitable for the planting shrubs and vegetation associated with the green space landscaping
- Maintain clean sight lines from Yakona Road to all areas of the park.

3.4.5 Long-term Care

The corrective action is intended to operate with a minimum level of maintenance and care. The key elements of the plan for long-term care include:

- NPDES permit for discharge of the groundwater from the groundwater management system at the storm water outfall
- Sample ports at the outfall of the storm discharges and at the discharge from the groundwater treatment system to allow collection of compliance samples
- Piezometers at locations around the collection trenches to monitor groundwater elevations associated with the groundwater collection system
- Cleanouts to allow access to the collection systems for periodic maintenance
- Groundwater monitoring wells to allow periodic assessment of the corrective action and attenuation.

4 Pre-Construction Planning

Pre-construction planning work preceded each major phase of site work. These activities included health and safety planning, permit procurement, and development of a Forest Conservation Plan. During the pre-construction phase, WSP also prepared scopes of work and solicited bids from qualified contractors for each major task of the CAP work. WSP developed and periodically updated a master schedule for all site work that tracked progress toward the August 30, 2014 milestone of the opening of Ridgely Manor Park.

4.1 Health and Safety

All work conducted under the CAP was completed in accordance with a site-specific Health and Safety Plan (HASP). Contractors were required to prepare and follow their own HASP that was commensurate with the work and activities that were performed. The contents of the HASP included physical, chemical, and biological hazard assessments; descriptions of personal protective equipment, training requirements, and site control measures; and procedures for personnel and equipment decontamination, air monitoring, and emergencies. The HASP established, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The HASP addressed site-specific health and safety requirements and procedures based upon site-specific conditions, the type of work, complexity of operations, and hazards anticipated.

The HASP included provisions for monitoring the breathing zone for workers to ensure that exposure criteria were not exceeded without respiratory protection. Monitoring stations were established at the upwind and downwind perimeters of the site. The work zone and site perimeter were monitored during all intrusive work. The areas where monitored using direct reading instruments with data logging capabilities for aerosol particulate (i.e., total suspended particulate) and noise. The particulate measurements were compared to US EPA National Ambient Air Quality Standards for Particulate Matter (PM_{10}) of 150 micrograms per cubic meter ($\mu g/m^3$) as a 24-hour average.

4.2 Permits

Several permits were procured before initiating major field activities described in Section 5. These permits included:

- Storm Water Discharge Permit – National Pollution Discharge Elimination System (NPDES) Permit No. MDG 915958 was obtained from the state of Maryland on November 20, 2013 to discharge water collected from the groundwater management system. The permit details sampling frequency, reporting requirements, and effluent discharge requirements for TPH and total BTEX.
- Demolition Permits – Sixteen individual building permits were issued by Baltimore County for the demolition of each residential structure.
- Plumbing Permits (demolition) – Sixteen individual plumbing permits were issued by Baltimore County to remove water connections from the water main and to plug sewer connections from each residential unit.
- Storage Tank Removal Permits – Permits were issued by Baltimore County to remove the two fuel oil tanks located at 1630 and 1634 Yakona Road.
- Erosion and Sediment Control Permit – An erosion and sediment control permit was issued by the Baltimore County Soil Conservation District. The permit required installation and maintenance of silt fence, super silt fence, check dams, construction entrance, mountable berm, and inlet protection during implementation of the CAP.

- Grading Permit – In conjunction with the erosion and sediment control permit, a grading permit was issued by Baltimore County for land disturbance activities.
- Plumbing Permits (hydrants) – Two plumbing permits were issued by Baltimore County for the installation of permanent water lines and hydrants installed as part of the park amenities plan.
- Electrical Permits – Electrical permits were issued by Baltimore County for the installation of electrical systems associated with the groundwater treatment system.
- Monitoring Well Permits – Monitoring well installation permits were issued by the MDE for the new monitoring wells and piezometers installed at the site.

4.3 Forest Conservation

The landscape architect for the project, Mahan Rykiel Associates Inc., coordinated the development of a Forest Conservation Plan to protect existing trees on the property from damage or stress during construction of the groundwater management system and site development activities. Six trees deemed sick or dying by a Maryland licensed arborist were subject to a variance to the Forest Conservation Law in which Hess agreed to Fee-in-Lieu payment to the Forest Conservation Fund.

Remaining trees were protected under the Baltimore County-approved Forest Conservation Plan. The plan included installation of a tree protection fence and implementation of stress reduction measures near critical root zones. Warning signs were installed along the tree protection fence.

5 Corrective Action Plan Implementation

The major phases of CAP work included structure demolition, tree removal, groundwater management system installation, site grading, park amenities installation, and groundwater treatment system design and installation. These activities are described in the following sections.

5.1 Demolition

The first major field activity was the demolition of the 8 duplexes comprising 16 homes. WSP contracted with Terra Technical Services (Terra) of Downingtown, Pennsylvania to complete the demolition scope of work that included permitting, installing erosion and sedimentation controls, removing utilities, installing a perimeter security fence, removing hazardous materials and universal wastes, removing storage tanks, demolishing the structures, disposing of the debris, backfilling the basements, and grading the disturbed areas to drain. Demolition work began in July 2013 and was substantially completed in November 2013. Details of the demolition work are provided on Sheet 3 of the as-built drawings and are described in the following sections.

5.1.1 Utility Removal

Terra coordinated with the local utility providers to de-energize or isolate the utility service to the residences. Overhead electric and cable connections were terminated at the utility poles. Underground gas and water connections were shut off at the main and sanitary sewer lines were cut and capped. To avoid risk of breaking a line during green space maintenance and development, the underground utility conduits were removed from the utility mains to the residential structures.

5.1.2 Hazardous Materials Abatement

Prior to removal of the residential structures, abatement activities were performed to remove asbestos containing materials (ACM), light bulbs, fluorescent tubes, ballasts suspected of containing polychlorinated biphenyls (PCBs), appliances, air conditioning units and potential refrigerants. Lead-based paint on walls, woodwork and frames was disposed with the demolition debris. Potentially hazardous materials were identified in a survey conducted by Hillis Carnes Engineering Associates in June 2013. This report provided the basis for hazardous materials abatement prior to structure demolition.

5.1.2.1 Asbestos Containing Materials

ACM identified in the hazardous materials survey, both friable and non-friable, was removed before structure demolition began. Terra contracted with ARC Construction Services of Baltimore, Maryland to complete the asbestos abatement activities. WSP contracted with McDelejams Technical Services, Inc. of Baltimore, Maryland to perform third party inspection and air monitoring services during ARC's work.

Additional transite wall board was found in two structures that were not previously identified in the survey. ARC and McDelejams were recalled to the site to remove and dispose of the transite.

5.1.2.2 Universal Wastes

The hazardous materials survey identified light ballasts that potentially contained PCBs, lighting that typically contains mercury vapor, mercury-containing thermostats, refrigerants, and batteries that were classified as universal wastes. These materials were removed, packaged, and transported offsite for proper disposal or recycling.

5.1.2.3 Fuel Oil Storage Tanks

One aboveground fuel oil storage tank located in the basement of 1636 Yakona Road was identified in the hazardous materials survey. Baltimore County Permit Number B827399 was issued for the tank removal. The contents were drained and disposed and the tank was cleaned and recycled. No evidence of historical leakage was detected.

An underground tank was found during demolition of the basement foundation at 1630 Yakona Road. Baltimore County Permit Number B827405 was issued for the tank removal. ACE Environmental Services (ACE), a MDE-certified UST remover, was contracted to oversee the tank removal. After draining and cleaning, the 300-gallon heating oil tank was found with perforations at the bottom. The MDE was notified of the potential release. During excavation of stained soil, the former French drain near the tank was breached and the excavation cavity was flooded. The water was pumped to a fractionation tank and the remaining affected soil was excavated. Two confirmation samples were collected after excavation. The sample results were acceptable to the MDE and the excavation was backfilled with clean soil. The water and soil were disposed of offsite and the cleaned tank was recycled. ACE submitted the UST removal report to the MDE on October 14, 2013.

5.1.3 Structure Demolition

Following utility removal and hazardous materials abatement, the residential structures were demolished to the ground level, including foundations, basement walls and basement slabs. Dust and noise levels were monitored continuously during active demolition work. The interior and exterior of the structures were sprayed with water during demolition to minimize dust generation. The demolition debris was crushed and loaded to dump trucks and disposed of offsite as construction and demolition (C&D) debris. Scrap metal was segregated and recycled. As part of the demolition work, exterior improvements including decks, patios, porches, stairs, railings, driveways, walkways, fences, pet enclosures, sheds, light posts, flagpoles, ornamental landscapes vegetation, and retaining walls were removed and disposed of as C&D debris. When demolition work was complete, except for non-recoverable concrete and masonry fragments, all man-made materials were removed from the site.

5.1.4 Temporary Restoration

Following demolition and debris removal, the basement cavities were backfilled with regraded soil from onsite. The backfilling and post-demolition grading plan was designed to eliminate abrupt grade changes and depressions and to promote positive drainage toward Yakona Road. Regraded soil was placed in 12-inch lifts and compacted with a minimum of three passes with a vibratory roller. No compaction testing was performed. The approximate post-demolition grades are shown on Sheet 4 of the as-built drawings. These post-demolition grades formed the basis for construction of the groundwater management system.

5.2 Tree Removal

WSP contracted with The Davey Tree Expert Company of Baltimore, Maryland to remove approximately 20 trees from the site. Of these 20, the trunks of 11 trees were sectioned and staged onsite for future use as decorative features in the park. The remaining trees were shredded and the chips stockpiled onsite for future use as mulch trails in the park. Tree cutting, sectioning, and chipping activities were completed in November 2013.

Following tree removal work, disturbed areas of the site were seeded with annual ryegrass and covered with straw mulch in accordance with the Maryland Standard Specifications for Soil Erosion and Sediment Control.

No additional site work was performed until the spring of 2014. The security fence was left in place during the work hiatus.

5.3 Groundwater Management System Installation

Site work resumed in April 2014 with preparation activities in advance of installation of the groundwater management system. Remediation Services Inc. (RSI) of Independence, Kansas was contracted to install the groundwater management system.

5.3.1 Site Preparation

RSI's scope of work included site preparation activities in advance of the groundwater management system installation. Site preparation activities included installing the erosion and sedimentation controls specified in the CAP drawings and grading permit and constructing the tree protection fence and signage in accordance with the Forest Conservation Plan.

The erosion and sedimentation control devices included super silt fence along the downgradient perimeter of the disturbed areas, silt fence check dams at four places along the super silt fence near Yakona Road, a stabilized construction entrance with a mountable berm, standard inlet protection and curb inlet protection around existing storm water collection basins, and a portable sediment tank. The controls were installed in accordance with the Maryland Standard Specifications for Soil Erosion and Sediment Control and inspected by a Baltimore County erosion and sediment control inspector. The locations of the erosion and sedimentation controls are shown on Sheet 8 of the as-built drawings. WSP staff holding a Maryland Erosion and Sediment Control Certification conducted daily inspections of the erosion and sedimentation controls and documented the results. Periodic maintenance was required to repair tears in the super silt fence, replenish gravel at the construction entrance, and replace inlet protection devices.

Sod was used as both a temporary and permanent erosion control. Permanent sod was installed in the two drainage swales in the northeastern portion of the site and the central portion of the site west of the paved pathway. Temporary sod was installed in the rain garden area to allow the inlet protection device to be removed during treatment system installation. The sod in the rain garden area was removed before installation of the rain garden plantings.

The tree fence was installed at the location shown on Sheet 8 of the as-built drawings in accordance with the Forest Conservation Plan drawings. The blaze orange construction fence was installed at the canopy limit of each specimen tree by measuring the required radii from the specimen tree trunks. Warning signs were placed along the length of the fence.

5.3.2 Groundwater Management System Installation

After tree fence and erosion and sediment control installation, RSI began installation of the groundwater management system. The manhole locations and piping network are shown on Sheet 4 of the as-built drawings. Groundwater management system profiles are shown on Sheets 5 and 6 of the as-built drawings. Details of the groundwater management system are shown on Sheet 9 of the as-built drawings.

Construction began with the installation of Manhole 21, the hydraulic low point of the groundwater management system. Trenching, perforated pipe installation, backfilling and manhole installation followed along the main trunk line that included Manholes 22, 23, and 24. The collection system laterals and cleanouts were installed after completion of the trunk line. Trenches deeper than 5 feet deep were installed using a trench shield to protect site workers during piping installation. The deeper portions of the laterals from Manholes 23 and 24 required two stacked trench shields.

During trenching and excavation for the manholes, soils were segregated based on the in-situ location in relation to the historical flux of the groundwater. Soil from above the water table was excavated and placed in stockpiles and the remaining soil to the required depth of the trenches was placed in separate stockpiles. Continuous soil screening using a photoionization detector (PID) was also used as a tool to aid the soil segregation process,

particularly in the laterals from Manholes 21 and 22. Twelve stockpiles of excavated soil were generated during the groundwater management system installation.

Soils from above the water table that had no detectable PID readings were reused as backfill above the granular fill in the trenches. Soils from below the water table and soils that contained detectable PID levels were characterized for offsite disposal. Soil characterization data reports are provided in Appendix A. As a conservative measure, all soils excavated from below the water table were disposed of offsite regardless of characterization results, even though samples from several stockpiles contained no detectable levels of TPH or BTEX. Soil from above the water table that contained detectable levels of TPH or BTEX was also disposed of offsite. Approximately 675 tons of soil from the trench and manhole installation activities were transported to Clean Earth of Greater Washington, LLC in Upper Marlboro, Maryland for treatment and disposal.

A 6-inch base layer of granular fill (i.e., No. 57 gravel) was placed and compacted at the bottom of the trenches. The top elevation of the gravel base was surveyed to assure the proper slope between the manholes. The perforated pipe sections were fusion welded and cut to length at the manholes. The pipes were sealed at the manholes using non-shrinking grout. After manhole and perforated piping installation, the trenches were backfilled with granular fill to serve as the filter media for the collection system. Gravel was placed to a minimum depth of 5 feet above the perforated pipe. A 3-inch diameter perforated pipe was installed near the top of the granular fill as a contingency should future venting of the trenches be required. Filter fabric was placed over the gravel and the remaining portions of the trench backfilled with clean soil and compacted.

Cleanout pipes were installed at the end of each lateral to facilitate flushing of the system. The cleanouts consist of solid PVC pipe that extend to within 1 foot of the ground surface. The pipes were capped and a flush mounted utility vault installed to protect the cleanouts from damage. The locations of the cleanout vaults are shown on Sheet 4 of the as-built drawings.

Initial flushing of the system was performed to remove sediment that accumulated in the pipes and manholes during installation. Approximately 25,000 gallons of water were jetted through the cleanouts and through the system. The wash water was subsequently treated and discharged as described in Section 5.3.4. ACE Environmental was retained to vacuum the sediments that were trapped in the manholes. The sediments and related groundwater were characterized using existing groundwater data and disposed of offsite.

The original collection sump for the French drain system was uncovered and inspected during the groundwater management system installation. The discharge line from the sump that originally discharged directly to the storm water system was rerouted to the granular fill in the collection trench to assure that any residual water produced by the old system would be collected and managed by the new system. The sump was backfilled with granular fill, and then covered with geotextile filter fabric and a minimum of one foot of clean soil.

5.3.3 Storm Water Basin and Treatment System Vault

The CAP included plans to modify the existing storm water basin I-2 (Manhole 3) by plumbing in the system piping and lowering the surface inlet elevation by two feet. During construction, the basin was found to be constructed of brick that could not be easily modified without damaging the integrity of the basin. The decision was made to replace the basin with a pre-cast concrete structure.

The new basin was fabricated with pipe knockouts to accommodate the existing 24-inch diameter reinforced concrete pipe and the proposed inlet from the groundwater management system and outlet from the treatment system vault. Pipe connections were grouted with non-shrinking grout. The top was fitted with a Y-1 inlet. Details of the new storm water basin are shown on Sheets 10 and 15 of the as-built drawings.

The treatment system vault was installed approximately 10 feet southwest of the new storm water basin, outside the county utility easement. Two 4-inch pipe conduits were installed in the vault, one for the groundwater influent piping from Manhole 21 and one for the treated groundwater effluent piping to Manhole 3. Three electrical conduits were installed to the vault, one for low voltage lines to the electric meter pedestal, one for electrical lines to an electrical pull box, and one for the low voltage wiring for the transducer in Manhole 21. The contingency vent line was also plumbed to the treatment system vault. The interior of the vault was sealed with two coats of Sikagard

62, a marine type sealant, to prevent groundwater intrusion into the vault through joints or cracks. A pedestrian-rated 4-foot by 4-foot man-way with lift-assist doors was installed within the cover of the vault.

A new Y-1 inlet was specified in the CAP for the storm water basin I-1. Upon inspection, the existing Y-1 inlet was found to be intact, but the top slab caved in at one corner. The top slab was removed and reset to correct the problem. Sod was placed around the inlet as a permanent erosion control.

The layout, cross sections, and details of the new storm water basin, treatment system vault, and associated piping and utilities are shown on Sheets 10 and 11 of the as-built drawings.

5.3.4 Temporary Water Management

Portable fractionation tanks were mobilized to temporarily store groundwater that was encountered during trenching and manhole installation. Based on the volume of groundwater generated, WSP contracted with Ground/Water Treatment &Technology LLC (GWTT) to mobilize a groundwater treatment system to treat the water to meet NPDES discharge criteria before discharge to the storm water system. The temporary treatment system consisted of a weir tank for primary settling and skimming, a bag filtration system, and activated carbon filter vessels.

The temporary system operated continuously during groundwater management system installation and continued to operate while WSP designed and installed the permanent treatment system. Approximately 825,000 gallons of water, which included decontamination water and water from the flushing of the groundwater management system, were treated by the temporary system. It should be noted that no untreated groundwater was discharged to the Baltimore County storm water system from the groundwater management system installation. All water was directed into onsite fractionation tanks and treated before final discharge. After installation of the permanent system, the fractionation tanks and weir tank were decontaminated. The decontamination water was treated. A portion of the sediments were transferred to drums for subsequent offsite disposal. The sediment was characterized with the drill cuttings from monitoring well and piezometer installation. The analytical data for the characterization samples are provided in Appendix B. The remainder of the sediments were vacuumed out of the tanks and disposed of by ACE.

5.3.5 Site Grading

After construction of the groundwater management system including the replacement of the storm water basin and treatment system vault, the site was graded as shown on Sheet 7 of the as-built drawings, subject to the tolerances described below. No soil cutting or filling was performed outside the limit of disturbance shown on Sheet 7. The grades were designed to accommodate the park amenities as follows:

- The sidewalk and paved pathways were graded to minus 8 inches to accommodate subbase and concrete thicknesses
- The pavilion was graded to minus 24 inches to accommodate the subbase and paver thicknesses
- The playground was graded to minus 12 inches to accommodate the subbase and safety surfacing thicknesses
- The rain garden area was graded to minus 6 inches of final grade to accommodate 6 inches of topsoil
- The lawn (except for the sodded area) and shrub seeding areas were graded to minus 4 inches to accommodate 4 inches of topsoil.

Grading to these tolerances resulted in a net surplus of soil. Approximately 1,150 tons of certified clean soil was transported offsite for beneficial reuse.

The site was graded to establish positive drainage in all disturbed areas of the site. The drainage swales in the central portion of the site (between pavilion/playground and the rain garden) and the north eastern portion of the site were established during the site grading phase. Regraded soil was compacted with multiple passes of the construction equipment. No compaction testing was performed.

5.3.6 Utility Installation

Several utilities were installed after the site was graded. In addition to the electrical service installed for the treatment system operation, electrical conduit and pull boxes were installed along the sidewalk and paved pathways for future lighting. The electrical conduit was installed approximately two feet below the final grade surface.

Water lines were installed to service two yard hydrants. Using the existing residential meter boxes, one line was installed from the 1612 Yakona Road meter box to a hydrant near the treatment system vault and one line was installed from the 1632 Yakona Road meter box to a hydrant between the playground and pavilion. The water lines were buried a minimum of 3.5 feet below the final grade surface to meet local building code. The water lines are ¾-inch polyethylene and each are equipped with a valve and backflow prevention device. The hydrants are locked and are intended to be used only for authorized maintenance activities (plant watering and treatment system cleaning).

The electrical conduit, pull boxes, water lines, and hydrants locations are shown on Sheets 7 and 10 of the as-built drawings.

5.4 Monitoring Well and Piezometer Installation

WSP contracted with A-Zone Environmental Services, Inc. (A-Zone) of Charles Town, West Virginia to install seven permanent monitoring wells and five piezometers at the site. The monitoring well and piezometer locations shown on Sheet 13 of the as-built drawings were reviewed and approved by the MDE OCP during a site meeting that coincided with A-Zone mobilization on August 11, 2014.

Except for YMW-7, monitoring wells were constructed of 2-inch diameter PVC casing with 15-foot screens. YMW-7 was installed with a 10-foot screen before the site meeting with MDE OCP. The piezometers were constructed of 1.25-inch diameter PVC casing with 5-foot screens. Piezometers will be used to monitor the groundwater elevations as a result of the groundwater management system. Boring logs and well construction diagrams are provided in Appendix C.

One recovery well from historical remedial actions was uncovered during site grading work. This 20-foot deep, 4-inch diameter PVC well was abandoned in accordance with MDE guidance during the drilling work.

Drill cuttings were transferred to drums and characterized for offsite disposal. The analytical data report for the characterization samples is provided in Appendix B.

5.5 Park Amenities Installation

Park amenities and landscaping installation began immediately following groundwater management system installation, site grading, and utility installation activities. WSP contracted with Chapel Valley Landscape Company of Woodbine, Maryland to install the park amenities and plantings that were designed by landscape architect Mahan Rykiel Associates, Inc. of Baltimore, Maryland. Chapel Valley began site work in July 2014 and completed the work in October 2014. RSI was retained to install certain park hardscapes including the paved pathway, sidewalk, and stairs.

5.5.1 Paved Walkways

RSI was retained to install the concrete pathway and the sidewalk along Yakona Road. The work was performed in two phases. The concrete pathway was installed first during site grading activities. The walkway established the critical grades for the central swale, the pavilion subgrade, and the playground subgrade. After grading the path to the minus 8-inch tolerance, RSI placed and compacted a 4-inch layer of gravel subbase and the 4-inch thick concrete slab. Expansion and control joints were installed in accordance with the landscape architect's plans. Concrete samples were collected and tested to assure the minimum strength of 3,000 psi was attained after 28 days of curing.

The remaining portion of the path that included the stairs and the sidewalk along Yakona Road was installed using similar construction methods near the end of the park amenities and landscaping phase. A 3-inch diameter perforated pipe drain was installed within the subbase beneath the Yakona Road sidewalk and was routed to the granular fill of the groundwater collection system.

Portions of the curb and gutter along Yakona Road were replaced as part of the concrete work. The recessed curbs from the former residential driveways were cut out and replaced with standard height curbs to match the existing conditions. In addition, an ADA-compliant pedestrian crossing was installed near the intersection of Yakona Road and Naturo Road.

5.5.2 Sod Installation

After construction of the paved pathway, Chapel Valley placed four inches of topsoil in the two drainage swales and installed sod as a permanent erosion control. Sod was also placed as a temporary erosion control in the rain garden area. This portion of the sod was subsequently removed when the rain garden plantings were installed. Near the end of the landscaping phase, sod was installed in the green space between the paved pathway and the Yakona Road sidewalk.

The sod type, installation procedures, and maintenance requirements were specified by the landscape architect. Watering continued until the sod became fully established.

5.5.3 Park Amenities

Ridgley Manor Park amenities included a pavilion with a gazebo, a playground area with a combination play set and a swing set, a seat wall against a steep slope behind the playground (where excavation/grading was not permitted by the Forest Conservation Plan), a decorative fence along the rear of the park, four park benches, four picnic tables, two grills, and a park sign. Decking material was used to construct a crossing over the swale to provide ADA-compliant access between the pavilion and playground areas.

Chapel Valley or their subcontractors installed the park amenities in accordance with the landscape architect's plans and manufacturer's recommendations. Locations of the park amenities are shown on Sheet 14 of the as-built drawings.

5.5.4 Landscaping and Plantings

With approval from the landscape architect, Chapel Valley removed the blaze orange tree protection fence and signage. An approved herbicide was sprayed in the area behind the fence to kill weeds and other unwanted vegetation. Invasive vines growing on the existing trees were cut.

Approximately 750 feet of mulch trails were constructed using the chipped trees from the 2013 clearing activities. Mulch beds were installed around the existing trees. All mulch applications were a minimum of four inches thick. Approximately 17 sectioned tree logs from the clearing phase were anchored in soil to serve as decorative features of the park.

A total of 29 new trees consisting of 12 varieties were planted at the approximate locations shown on Sheet 14 of the as-built drawings. Planting, anchoring, and mulching methods conformed to the landscape architect's specifications.

Following installation of the mulch, trees, and trails, Chapel Valley spread approximately four inches of topsoil over all of the disturbed areas including the areas where herbicide was sprayed. The topsoil surface was amended with lime as necessary and raked smooth. The disturbed areas were seeded with turf grasses, low-land shrub seed, and meadow mix as prescribed in the landscape plans. All seeded areas were fertilized and covered with straw mulch.

The rain garden was planted last in the sequence of work. After stripping off the temporary sod, Chapel Valley placed 6 inches of topsoil to match the grades established by Manholes 3 and 21 and the treatment system vault. Four varieties of moisture-tolerant plants were installed as shown on the landscape drawings. Mulch was then placed around the plants.

All newly planted areas were watered for a minimum of 30 days after planting. Chapel Valley will continue to perform periodic maintenance of the plantings through August 30, 2015.

6 Groundwater Treatment System

This section describes the design, installation, operation, and maintenance of the permanent groundwater treatment system for the site.

6.1 Pre-Design Sampling

The groundwater management system began producing groundwater within a week of installing Manhole 21 and the main trunk line of the system. The groundwater was pumped to fractionation tanks and sampled to assess compliance with the NPDES discharge limits. The results indicated that pre-treatment was necessary before discharge to the storm water system.

As described in Section 5.3.4, WSP contracted with GWTT to install a temporary water treatment system. Post-treatment water samples were collected in accordance with the NPDES permit. After treating all of the water stored in fractionation tanks, WSP continued to monitor flow rates and collect samples of the system influent (at Manhole 21) and effluent in accordance with the permit. After completing the groundwater management system installation, additional influent samples were collected, the results of which formed the basis for the design of the permanent treatment system. The results of the influent and effluent samples are provided in Table 1. Laboratory reports for these data were provided to the MDE OCP under separate cover from EMS Environmental, Inc. as a part of monthly and quarterly correspondence.

Sampling was also conducted at each of the laterals to determine the TPH and BTEX contribution from each portion of the collection system. The results of this single event are provided in Table 2. The laboratory data report is provided in Appendix D.

6.2 System Design

WSP designed the permanent treatment system based on the sampling results and flow measurements. The system was designed for a maximum flow rate of 10 gallons per minute and influent concentrations of TPH and total BTEX of 9.8 mg/L and 1.76 mg/L, respectively. Based on this flow rate and loading, the design estimate of carbon usage was 2.3 pounds per day and the calculated carbon bed area was 6.02 square feet.

The system was conservatively designed to accommodate seasonal fluctuations in flow and constituent concentrations. The system consists of bag filters to remove suspended particulate and granular activated carbon to remove dissolved hydrocarbons and gasoline constituents. The bag filters and carbon drums were sized to fit within the 7-foot by 4-foot by 3.3-foot high treatment system vault installed approximately 10 feet southwest of the storm water basin (Manhole 3). WSP specified a submersible pump to draw the groundwater from Manhole 21 and pump the water through the bag filters and carbon vessels then back to the storm water basin (Manhole 3). WSP specified interconnecting hoses, sampling ports, valves, pressure gages, analog telemetry, flow meter, water level controls, freeze protection, and lighting for the system.

6.3 System Installation

WSP solicited bids for the system installation and subsequently retained GWTT to purchase the equipment and install the system. GWTT began treatment system installation on August 18, 2014 and the system was operational (by temporary electrical connections) at the time of the park opening on August 30, 2014. Permanent power was subsequently installed and final system configuration was completed on December 12, 2014.

Two bag filter units and two carbon drums were installed in parallel inside the vault. The flow then combined and was treated by a polishing drum of carbon before being routed back to the storm water manhole. The interconnecting hoses, sample ports, valves, pressure gages, and flow meter were installed as shown on Sheets

10 and 11 of the as-built drawings. The system components were tested to assure proper operation before full-scale operation. The piping and instrumentation diagram is provided on Sheet 12 of the as-built drawings.

The system was powered by a temporary electrical connection at the Hess-owned residence at 1610 Yakona Road until November 2014 when the power source was transferred to the permanent service from the utility pole near 1612 Yakona Road. WSP contracted with Tim Kyle Electric of Westminster, Maryland to install a meter pedestal and breaker panel near the utility pole. Baltimore Gas and Electric installed a 50-amp service from the utility pole to the electric meter. After obtaining electrical permits from Baltimore County, Tim Kyle Electric installed the underground electrical wiring to the submersible pump and installed an electrical outlet inside the vault for the sump pump, light and heat tracing. The electrical layout is shown on Sheet 10 of the as-built drawings.

A pressure transducer was installed in Manhole 21 to control the submersible pump operation. The pump control points were set to minimize cascading of water into the manhole, a condition that could cause volatilization of gasoline constituents and result in odor issues near the treatment system. A high water alarm connected to a wireless modem was installed in the treatment system vault to notify a system operator that a leak has been detected inside the vault. A level sensor inside the vault will trigger the operation of the sump pump to evacuate water leakage inside the vault and pump the water to Manhole 3. This setup is designed to maintain operation of the system until an operator can perform maintenance on the system.

7 Operation, Maintenance, and Monitoring

Operation, maintenance, and monitoring are necessary to assure that the CAP goals and objectives are met in the long term, to preserve the integrity and competency of the CAP components, and to provide continued safety to future users of the park. Operation, maintenance, and monitoring requirements for the groundwater management system, park amenities and landscaping, and groundwater treatment system are described in the following sections.

7.1 Groundwater Management System

The groundwater management system has no mechanical components that require maintenance. To prevent accumulation of sediments and debris within the system, the laterals will be flushed for at least 5 minutes using full pressure from the onsite hydrants at least once per year. The flushing will proceed from the furthest upgradient cleanout (lateral from manhole 24) to the furthest downgradient cleanout (lateral at manhole 21). Sediment and debris that collects in the manholes will be removed and properly disposed. Chlorine or other approved disinfectant may be added to a final rinse of the piping networks to prevent accumulation of microbial growth. Once every ten years, video inspection of the piping networks will be performed to assure that no roots or other obstructions are present with in the pipelines.

The open storm drain inlet at the curb on Yakona Road in the vicinity of the former 1614 Yakona Road residential structure, and any storm drain (e.g., manhole 3) or subgrade utility in the park that has the potential to generate hydrocarbon vapors, will be field screened for the detection of petroleum vapors with a calibrated PID on a monthly basis for a minimum of one year. After one year of monthly vapor monitoring has been completed, Hess may submit a request to the MDE OCP for consideration of a reduced monitoring frequency.

7.2 Park Amenities and Landscaping

Chapel Valley is responsible for maintenance of the landscaping through August 30, 2015, which will include reseeding lawn and shrub areas as needed during vegetation establishment, watering, mowing, and edging. After August 30, 2015, NeighborSpace, along with assistance from the Ridgely Manor Park Community Association, will perform these activities. The park amenities and grounds will be inspected to assure that no plants or trees are planted above the groundwater management system piping networks, no apparent damage has occurred to the groundwater management system and monitoring wells, and that the park and grounds are used as intended.

The lawn and shrub areas should be fertilized at least four times per year and weed control agents should be applied at least twice per year.

7.3 Groundwater Treatment System

The groundwater treatment system is designed to operate continuously with periodic maintenance to assure efficient operation and compliance with the NPDES discharge limits. The vault and electrical panel are locked to prevent unauthorized entry.

WSP developed an O&M Plan that describes the routine operation of the groundwater treatment system, safety requirements, start up and shut down procedures, system components and replacement parts, sampling and analysis procedures, emergency and contingency actions, and routine maintenance activities. Routine maintenance will include periodic changing of the bag filters, backwashing of the carbon drums, cleaning of the pump and pressure transducer, and carbon change out when breakthrough occurs. The O&M plan provides the expected frequency of these maintenance items and the procedures to implement them.

Routine system monitoring includes inspection for signs of unauthorized entry, checks for leaks or other component failures, PID monitoring of the utility vaults and manholes, recording of pressure gage readings and totalizer volumes, and NPDES permit compliance sampling.

Premature fouling of system components with iron particulate has become a maintenance issue during system operation. Laboratory analysis conducted by Water Remediation Technologies Inc. (WRT) has shown that Manhole 21 can experience a buildup of aerobic bacteria in excess of 10,000 colony Forming Units per milliliter (CFU/ml) and iron oxidizing bacteria between 100 – 1000 CFU/ml. Bacterial growth is classified as is moderately aggressive. Iron oxidation and bacterial growth has caused premature fouling of the submersible pump, bag filters and carbon drums and has caused system pressures to exceed working pressures of the carbon vessels. Hess informed the MDE of the planned use of Redux 620 and STX 100 sequestering agents to minimize the fouling and will implement the use of the sequestering agents during normal operation of the treatment system.

7.3.1 Effluent Discharge Sampling

During treatment system operation, influent (i.e., discharge from the groundwater management system) and effluent (i.e., discharge of treated water from the treatment system) samples will be collected on a bi-monthly basis (twice per month). Samples will be analyzed for BTEX, TPH-DRO, TPH-GRO, naphthalene, and methyl tertiary-butyl ether (MTBE) in accordance with the NPDES permit. A sample will be collected from the mid-point of the treatment train (before the polishing carbon drum) on a quarterly basis. If the effluent sample results exceed the NPDES permit limits, this mid-point sample will be collected on a bi-monthly basis.

7.3.2 Contingency Plan

In accordance with the MDE OCP-approved Contingency Plan dated April 10, 2014, the treatment system will be bypassed and shut down (with MDE OCP approval) if three consecutive months of bi-monthly influent samples meet the NPDES permit discharge criteria. Influent samples will continue to be collected on a bi-monthly basis until the MDE OCP approves a reduction to monthly monitoring or an agreed upon alternative schedule.

If bypassing or removal of groundwater treatment system is approved by the MDE OCP and if an exceedance is detected above stipulated standards, the MDE OCP will be notified within 24 hours upon receipt of the laboratory data. A confirmation sample will be collected within 48 hours of receipt of the original results and will be analyzed on an expedited basis (48-hour turnaround time) with results provided to the MDE OCP within 24 hours of receipt of final data. If the results from the confirmation sample continue to identify an exceedance of the applicable NPDES discharge criteria, the treatment system will be reactivated as soon as practicable, but no later than 14 calendar days after receipt of the confirmation sample results. Upon restarting of the system, compliance sampling will resume on a bi-monthly frequency and will continue until three consecutive months of bi-monthly sampling results meet the NPDES discharge limits.

7.4 Groundwater Monitoring

All monitoring wells and piezometers will be gauged using an oil/water interface probe on a monthly basis for a minimum of 12 months. After the minimum monitoring period had been satisfied and if the data supports a reduced gauging frequency, a written request may be submitted to reduce this frequency. Monthly gauging will continue until written approval for reduced monitoring is received from the MDE OCP.

Groundwater samples will be collected from all monitoring wells and piezometers shown on Sheet 13 of the as-built drawings on a quarterly basis (i.e., every three months) for a minimum of one year (i.e., four quarters). Groundwater samples will be analyzed for VOCs and fuel oxygenates by EPA Method 8260B and TPH-GRO and TPH-DRO by EPA Method 8015C. If the groundwater sampling data indicate stable and/or decreasing trends, a written request may be submitted to the MDE OCP to reduce the sampling frequency. Quarterly sampling will continue until written approval to reduce the frequency is received from the MDE OCP.

Monthly gauging and quarterly sampling data will be submitted to the MDE OCP in Quarterly Discharge Monitoring Reports required by the NPDES permit.

Data collected from vapor field screening and groundwater discharge sampling will be submitted in Monthly Update Reports. The reports will include a map of the groundwater management system noting the locations where PID screening was conducted. Submittal of monthly reports shall be performed for a minimum of 1 year (i.e., 12 months).

Figures

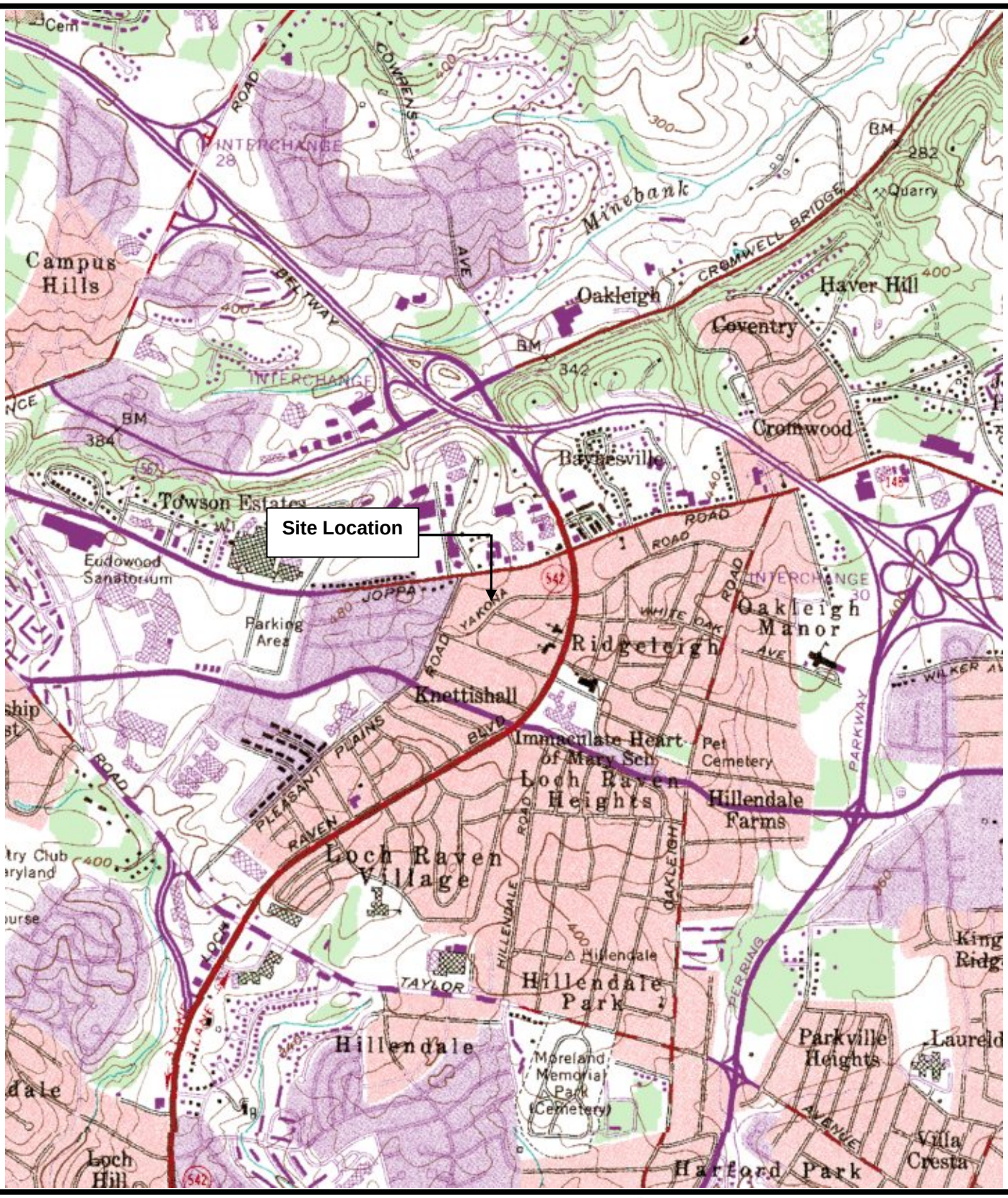
DWG Name:

Checked:

Approved:

Drawn By:

A



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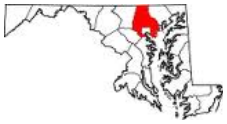
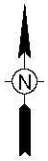




0 1000 2000 4000
SCALE, FEET

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500

FIGURE 1

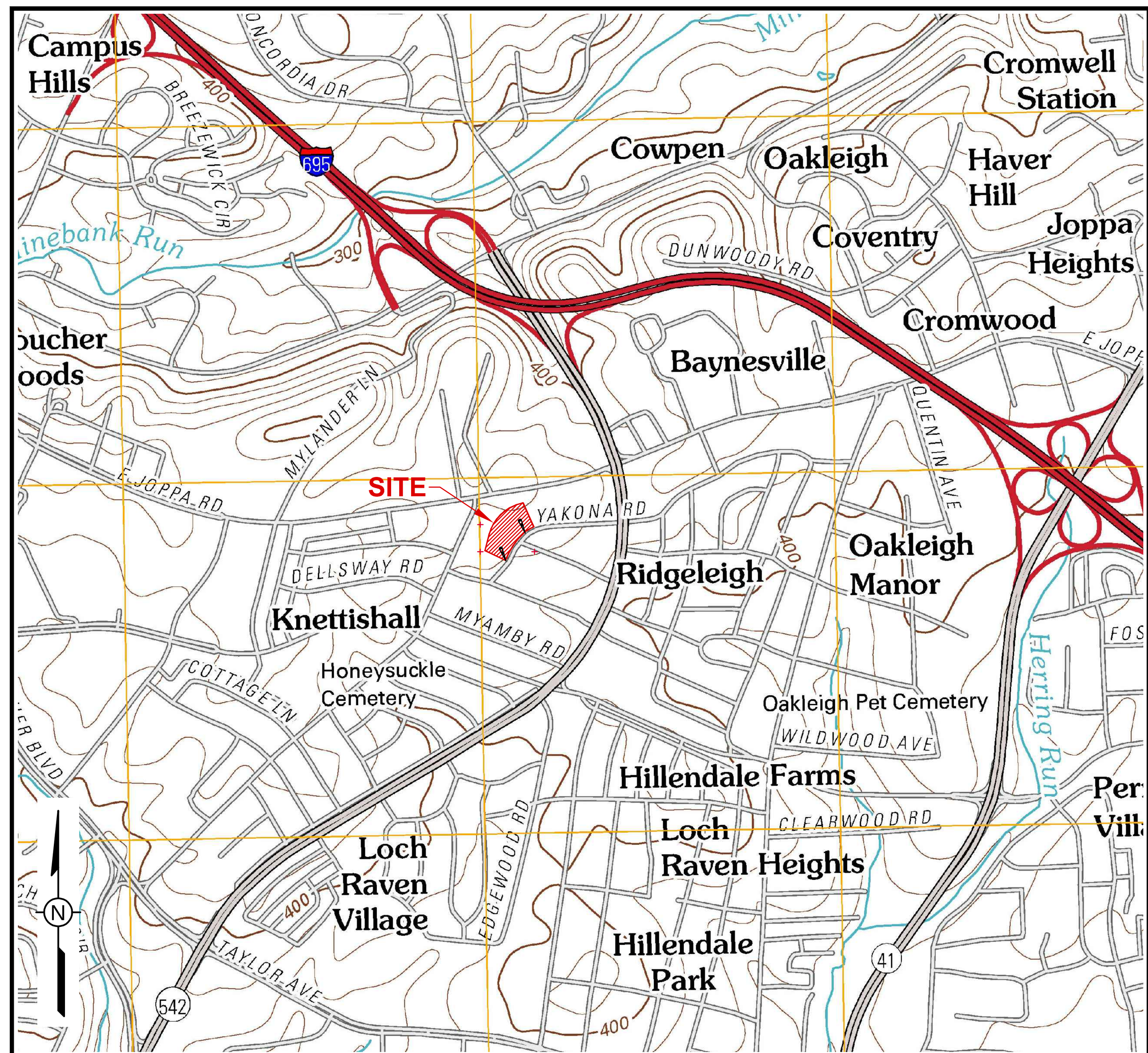
SITE LOCATION MAP

1612 THROUGH 1642 YAKONA ROAD
TOWSON, MARYLAND

PREPARED FOR

BAKER BOTTS LLC
WASHINGTON, DC

As-Built Drawings



LOCATION MAP

SCALE, FEET: 0 600 1200 2400

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14P1020-D03	3	DEMOLITION PLAN
14P1020-D04	4	PLAN - GROUNDWATER MANAGEMENT SYSTEM
14P1020-D05	5	PROFILES - GROUNDWATER MANAGEMENT SYSTEM
14P1020-D06	6	PROFILES - GROUNDWATER MANAGEMENT SYSTEM
14P1020-D07	7	GRADING PLAN AND STORMWATER MANAGEMENT
14P1020-D08	8	TEMPORARY SITE CONTROLS AND EROSION AND SEDIMENT CONTROLS
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14P1020-D13	13	MONITORING WELL PLAN
14P1020-D14	14	PARK AMENITIES PLAN

TITLE SHEET

CORRECTIVE ACTION PLAN IMPLEMENTATION AND PARK DEVELOPMENT
AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR

HESS CORPORATION
WOODBRIDGE, NEW JERSEY

D

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REVISIONS
REV | DESCRIPTION

SEAL — DATE: January 7, 2015

DRAWN BY: RAE 11/24/2014
CHECKED: SAR 12/1/2014
APPROVED: DHS 01/07/2015

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TITLE SHEET
AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND
PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
www.wspgroup.com/usa

SHEET 1

Drawing Number
14P1020-D01

Property Information					
Address	Owner	Tax Map	Parcel	Liber	Folio
1612 Yakona Road	Hess Corporation	70	294	32800	317
1614 Yakona Road	Hess Corporation	70	294	32800	304
1616 Yakona Road	Hess Corporation	70	294	32800	309
1618 Yakona Road	Hess Corporation	70	294	32786	104
1620 Yakona Road	Hess Corporation	70	294	32786	108
1622 Yakona Road	Hess Corporation	70	294	32786	377
1624 Yakona Road	Hess Corporation	70	294	32786	100
1626 Yakona Road	Hess Corporation	70	294	32786	96
1628 Yakona Road	Hess Corporation	70	294	32786	92
1630 Yakona Road	Hess Corporation	70	294	32800	321
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1636 Yakona Road	Hess Corporation	70	294	32800	313
1638 Yakona Road	Hess Corporation	70	294	32786	365
1640 Yakona Road	Hess Corporation	70	294	32786	373
1642 Yakona Road	Hess Corporation	70	294	32786	369

SURVEY NOTES:

1. HORIZONTAL DATUM: MARYLAND STATE PLANE NAD 83/2007
2. VERTICAL DATUM: NAVD 88

BENCHMARK DATA			
NO	COORDINATES	ELEV	DESCRIPTION
500	N 629,925.90 E 1,434,899.90	434.57	BM NAIL WITH TAG IN PP #BG&E 167104
501	N 629,672.27 E 1,434,724.32	430.38	BM NAIL WITH TAG IN PP #BG&E 167102

LEGEND

- EXISTING CONTOUR
- EXISTING FENCE
- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING TREELINE
- EXISTING TREES
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- SURVEY BENCHMARK

NOTE:

TREE LOCATIONS ARE APPROXIMATE.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

25 0 25 50
SCALE, FEET

REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

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REV	REVISIONS DESCRIPTION		
1	Revised:	Chkd:	Appr.:
2	Revised:	Chkd:	Appr.:
3	Revised:	Chkd:	Appr.:

SEAL

STATE OF MARYLAND · DAVID H. SARR · No. 37125 · PROFESSIONAL ENGINEER

January 7, 2015
DATE

DRAWN BY	RAE 11/24/2014
CHECKED	DHR 12/1/2014
APPROVED	DHS 01/07/2015

PROPERTY OF WSP USA CORP.

IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS AND SUPPLIERS WITHOUT THE WRITTEN CONSENT OF WSP USA CORP.

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SITE PLAN AND INITIAL CONDITIONS

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
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SHEET 2

Drawing Number
14P1020-D02

LEGEND

- EXISTING CONTOUR
- EXISTING FENCE
- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING TREELINE
- EXISTING TREES
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- SURVEY BENCHMARK
- TEMPORARY SECURITY FENCE
- TEMPORARY SILT FENCE
- TREES/SHRUBS REMOVED
- TEMPORARY ORANGE CONSTRUCTION FENCE AROUND TREES
- DEMOLISHED STRUCTURE

DEMOLITION PLAN NOTES

1. DEMOLITION AND UTILITY REMOVAL PERMITS WERE OBTAINED BEFORE DEMOLITION WORK BEGAN.
2. TEMPORARY SECURITY FENCING WAS INSTALLED ALONG YAKONA ROAD AND BETWEEN THE 1610/1612 AND 1642/1644 YAKONA ROAD PROPERTIES. THE FENCE REMAINED UNTIL THE OPENING OF THE PARK.
3. TEMPORARY EROSION AND SEDIMENT CONTROLS INCLUDING SILT FENCE, STORM WATER INLET PROTECTION, AND CONSTRUCTION ENTRANCE WERE INSTALLED AND MAINTAINED THROUGHOUT THE DEMOLITION WORK.
4. UTILITY SERVICES DESIGNATED TO REMAIN (GAS MAIN, WATER MAIN, STORM WATER, OVERHEAD ELECTRIC TRANSMISSION LINES AND GUY WIRES) WERE PROTECTED THROUGHOUT THE DEMOLITION ACTIVITIES.
5. YAKONA ROAD PAVEMENTS, CURB AND GUTTER, VEGETATION IN NON-DEMOLITION AREA, AND ADJACENT HOMES AND PROPERTIES WERE PROTECTED THROUGHOUT THE DEMOLITION WORK.
6. UNIVERSAL WASTES (LIGHT BULBS, MERCURY SWITCHES, BATTERIES, REFRIGERANTS) WERE REMOVED AND DISPOSED/RECYCLED BEFORE DEMOLITION BEGAN.
7. ASBESTOS CONTAINING MATERIALS WERE LIMITED TO NON-FRIABLE TRANSITE SIDING ON TWO STRUCTURES. THE TRANSITE WAS REMOVED AND PROPERLY DISPOSED OF BEFORE DEMOLITION BEGAN.
8. ONE ABOVE GROUND STORAGE TANK AND ONE UNDERGROUND STORAGE TANK WERE DRAINED, CLEANED, AND REMOVED DURING THE DEMOLITION WORK. PETROLEUM IMPACTED SOIL FROM BENEATH THE UNDERGROUND TANK WAS REMOVED AND DISPOSED IN ACCORDANCE WITH MDE OIL POLLUTION CONTROL REGULATIONS.
9. NOISE AND DUST MONITORING WAS CONDUCTED CONTINUOUSLY DURING HEAVY EQUIPMENT OPERATION.
10. DUSTS WERE CONTROLLED WITH WATER SPRAY CONTINUOUSLY DURING ACTIVE DEMOLITION.
11. EXTERIOR PROPERTY IMPROVEMENTS INCLUDING SHEDS, CAR SHELTERS, DECKS, PORCHES, FLAG POLES, PET ENCLOSURES, FENCES, DRIVEWAY PAVEMENTS, RETAINING WALLS, GARDENS, ORNAMENTAL PLANTS AND SHRUBS, STAIRS, AND RAILINGS WERE REMOVED DURING DEMOLITION WORK.
12. AT THE COMPLETION OF DEMOLITION WORK, ALL CONSTRUCTION AND DEMOLITION DEBRIS INCLUDING BASEMENT WALLS, FOOTERS, FOUNDATIONS WERE REMOVED FROM THE SITE. CONCRETE, BRICK, AND CEMENT BLOCK WERE NOT USED FOR BACKFILL.
13. GROUNDWATER ENCOUNTERED DURING BASEMENT DEMOLITION AND FRENCH DRAIN REMOVAL WAS CONTAINERIZED, CHARACTERIZED, AND DISPOSED OF OFFSITE.
14. SEVERAL TREES THAT HAD ROOTS INTERTWINED IN SUBSTRUCTURES AND OTHER TREES IN POOR HEALTH WERE REMOVED. SELECTED TREE TRUNKS WERE SALVAGED FOR INCORPORATION AS A PARK FEATURE AND THE REMAINING TREES WERE CHIPPED FOR USE AS MULCH IN THE PARK.
15. THE LOCATIONS OF THE REMAINING TREES ONSITE ARE APPROXIMATE.
16. THE BASEMENT CAVITIES WERE BACKFILLED WITH REGRADED SOIL AT THE COMPLETION OF THE DEMOLITION PHASE OF WORK. THE APPROXIMATE POST-DEMOLITION GRADES ARE SHOWN ON SHEET 4.
17. UTILITY POLE GUY WIRES AFFECTED BY SITE GRADING WERE RESET BY BALTIMORE GAS AND ELECTRIC AT THE PROPOSED FINAL GRADE.
18. DISTURBED AREAS WERE SEEDED WITH ANNUAL RYEGRASS AT THE COMPLETION OF DEMOLITION ACTIVITIES.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

25 0 25 50
SCALE, FEET

D

REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

REVISIONS

REV	DESCRIPTION
1	Revised: Chkd: Appr.:
2	Revised: Chkd: Appr.:
3	Revised: Chkd: Appr.:

SEAL

STATE OF MARYLAND · PROFESSIONAL ENGINEER

January 7, 2015
DATE

DRAWN BY	RAE 11/24/2014
CHECKED	DAR 12/1/2014
APPROVED	DHS 01/07/2015

DEMOLITION PLAN

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

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SHEET 3

Drawing Number
14P1020-D03

LEGEND

435	5' POST DEMOLITION CONTOUR
	1' POST DEMOLITION CONTOUR
435	5' EXISTING CONTOUR
	1' EXISTING CONTOUR
G	EXISTING UNDERGROUND GAS LINE
W	EXISTING UNDERGROUND WATER LINE
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
OHE	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING TREELINE
	EXISTING TREES
2	STORM SEWER MANHOLE AND INLET CALLOUT
3	SANITARY SEWER MANHOLE CALLOUT
MDE-1	EXISTING MONITORING WELL
	GROUNDWATER MANAGEMENT SYSTEM DRAINAGE PIPING
	CONTINGENCY VENT PIPING

NOTES:

1. GROUNDWATER AND FRENCH DRAIN WATER ENCOUNTERED DURING SYSTEM INSTALLATION WAS CONTAINED AND TREATED.
2. THE EXISTING MONITORING WELLS WERE PROTECTED DURING EXCAVATION AND GRADING.
3. CONTINGENCY VENT PIPING WAS INSTALLED DIRECTLY ABOVE DRAINAGE PIPE, BUT AROUND THE MANHOLES.
4. TREE LOCATIONS ARE APPROXIMATE.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

25 0 25 50
SCALE, FEET

REVISIONS

REV	DESCRIPTION

SEAL

January 7, 2015
DATE

DRAWN BY		12/01/2014
CHECKED		12/11/2014
APPROVED	DHS	01/07/2015

PLAN
GROUNDWATER MANAGEMENT SYSTEM

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

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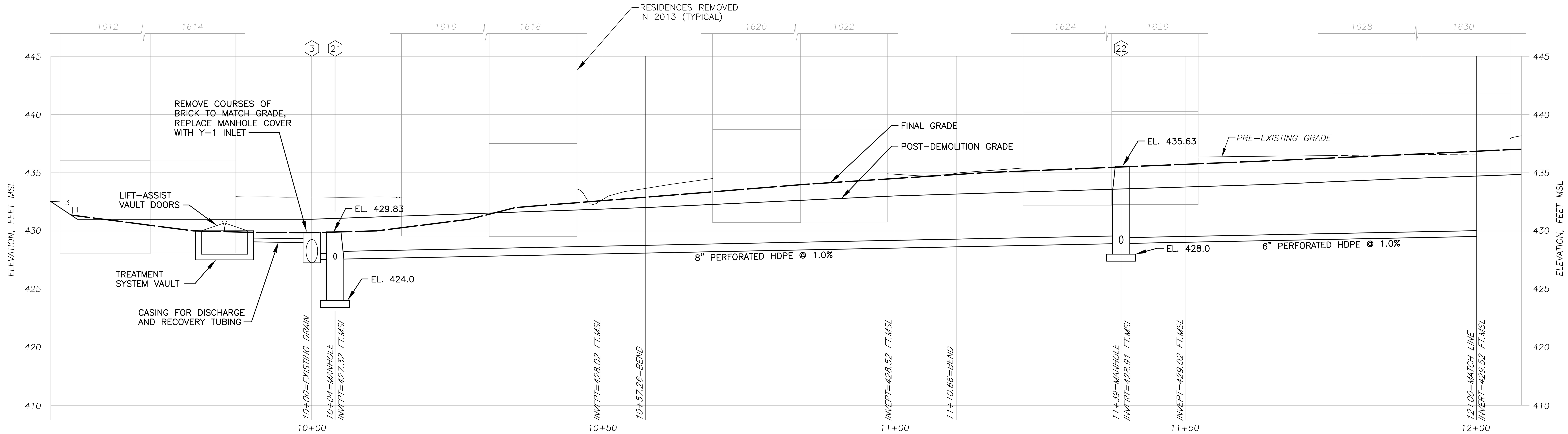
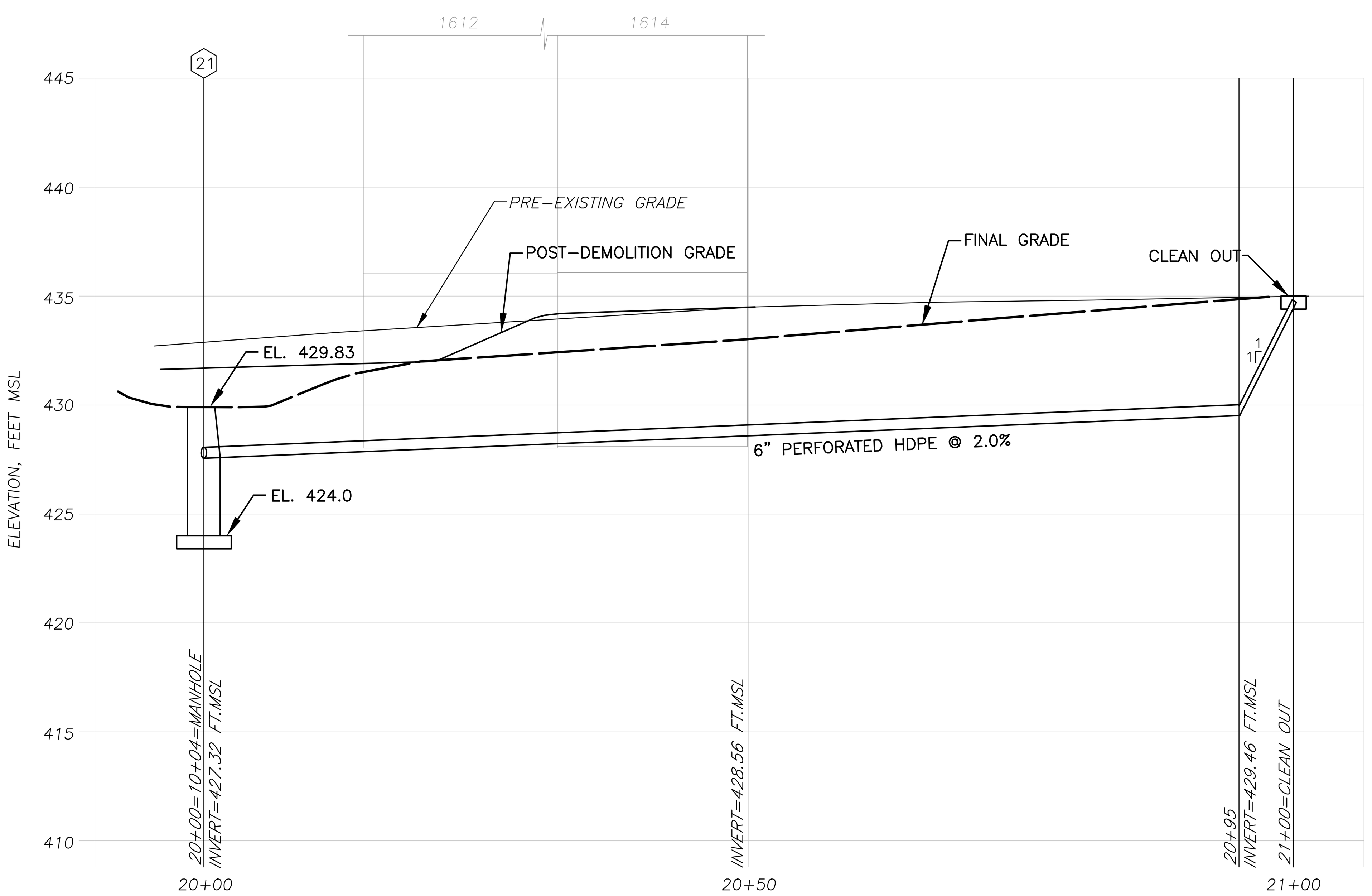
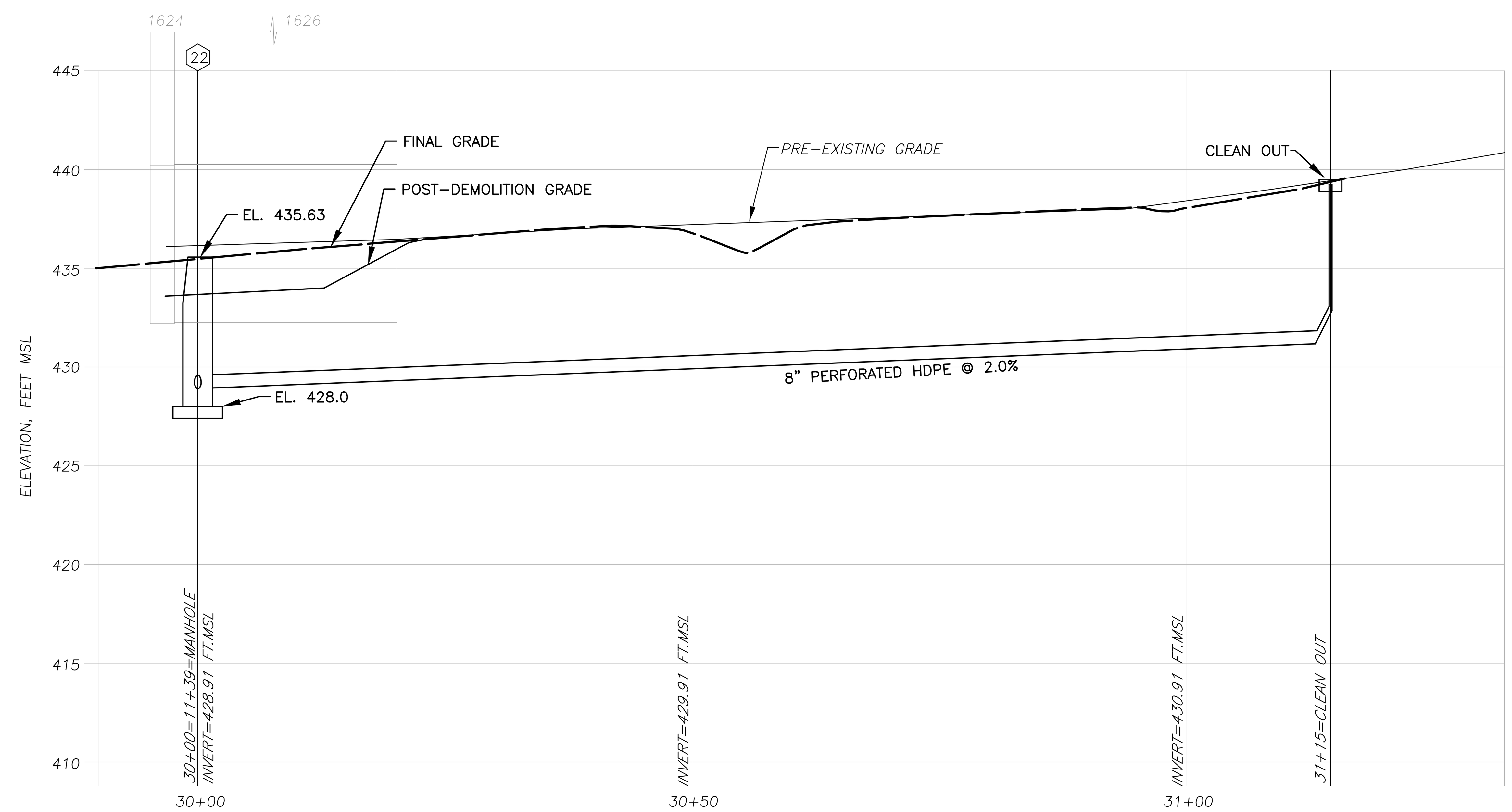
SHEET 4

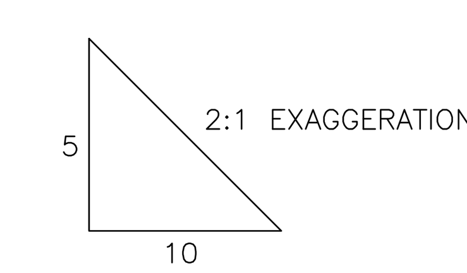
Drawing Number
14P1020-D04

D









THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

HORIZONTAL SCALE, FEET

VERTICAL SCALE, FEET

REVISIONS

REV	DESCRIPTION

SEAL

DATE January 7, 2015

DRAWN BY	RA 12/02/2014
CHECKED	DAR 12/1/2014
APPROVED	DHS 01/07/2015

PROFILES
GROUNDWATER MANAGEMENT SYSTEM

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

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SHEET 5

Drawing Number
14P1020-D05

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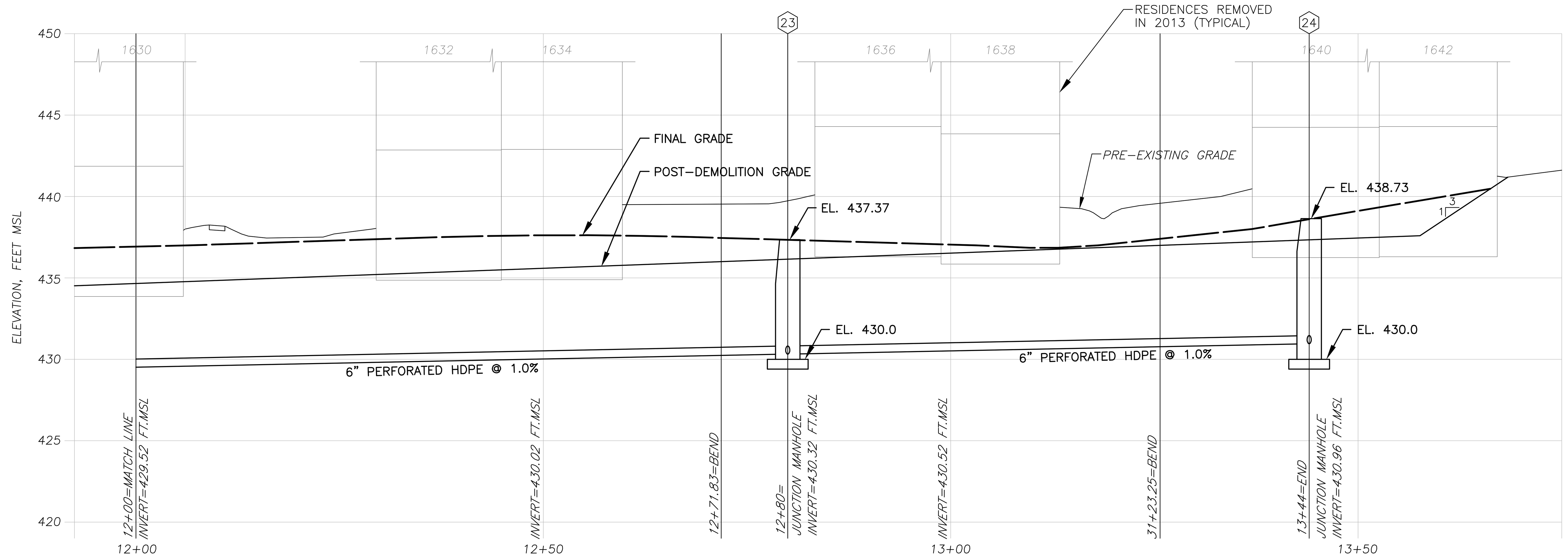
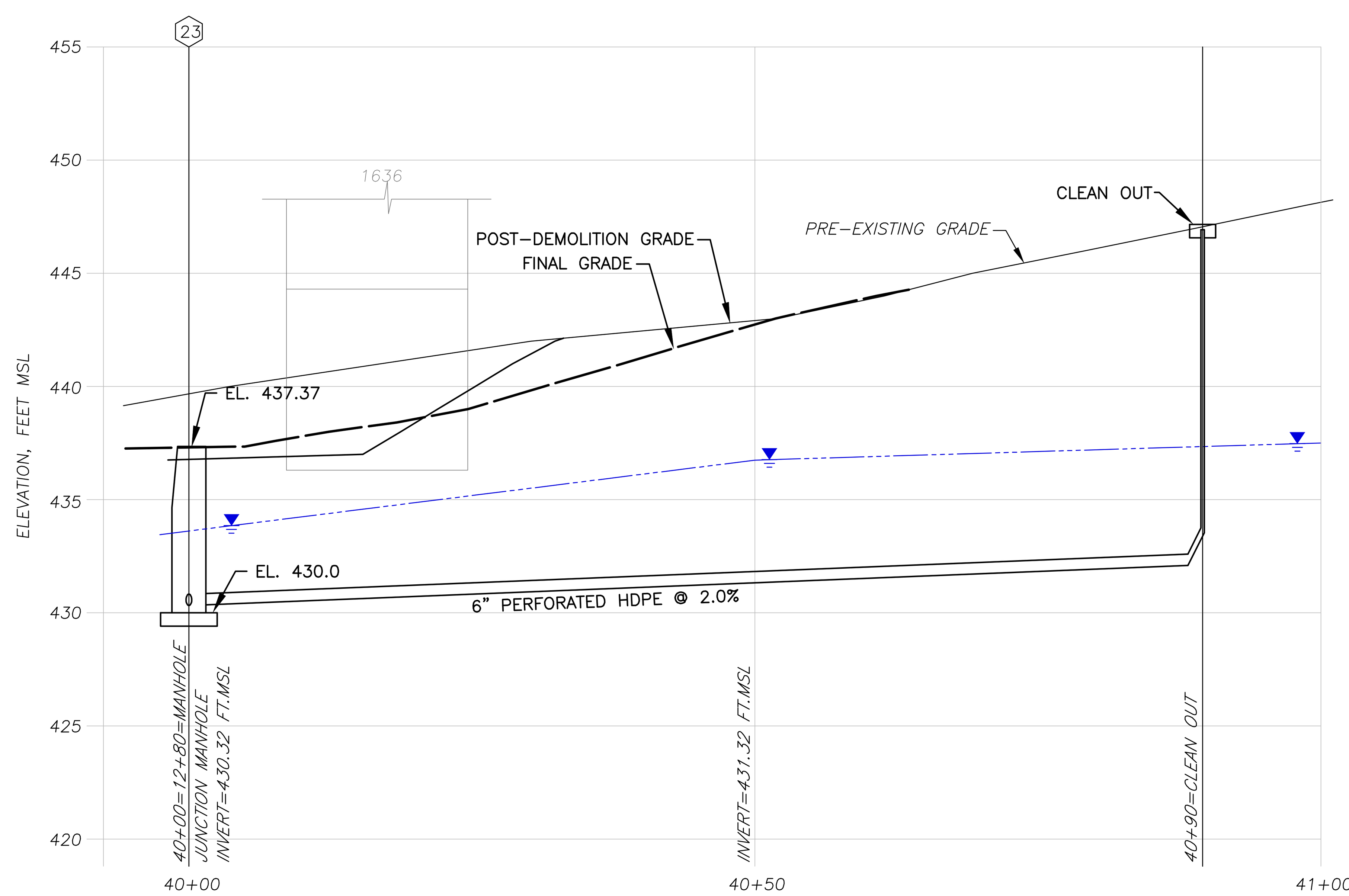
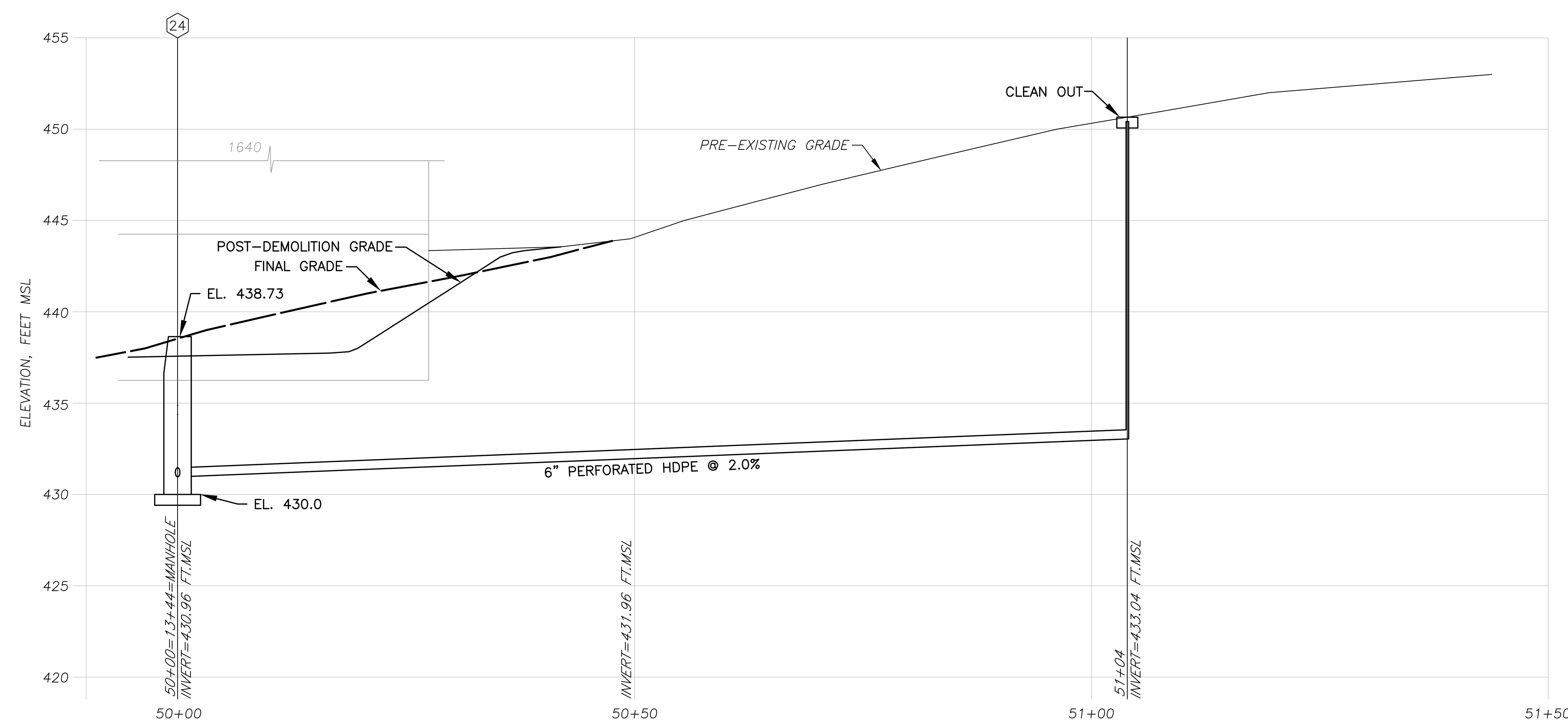
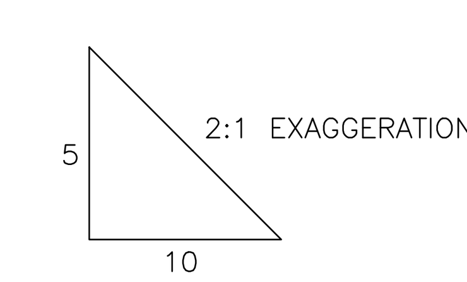
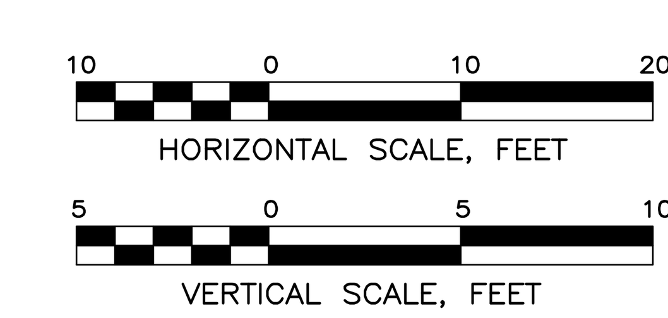








THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.



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REVISIONS

REV	DESCRIPTION
1	Revised: Chkd: Appr.:
2	Revised: Chkd: Appr.:
3	Revised: Chkd: Appr.:

SEAL

January 7, 2015
DATE

DRAWN BY	RAZ 12/02/2014
CHECKED	SAR 12/1/2014
APPROVED	DHS 01/07/2015

PROFILES
GROUNDWATER MANAGEMENT SYSTEM

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

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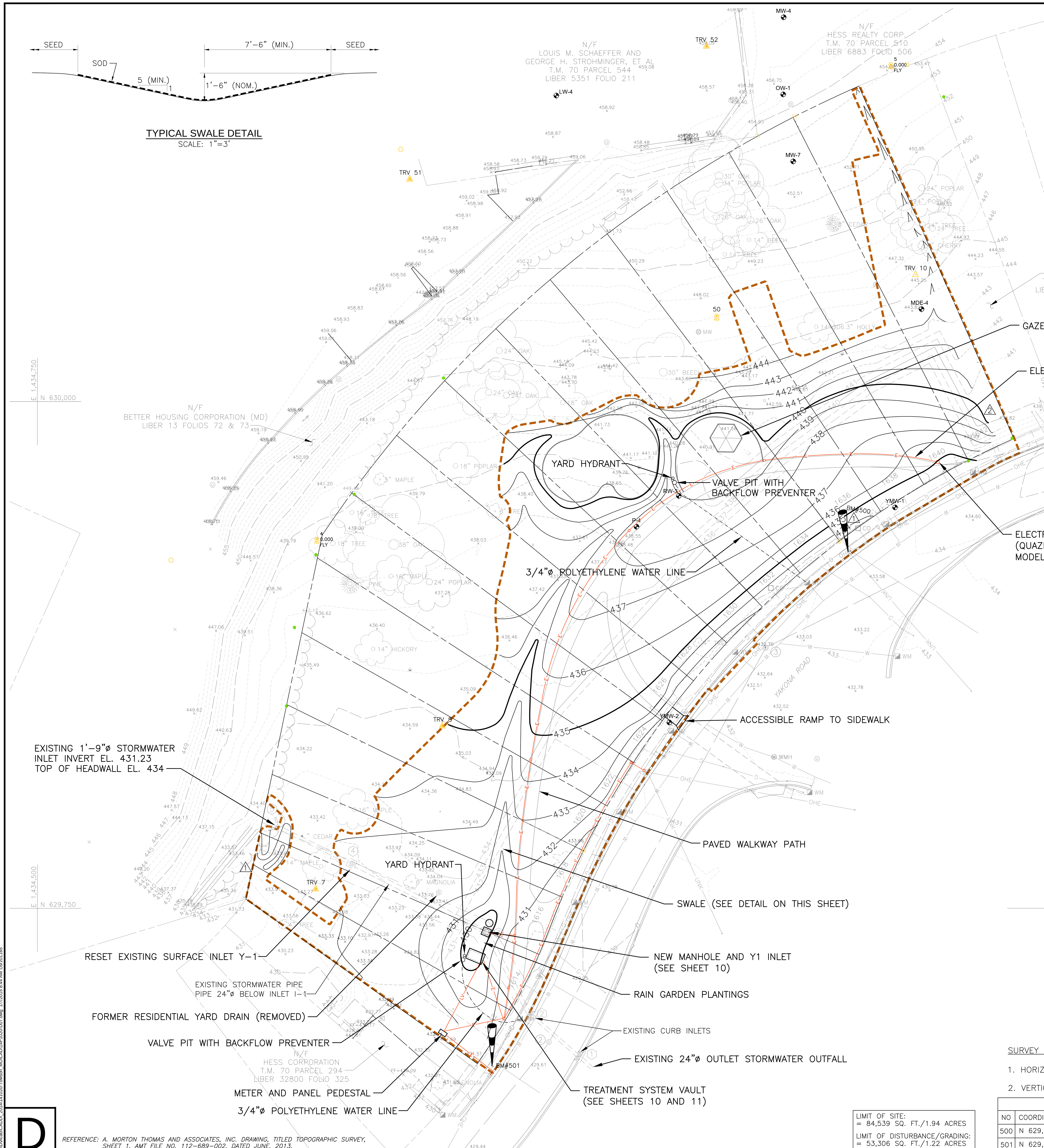
SHEET 6

Drawing Number
14P1020-D06



Property Information

Address	Owner	Tax Map	Parcel	Liber	Folio
1612 Yakona Road	Hess Corporation	70	294	32800	317
1614 Yakona Road	Hess Corporation	70	294	32800	304
1616 Yakona Road	Hess Corporation	70	294	32800	309
1618 Yakona Road	Hess Corporation	70	294	32786	104
1620 Yakona Road	Hess Corporation	70	294	32786	108
1622 Yakona Road	Hess Corporation	70	294	32786	377
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1632 Yakona Road	Hess Corporation	70	294	32786	361
1634 Yakona Road	Hess Corporation	70	294	32800	329
1636 Yakona Road	Hess Corporation	70	294	32800	313
1638 Yakona Road	Hess Corporation	70	294	32786	365
1640 Yakona Road	Hess Corporation	70	294	32786	373
1642 Yakona Road	Hess Corporation	70	294	32786	369

NOTE: ONSITE PROPERTIES 1612 TO 1642 YAKONA ROAD OWNED BY HESS CORPORATION, 1 HESS PLAZA, WOODBRIDGE, NEW JERSEY 07095.

LEGEND

- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING TREELINE
- EXISTING TREES
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- SURVEY BENCHMARK
- 5' EXISTING SURFACE CONTOUR IN AREA OF REGRADING
- 1' EXISTING SURFACE CONTOUR IN AREA OF REGRADING
- 5' EXISTING SURFACE CONTOUR TO REMAIN
- 1' EXISTING SURFACE CONTOUR TO REMAIN
- 5' PROPOSED SURFACE CONTOUR
- 1' PROPOSED SURFACE CONTOUR
- LIMITS OF GRADING
- ELECTRICAL LINE
- LOW VOLTAGE ELECTRICAL LINE

GRADING PLAN NOTES

1. A GRADING PERMIT (PERMIT NO. B829569) WAS ISSUED FROM BALTIMORE COUNTY BEFORE CORRECTIVE ACTION WORK BEGAN.
2. NO GROUND DISTURBANCE WAS PERFORMED OUTSIDE THE LIMITS OF GRADING SHOWN ON THIS DRAWING. EXISTING VEGETATION WAS PROTECTED.
3. EROSION AND SEDIMENTATION CONTROLS WERE INSTALLED AND INSPECTED BY BALTIMORE COUNTY BEFORE BEGINNING LAND DISTURBANCE AND SITE GRADING (SEE SHEET 8).
4. NOISE AND DUST MONITORING WAS CONDUCTED CONTINUOUSLY DURING GRADING WORK. DUSTS WERE CONTROLLED WITH WATER SPRAY.
5. THE SITE WAS GRADED TO THE FOLLOWING TOLERANCES TO ACCOUNT FOR THE FINAL SURFACE THICKNESSES:
   - MINUS 8 INCHES FOR THE SIDEWALKS AND PAVED PATHWAYS
   - MINUS 24 INCHES FOR THE PAVILION AREA
   - MINUS 12 INCHES FOR THE PLAYGROUND AREA
   - MINUS 6 INCHES FOR THE RAIN GARDEN PLANTINGS AREA
   - MINUS 4 INCHES FOR ALL OTHER LAWN AND SHRUB SEEDING AREAS
6. PLUMBING PERMITS (PERMIT NOS. P853289 AND P853290) WERE ISSUED FROM BALTIMORE COUNTY BEFORE INSTALLATION OF THE WATER LINE AND HYDRANTS.

SURVEY NOTES:

1. HORIZONTAL DATUM: MARYLAND STATE PLANE NAD 83/2007
2. VERTICAL DATUM: NAVD 88

BENCHMARK DATA

NO	COORDINATES	ELEV	DESCRIPTION
500	N 629,925.90 E 1,434,899.90	434.57	BM NAIL WITH TAG IN PP #BG&E 167104
501	N 629,672.27 E 1,434,724.32	430.38	BM NAIL WITH TAG IN PP #BG&E 167102

LIMIT OF SITE:
= 84,539 SQ. FT./1.94 ACRES

LIMIT OF DISTURBANCE/GRADING:
= 53,306 SQ. FT./1.22 ACRES

REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

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SCALE, FEET

REVISIONS

REV	DESCRIPTION

DRAWN BY
CHECKED
APPROVED DHS 01/07/2015

SEAL
January 7, 2015
DATE

GRADING PLAN AND STORMWATER MANAGEMENT

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

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Reston, Virginia 20191
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SHEET 7

Drawing Number
14P1020-D07

Property Information

Address	Owner	Tax Map	Parcel	Liber	Folio
1612 Yakona Road	Hess Corporation	70	294	32800	317
1614 Yakona Road	Hess Corporation	70	294	32800	304
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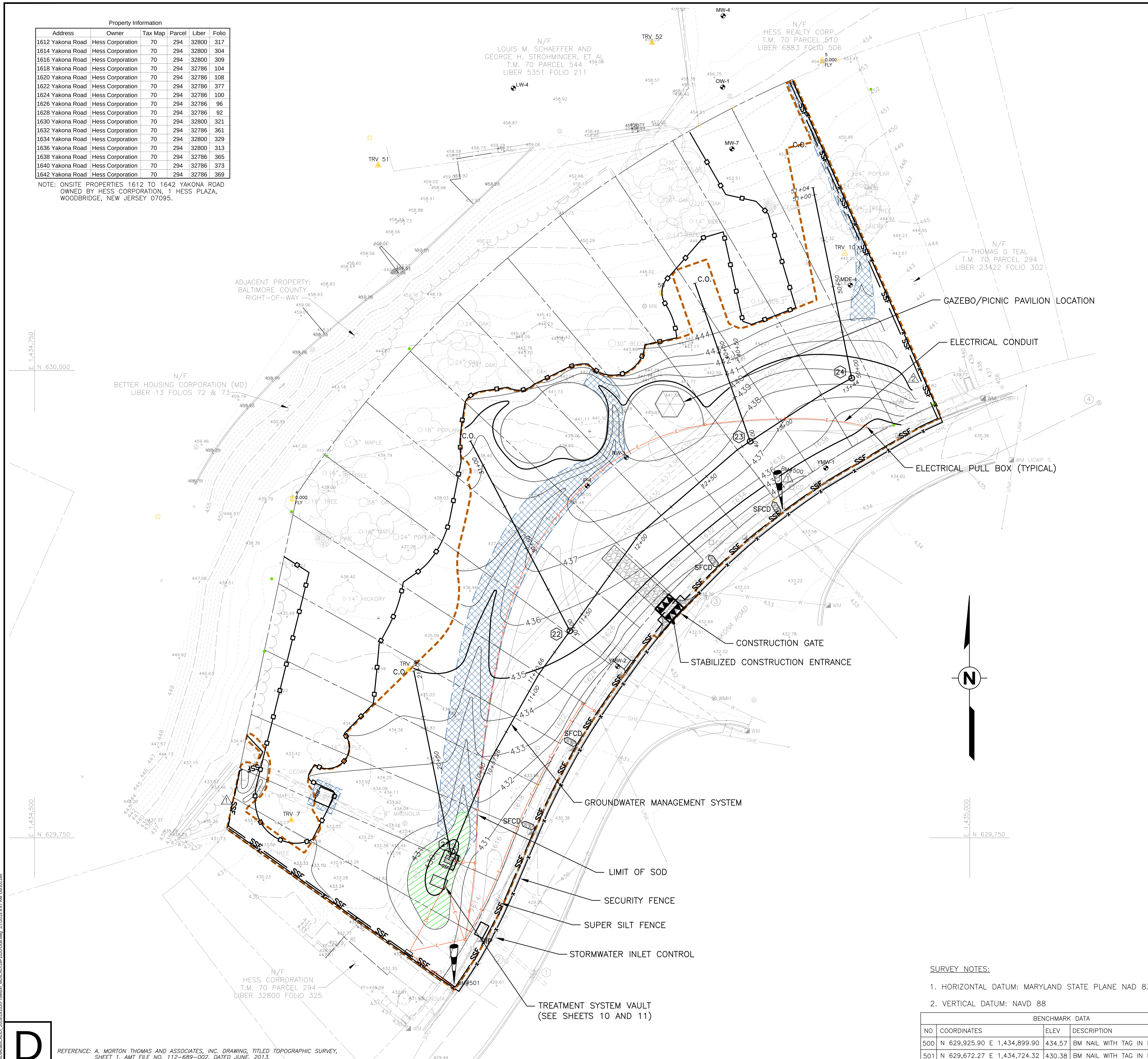
1640 Yakona Road	Hess Corporation	70	294	32786	373
1642 Yakona Road	Hess Corporation	70	294	32786	369

NOTE: ONSITE PROPERTIES 1612 TO 1642 YAKONA ROAD OWNED BY HESS CORPORATION, 1 HESS PLAZA, WOODBRIDGE, NEW JERSEY 07095.



LEGEND

- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING TREELINE
- EXISTING TREES
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- SURVEY BENCHMARK
- 5' EXISTING SURFACE CONTOUR IN AREA OF REGRADING
- 1' EXISTING SURFACE CONTOUR IN AREA OF REGRADING
- 5' EXISTING SURFACE CONTOUR TO REMAIN
- 1' EXISTING SURFACE CONTOUR TO REMAIN
- 5' PROPOSED SURFACE CONTOUR
- 1' PROPOSED SURFACE CONTOUR
- LIMITS OF GRADING
- SECURITY FENCE
- SSF — SUPER SILT FENCE
- TREE PROTECTION FENCE (FOREST CONSERVATION PLAN)
- STABILIZED CONSTRUCTION ENTRANCE WITH MOUNTABLE BERM
- SOD AREA (PERMANENT)
- SOD AREA (TEMPORARY, SEE NOTE 6)
- SIP — INLET PROTECTION
- SFCD — SILT FENCE CHECK DAM

SITE CONTROLS AND E&S CONTROL PLAN NOTES

1. A GRADING PERMIT (PERMIT NO. B829569) WAS ISSUED FROM BALTIMORE COUNTY BEFORE CORRECTIVE ACTION WORK BEGAN.
2. EROSION AND SEDIMENTATION CONTROLS WERE INSTALLED AND INSPECTED BY BALTIMORE COUNTY BEFORE BEGINNING LAND DISTURBANCE AND SITE GRADING.
3. A MARYLAND-CERTIFIED EROSION AND SEDIMENT CONTROL "GREEN CARD" HOLDER WAS ONSITE DURING ALL GRADING ACTIVITIES.
4. EROSION AND SEDIMENTATION CONTROLS WERE INSPECTED AT THE END OF EACH WORK DAY. REQUIRED REPAIRS WERE MADE WITHIN 24 HOURS OF DISCOVERY.
5. EROSION AND SEDIMENTATION CONTROLS WERE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
6. SOD AT THE RAIN GARDEN PLANTINGS AREA WAS INSTALLED AS A TEMPORARY MEASURE TO PREVENT SEDIMENT DISCHARGE TO STORM WATER INLET. THE SOD WAS REMOVED WHEN THE RAIN GARDEN MULCH WAS INSTALLED.
7. EXISTING TREES AND VEGETATION WERE PROTECTED TO THE EXTENT PRACTICAL.
8. EROSION AND SEDIMENT CONTROLS WERE REMOVED AFTER SITE STABILIZATION.
9. ALL DISTURBED AREAS OF THE SITE WERE EITHER COVERED WITH PARK HARDSCAPE (SIDEWALK, PATHS, PAVERS, PLAYGROUND SURFACING) OR COVERED WITH TOPSOIL AND REVEGETATED IN ACCORDANCE WITH THE LANDSCAPE PLANS (LOWLAND SHRUB SEED MIX OR LAWN SEED MIX). SEEDED AREAS WERE COVERED WITH HAY MULCH.
10. THE TEMPORARY SECURITY FENCE WAS REMOVED AFTER THE SITE WAS STABILIZED.

SURVEY NOTES:

1. HORIZONTAL DATUM: MARYLAND STATE PLANE NAD 83/2007
2. VERTICAL DATUM: NAVD 88

BENCHMARK DATA

NO	COORDINATES	ELEV	DESCRIPTION
500	N 629,925.90 E 1,434,899.90	434.57	BM NAIL WITH TAG IN PP #BG&E 167104
501	N 629,672.27 E 1,434,724.32	430.38	BM NAIL WITH TAG IN PP #BG&E 167102

25 0 25 50
SCALE, FEET

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REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

REVISIONS

REV	DESCRIPTION

DRAWN BY
CHECKED
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SEAL

STATE OF MARYLAND PROFESSIONAL ENGINEER

January 7, 2015
DATE

TEMPORARY SITE CONTROLS AND EROSION AND SEDIMENT CONTROLS

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

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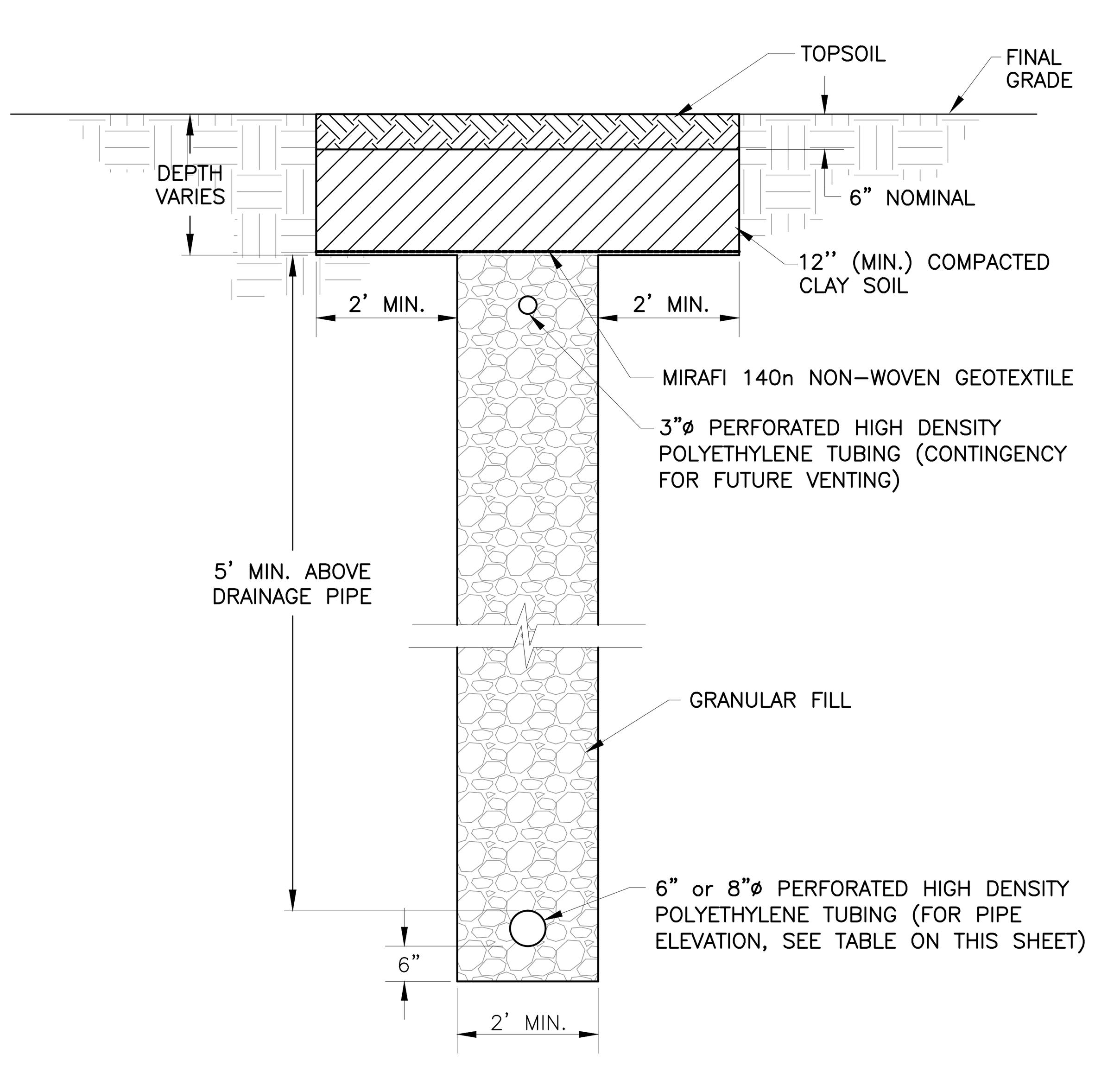
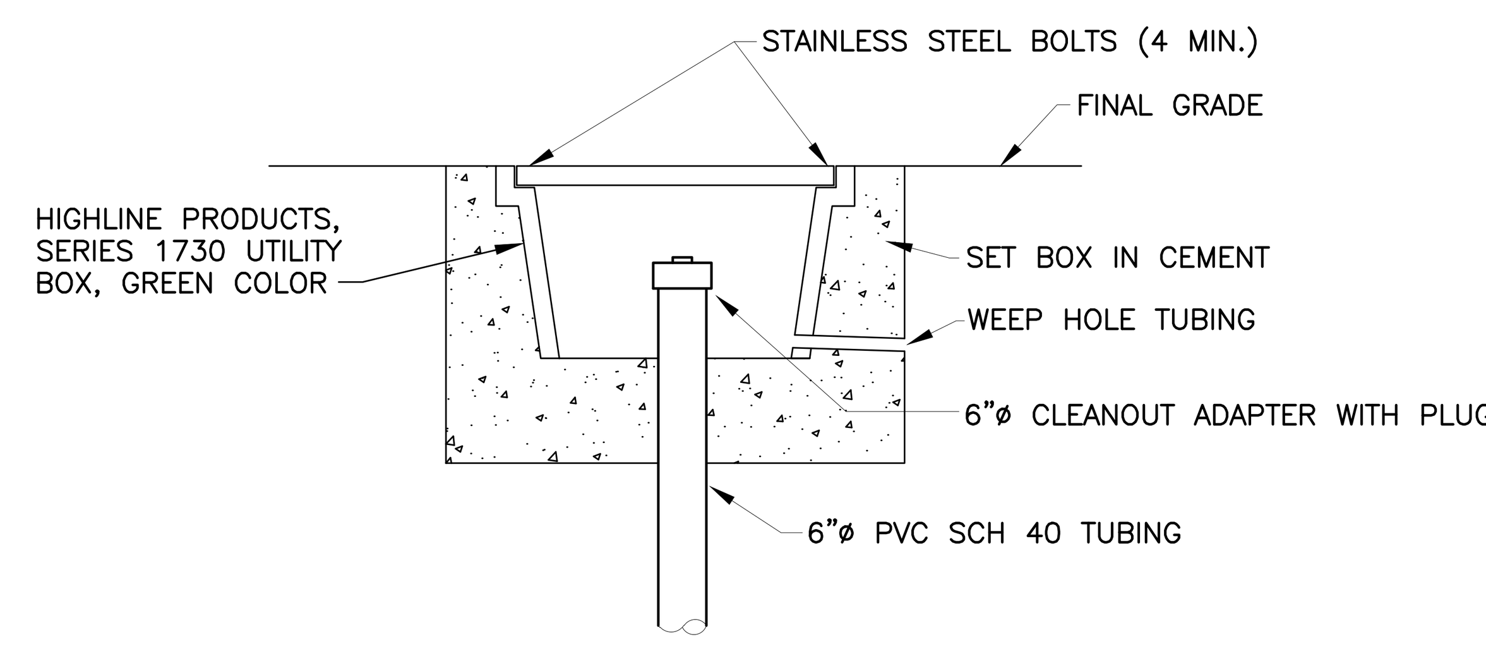
SHEET 8

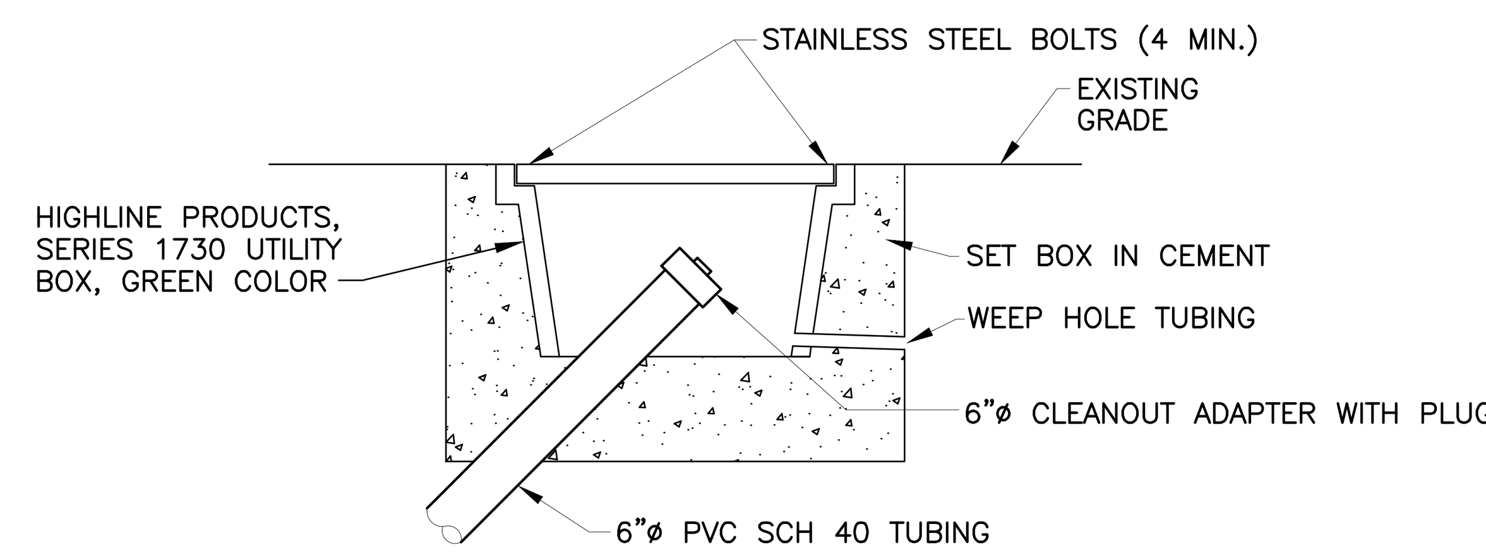
Drawing Number
14P1020-D08



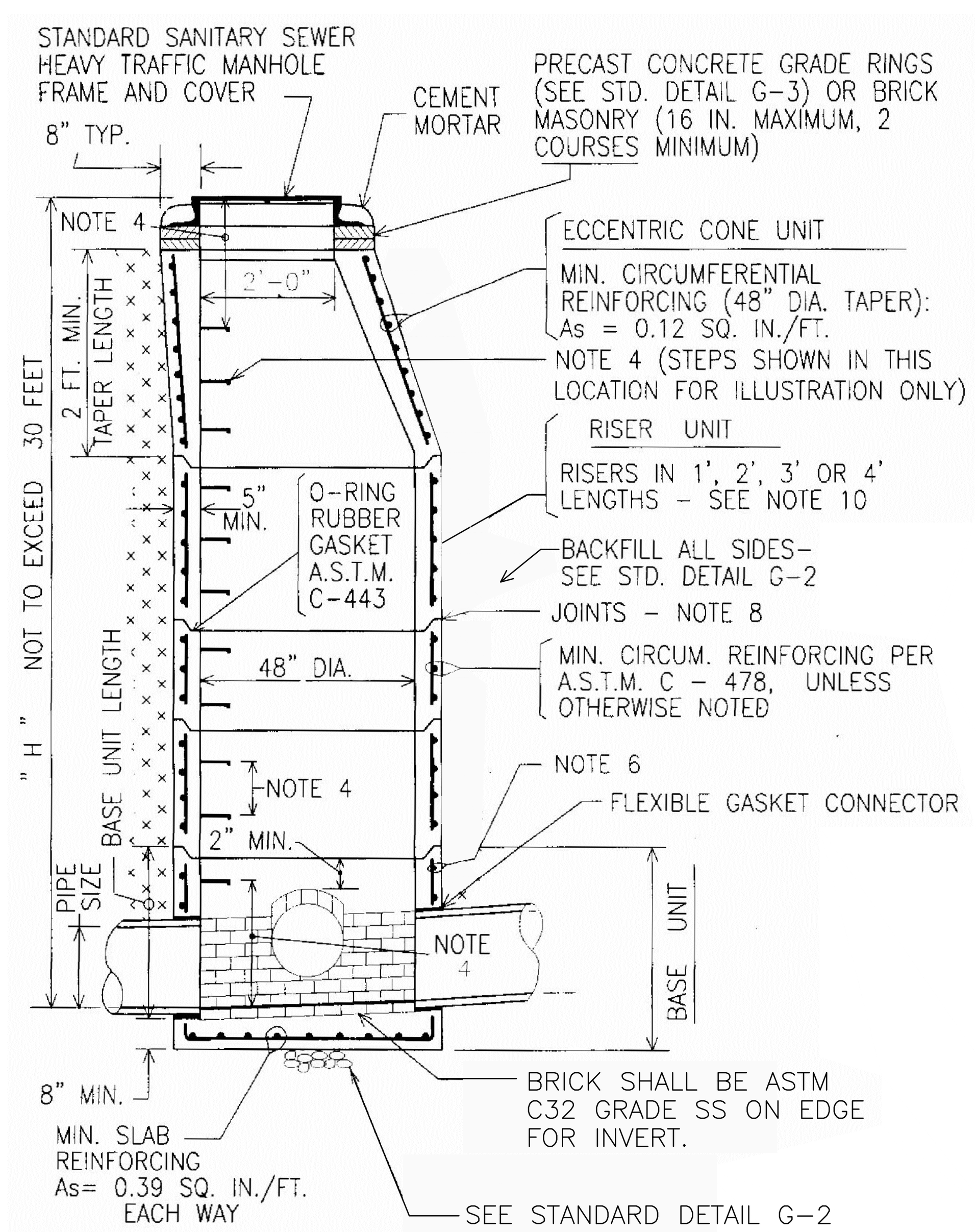
TRENCH DETAIL



CLEANOUT SURFACE BOX
(PLAYGROUND, CENTRAL, AND NORTH COLLECTORS)



CLEANOUT SURFACE BOX (SOUTH COLLECTOR)



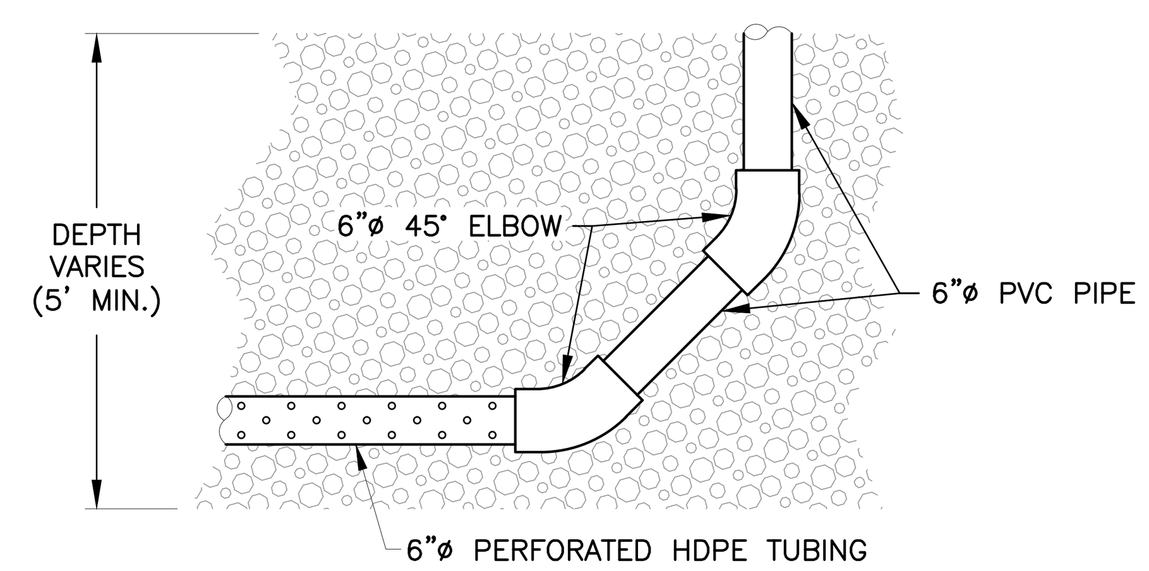
PRECAST MANHOLE A-2
48" STANDARD

TYPICAL MANHOLE DETAIL
MANHOLES 21, 22, 23, AND 24

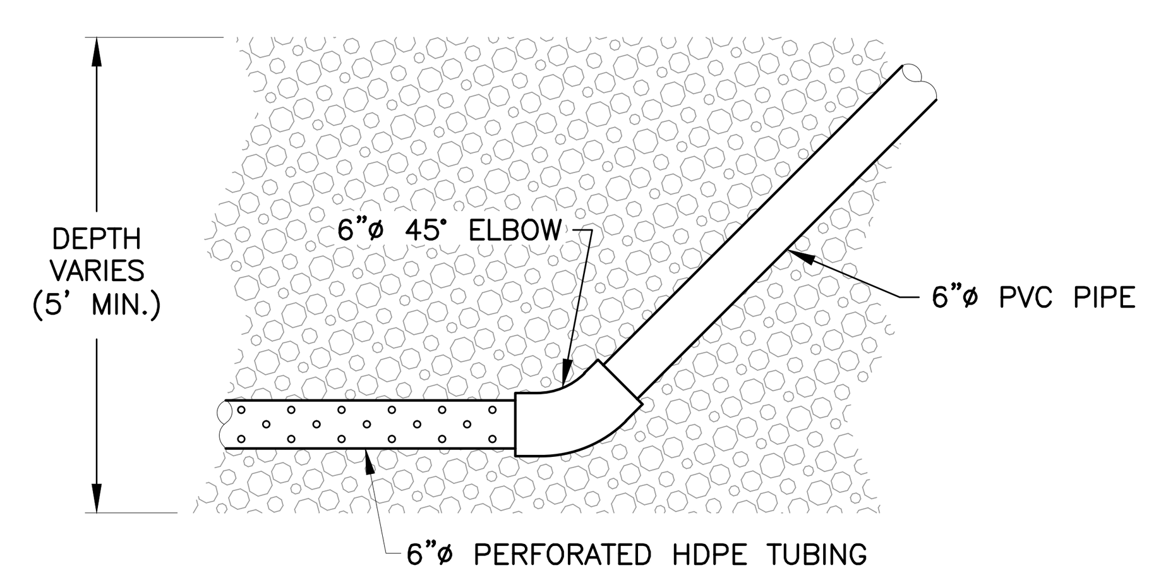
NOT TO SCALE

REFERENCE:

BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS, STORM DRAINAGE DETAILS, PRECAST A & B MANHOLE, PLATE D-3.01.



TRANSITION DETAIL
(PLAYGROUND, CENTRAL, AND NORTH COLLECTORS)



TRANSITION DETAIL (SOUTH COLLECTOR)

SCALE, FEET

Groundwater Management System (Yakona Road Collector)					
Station	Description	Material	Final Ground Surface Elevation (ft-msl)	Pipe Invert Elevation (ft-msl)	Trench Bottom Elevation (ft-msl)
10+00	Western End of Management System	Junction with Existing Storm System	429.36	427.56	427.06
10+04	Manhole #21	Concrete manhole	429.83	427.56	427.06
10+04	Manhole Junction	8-inch diameter perforated HDPE tubing	429.83	427.56	427.06
10+25	Collection tubing	8-inch diameter perforated HDPE tubing	432	427.77	427.27
10+50	Collection tubing	8-inch diameter perforated HDPE tubing	432.8	428.02	427.52
10+57	Collection tubing (Bend)	8-inch diameter perforated HDPE tubing	432.8	428.09	427.59
11+00	Collection tubing	8-inch diameter perforated HDPE tubing	433.9	428.52	428.02
11+11	Collection tubing (Bend)	8-inch diameter perforated HDPE tubing	434.8	428.63	428.13
11+25	Collection tubing	8-inch diameter perforated HDPE tubing	435	428.77	428.27
11+39	Manhole Junction	8-inch diameter perforated HDPE tubing	435.5	428.91	428.41
11+39	Manhole #22	Concrete manhole	435.5	428.91	428.41
11+39	Manhole Junction	8-inch diameter perforated HDPE tubing	435.5	428.91	428.41
11+50	Collection tubing	8-inch diameter perforated HDPE tubing	435.5	429.02	428.52
11+75	Collection tubing	8-inch diameter perforated HDPE tubing	436.2	429.27	428.77
12+00	Collection tubing	8-inch diameter perforated HDPE tubing	436.9	429.52	429.02
12+03	Collection tubing (Bend)	8-inch diameter perforated HDPE tubing	436.9	429.55	429.05
12+25	Collection tubing	8-inch diameter perforated HDPE tubing	437.4	429.77	429.27
12+50	Collection tubing	8-inch diameter perforated HDPE tubing	437.5	430.02	429.52
12+75	Collection tubing	8-inch diameter perforated HDPE tubing	437.3	430.27	429.77
12+80	Manhole Junction	8-inch diameter perforated HDPE tubing	437.3	430.32	429.82
12+80	Manhole #23	Concrete manhole	437.3	430.32	429.82
12+80	Manhole Junction	8-inch diameter perforated HDPE tubing	437.3	430.32	429.82
13+00	Collection tubing	8-inch diameter perforated HDPE tubing	437	430.52	430.02
13+25	Collection tubing	8-inch diameter perforated HDPE tubing	436.5	430.77	430.27
13+44	Manhole Junction	8-inch diameter perforated HDPE tubing	438.6	430.96	430.46
13+44	Manhole #24	Concrete manhole	438.6	430.96	430.46

South Collector Groundwater Management System					
Station	Description	Material	Final Ground Surface Elevation (ft-msl)	Pipe Invert Elevation (ft-msl)	Trench Bottom Elevation (ft-msl)
20+00	Junction with Yakona Road Collector	Manhole #21	429.83		
20+00	Manhole Junction	6-inch diameter perforated HDPE tubing	429.83	427.56	427.06
20+25	Collection tubing	6-inch diameter perforated HDPE tubing	432.2	428.06	427.56
20+50	Collection tubing	6-inch diameter perforated HDPE tubing	433	428.56	428.06
20+75	Collection tubing	6-inch diameter perforated HDPE tubing	434.1	429.06	428.56
20+95	Collection tubing	6-inch diameter perforated HDPE tubing	435	429.46	428.96
21+00	Cleanout	6-inch diameter perforated PVC tubing	435	434	433.5

Playground Collector Groundwater Management System					
Station	Description	Material	Final Ground Surface Elevation (ft-msl)	Pipe Invert Elevation (ft-msl)	Trench Bottom Elevation (ft-msl)
30+00	Junction with Yakona Road Collector	Manhole #22	435.63		
30+00	Manhole Junction	8-inch diameter perforated HDPE tubing	435.63	428.91	428.41
30+25	Collection tubing	8-inch diameter perforated HDPE tubing	436.2	429.41	428.91
30+50	Collection tubing	8-inch diameter perforated HDPE tubing	437.3	429.91	429.41
30+75	Collection tubing	8-inch diameter perforated HDPE tubing	437.9	430.41	429.91
31+00	Collection tubing	8-inch diameter perforated HDPE tubing	440.4	430.91	430.41
31+15	Cleanout	8-inch diameter perforated PVC tubing	439.4	438.4	437.9

Central Collector Groundwater Management System					
Station	Description	Material	Final Ground Surface Elevation (ft-msl)	Pipe Invert Elevation (ft-msl)	Trench Bottom Elevation (ft-msl)
40+00	Junction with Yakona Road Collector	Manhole #23	437.7		
40+00	Manhole Junction	6-Inch Diameter solid HDPE tubing	437.7	430.32	429.82
40+25	Collection tubing	6-inch diameter perforated HDPE tubing	439	430.82	430.32
40+50	Collection tubing	6-inch diameter perforated HDPE tubing	442.5	431.32	430.82
40+75	Collection tubing	6-inch diameter perforated HDPE tubing	445.5	431.82	431.32
40+90	Cleanout	6-Inch Diameter solid PVC tubing	447.2	446.2	445.7

North Collector Groundwater Management System					
Station	Description	Material	Final Ground Surface Elevation (ft-msl)	Pipe Invert Elevation (ft-msl)	Trench Bottom Elevation (ft-msl)
50+00	Junction with Yakona Road Collector	Manhole #24	438.73		
50+00	Manhole Junction	6-Inch Diameter solid HDPE tubing	438.73	430.96	430.46
50+25	Collection tubing	6-inch diameter perforated HDPE tubing	439.9	431.46	430.96
50+50	Collection tubing	6-inch diameter perforated HDPE tubing	444	431.96	431.46
50+75	Collection tubing	6-inch diameter perforated HDPE tubing	447.4	432.46	431.96
51+00	Collection tubing	6-inch diameter perforated HDPE tubing	451	432.96	432.46
51+04	Collection tubing Cleanout	6-inch diameter perforated PVC tubing	450.9	433.04	432.54

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DETAILS
GROUNDWATER MANAGEMENT SYSTEM

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
WOODBRIDGE, NEW JERSEY

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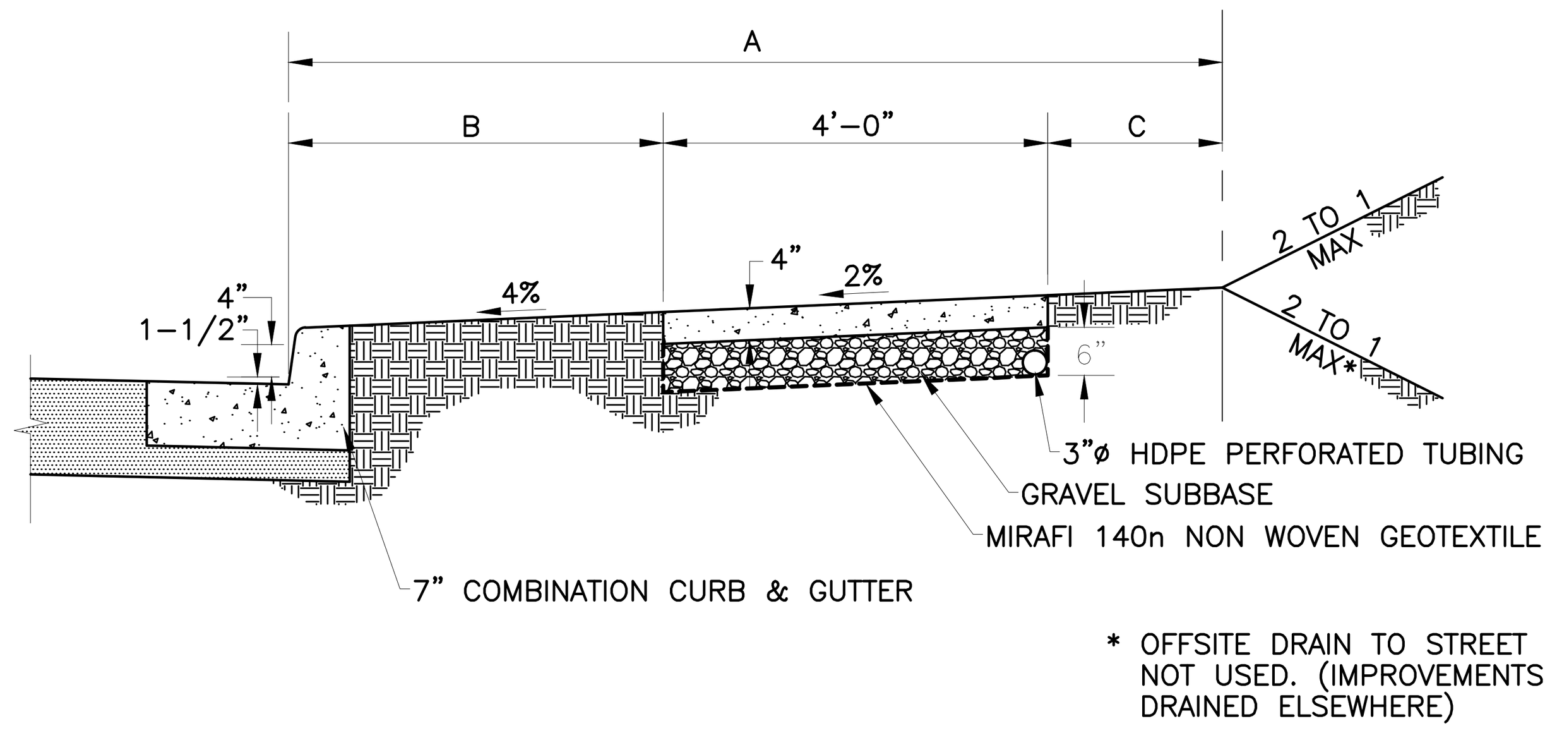
SHEET 9

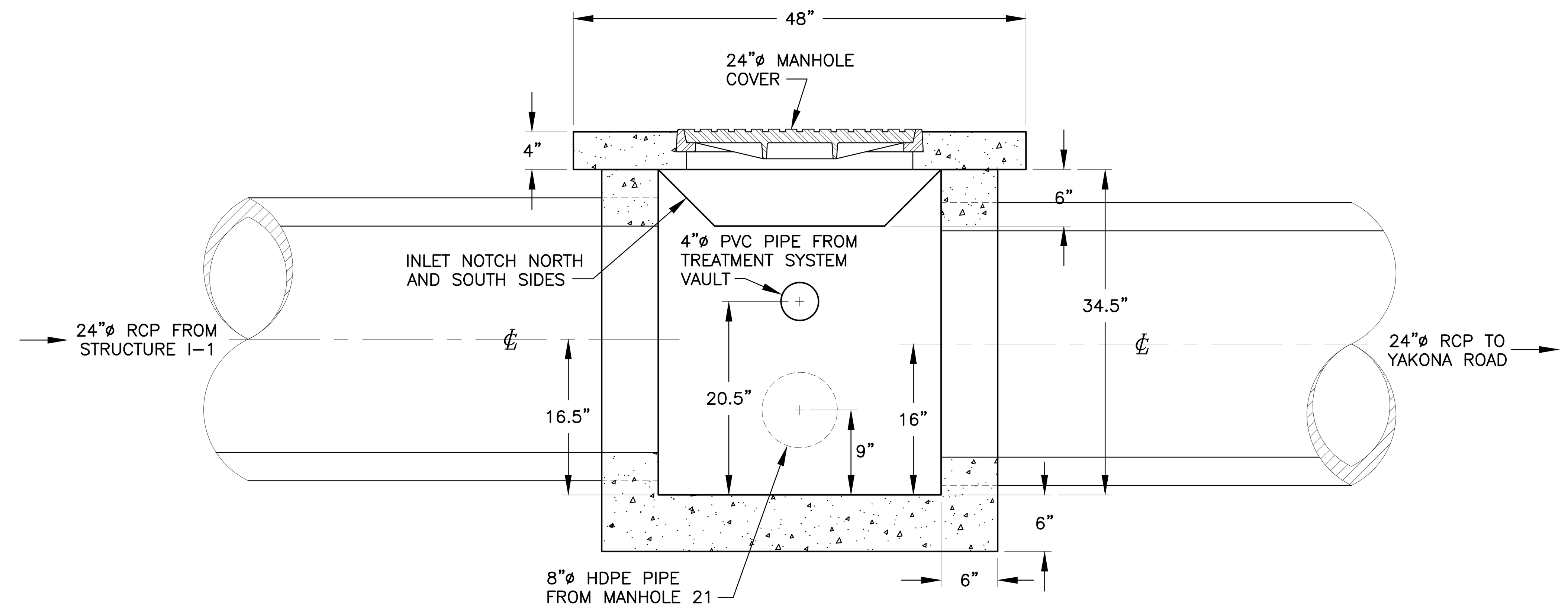
Drawing Number
14P1020-D09

D



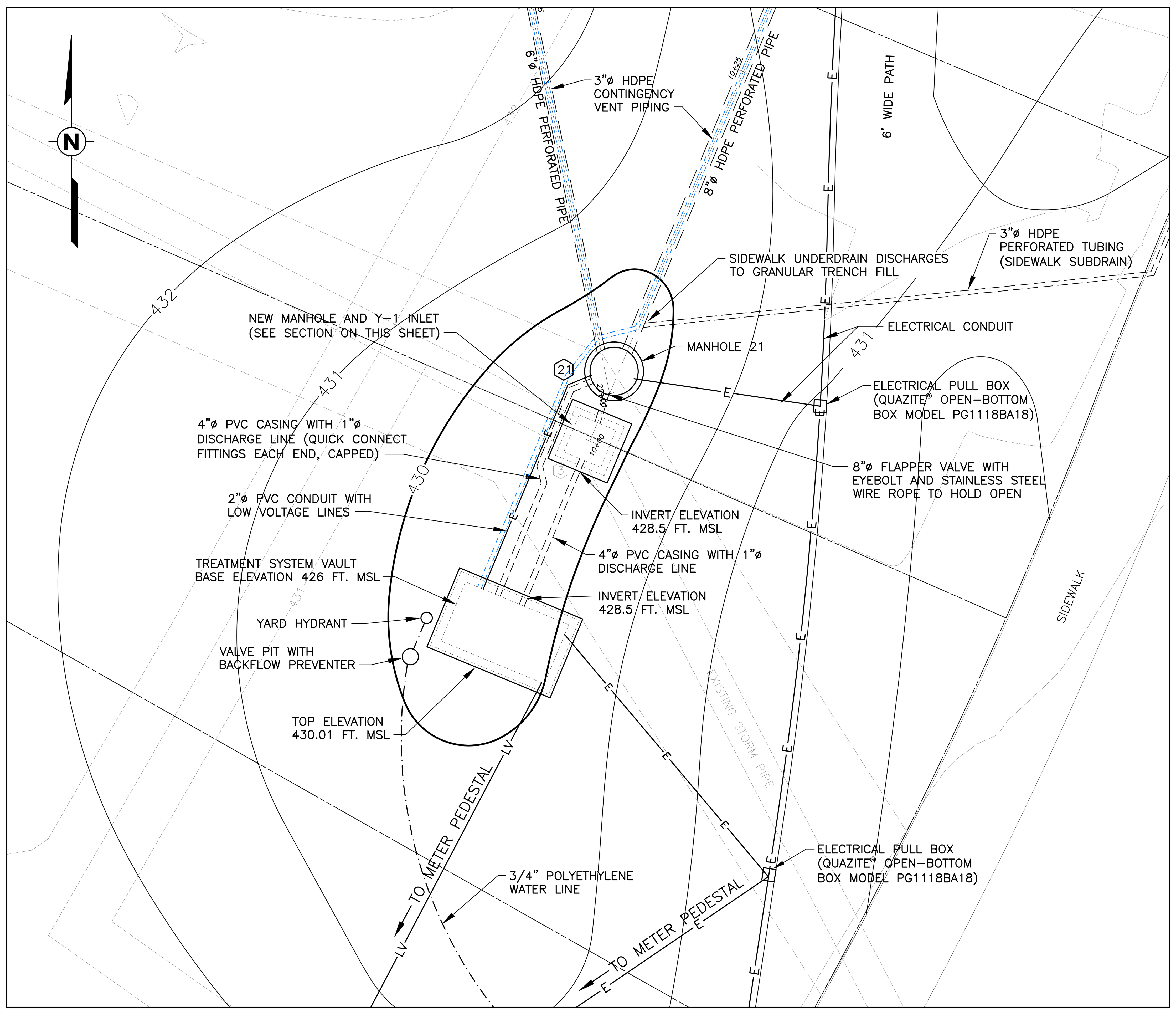
STANDARD 4 FOOT SIDEWALK
NOT TO SCALE

REFERENCE:
BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS, ROAD AND STREET DETAILS, PLATE R-19.



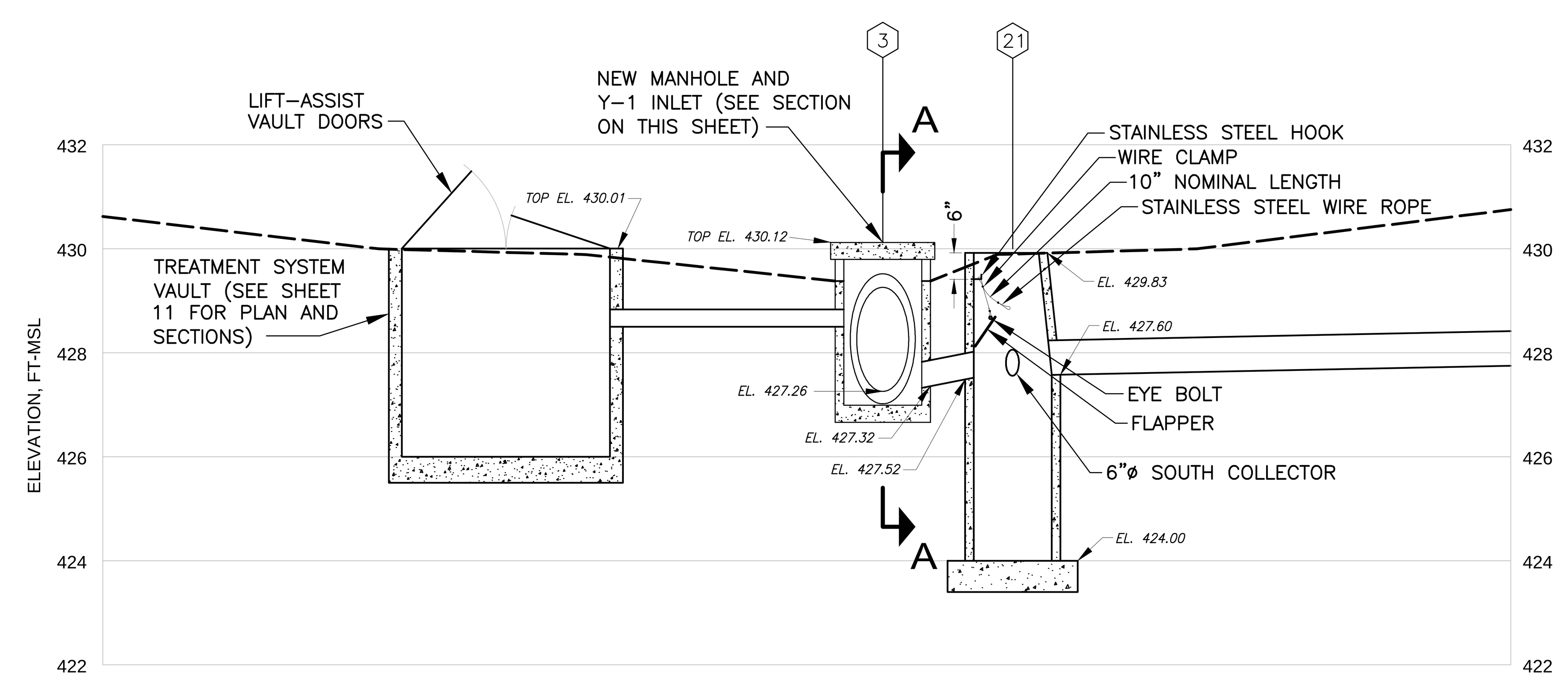
SECTION - NEW MANHOLE 3 AND Y-1 INLET

0 6 12 24
SCALE, INCHES



PLAN
TREATMENT SYSTEM VAULT

0 5 10
SCALE IN FEET



SECTION
CONTINGENCY TREATMENT SYSTEM VAULT

0 5 10
HORIZONTAL SCALE IN FEET

0 2.5 5
VERTICAL SCALE IN FEET

D

REVISIONS

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1	Revised: Chkd: Appr.:
2	Revised: Chkd: Appr.:
3	Revised: Chkd: Appr.:

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January 7, 2015
DATE

DRAWN BY RA 12052014
CHECKED DAR 01062015
APPROVED DHS 01072015

DETAILS
SEWER CONNECTIONS

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
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SHEET 10

Drawing Number
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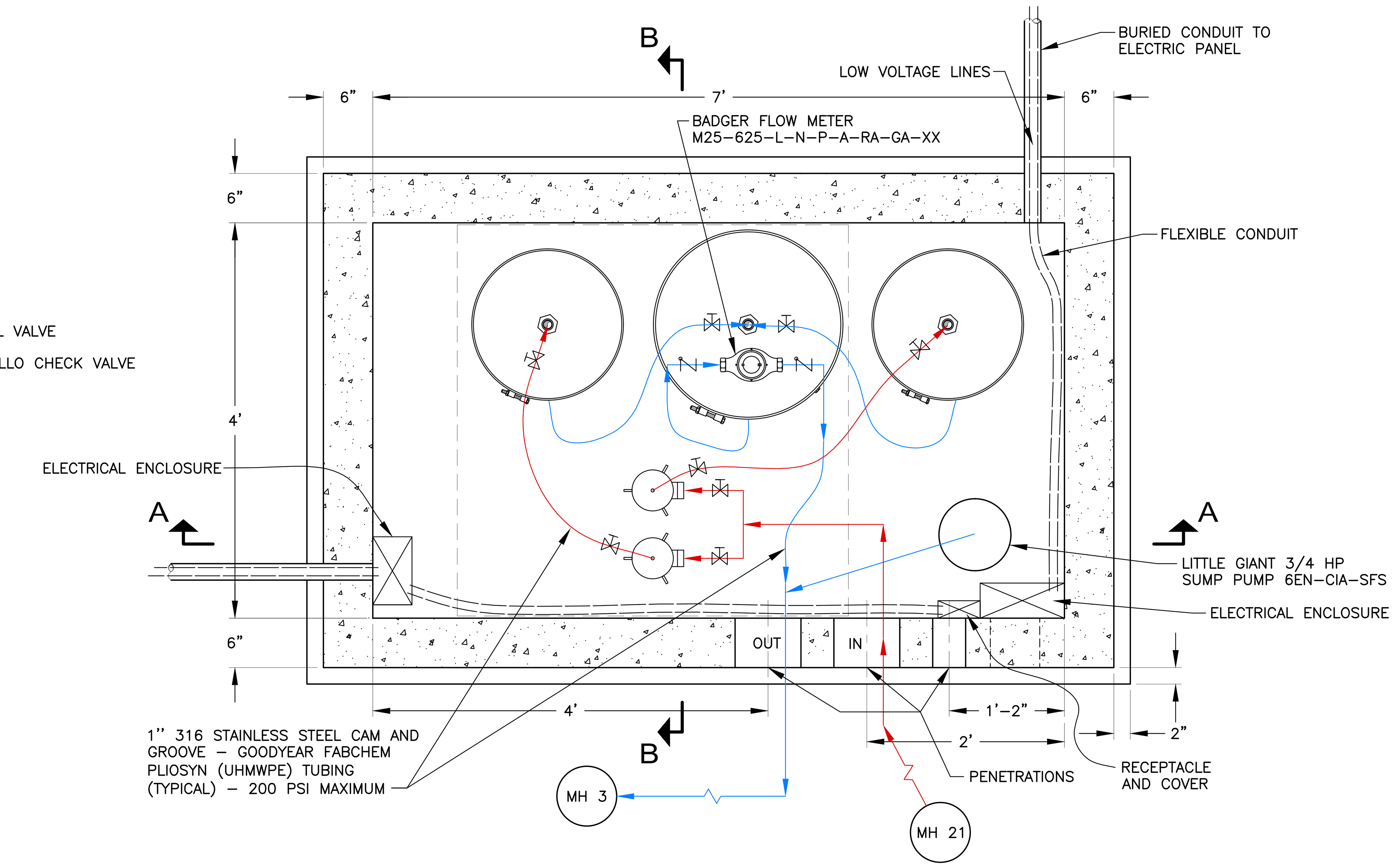
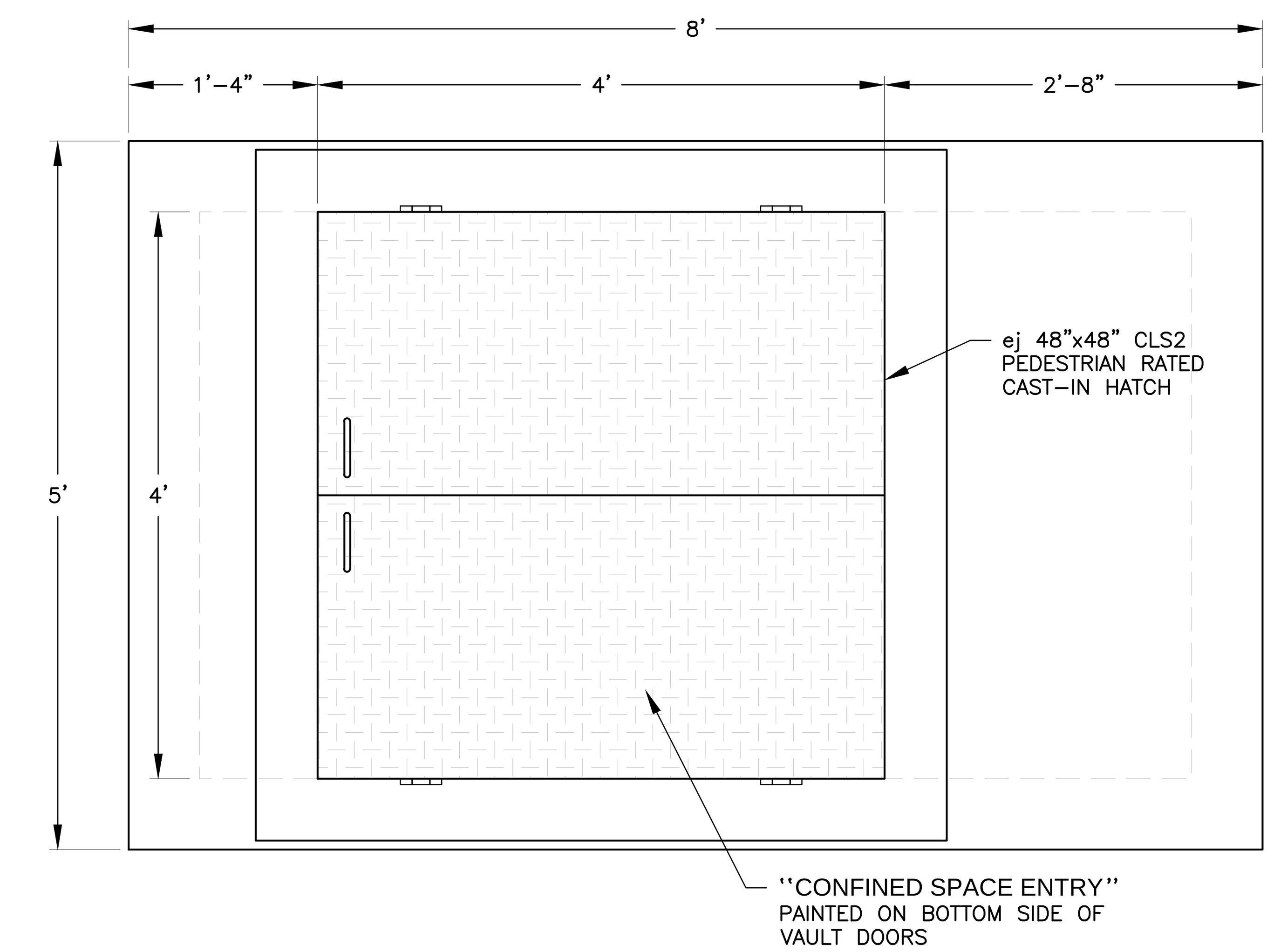
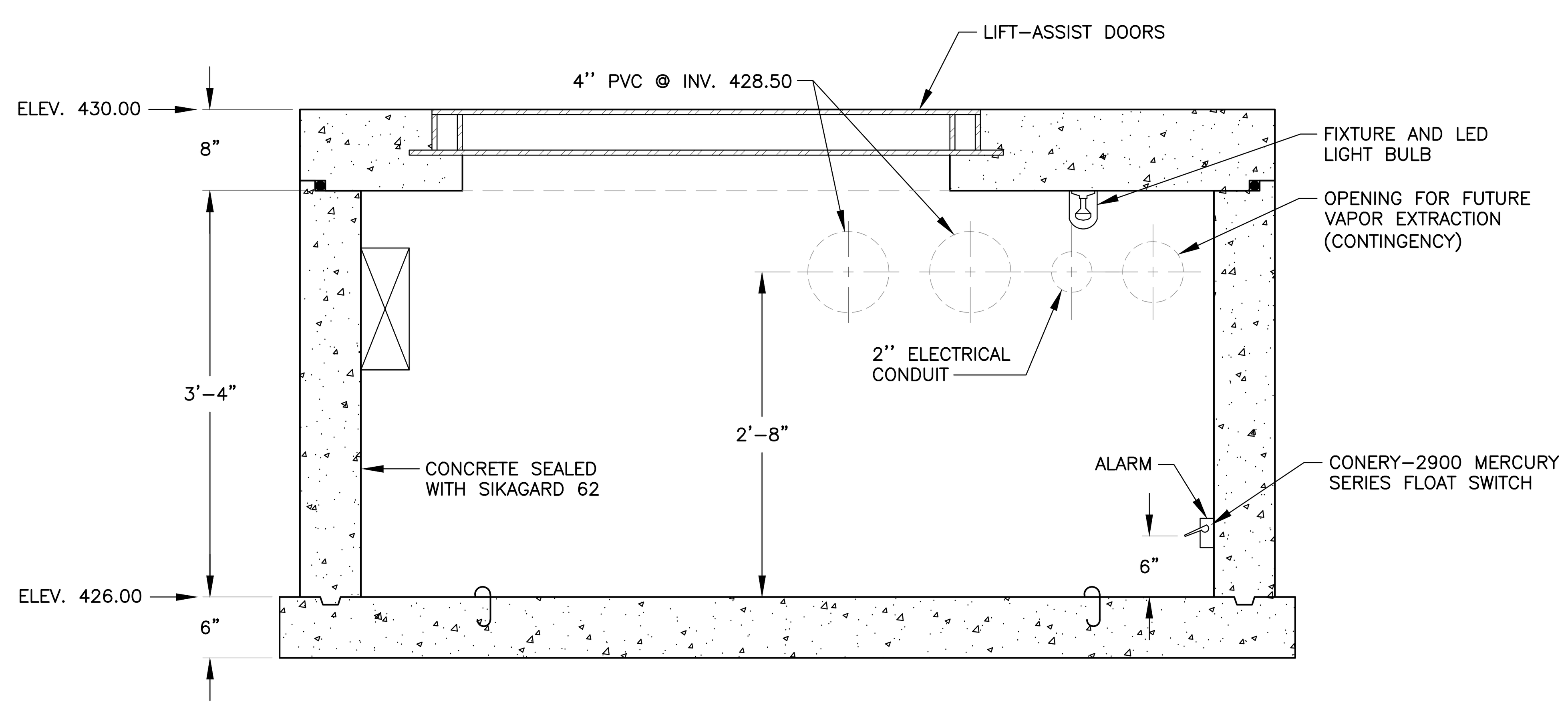
LEGEND
1'' BALL VALVE
1'' APOLLO CHECK VALVE



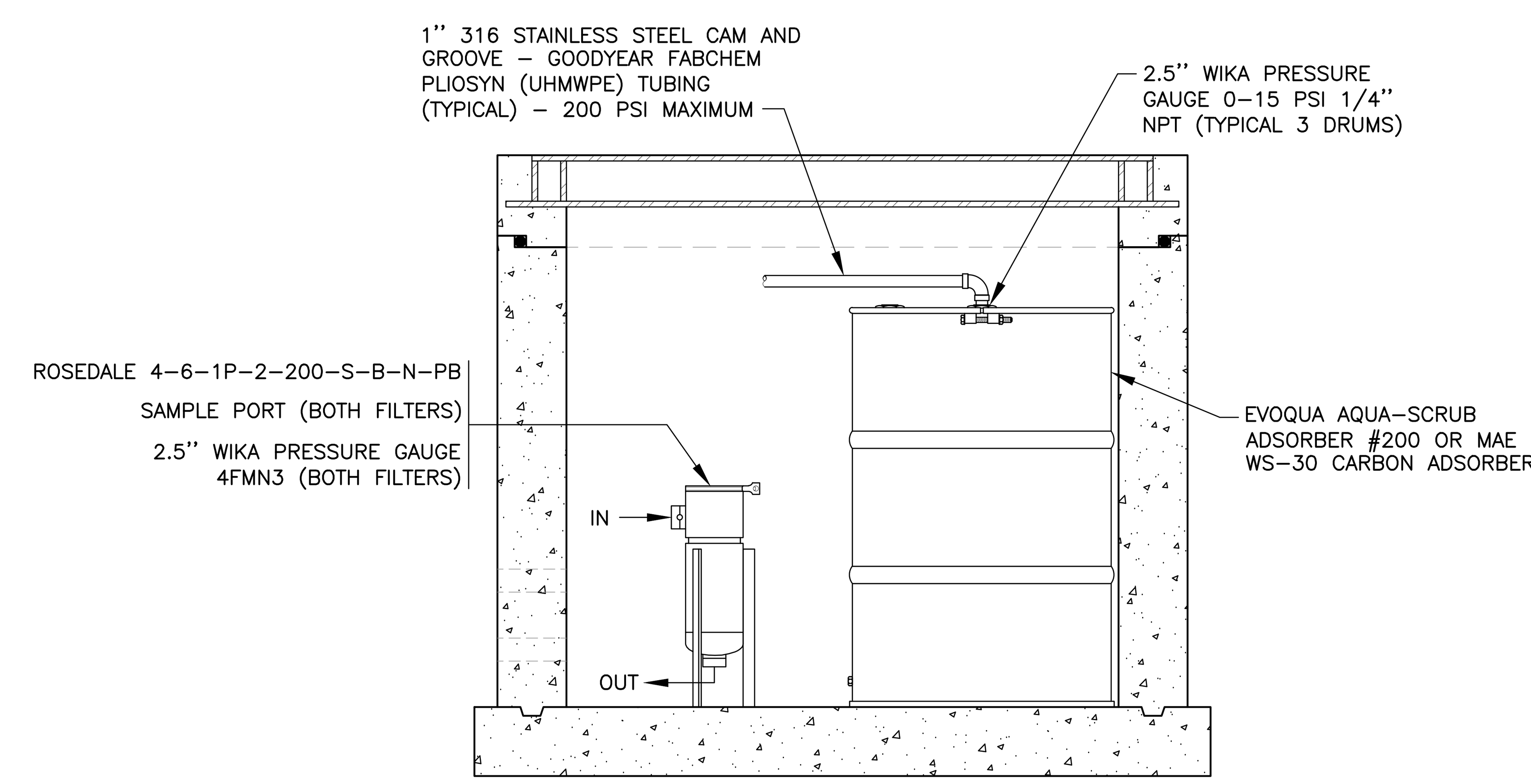
TREATMENT SYSTEM VAULT LAYOUT



TOP SLAB PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. ALL INTERCONNECTING FITTINGS CONSIST OF STAINLESS STEEL.

2. ALL INTERCONNECTING TUBING CONSISTS OF GOODYEAR FABCHEM PLIOSYN (UHMWPE) – 200 PSI MAXIMUM – CAM & GROOVE – 1-INCH.

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12 6 0 12 24
SCALE, INCHES

D

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TREATMENT SYSTEM
VAULT DETAILS AND LAYOUT
AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
HESS CORPORATION
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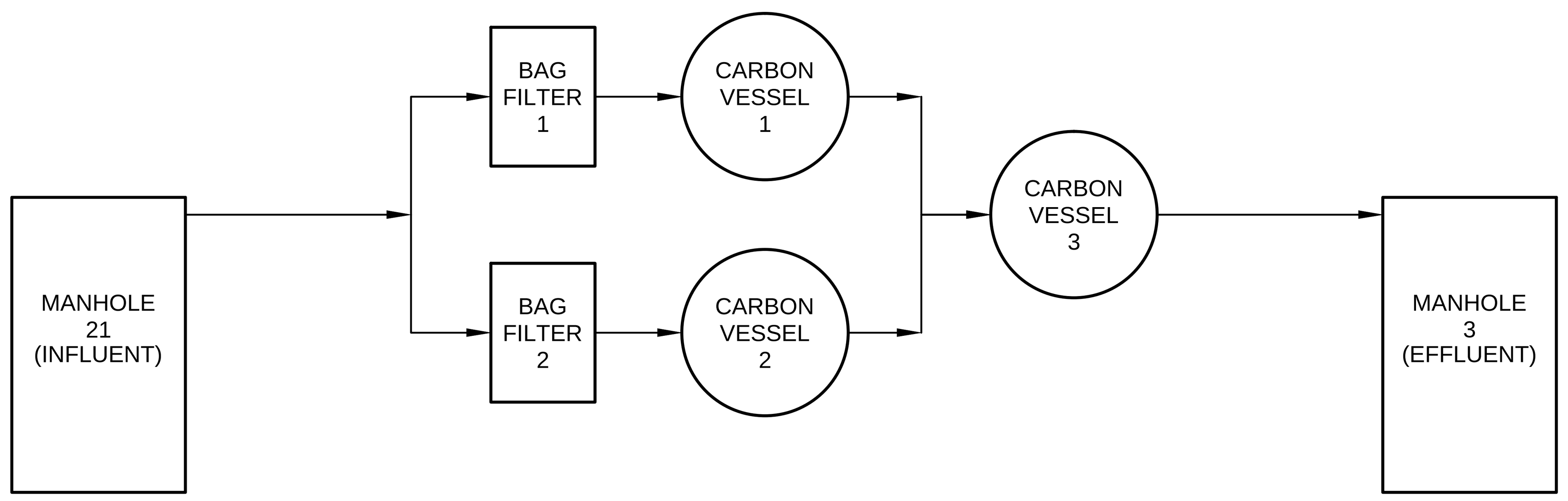
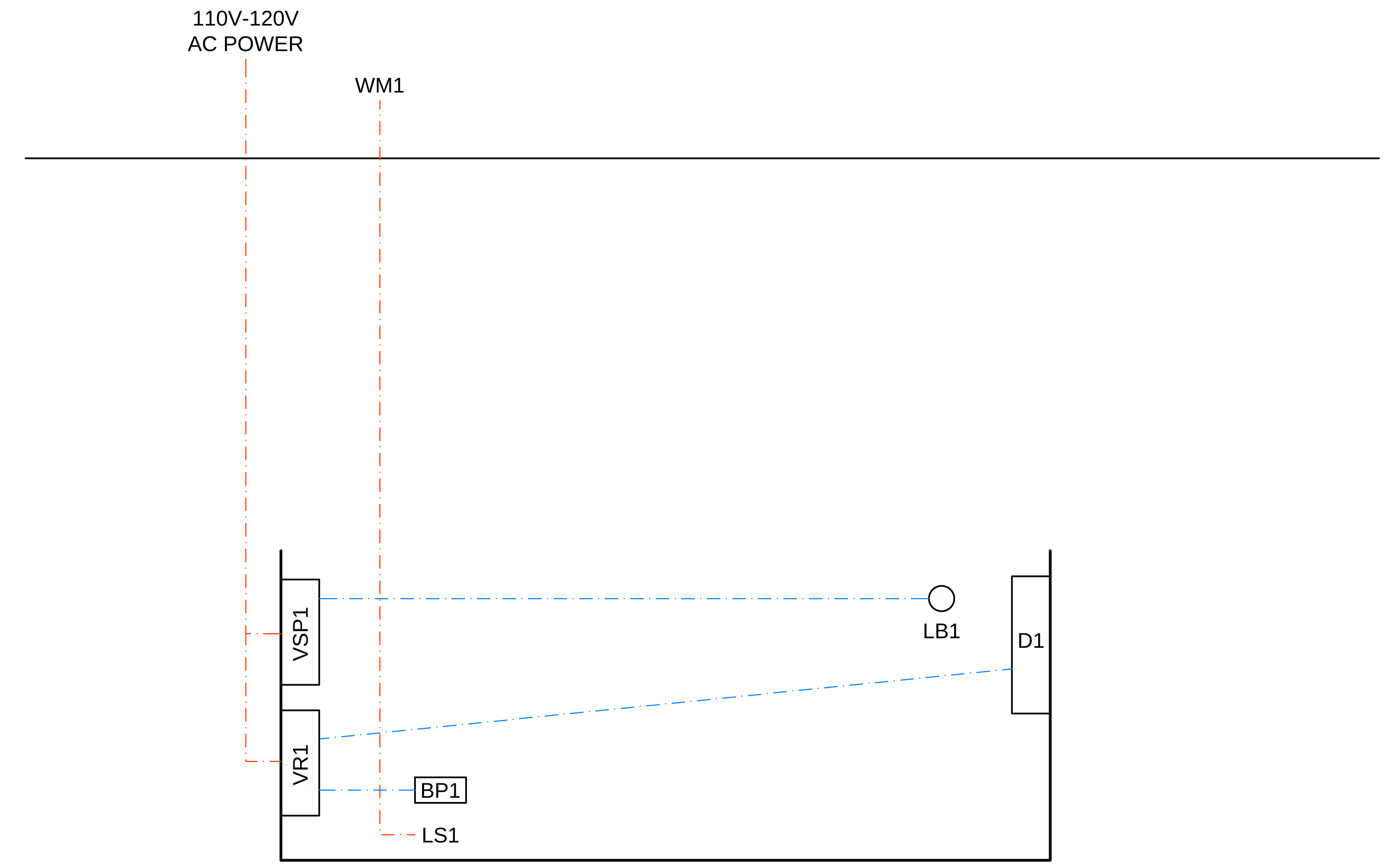


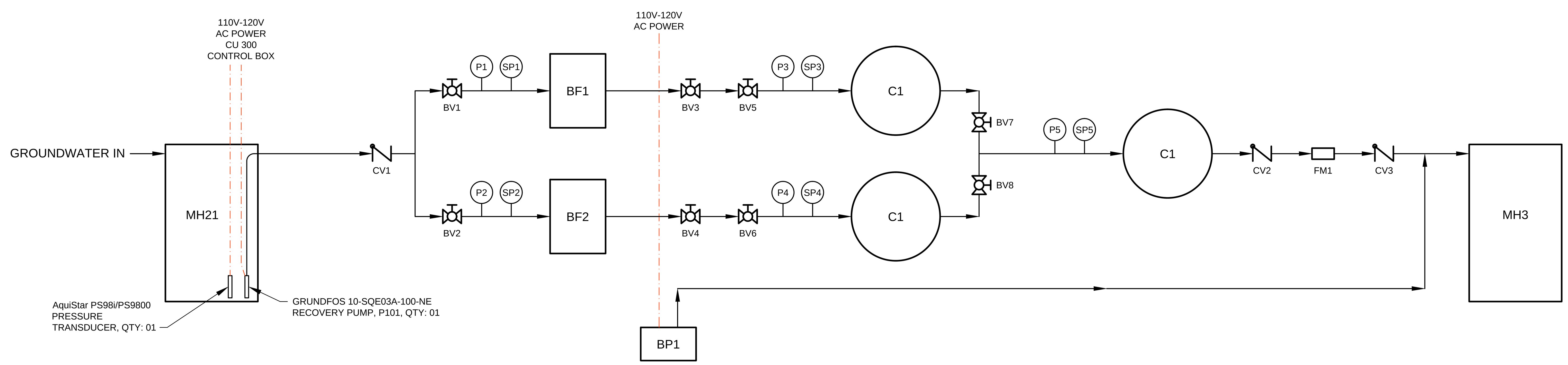
AS-BUILT CONCEPTUAL LAYOUT

NOT TO SCALE



VAULT ELECTRICAL COMPONENTS
AS-BUILT PROCESS AND INSTRUMENTATION DIAGRAM

NOT TO SCALE



AS-BUILT PIPING AND INSTRUMENTATION DIAGRAM

NOT TO SCALE

CODE	IDENTIFICATION	MODEL
P101	Grundfos Pump	10-SQE03A-100-NE
CV1	Pump Check Valve	Apollo-1CKV1
CV2	Flow Meter Check Valve	Apollo-1CKV1
CV3	Flow Meter Check Valve	Apollo-1CKV1
P1	Bag Filter 1 Pressure Gauge	4FMN3
P2	Bag Filter 2 Pressure Gauge	4FMN3
P3	Carbon Vessel 1 Pressure Gauge	4FMN1
P4	Carbon Vessel 2 Pressure Gauge	4FMN1
P5	Carbon Vessel 3 Pressure Gauge	4FMN1
SP1	Sample Port	-
SP2	Sample Port	-
SP3	Sample Port	-
SP4	Sample Port	-
SP5	Sample Port	-
BF1	Bag Filter 1	Rosedale 4-6-1P-2-200-S-B-N-PB
BF2	Bag Filter 2	Rosedale 4-6-1P-2-200-S-B-N-PB
C1	Carbon Vessel 1	MAE2 Model WS-30 Carbon Adsorber
C2	Carbon Vessel 2	MAE2 Model WS-30 Carbon Adsorber
C3	Carbon Vessel 3	Evoqua Aqua-Scrub Adsorber Number 200
MH21	Manhole 21	-
MH3	Manhole 3	-
FM1	Flow Totalizer	M25-625-L-N-P-A-RA-GA-XX
BV1	Ball Valve	1-inch Stainless Steel
BV2	Ball Valve	1-inch Stainless Steel
BV3	Ball Valve	1-inch Stainless Steel
BV4	Ball Valve	1-inch Stainless Steel
BV5	Ball Valve	1-inch Stainless Steel
BV6	Ball Valve	1-inch Stainless Steel
BV7	Ball Valve	1-inch Stainless Steel
BV8	Ball Valve	1-inch Stainless Steel
BP1	Sump Pump	6EN-CIA-SFS
WM1	Wireless Modem	OmniSite XR50-PM-120
EP1	Electrical Power	110V to 120V, 60Hz
HT1	Heat Trace	Raychem Self-Regulating Heat Cable, 50 ft.
LS1	Level Switch	Conery – 2900 Mercury Series Float Switch
LB1	LED Light Bulb	4.5 watt/3RB17
VSP1	Vault Sub-Panel	110V-120V AC Power
VR1	Vault Receptacle	110V-120V AC Power

D

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TREATMENT SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM

AS–BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

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SHEET 12

Drawing Number
14P1020–D12

LEGEND

- EXISTING CONTOUR
- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING TREELINE
- EXISTING TREES
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- EXISTING MONITORING WELL
- PROPOSED SURFACE CONTOUR

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25 0 25 50

SCALE, FEET

D

REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

REV	REVISIONS DESCRIPTION

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MONITORING WELL PLAN

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

PREPARED FOR
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SHEET 13

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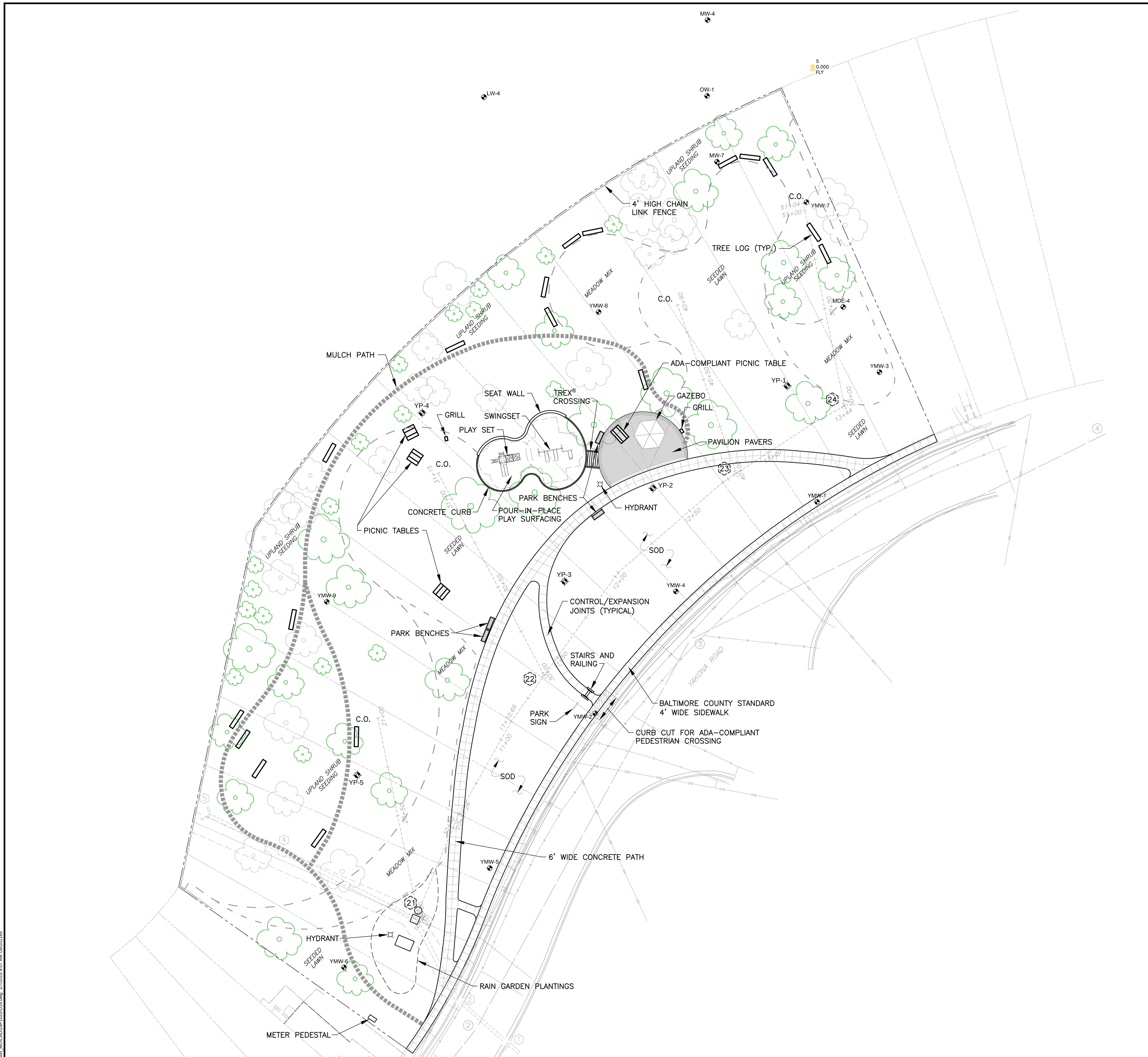
14P1020-D13



LEGEND

- EXISTING UNDERGROUND GAS LINE
- EXISTING UNDERGROUND WATER LINE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING OVERHEAD ELECTRIC LINE
- STORM SEWER MANHOLE AND INLET CALLOUT
- SANITARY SEWER MANHOLE CALLOUT
- EXISTING MONITORING WELL
- PIEZOMETER
- HYDRANT
- GROUNDWATER MANAGEMENT SYSTEM (APPROXIMATE LOCATION)

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25 0 25 50
SCALE, FEET

D

REFERENCE: A. MORTON THOMAS AND ASSOCIATES, INC. DRAWING, TITLED TOPOGRAPHIC SURVEY, SHEET 1, AMT FILE NO. 112-689-002, DATED JUNE, 2013.

REVISIONS

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1	Revised: Chkd: Appr.:
2	Revised: Chkd: Appr.:
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STATE OF MARYLAND · DAVID H. SARR · No. 37172 · PROFESSIONAL ENGINEER

January 7, 2015
DATE

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PARK AMENITIES PLAN

AS-BUILT DRAWINGS
RIDGELY MANOR PARK DEVELOPMENT
TOWSON, MARYLAND

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SHEET 14

Drawing Number
14P1020-D14

Tables

Table 1

Groundwater Management System Influent and Effluent Sample Results
Ridgely Manor Park
Towson, Maryland

Parameter	Daily Maximums (b)	Sample Date: 5/22/2014	5/28/2014	6/5/2014	6/11/2014	6/17/2014	7/1/2014	7/9/2014	7/16/2014	7/24/2014	7/31/2014	8/15/2014	8/29/2014	9/15/2014	10/9/2014	10/16/2014	10/29/2014	11/14/2014	11/25/2014	12/12/2014
Influent																				
Volatile Organic Compounds (µg/l)																				
Benzene	-	-	1.2	-	-	10 U	-	-	1 U	1.1	-	5 U	-	-	-	-	1 U	1 U	1 U	1 U
Ethylbenzene	-	-	100	-	-	230	-	-	1.1	130	-	120	-	-	-	-	82	42	37	37
Toluene	-	-	40	-	-	120	-	-	2.2	50	-	32	-	-	-	-	9.7	4.6	3.5	4.2
m&p-Xylene	-	-	710	-	-	1,100	-	-	18	700	-	430	-	-	-	-	110	56	42	45
o-Xylene	-	-	150	-	-	260	-	-	12	210	-	32	-	-	-	-	7.8	4.1	3.7	5.0
Total BTEX	-	-	1,001	-	-	1,720	-	-	34.3	1,091	-	619	-	-	-	-	210.5	107.7	87.2	92.2
Methyl-t-Butyl Ether (MTBE)	-	-	1 U	-	-	10 U	-	-	4.9	1 U	-	5 U	-	-	-	-	1 U	1 U	1 U	1 U
Naphthalene	-	-	92	-	-	49	-	-	1.4	110	-	96	-	-	-	-	60	50	40	27
Petroleum Hydrocarbons (mg/l)																				
DRO	-	-	0.8	-	-	1.4	-	-	0.93	0.79	-	1.3	-	-	-	-	0.81	0.48	0.38	0.31
GRO	-	-	5.2	-	-	8.4	-	-	0.17	4.9	-	2.9	-	-	-	-	1.2	0.93	0.59	0.71
Total TPH	-	-	6	-	-	9.8	-	-	1.1	5.69	-	4.2	-	-	-	-	2.01	1.41	0.97	1.02
Effluent																				
Volatile Organic Compounds (µg/l)																				
Benzene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m&p-Xylene	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total BTEX	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl-t-Butyl Ether (MTBE)	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	6.3	1 U	1 U	1 U
Naphthalene	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Petroleum Hydrocarbons (mg/l)																				
DRO	-	0.1 U	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U	0.1 U	-	0.37	0.1 U	0.13	0.1 U	0.1 U	0.1 U	0.16	0.1 U	0.1 U	0.1 U
GRO	-	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	-	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Total TPH	15	-	-	-	-	0.13	-	-	-	-	0.37	-	0.13	-	0.11	-	0.16	-	-	-

a/ µg/l = micrograms per liter; BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes; DRO = Diesel Range Organics; GRO = Gasoline Range Organics; TPH = Total Petroleum Hydrocarbons; "-" = not promulgated, not sampled or not detected.
b/ Effluent limitations for treated petroleum hydrocarbon contaminated groundwater to surface water or groundwaters of the State.
c/ Data Qualifiers:
U = Compound not detected above reported limit.

Table 2

Groundwater Management System Laterals Sample Results
Ridgely Manor Park
Towson, Maryland

Sample Location:	MH-21 Lateral	MH-21 Composite	MH-22 Lateral	MH-23 Lateral	MH-24 Lateral
Sample Date:	**7/1/2014**	**7/1/2014**	**7/1/2014**	**7/1/2014**	**7/1/2014**
Parameter					
Volatile Organic Compounds (µg/l)					
Benzene	1 U	10 U	10 U	10 U	10 U
Ethylbenzene	1.8	40	64	57	930
Toluene	13	37	44	250	15
m&p-Xylene	310	590	690	2800	1300
o-Xylene	120	140	140	720	170
Total BTEX	444.8	807	938	3827	2415
Methyl-t-Butyl Ether (MTBE)	1 U	10 U	10 U	10 U	10 U
Naphthalene	5.5	46	40	180	54
Petroleum Hydrocarbons (mg/l)					
DRO	0.15	3.3	0.66	1.5	0.52
GRO	1.8	3.6	4.7	15	7.6
Total TPH	1.95	6.9	5.36	16.5	8.12
pH (S.U.)					
pH, electrometric	7.3	7.3	6.9	6.8	6.7

a/ µg/l = micrograms per liter, mg/l = milligrams per liter, S.U. = Standard Units; BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes; DRO = Diesel Range Organics; GRO = Gasoline Range Organics; TPH = Total Petroleum Hydrocarbons

b/ Data Qualifiers:

U = Compound not detected above reported limit.

Appendix A – Analytical Data Reports – Soil Characterization

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14051612

Project Manager: Jim Bowie

Project Name : Ridgely Manor Park

Project Location: Towson

Project ID : 1401430

May 21, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

May 21, 2014

Jim Bowie
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14051612**
Project Name: Ridgely Manor Park
Project Location: Towson
Project ID.: 1401430

Dear Jim Bowie :

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 **14051612**.

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 20, 2014. 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,

Cathy Thompson
QA Officer

Sample Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14051612

Project ID: 1401430

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/16/2014 at 01:19 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14051612-001	Soil 051614	SOIL	05/16/14 11:30
14051612-002	Soil 051614	SOIL	05/16/14 11:30

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)].

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 LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14051612

WSP Environment & Energy - Reston, Reston, VA

May 21, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401430

Sample ID: Soil 051614 | **Date/Time Sampled: 05/16/2014 11:30** | **PSS Sample ID: 14051612-001**
Matrix: SOIL | **Date/Time Received: 05/16/2014 13:19** | **% Solids: 84**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	59		1	05/19/14	05/19/14 06:52	1028

RCRA Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**2.2**	mg/kg	0.55		1	05/16/14	05/20/14 13:53	1033
Barium	**34**	mg/kg	2.7		1	05/16/14	05/20/14 13:53	1033
Cadmium	ND	mg/kg	2.7		1	05/16/14	05/19/14 16:05	1033
Chromium	**24**	mg/kg	2.7		1	05/16/14	05/19/14 16:05	1033
Lead	**27**	mg/kg	2.7		1	05/16/14	05/19/14 16:05	1033
Mercury	ND	mg/kg	0.11		1	05/16/14	05/19/14 16:05	1033
Selenium	ND	mg/kg	2.7		1	05/16/14	05/19/14 16:05	1033
Silver	ND	mg/kg	2.7		1	05/16/14	05/19/14 16:05	1033

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)	**7.5**	mg/kg	4.8		1	05/16/14	05/19/14 11:28	1040

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	05/19/14	05/19/14 11:43	1035

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6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

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No: 14051612

WSP Environment & Energy - Reston, Reston, VA

May 21, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401430

Sample ID: Soil 051614 | **Date/Time Sampled: 05/16/2014 11:30** | **PSS Sample ID: 14051612-001**
Matrix: SOIL | **Date/Time Received: 05/16/2014 13:19** | **% Solids: 84**

Polychlorinated Biphenyls | Analytical Method: SW-846 8082 A | Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1221	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1232	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1242	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1248	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1254	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029
PCB-1260	ND	mg/kg	0.060		1	05/19/14	05/20/14 13:02	1029

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6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

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CERTIFICATE OF ANALYSIS

No: 14051612

WSP Environment & Energy - Reston, Reston, VA

May 21, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401430

Sample ID: Soil 051614 | **Date/Time Sampled: 05/16/2014 11:30** | **PSS Sample ID: 14051612-001**
Matrix: SOIL | **Date/Time Received: 05/16/2014 13:19** | **% Solids: 84**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Chloromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Vinyl Chloride	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Bromomethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Chloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Acetone	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
Cyclohexane	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
Trichlorofluoromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1-Dichloroethene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Methylene Chloride	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
trans-1,2-Dichloroethene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Methyl-t-butyl ether	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1-Dichloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
2-Butanone (MEK)	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
cis-1,2-Dichloroethene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Bromochloromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Chloroform	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1,1-Trichloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,2-Dichloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Carbon Tetrachloride	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Benzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,2-Dichloropropane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Carbon Disulfide	ND	ug/kg	12		1	05/19/14	05/20/14 04:44	1011
Methylcyclohexane	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
Trichloroethene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Methyl Acetate	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
Bromodichloromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
cis-1,3-Dichloropropene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
4-Methyl-2-Pentanone	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14051612

WSP Environment & Energy - Reston, Reston, VA

May 21, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401430

Sample ID: Soil 051614 **Date/Time Sampled: 05/16/2014 11:30** **PSS Sample ID: 14051612-001**
Matrix: SOIL **Date/Time Received: 05/16/2014 13:19** **% Solids: 84**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1,2-Trichloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Toluene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
2-Hexanone	ND	ug/kg	24		1	05/19/14	05/20/14 04:44	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Dibromochloromethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Bromoform	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Tetrachloroethene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Chlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Ethylbenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
m,p-Xylenes	ND	ug/kg	12		1	05/19/14	05/20/14 04:44	1011
Styrene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
o-Xylene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Isopropylbenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,3-Dichlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,4-Dichlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,2-Dichlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	48		1	05/19/14	05/20/14 04:44	1011
1,2,4-Trichlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
Naphthalene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011
1,2,3-Trichlorobenzene	ND	ug/kg	6.0		1	05/19/14	05/20/14 04:44	1011

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

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CERTIFICATE OF ANALYSIS

No: 14051612

WSP Environment & Energy - Reston, Reston, VA

May 21, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401430

Sample ID: Soil 051614 **Date/Time Sampled: 05/16/2014 11:30** **PSS Sample ID: 14051612-002**
Matrix: SOIL **Date/Time Received: 05/16/2014 13:19**

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

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Vinyl chloride	ND	mg/L	0.10		100	0.2	05/19/14	05/19/14 16:47	1011
1,1-Dichloroethene	ND	mg/L	0.10		100	0.7	05/19/14	05/19/14 16:47	1011
2-Butanone (MEK)	ND	mg/L	1.0		100	200	05/19/14	05/19/14 16:47	1011
Chloroform	ND	mg/L	0.10		100	6	05/19/14	05/19/14 16:47	1011
1,2-Dichloroethane	ND	mg/L	0.10		100	0.5	05/19/14	05/19/14 16:47	1011
Carbon tetrachloride	ND	mg/L	0.10		100	0.5	05/19/14	05/19/14 16:47	1011
Benzene	ND	mg/L	0.10		100	0.5	05/19/14	05/19/14 16:47	1011
Trichloroethene	ND	mg/L	0.10		100	0.5	05/19/14	05/19/14 16:47	1011
Tetrachloroethene	ND	mg/L	0.10		100	0.7	05/19/14	05/19/14 16:47	1011
Chlorobenzene	ND	mg/L	0.10		100	100	05/19/14	05/19/14 16:47	1011
1,4-Dichlorobenzene	ND	mg/L	0.10		100	7.5	05/19/14	05/19/14 16:47	1011

TCLP Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	mg/L	0.010		1	0.13	05/19/14	05/20/14 21:43	1014
Hexachlorobenzene	ND	mg/L	0.010		1	0.13	05/19/14	05/20/14 21:43	1014
Hexachlorobutadiene	ND	mg/L	0.010		1	0.5	05/19/14	05/20/14 21:43	1014
Hexachloroethane	ND	mg/L	0.010		1	3	05/19/14	05/20/14 21:43	1014
2-Methylphenol	ND	mg/L	0.010		1	200	05/19/14	05/20/14 21:43	1014
3&4-Methylphenol	ND	mg/L	0.010		1	200	05/19/14	05/20/14 21:43	1014
Nitrobenzene	ND	mg/L	0.010		1	2	05/19/14	05/20/14 21:43	1014
Pentachlorophenol	ND	mg/L	0.020		1	100	05/19/14	05/20/14 21:43	1014
Pyridine	ND	mg/L	0.010		1	5	05/19/14	05/20/14 21:43	1014
2,4,6-Trichlorophenol	ND	mg/L	0.010		1	2	05/19/14	05/20/14 21:43	1014
2,4,5-Trichlorophenol	ND	mg/L	0.010		1	400	05/19/14	05/20/14 21:43	1014

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14051612
Project ID: 1401430

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.

Sample Receipt:

Per client - 6010 = SW6020 RCRA metals

Analytical:

TCLP Volatile Organic Compounds

Batch: 113947
Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

TCLP Semivolatile Organic Compounds

Batch: 113951
Laboratory control sample (LCS) exceedances identified; 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.

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): **14051612**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	Soil 051614	Initial	14051612-001	1045	S	113885	113885	05/16/2014	05/16/2014 14:29	05/16/2014 14:29
EPA 9071 B-Modified	Soil 051614	Initial	14051612-001	1028	S	113899	113899	05/16/2014	05/19/2014 06:52	05/19/2014 06:52
	113899-1-BKS	BKS	113899-1-BKS	1028	S	113899	113899	--------	05/19/2014 06:52	05/19/2014 06:52
	113899-1-BLK	BLK	113899-1-BLK	1028	S	113899	113899	--------	05/19/2014 06:52	05/19/2014 06:52
	113899-1-BSD	BSD	113899-1-BSD	1028	S	113899	113899	--------	05/19/2014 06:52	05/19/2014 06:52
	Soil 051614 S	MS	14051612-001 S	1028	S	113899	113899	05/16/2014	05/19/2014 06:52	05/19/2014 06:52
	Soil 051614 SD	MSD	14051612-001 SD	1028	S	113899	113899	05/16/2014	05/19/2014 06:52	05/19/2014 06:52
SW-846 6020 A	Soil 051614	Initial	14051612-001	1033	S	50425	113940	05/16/2014	05/16/2014 13:11	05/19/2014 16:05
	50425-1-BKS	BKS	50425-1-BKS	1033	S	50425	113940	--------	05/16/2014 13:11	05/19/2014 14:34
	50425-1-BLK	BLK	50425-1-BLK	1033	S	50425	113940	--------	05/16/2014 13:11	05/19/2014 14:28
	S-1 S	MS	14050715-001 S	1033	S	50425	113940	05/07/2014	05/16/2014 13:11	05/19/2014 14:46
	S-1 SD	MSD	14050715-001 SD	1033	S	50425	113940	05/07/2014	05/16/2014 13:11	05/19/2014 14:52
	Soil 051614	Reanalysis	14051612-001	1033	S	50425	113969	05/16/2014	05/16/2014 13:11	05/20/2014 13:53
SW-846 8015 C	Soil 051614	Initial	14051612-001	1040	S	50429	113920	05/16/2014	05/16/2014 17:29	05/19/2014 11:28
	50429-1-BKS	BKS	50429-1-BKS	1040	S	50429	113920	--------	05/16/2014 17:29	05/19/2014 09:18
	50429-1-BLK	BLK	50429-1-BLK	1040	S	50429	113920	--------	05/16/2014 17:29	05/19/2014 10:02
	50429-1-BSD	BSD	50429-1-BSD	1040	S	50429	113920	--------	05/16/2014 17:29	05/19/2014 09:40
	Soil 051614 S	MS	14051612-001 S	1040	S	50429	113920	05/16/2014	05/16/2014 17:29	05/19/2014 10:23
	Soil 051614 SD	MSD	14051612-001 SD	1040	S	50429	113920	05/16/2014	05/16/2014 17:29	05/19/2014 10:45
SW-846 8015C	Soil 051614	Initial	14051612-001	1035	S	50458	113960	05/16/2014	05/19/2014 08:38	05/19/2014 11:43
	50458-2-BKS	BKS	50458-2-BKS	1035	S	50458	113960	--------	05/19/2014 08:38	05/19/2014 14:10
	50458-2-BLK	BLK	50458-2-BLK	1035	S	50458	113960	--------	05/19/2014 08:38	05/19/2014 09:45
	Soil 051614 S	MS	14051612-001 S	1035	S	50458	113960	05/16/2014	05/19/2014 08:38	05/19/2014 18:32
	Soil 051614 SD	MSD	14051612-001 SD	1035	S	50458	113960	05/16/2014	05/19/2014 08:38	05/19/2014 19:01
SW-846 8082 A	Soil 051614	Initial	14051612-001	1029	S	50441	113967	05/16/2014	05/19/2014 10:22	05/20/2014 13:02
	50441-1-BKS	BKS	50441-1-BKS	1029	S	50441	113967	--------	05/19/2014 10:22	05/20/2014 12:04
	50441-1-BLK	BLK	50441-1-BLK	1029	S	50441	113967	--------	05/19/2014 10:22	05/20/2014 11:35

Analytical Data Package Information Summary

Work Order(s): 14051612
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8082 A	50441-1-BSD	BSD	50441-1-BSD	1029	S	50441	113967	--------	05/19/2014 10:22	05/20/2014 12:33
	Soil 051614 S	MS	14051612-001 S	1029	S	50441	113967	05/16/2014	05/19/2014 10:22	05/20/2014 12:33
	Soil 051614 SD	MSD	14051612-001 SD	1029	S	50441	113967	05/16/2014	05/19/2014 10:22	05/20/2014 13:02
SW-846 8260 B	Soil 051614	Initial	14051612-002	1011	W	50462	113947	05/16/2014	05/19/2014 13:00	05/19/2014 16:47
	50462-1-BKS	BKS	50462-1-BKS	1011	W	50462	113947	--------	05/19/2014 13:00	05/19/2014 13:19
	50462-1-BLK	BLK	50462-1-BLK	1011	W	50462	113947	--------	05/19/2014 13:00	05/19/2014 15:37
	S1 s S	MS	14051511-001 S	1011	W	50462	113947	05/14/2014	05/19/2014 13:00	05/19/2014 18:32
	S1 s SD	MSD	14051511-001 SD	1011	W	50462	113947	05/14/2014	05/19/2014 13:00	05/19/2014 19:07
SW-846 8260 B	Soil 051614	Initial	14051612-001	1011	S	50461	113946	05/16/2014	05/19/2014 13:00	05/20/2014 04:44
	50461-1-BKS	BKS	50461-1-BKS	1011	S	50461	113946	--------	05/19/2014 13:00	05/19/2014 22:51
	50461-1-BLK	BLK	50461-1-BLK	1011	S	50461	113946	--------	05/19/2014 13:00	05/19/2014 22:21
	S-1 S	MS	14050715-001 S	1011	S	50461	113946	05/07/2014	05/19/2014 13:00	05/20/2014 00:48
	S-1 SD	MSD	14050715-001 SD	1011	S	50461	113946	05/07/2014	05/19/2014 13:00	05/20/2014 01:18
SW-846 8270 C	50446-1-BKS	BKS	50446-1-BKS	1014	W	50446	113951	--------	05/19/2014 11:33	05/20/2014 06:17
	50446-1-BLK	BLK	50446-1-BLK	1014	W	50446	113951	--------	05/19/2014 11:33	05/20/2014 05:14
	50446-1-BSD	BSD	50446-1-BSD	1014	W	50446	113951	--------	05/19/2014 11:33	05/20/2014 06:48
	Soil 051614	Initial	14051612-002	1014	W	50446	113991	05/16/2014	05/19/2014 11:33	05/20/2014 21:43
	S1 s S	MS	14051511-001 S	1014	W	50446	113991	05/14/2014	05/19/2014 11:33	05/20/2014 20:40

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113920 **Sample:** 50429-1-BKS / BKS **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/19/2014 09:18

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	24.3	33.80	72	42-129	

Lab Batch #: 113920 **Sample:** 50429-1-BSD / BSD **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/19/2014 09:40

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	22.3	33.70	66	42-129	

Lab Batch #: 113920 **Sample:** 50429-1-BLK / BLK **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/19/2014 10:02

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	17.1	33.90	50	42-129	

Lab Batch #: 113920 **Sample:** 14051612-001 S / MS **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/19/2014 10:23

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	21.8	33.70	65	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113920 **Sample:** 14051612-001 SD / MSD **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/19/2014 10:45

	SURROGATE RECOVERY STUDY				
Total Petroleum Hydrocarbons - DRO **Analytes**	**Amount Found [A]**	**True Amount [B]**	**Recovery %R [C]**	**Control Limits %R**	**Flags**
o-Terphenyl	21.7	33.70	64	42-129	

Lab Batch #: 113920 **Sample:** 14051612-001 / SMP **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/19/2014 11:28

	SURROGATE RECOVERY STUDY				
Total Petroleum Hydrocarbons - DRO **Analytes**	**Amount Found [A]**	**True Amount [B]**	**Recovery %R [C]**	**Control Limits %R**	**Flags**
o-Terphenyl	22.0	33.50	66	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113960 **Sample:** 50458-2-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/19/2014 09:45

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	79.2	100	79	55-142	

Lab Batch #: 113960 **Sample:** 14051612-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/19/2014 11:43

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	81.0	100	81	55-142	

Lab Batch #: 113960 **Sample:** 50458-2-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/19/2014 14:10

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	93.5	100	94	55-142	

Lab Batch #: 113960 **Sample:** 14051612-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/19/2014 18:32

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	90.4	100	90	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113960 **Sample:** 14051612-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/19/2014 19:01

	SURROGATE RECOVERY STUDY				
Total Petroleum Hydrocarbons-GRO **Analytes**	**Amount Found [A]**	**True Amount [B]**	**Recovery %R [C]**	**Control Limits %R**	**Flags**
a,a,a-Trifluorotoluene	97.6	100	98	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113967 **Sample:** 50441-1-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/20/2014 11:35

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	28.3	25.00	113	44-157	
Tetrachloro-m-xylene	29.3	25.00	117	41-153	

Lab Batch #: 113967 **Sample:** 50441-1-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/20/2014 12:04

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	27.3	25.00	109	44-157	
Tetrachloro-m-xylene	28.5	25.00	114	41-153	

Lab Batch #: 113967 **Sample:** 14051612-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 12:33

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	16.8	25.00	67	44-157	
Tetrachloro-m-xylene	18.6	25.00	74	41-153	

Lab Batch #: 113967 **Sample:** 50441-1-BSD / BSD **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/20/2014 12:33

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	29.2	25.00	117	44-157	
Tetrachloro-m-xylene	25.5	25.00	102	41-153	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113967 **Sample:** 14051612-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 13:02

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	15.0	25.00	59	44-157	
Tetrachloro-m-xylene	17.0	25.00	69	41-153	

Lab Batch #: 113967 **Sample:** 14051612-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 13:02

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	18.0	25.00	72	44-157	
Tetrachloro-m-xylene	20.2	25.00	81	41-153	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113946 **Sample:** 50461-1-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/19/2014 22:21

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	52.6	50.00	105	85-115	
Toluene-D8	54.0	50.00	108	91-109	
4-Bromofluorobenzene	55.7	50.00	111	80-125	

Lab Batch #: 113946 **Sample:** 50461-1-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/19/2014 22:51

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	51.7	50.00	103	85-115	
Toluene-D8	55.2	50.00	110	91-109	*
4-Bromofluorobenzene	53.7	50.00	107	80-125	

Lab Batch #: 113946 **Sample:** 14050715-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 00:48

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	52.3	50.00	105	85-115	
Toluene-D8	55.2	50.00	110	91-109	*
4-Bromofluorobenzene	58.4	50.00	117	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113946 **Sample:** 14050715-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 01:18

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	52.3	50.00	105	85-115	
Toluene-D8	54.0	50.00	108	91-109	
4-Bromofluorobenzene	56.8	50.00	114	80-125	

Lab Batch #: 113946 **Sample:** 14051612-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/20/2014 04:44

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	52.0	50.00	105	85-115	
Toluene-D8	53.0	50.00	106	91-109	
4-Bromofluorobenzene	58.0	50.00	117	80-125	

Lab Batch #: 113947 **Sample:** 50462-1-BKS / BKS **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/19/2014 13:19

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	48.8	50.00	98	84-110	
Toluene-D8	50.3	50.00	101	94-109	
4-Bromofluorobenzene	54.6	50.00	109	81-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113947 **Sample:** 50462-1-BLK / BLK **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/19/2014 15:37

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.5	50.00	99	84-110	
Toluene-D8	50.6	50.00	101	94-109	
4-Bromofluorobenzene	56.6	50.00	113	81-133	

Lab Batch #: 113947 **Sample:** 14051612-002 / SMP **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/19/2014 16:47

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.0	50.00	98	84-110	
Toluene-D8	51.0	50.00	102	94-109	
4-Bromofluorobenzene	58.0	50.00	115	81-133	

Lab Batch #: 113947 **Sample:** 14051511-001 S / MS **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/19/2014 18:32

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.0	50.00	98	84-110	
Toluene-D8	50.7	50.00	101	94-109	
4-Bromofluorobenzene	54.0	50.00	108	81-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113947 **Sample:** 14051511-001 SD / MSD **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/19/2014 19:07

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.5	50.00	99	84-110	
Toluene-D8	50.9	50.00	102	94-109	
4-Bromofluorobenzene	54.2	50.00	108	81-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113951 **Sample:** 50446-1-BLK / BLK **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/20/2014 05:14

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	43.1	40.00	108	68-116	
2-Fluorophenol	77.7	80.00	97	57-98	
Nitrobenzene-d5	42.2	40.00	105	58-107	
Phenol-d6	78.8	80.00	99	59-109	
Terphenyl-D14	40.7	40.00	102	69-121	
2,4,6-Tribromophenol	76.0	80.00	95	48-119	

Lab Batch #: 113951 **Sample:** 50446-1-BKS / BKS **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/20/2014 06:17

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	18.5	20.00	92	68-116	
2-Fluorophenol	35.8	40.00	90	57-98	
Nitrobenzene-d5	19.6	20.00	98	58-107	
Phenol-d6	38.6	40.00	97	59-109	
Terphenyl-D14	22.5	20.00	113	69-121	
2,4,6-Tribromophenol	40.0	40.00	100	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113951 **Sample:** 50446-1-BSD / BSD **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/20/2014 06:48

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	19.2	20.00	96	68-116	
2-Fluorophenol	36.9	40.00	92	57-98	
Nitrobenzene-d5	19.8	20.00	99	58-107	
Phenol-d6	40.1	40.00	100	59-109	
Terphenyl-D14	21.8	20.00	109	69-121	
2,4,6-Tribromophenol	40.7	40.00	102	48-119	

Lab Batch #: 113991 **Sample:** 14051511-001 S / MS **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/20/2014 20:40

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	33.9	40.00	85	68-116	
2-Fluorophenol	47.7	80.00	60	57-98	
Nitrobenzene-d5	28.1	40.00	70	58-107	
Phenol-d6	57.0	80.00	71	59-109	
Terphenyl-D14	40.1	40.00	100	69-121	
2,4,6-Tribromophenol	81.9	80.00	102	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

05/21/2014

Work Order #: 14051612 **Project ID:** 1401430

Lab Batch #: 113991 **Sample:** 14051612-002 / SMP **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/20/2014 21:43

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	37.0	40.00	91	68-116	
2-Fluorophenol	56.0	80.00	70	57-98	
Nitrobenzene-d5	32.0	40.00	80	58-107	
Phenol-d6	61.0	80.00	76	59-109	
Terphenyl-D14	38.0	40.00	94	69-121	
2,4,6-Tribromophenol	58.0	80.00	72	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **EPA 9071 B-Modified** Prep Method:

Matrix: **SOLID**

Sample Id: **113899-1-BLK** Lab Sample Id: **113899-1-BLK**

Date Analyzed: May-19-14 06:52 Analyst: 1028 Date Prep: Tech: 1028

Seq Number: 113899

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Oil & Grease, Total Recovered *	OG_TR	ND	49.97	39.98	mg/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 6020 A** Prep Method: SW3050B

Matrix: **SOLID**

Sample Id: **50425-1-BLK** Lab Sample Id: **50425-1-BLK**

Date Analyzed: May-19-14 14:28 Analyst: 1033 Seq Number: 113940 Date Prep: May-16-14 13:11 Tech: 1034

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Arsenic	7440-38-2	ND	0.4783	0.2391	mg/kg	U	1
Barium	7440-39-3	ND	2.391	1.196	mg/kg	U	1
Cadmium	7440-43-9	ND	2.391	1.196	mg/kg	U	1
Chromium	7440-47-3	ND	2.391	1.196	mg/kg	U	1
Lead	7439-92-1	ND	2.391	1.196	mg/kg	U	1
Mercury	7439-97-6	ND	0.09566	0.04783	mg/kg	U	1
Selenium	7782-49-2	ND	2.391	1.196	mg/kg	U	1
Silver	7440-22-4	ND	2.391	1.196	mg/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8015 C** Prep Method: SW3550C

Matrix: **SOLID**

Sample Id: **50429-1-BLK** Lab Sample Id: **50429-1-BLK**

Date Analyzed: May-19-14 10:02 Analyst: 1040 Seq Number: 113920 Date Prep: May-16-14 17:29 Tech: 1054

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-DRO (Diesel Range Organics)	C10C28DRO	ND	4.064	4.064	mg/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8015C** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50458-2-BLK** Lab Sample Id: **50458-2-BLK**

Date Analyzed: May-19-14 09:45 Analyst: 1035 Seq Number: 113960 Date Prep: May-19-14 08:38 Tech: 1035

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-GRO (Gasoline Range Organics)	C6C10GRO	ND	97.28	48.64	ug/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8082 A** Prep Method: SW3550C

Matrix: **SOLID**

Sample Id: **50441-1-BLK** Lab Sample Id: **50441-1-BLK**

Date Analyzed: May-20-14 11:35 Analyst: 1029 Seq Number: 113967 Date Prep: May-19-14 10:22 Tech: 1044

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
PCB-1016	12674-11-2	ND	0.05076	0.05076	mg/kg	U	1
PCB-1221	11104-28-2	ND	0.05076	0.05076	mg/kg	U	1
PCB-1232	11141-16-5	ND	0.05076	0.05076	mg/kg	U	1
PCB-1242	53469-21-9	ND	0.05076	0.05076	mg/kg	U	1
PCB-1248	12672-29-6	ND	0.05076	0.05076	mg/kg	U	1
PCB-1254	11097-69-1	ND	0.05076	0.05076	mg/kg	U	1
PCB-1260	11096-82-5	ND	0.05076	0.05076	mg/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8260 B** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50461-1-BLK** Lab Sample Id: **50461-1-BLK**

Date Analyzed: May-19-14 22:21 Analyst: 1011 Date Prep: May-19-14 13:00 Tech: 1011

Seq Number: 113946

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Dichlorodifluoromethane	75-71-8	ND	5.071	2.535	ug/kg	U	1
Chloromethane	74-87-3	ND	5.071	2.535	ug/kg	U	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	ND	5.071	2.535	ug/kg	U	1
Vinyl Chloride	75-01-4	ND	5.071	2.535	ug/kg	U	1
Bromomethane	74-83-9	ND	5.071	2.535	ug/kg	U	1
Chloroethane	75-00-3	ND	5.071	2.535	ug/kg	U	1
Acetone	67-64-1	ND	20.28	10.14	ug/kg	U	1
Cyclohexane	110-82-7	ND	20.28	10.14	ug/kg	U	1
Trichlorofluoromethane	75-69-4	ND	5.071	2.535	ug/kg	U	1
1,1-Dichloroethene	75-35-4	ND	5.071	2.535	ug/kg	U	1
Methylene Chloride	75-09-2	ND	5.071	2.535	ug/kg	U	1
trans-1,2-Dichloroethene	156-60-5	ND	5.071	2.535	ug/kg	U	1
Methyl-t-butyl ether	1634-04-4	ND	5.071	2.535	ug/kg	U	1
1,1-Dichloroethane	75-34-3	ND	5.071	2.535	ug/kg	U	1
2-Butanone (MEK)	78-93-3	ND	20.28	10.14	ug/kg	U	1
cis-1,2-Dichloroethene	156-59-2	ND	5.071	2.535	ug/kg	U	1
Bromochloromethane	74-97-5	ND	5.071	2.535	ug/kg	U	1
Chloroform	67-66-3	ND	5.071	2.535	ug/kg	U	1
1,1,1-Trichloroethane	71-55-6	ND	5.071	2.535	ug/kg	U	1
1,2-Dichloroethane	107-06-2	ND	5.071	2.535	ug/kg	U	1
Carbon Tetrachloride	56-23-5	ND	5.071	2.535	ug/kg	U	1
Benzene	71-43-2	ND	5.071	2.535	ug/kg	U	1
1,2-Dichloropropane	78-87-5	ND	5.071	2.535	ug/kg	U	1
Carbon Disulfide	75-15-0	ND	10.14	5.071	ug/kg	U	1
Methylcyclohexane	108-87-2	ND	20.28	10.14	ug/kg	U	1
Trichloroethene	79-01-6	ND	5.071	2.535	ug/kg	U	1
Methyl Acetate	79-20-9	ND	20.28	10.14	ug/kg	U	1
Bromodichloromethane	75-27-4	ND	5.071	2.535	ug/kg	U	1
cis-1,3-Dichloropropene	10061-01-5	ND	5.071	2.535	ug/kg	U	1
4-Methyl-2-Pentanone	108-10-1	ND	20.28	10.14	ug/kg	U	1
trans-1,3-Dichloropropene	10061-02-6	ND	5.071	2.535	ug/kg	U	1
1,1,2-Trichloroethane	79-00-5	ND	5.071	2.535	ug/kg	U	1
Toluene	108-88-3	ND	5.071	2.535	ug/kg	U	1
2-Hexanone	591-78-6	ND	20.28	10.14	ug/kg	U	1
1,2-Dibromoethane (EDB)	106-93-4	ND	5.071	2.535	ug/kg	U	1
Dibromochloromethane	124-48-1	ND	5.071	2.535	ug/kg	U	1
Bromoform	75-25-2	ND	5.071	2.535	ug/kg	U	1
Tetrachloroethene	127-18-4	ND	5.071	2.535	ug/kg	U	1
Chlorobenzene	108-90-7	ND	5.071	2.535	ug/kg	U	1
Ethylbenzene	100-41-4	ND	5.071	2.535	ug/kg	U	1
m,p-Xylenes	108-38-3	ND	10.14	5.071	ug/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8260 B** Prep Method: SW5030
Matrix: **SOLID**

Sample Id: **50461-1-BLK** Lab Sample Id: **50461-1-BLK**

Date Analyzed: May-19-14 22:21 Analyst: 1011 Date Prep: May-19-14 13:00 Tech: 1011
Seq Number: 113946

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Styrene	100-42-5	ND	5.071	2.535	ug/kg	U	1
1,1,2,2-Tetrachloroethane	79-34-5	ND	5.071	2.535	ug/kg	U	1
o-Xylene	95-47-6	ND	5.071	2.535	ug/kg	U	1
Isopropylbenzene	98-82-8	ND	5.071	2.535	ug/kg	U	1
1,3-Dichlorobenzene	541-73-1	ND	5.071	2.535	ug/kg	U	1
1,4-Dichlorobenzene	106-46-7	ND	5.071	2.535	ug/kg	U	1
1,2-Dichlorobenzene	95-50-1	ND	5.071	2.535	ug/kg	U	1
1,2-Dibromo-3-Chloropropane	96-12-8	ND	40.57	20.28	ug/kg	U	1
1,2,4-Trichlorobenzene	120-82-1	ND	5.071	2.535	ug/kg	U	1
Naphthalene	91-20-3	ND	5.071	2.535	ug/kg	U	1
1,2,3-Trichlorobenzene	87-61-6	ND	5.071	2.535	ug/kg	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8260 B** Prep Method: SW5030B

Matrix: **WATER**

Sample Id: **50462-1-BLK** Lab Sample Id: **50462-1-BLK**

Date Analyzed: May-19-14 15:37 Analyst: 1011 Seq Number: 113947 Date Prep: May-19-14 13:00 Tech: 1011

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Vinyl chloride	75-01-4	ND	0.1000	0.05000	mg/L	U	1
1,1-Dichloroethene	75-35-4	ND	0.1000	0.05000	mg/L	U	1
2-Butanone (MEK)	78-93-3	ND	1.000	0.5000	mg/L	U	1
Chloroform	67-66-3	ND	0.1000	0.05000	mg/L	U	1
1,2-Dichloroethane	107-06-2	ND	0.1000	0.05000	mg/L	U	1
Carbon tetrachloride	56-23-5	ND	0.1000	0.05000	mg/L	U	1
Benzene	71-43-2	ND	0.1000	0.05000	mg/L	U	1
Trichloroethene	79-01-6	ND	0.1000	0.05000	mg/L	U	1
Tetrachloroethene	127-18-4	ND	0.1000	0.05000	mg/L	U	1
Chlorobenzene	108-90-7	ND	0.1000	0.05000	mg/L	U	1
1,4-Dichlorobenzene	106-46-7	ND	0.1000	0.05000	mg/L	U	1

Blank Summary 14051612

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8270 C** Prep Method: SW3510C

Matrix: **WATER**

Sample Id: **50446-1-BLK** Lab Sample Id: **50446-1-BLK**

Date Analyzed: May-20-14 05:14 Analyst: 1014 Seq Number: 113951 Date Prep: May-19-14 11:33 Tech: 1022

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
2,4-Dinitrotoluene	121-14-2	ND	0.01000	0.005000	mg/L		1
Hexachlorobenzene	118-74-1	ND	0.01000	0.005000	mg/L		1
Hexachlorobutadiene	87-68-3	ND	0.01000	0.005000	mg/L		1
Hexachloroethane	67-72-1	ND	0.01000	0.005000	mg/L		1
2-Methylphenol	95-48-7	ND	0.01000	0.005000	mg/L		1
3&4-Methylphenol		ND	0.01000	0.005000	mg/L		1
Nitrobenzene	98-95-3	ND	0.01000	0.005000	mg/L		1
Pentachlorophenol	87-86-5	ND	0.02000	0.01000	mg/L		1
Pyridine	110-86-1	ND	0.01000	0.005000	mg/L		1
2,4,6-Trichlorophenol	88-06-2	ND	0.01000	0.005000	mg/L		1
2,4,5-Trichlorophenol	95-95-4	ND	0.01000	0.005000	mg/L		1

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50425 **Date Prepared:** 05/16/2014 13:11 **Sample ID:** 50425-1-BKS **Matrix:** Solid

Lab Batch ID: 113940 **Date Analyzed:** 05/19/2014 14:28 **Analyst:** 1033

Reporting Units: mg/kg

BLANK /BLANK SPIKE RECOVERY STUDY

RCRA Metals Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Arsenic	<0.4788	19.15	19.22	100	80-120	
Barium	<2.394	19.15	19.91	104	80-120	
Cadmium	<2.394	19.15	17.94	94	80-120	
Chromium	<2.394	19.15	19.73	103	80-120	
Lead	<2.394	19.15	20.01	104	80-120	
Mercury	<0.09577	0.4788	0.4693	98	80-120	
Selenium	<2.394	19.15	17.76	93	80-120	
Silver	<2.394	19.15	19.53	102	80-120	

Blank Spike Recovery [D] = 100*(([C])/[B])

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50458 **Date Prepared:** 05/19/2014 08:38 **Sample ID:** 50458-2-BKS **Matrix:** Solid

Lab Batch ID: 113960 **Date Analyzed:** 05/19/2014 09:45 **Analyst:** 1035

Reporting Units: ug/kg

	BLANK /BLANK SPIKE RECOVERY STUDY					
Total Petroleum Hydrocarbons-GRO **Analytes**	**Blank Result [A]**	**Spike Added [B]**	**Blank Spike Result [C]**	**Blank Spike %R [D]**	**Control Limits %R**	**Flags**
TPH-GRO (Gasoline Range Organics)	<98.04	4902	4452	91	60-112	

Blank Spike Recovery [D] = 100*(([C])/[B])

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50461 **Date Prepared:** 05/19/2014 13:00 **Sample ID:** 50461-1-BKS **Matrix:** Solid

Lab Batch ID: 113946 **Date Analyzed:** 05/19/2014 22:21 **Analyst:** 1011

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

TCL Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Dichlorodifluoromethane	<5.155	61.86	64.51	104	53-144		38-159
Chloromethane	<5.155	61.86	72.71	118	62-143		48-157
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5.155	61.86	51.65	83	50-162		31-181
Vinyl Chloride	<5.155	61.86	59.87	97	61-156		45-172
Bromomethane	<5.155	61.86	80.58	130	45-199		19-225
Chloroethane	<5.155	61.86	54.32	88	59-151		44-167
Acetone	<20.62	61.86	52.48	85	24-197		0-225
Cyclohexane	<20.62	61.86	51.43	83	50-148		34-164
Trichlorofluoromethane	<5.155	61.86	64.67	105	54-175		33-195
1,1-Dichloroethene	<5.155	61.86	59.13	96	60-154		44-170
Methylene Chloride	<5.155	61.86	63.15	102	56-140		43-154
trans-1,2-Dichloroethene	<5.155	61.86	59.81	97	60-153		45-168
Methyl-t-butyl ether	<5.155	61.86	50.59	82	59-133		47-145
1,1-Dichloroethane	<5.155	61.86	57.27	93	60-148		46-162
2-Butanone (MEK)	<20.62	61.86	56.10	91	35-173		13-196
cis-1,2-Dichloroethene	<5.155	61.86	60.62	98	67-126		57-136
Bromochloromethane	<5.155	61.86	56.78	92	64-121		55-131
Chloroform	<5.155	61.86	64.78	105	65-126		55-137
1,1,1-Trichloroethane	<5.155	61.86	66.09	107	60-145		46-160
1,2-Dichloroethane	<5.155	61.86	69.77	113	62-127		51-137
Carbon Tetrachloride	<5.155	61.86	63.43	103	55-152		38-168
Benzene	<5.155	61.86	59.68	96	69-128		59-138
1,2-Dichloropropane	<5.155	61.86	57.80	93	66-125		56-135
Carbon Disulfide	<10.31	61.86	62.93	102	58-153		42-168
Methylcyclohexane	<20.62	61.86	47.66	77	41-142		25-159
Trichloroethene	<5.155	61.86	60.18	97	68-130		57-141
Methyl Acetate	<20.62	61.86	66.70	108	47-151		30-169
Bromodichloromethane	<5.155	61.86	61.15	99	60-125		49-136
cis-1,3-Dichloropropene	<5.155	61.86	53.45	86	59-122		49-133
4-Methyl-2-Pentanone	<20.62	61.86	48.38	78	22-173		0-198
trans-1,3-Dichloropropene	<5.155	61.86	52.59	85	56-124		44-135
1,1,2-Trichloroethane	<5.155	61.86	66.97	108	65-120		55-129
Toluene	<5.155	61.86	59.62	96	66-127		56-138
2-Hexanone	<20.62	61.86	51.27	83	30-175		6-199
1,2-Dibromoethane (EDB)	<5.155	61.86	55.14	89	64-123		54-133

Blank Spike Recovery [D] = 100*(([C])/[B])

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Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50461 **Date Prepared:** 05/19/2014 13:00 **Sample ID:** 50461-1-BKS **Matrix:** Solid

Lab Batch ID: 113946 **Date Analyzed:** 05/19/2014 22:21 **Analyst:** 1011

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

TCL Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Dibromochloromethane	<5.155	61.86	52.15	84	55-128		43-141
Bromoform	<5.155	61.86	49.01	79	46-128		33-141
Tetrachloroethene	<5.155	61.86	59.03	95	55-145		40-160
Chlorobenzene	<5.155	61.86	50.88	82	61-124		50-134
Ethylbenzene	<5.155	61.86	51.08	83	58-130		46-142
m,p-Xylenes	<10.31	123.7	107.5	87	60-131		48-143
Styrene	<5.155	61.86	48.67	79	54-123		42-134
1,1,2,2-Tetrachloroethane	<5.155	61.86	55.23	89	50-134		37-148
o-Xylene	<5.155	61.86	50.80	82	60-126		49-137
Isopropylbenzene	<5.155	61.86	47.72	77	52-130		38-143
1,3-Dichlorobenzene	<5.155	61.86	41.84	68	42-123		29-136
1,4-Dichlorobenzene	<5.155	61.86	41.07	66	40-121		26-135
1,2-Dichlorobenzene	<5.155	61.86	40.82	66	38-128		23-143
1,2-Dibromo-3-Chloropropane	<41.24	61.86	66.22	107	43-149		25-167
1,2,4-Trichlorobenzene	<5.155	61.86	31.63	51	14-143		0-164
Naphthalene	<5.155	61.86	37.33	60	30-155		9-176
1,2,3-Trichlorobenzene	<5.155	61.86	38.27	62	15-144		0-165

Prep Batch #: 50462 **Date Prepared:** 05/19/2014 13:00 **Sample ID:** 50462-1-BKS **Matrix:** Water

Lab Batch ID: 113947 **Date Analyzed:** 05/19/2014 15:37 **Analyst:** 1011

Reporting Units: mg/L

BLANK /BLANK SPIKE RECOVERY STUDY

TCLP Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Vinyl chloride	<0.001000	0.0500	0.0523	105	64-132		52-144
1,1-Dichloroethene	<0.001000	0.0500	0.0418	84	59-123		48-134
2-Butanone (MEK)	<0.01000	0.0500	0.0583	117	56-133		44-146
Chloroform	<0.001000	0.0500	0.0382	76	71-118		63-126
1,2-Dichloroethane	<0.001000	0.0500	0.0375	75	64-130		53-140
Carbon tetrachloride	<0.001000	0.0500	0.0352	70	74-127	L	65-136
Benzene	<0.001000	0.0500	0.0395	79	77-122		70-130
Trichloroethene	<0.001000	0.0500	0.0369	74	72-127		63-137
Tetrachloroethene	<0.001000	0.0500	0.0330	66	78-113	L	72-119
Chlorobenzene	<0.001000	0.0500	0.0382	76	76-116		69-122
1,4-Dichlorobenzene	<0.001000	0.0500	0.0374	75	77-118	L	70-125

Blank Spike Recovery [D] = 100*(([C])/[B])

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: **Date Prepared:** 05/19/2014 06:52 **Sample:** 113899-1-BKS **Analyst:** 1028

Lab Batch ID: 113899 **Date Analyzed:** 05/19/2014 06:52 **Method:** / SW9071B_MOD **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Oil and Grease Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Oil & Grease, Total Recovered	<49.89	798.2	762.3	96	797.4	765.6	96	0	78-114	28	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50429 **Date Prepared:** 05/16/2014 17:29 **Sample:** 50429-1-BKS **Analyst:** 1040

Lab Batch ID: 113920 **Date Analyzed:** 05/19/2014 09:18 **Method:** SW3550C / SW8015DRO **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
TPH-DRO (Diesel Range Organics)	<4.058	33.82	27.86	82	33.65	27.20	81	2	56-117	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50441 **Date Prepared:** 05/19/2014 10:22 **Sample:** 50441-1-BKS **Analyst:** 1029

Lab Batch ID: 113967 **Date Analyzed:** 05/20/2014 12:04 **Method:** SW3550C / SW8082 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Polychlorinated Biphenyls Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
PCB-1016	<0.05056	0.5056	0.4647	92	0.5005	0.4963	99	7	70-108	25	
PCB-1260	<0.05056	0.5056	0.3974	79	0.5005	0.4202	84	6	63-104	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor Park

Work Order #: 14051612 **Project ID:** 1401430

Prep Batch #: 50446 **Date Prepared:** 05/19/2014 11:33 **Sample:** 50446-1-BKS **Analyst:** 1014

Lab Batch ID: 113951 **Date Analyzed:** 05/20/2014 06:17 **Method:** SW3510C / SW8270C **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TCLP Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag	Marginal Exceedance Limit
2,4-Dinitrotoluene	<0.005000	0.04000	0.04467	112	0.04000	0.04306	108	4	72-109	20	HH	65-115
Hexachlorobenzene	<0.005000	0.04000	0.03734	93	0.04000	0.03760	94	1	71-115	20		64-122
Hexachlorobutadiene	<0.005000	0.04000	0.03334	83	0.04000	0.03345	84	0	71-102	20		66-107
Hexachloroethane	<0.005000	0.04000	0.03339	83	0.04000	0.03289	82	2	63-107	20		56-115
2-Methylphenol	<0.005000	0.04000	0.03601	90	0.04000	0.03578	89	1	69-103	20		63-108
3&4-Methylphenol	<0.005000	0.04000	0.03707	93	0.04000	0.03553	89	4	61-115	20		52-124
Nitrobenzene	<0.005000	0.04000	0.03729	93	0.04000	0.03648	91	2	62-104	20		55-111
Pentachlorophenol	<0.01000	0.04000	0.04035	101	0.04000	0.04000	100	1	66-121	20		57-130
Pyridine	<0.005000	0.04000	0.03226	81	0.04000	0.03141	79	3	57-88	20		52-93
2,4,6-Trichlorophenol	<0.005000	0.04000	0.03847	96	0.04000	0.03874	97	1	71-113	20		64-120
2,4,5-Trichlorophenol	<0.005000	0.04000	0.03956	99	0.04000	0.03954	99	0	77-112	20		72-118

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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CHAIN OF CUSTODY RECORD

14051612 Page _____ of _____

Nº 03091

Project Number:	Site and Location:
1401430	Ridgely Manor Park Towson

Contact Name:	Contact Email:
Jim Bowie	Jim.Bowie@wspgroup.com

Sampler's Name:	Sampler's Signature:
Jim Bowie	[signature]

Matrices:
S = Soil:
Aq = Water
A = Air: Bu = Bulk
W = Wipe
Bi = Biota:
OW = Oily Waste:
O = Other

Requested Analyses

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	8015 DRO	8015 TPH (GRO)	8071	8260 TCLP	8260 TOTAL	8082	6010	8270 TCLP		Remarks
Soil051614		5/16/14	11:30	S	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	

\# of Coolers: 1
Custody Seal: Abs
Ice Present: Yes Temp: 16°C
Shipping Carrier: Client

Relinquished by (Signature):	Date / Time	Received by (Signature):	Laboratory Name:
[signature]	5/16/14 1400	[signature] 13:19	PHASE Separation
Relinquished by (Signature):	Date / Time	Received by (Signature):	Laboratory Location: Baltimore
			Custody Seal Numbers: —
Turn-Around Time: 72 HR		Tracking Number:	Method of Shipment: Drop off

WSP
WSP Environment & Energy

- ☒ Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
- ☐ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
- ☐ San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
- ☐ New Jersey Office: 334 Elizabeth Ave., Somerset, NJ 08873 / Tel: 732-564-0888
- ☐ Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
- ☐ Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
- ☐ Boxborough Office: 1740 Massachusetts Ave., Boxborough, MA 01719 / Tel: 978-635-9600
- ☐ Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14051612	**Received By**	Robyn Rhudy
Client Name	WSP Environment & Energy - Restor	**Date Received**	05/16/2014 01:19:00 PM
Project Name	Ridgely Manor Park	**Delivered By**	Client
Project Number	1401430	**Tracking No**	Not Applicable
Disposal Date	06/20/2014	**Logged In By**	Robyn Rhudy

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	16
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Jim Bowie
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 2

Total No. of Containers Received 8

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, 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

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.

Per client - 6010 = SW6020 RCRA metals

Samples Inspected/Checklist Completed By: Robyn Rhudy Date: 05/16/2014

Robyn Rhudy

PM Review and Approval: Date: 05/19/2014

Simon Crisp

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14052319

Project Manager: Dave Rykaczewski

Project Name : Ridgely Manor Park

Project Location: Towson

Project ID : 1401020

June 2, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

June 2, 2014

Dave Rykaczewski
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14052319**
Project Name: Ridgely Manor Park
Project Location: Towson
Project ID.: 1401020

Dear Dave Rykaczewski :

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 **14052319**.

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 27, 2014. 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: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14052319

Project ID: 1401020

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/23/2014 at 04:18 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14052319-001	StockSW-052314	SOIL	05/23/14 14:50
14052319-002	Stock23-052314	SOIL	05/23/14 14:55
14052319-003	StockN-052314	SOIL	05/23/14 15:00

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)].

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 LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052319

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401020

Sample ID: StockSW-052314 **Date/Time Sampled: 05/23/2014 14:50** **PSS Sample ID: 14052319-001**
Matrix: SOIL **Date/Time Received: 05/23/2014 16:18** **% Solids: 87**

RCRA Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**2.6**	mg/kg	0.43		1	05/27/14	05/28/14 15:55	1033
Barium	**48**	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033
Cadmium	ND	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033
Chromium	**27**	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033
Lead	**22**	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033
Mercury	ND	mg/kg	0.086		1	05/27/14	05/29/14 14:23	1033
Selenium	ND	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033
Silver	ND	mg/kg	2.2		1	05/27/14	05/28/14 15:55	1033

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)	ND	mg/kg	4.6		1	05/27/14	05/28/14 12:40	1040

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	110		1	05/27/14	05/27/14 15:31	1035

BTEX + MTBE — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Methyl-t-Butyl Ether	ND	ug/kg	5.6		1	05/27/14	05/27/14 19:21	1011
Benzene	ND	ug/kg	5.6		1	05/27/14	05/27/14 19:21	1011
Toluene	ND	ug/kg	5.6		1	05/27/14	05/27/14 19:21	1011
Ethylbenzene	ND	ug/kg	5.6		1	05/27/14	05/27/14 19:21	1011
m&p-Xylene	ND	ug/kg	11		1	05/27/14	05/27/14 19:21	1011
o-Xylene	ND	ug/kg	5.6		1	05/27/14	05/27/14 19:21	1011

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052319

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401020

Sample ID: Stock23-052314 **Date/Time Sampled: 05/23/2014 14:55** **PSS Sample ID: 14052319-002**
Matrix: SOIL **Date/Time Received: 05/23/2014 16:18** **% Solids: 94**

RCRA Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**1.2**	mg/kg	0.49		1	05/27/14	05/28/14 16:01	1033
Barium	**9.6**	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033
Cadmium	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033
Chromium	**15**	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033
Lead	**4.4**	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033
Mercury	ND	mg/kg	0.097		1	05/27/14	05/29/14 14:29	1033
Selenium	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033
Silver	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:01	1033

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)	ND	mg/kg	4.3		1	05/27/14	05/28/14 12:40	1040

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	100		1	05/27/14	05/27/14 16:01	1035

BTEX + MTBE — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Methyl-t-Butyl Ether	ND	ug/kg	5.2		1	05/27/14	05/27/14 19:51	1011
Benzene	ND	ug/kg	5.2		1	05/27/14	05/27/14 19:51	1011
Toluene	ND	ug/kg	5.2		1	05/27/14	05/27/14 19:51	1011
Ethylbenzene	ND	ug/kg	5.2		1	05/27/14	05/27/14 19:51	1011
m&p-Xylene	ND	ug/kg	10		1	05/27/14	05/27/14 19:51	1011
o-Xylene	ND	ug/kg	5.2		1	05/27/14	05/27/14 19:51	1011

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052319

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor Park
Project Location: Towson
Project ID: 1401020

Sample ID: StockN-052314 **Date/Time Sampled: 05/23/2014 15:00** **PSS Sample ID: 14052319-003**
Matrix: SOIL **Date/Time Received: 05/23/2014 16:18** **% Solids: 91**

RCRA Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**1.8**	mg/kg	0.48		1	05/27/14	05/28/14 16:07	1033
Barium	**12**	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033
Cadmium	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033
Chromium	**21**	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033
Lead	**5.5**	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033
Mercury	ND	mg/kg	0.095		1	05/27/14	05/29/14 14:35	1033
Selenium	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033
Silver	ND	mg/kg	2.4		1	05/27/14	05/28/14 16:07	1033

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)	**6.5**	mg/kg	4.4	DF	1	05/27/14	05/28/14 13:01	1040

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	110		1	05/27/14	05/27/14 16:31	1035

BTEX + MTBE — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Methyl-t-Butyl Ether	ND	ug/kg	5.4		1	05/27/14	05/27/14 20:20	1011
Benzene	ND	ug/kg	5.4		1	05/27/14	05/27/14 20:20	1011
Toluene	ND	ug/kg	5.4		1	05/27/14	05/27/14 20:20	1011
Ethylbenzene	ND	ug/kg	5.4		1	05/27/14	05/27/14 20:20	1011
m&p-Xylene	ND	ug/kg	11		1	05/27/14	05/27/14 20:20	1011
o-Xylene	ND	ug/kg	5.4		1	05/27/14	05/27/14 20:20	1011

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14052319
Project ID: 1401020

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.

Sample Receipt:

Sample(s) received at a temperature greater than 6 degrees C, and ice was not present.

General Comments:
Report revised to include MTBE in VOC analysis.
NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 14052319
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Dave Rykaczewski

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	StockSW-052314	Initial	14052319-001	1045	S	114105	114105	05/23/2014	05/27/2014 10:03	05/27/2014 10:03
	Stock23-052314	Initial	14052319-002	1045	S	114105	114105	05/23/2014	05/27/2014 10:03	05/27/2014 10:03
	StockN-052314	Initial	14052319-003	1045	S	114105	114105	05/23/2014	05/27/2014 10:03	05/27/2014 10:03
SW-846 6020 A	StockSW-052314	Initial	14052319-001	1033	S	50540	114169	05/23/2014	05/27/2014 14:29	05/28/2014 15:55
	Stock23-052314	Initial	14052319-002	1033	S	50540	114169	05/23/2014	05/27/2014 14:29	05/28/2014 16:01
	StockN-052314	Initial	14052319-003	1033	S	50540	114169	05/23/2014	05/27/2014 14:29	05/28/2014 16:07
	50540-1-BKS	BKS	50540-1-BKS	1033	S	50540	114169	--------	05/27/2014 14:29	05/28/2014 13:13
	50540-1-BLK	BLK	50540-1-BLK	1033	S	50540	114169	--------	05/27/2014 14:29	05/28/2014 14:26
	ATC-1 (4-5) S	MS	14052308-001 S	1033	S	50540	114169	05/23/2014	05/27/2014 14:29	05/28/2014 14:38
	ATC-1 (4-5) SD	MSD	14052308-001 SD	1033	S	50540	114169	05/23/2014	05/27/2014 14:29	05/28/2014 14:44
	StockSW-052314	Reanalysis	14052319-001	1033	S	50540	114205	05/23/2014	05/27/2014 14:29	05/29/2014 14:23
	Stock23-052314	Reanalysis	14052319-002	1033	S	50540	114205	05/23/2014	05/27/2014 14:29	05/29/2014 14:29
	StockN-052314	Reanalysis	14052319-003	1033	S	50540	114205	05/23/2014	05/27/2014 14:29	05/29/2014 14:35
SW-846 8015 C	StockSW-052314	Initial	14052319-001	1040	S	50543	114168	05/23/2014	05/27/2014 17:20	05/28/2014 12:40
	Stock23-052314	Initial	14052319-002	1040	S	50543	114168	05/23/2014	05/27/2014 17:20	05/28/2014 12:40
	StockN-052314	Initial	14052319-003	1040	S	50543	114168	05/23/2014	05/27/2014 17:20	05/28/2014 13:01
	50543-1-BKS	BKS	50543-1-BKS	1040	S	50543	114168	--------	05/27/2014 17:20	05/28/2014 09:47
	50543-1-BLK	BLK	50543-1-BLK	1040	S	50543	114168	--------	05/27/2014 17:20	05/28/2014 10:31
	50543-1-BSD	BSD	50543-1-BSD	1040	S	50543	114168	--------	05/27/2014 17:20	05/28/2014 10:09
	2 S	MS	14052314-002 S	1040	S	50543	114168	05/21/2014	05/27/2014 17:20	05/28/2014 09:47
	2 SD	MSD	14052314-002 SD	1040	S	50543	114168	05/21/2014	05/27/2014 17:20	05/28/2014 10:09
SW-846 8015C	StockSW-052314	Initial	14052319-001	1035	S	50562	114161	05/23/2014	05/27/2014 08:53	05/27/2014 15:31
	Stock23-052314	Initial	14052319-002	1035	S	50562	114161	05/23/2014	05/27/2014 08:53	05/27/2014 16:01
	StockN-052314	Initial	14052319-003	1035	S	50562	114161	05/23/2014	05/27/2014 08:53	05/27/2014 16:31
	50562-2-BKS	BKS	50562-2-BKS	1035	S	50562	114161	--------	05/27/2014 08:53	05/27/2014 11:07
	50562-2-BLK	BLK	50562-2-BLK	1035	S	50562	114161	--------	05/27/2014 08:53	05/27/2014 10:37
	StockN-052314 S	MS	14052319-003 S	1035	S	50562	114161	05/23/2014	05/27/2014 08:53	05/27/2014 17:59
	StockN-052314 SD	MSD	14052319-003 SD	1035	S	50562	114161	05/23/2014	05/27/2014 08:53	05/27/2014 18:29

Analytical Data Package Information Summary

Work Order(s): **14052319**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Dave Rykaczewski

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8260 B	StockSW-052314	Initial	14052319-001	1011	S	50552	114144	05/23/2014	05/27/2014 13:00	05/27/2014 19:21
	Stock23-052314	Initial	14052319-002	1011	S	50552	114144	05/23/2014	05/27/2014 13:00	05/27/2014 19:51
	StockN-052314	Initial	14052319-003	1011	S	50552	114144	05/23/2014	05/27/2014 13:00	05/27/2014 20:20
	50552-1-BKS	BKS	50552-1-BKS	1011	S	50552	114144	--------	05/27/2014 13:00	05/27/2014 12:14
	50552-1-BLK	BLK	50552-1-BLK	1011	S	50552	114144	--------	05/27/2014 13:00	05/27/2014 11:39
	SS-2-052114 S	MS	14052222-002 S	1011	S	50552	114144	05/21/2014	05/27/2014 13:00	05/27/2014 15:26
	SS-2-052114 SD	MSD	14052222-002 SD	1011	S	50552	114144	05/21/2014	05/27/2014 13:00	05/27/2014 15:55

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114168 **Sample:** 14052314-002 S / MS **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/28/2014 09:47

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	20.1	33.80	60	42-129	

Lab Batch #: 114168 **Sample:** 50543-1-BKS / BKS **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/28/2014 09:47

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	23.7	33.40	71	42-129	

Lab Batch #: 114168 **Sample:** 14052314-002 SD / MSD **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/28/2014 10:09

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	23.9	33.10	72	42-129	

Lab Batch #: 114168 **Sample:** 50543-1-BSD / BSD **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/28/2014 10:09

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	22.6	33.30	68	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114168 **Sample:** 50543-1-BLK / BLK **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/28/2014 10:31

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	23.5	33.80	69	42-129	

Lab Batch #: 114168 **Sample:** 14052319-001 / SMP **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/28/2014 12:40

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	22.0	33.30	65	42-129	

Lab Batch #: 114168 **Sample:** 14052319-002 / SMP **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/28/2014 12:40

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	26.0	33.50	77	42-129	

Lab Batch #: 114168 **Sample:** 14052319-003 / SMP **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/28/2014 13:01

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	22.0	33.60	66	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114161 **Sample:** 50562-2-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/27/2014 10:37

Total Petroleum Hydrocarbons-GRO	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	73.7	100	74	55-142	

Lab Batch #: 114161 **Sample:** 50562-2-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/27/2014 11:07

Total Petroleum Hydrocarbons-GRO	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	89.2	100	89	55-142	

Lab Batch #: 114161 **Sample:** 14052319-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 15:31

Total Petroleum Hydrocarbons-GRO	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	73.0	100	73	55-142	

Lab Batch #: 114161 **Sample:** 14052319-002 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 16:01

Total Petroleum Hydrocarbons-GRO	SURROGATE RECOVERY STUDY				
Analytes	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	74.0	100	74	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114161 **Sample:** 14052319-003 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 16:31

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	74.0	100	74	55-142	

Lab Batch #: 114161 **Sample:** 14052319-003 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 17:59

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	84.7	100	85	55-142	

Lab Batch #: 114161 **Sample:** 14052319-003 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 18:29

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	87.4	100	87	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114144 **Sample:** 50552-1-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/27/2014 11:39

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY				
	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.6	50.00	99	85-115	
Toluene-D8	49.4	50.00	99	91-109	
4-Bromofluorobenzene	52.2	50.00	104	80-125	

Lab Batch #: 114144 **Sample:** 50552-1-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/27/2014 12:14

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY				
	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.6	50.00	101	85-115	
Toluene-D8	51.2	50.00	102	91-109	
4-Bromofluorobenzene	51.4	50.00	103	80-125	

Lab Batch #: 114144 **Sample:** 14052222-002 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 15:26

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY				
	Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.6	50.00	101	85-115	
Toluene-D8	51.0	50.00	102	91-109	
4-Bromofluorobenzene	51.3	50.00	103	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114144 **Sample:** 14052222-002 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 15:55

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.6	50.00	101	85-115	
Toluene-D8	50.6	50.00	101	91-109	
4-Bromofluorobenzene	50.7	50.00	101	80-125	

Lab Batch #: 114144 **Sample:** 14052319-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 19:21

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.0	50.00	101	85-115	
Toluene-D8	50.0	50.00	101	91-109	
4-Bromofluorobenzene	52.0	50.00	105	80-125	

Lab Batch #: 114144 **Sample:** 14052319-002 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 19:51

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	49.0	50.00	99	85-115	
Toluene-D8	50.0	50.00	100	91-109	
4-Bromofluorobenzene	54.0	50.00	108	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor Park

06/02/2014

Work Order #: 14052319 **Project ID:** 1401020

Lab Batch #: 114144 **Sample:** 14052319-003 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/27/2014 20:20

BTEX + MTBE Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.0	50.00	99	85-115	
Toluene-D8	50.0	50.00	100	91-109	
4-Bromofluorobenzene	52.0	50.00	103	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Blank Summary 14052319

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 6020 A** Prep Method: SW3050B

Matrix: **SOLID**

Sample Id: **50540-1-BLK** Lab Sample Id: **50540-1-BLK**

Date Analyzed: May-28-14 14:26 Analyst: 1033 Seq Number: 114169 Date Prep: May-27-14 14:29 Tech: 1034

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Arsenic	7440-38-2	ND	0.3609	0.1804	mg/kg	U	1
Barium	7440-39-3	ND	1.804	0.9022	mg/kg	U	1
Cadmium	7440-43-9	ND	1.804	0.9022	mg/kg	U	1
Chromium	7440-47-3	ND	1.804	0.9022	mg/kg	U	1
Lead	7439-92-1	ND	1.804	0.9022	mg/kg	U	1
Mercury	7439-97-6	ND	0.07218	0.03609	mg/kg	U	1
Selenium	7782-49-2	ND	1.804	0.9022	mg/kg	U	1
Silver	7440-22-4	ND	1.804	0.9022	mg/kg	U	1

Blank Summary 14052319

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8015 C** Prep Method: SW3550C

Matrix: **SOLID**

Sample Id: **50543-1-BLK** Lab Sample Id: **50543-1-BLK**

Date Analyzed: May-28-14 10:31 Analyst: 1040 Seq Number: 114168 Date Prep: May-27-14 17:20 Tech: 1054

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-DRO (Diesel Range Organics)	C10C28DRO	ND	4.058	4.058	mg/kg	U	1

Blank Summary 14052319

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8015C** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50562-2-BLK** Lab Sample Id: **50562-2-BLK**

Date Analyzed: May-27-14 10:37 Analyst: 1035 Seq Number: 114161 Date Prep: May-27-14 08:53 Tech: 1035

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-GRO (Gasoline Range Organics)	C6C10GRO	ND	99.60	49.80	ug/kg	U	1

Blank Summary 14052319

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor Park

Analytical Method: **SW-846 8260 B** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50552-1-BLK** Lab Sample Id: **50552-1-BLK**

Date Analyzed: May-27-14 11:39 Analyst: 1011 Seq Number: 114144 Date Prep: May-27-14 13:00 Tech: 1011

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Methyl-t-Butyl Ether	1634-04-4	ND	5.144	2.572	ug/kg	U	1
Benzene	71-43-2	ND	5.144	2.572	ug/kg	U	1
Toluene	108-88-3	ND	5.144	2.572	ug/kg	U	1
Ethylbenzene	100-41-4	ND	5.144	2.572	ug/kg	U	1
m&p-Xylene	108-38-3	ND	10.29	5.144	ug/kg	U	1
o-Xylene	95-47-6	ND	5.144	2.572	ug/kg	U	1

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14052319 **Project ID:** 1401020

Prep Batch #: 50540 **Date Prepared:** 05/27/2014 14:29 **Sample ID:** 50540-1-BKS **Matrix:** Solid

Lab Batch ID: 114169 **Date Analyzed:** 05/28/2014 14:26 **Analyst:** 1033

Reporting Units: mg/kg

BLANK /BLANK SPIKE RECOVERY STUDY

RCRA Metals Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Arsenic	<0.4641	18.56	17.75	96	80-120	
Barium	<2.321	18.56	19.20	103	80-120	
Cadmium	<2.321	18.56	17.21	93	80-120	
Chromium	<2.321	18.56	18.80	101	80-120	
Lead	<2.321	18.56	19.39	104	80-120	
Mercury	<0.09282	0.4641	0.5059	109	80-120	
Selenium	<2.321	18.56	16.74	90	80-120	
Silver	<2.321	18.56	18.72	101	80-120	

Blank Spike Recovery [D] = 100*(([C])/[B])

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14052319 **Project ID:** 1401020

Prep Batch #: 50562 **Date Prepared:** 05/27/2014 08:53 **Sample ID:** 50562-2-BKS **Matrix:** Solid

Lab Batch ID: 114161 **Date Analyzed:** 05/27/2014 10:37 **Analyst:** 1035

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

Total Petroleum Hydrocarbons-GRO Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
TPH-GRO (Gasoline Range Organics)	<100	5000	3974	79	60-112	

Blank Spike Recovery [D] = 100*(([C])/[B])

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor Park

Work Order #: 14052319 **Project ID:** 1401020

Prep Batch #: 50552 **Date Prepared:** 05/27/2014 13:00 **Sample ID:** 50552-1-BKS **Matrix:** Solid

Lab Batch ID: 114144 **Date Analyzed:** 05/27/2014 11:39 **Analyst:** 1011

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

BTEX + MTBE Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Methyl-t-Butyl Ether	<5.123	61.48	58.31	95	59-133		47-145
Benzene	<5.123	61.48	53.79	87	69-128		59-138
Toluene	<5.123	61.48	54.82	89	66-127		56-138
Ethylbenzene	<5.123	61.48	55.87	91	58-130		46-142
m&p-Xylene	<10.25	123	111.4	91	60-131		48-143
o-Xylene	<5.123	61.48	55.91	91	60-126		49-137

Blank Spike Recovery [D] = 100*(([C])/[B])

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor Park

Work Order #: 14052319 **Project ID:** 1401020

Prep Batch #: 50543 **Date Prepared:** 05/27/2014 17:20 **Sample:** 50543-1-BKS **Analyst:** 1040

Lab Batch ID: 114168 **Date Analyzed:** 05/28/2014 09:47 **Method:** SW3550C / SW8015DRO **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
TPH-DRO (Diesel Range Organics)	<4.007	33.39	28.85	86	33.33	24.94	75	15	56-117	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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F = RPD 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.

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

(1) *CLIENT: WSP *OFFICE LOC. Reston
*PROJECT MGR: Dave Rykaczewski *PHONE NO.: (412) 418-0140
EMAIL: Dave.Rykaczewski@wsp.com FAX NO.: ( )
*PROJECT NAME: Ridgely Manor Park PROJECT NO. 1401020
SITE LOCATION: Towson P.O. NO.: 1401020
SAMPLER(S): David Sarr DW CERT NO.:

PSS Work Order #: 1405239 PAGE 1 OF 1

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) * TPH-GRO	TPH-DRO	BTEX (8260)	RCRA Metals	REMARKS
1	STOCKSW-052314	5/23/14	1450	S	2	C	-	✓	✓	✓	✓	3-day TAT
2	STOCK 23 -052314	5/23/14	1455	S	2	C	-	✓	✓	✓	✓	3-day TAT
3	STOCK N -052314	5/23/14	1500	S	2	C	-	✓	✓	✓	✓	3-day TAT

(5)

Relinquished By: (1)	Date	Time	Received By:
David Sarr	5/23/14	1530	TE 123
Relinquished By: (2)	Date	Time	Received By:
TE 123	5/23/14	1618	Robyn Rhodes
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: Abs Temp: 25°C
Shipping Carrier: TE

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE ____

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

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14052319	**Received By**	Robyn Rhudy
Client Name	WSP Environment & Energy - Restor	**Date Received**	05/23/2014 04:18:00 PM
Project Name	Ridgely Manor Park	**Delivered By**	Trans Time Express
Project Number	1401020	**Tracking No**	Not Applicable
Disposal Date	06/27/2014	**Logged In By**	Robyn Rhudy

Shipping Container(s)

No. of Coolers 1

		Ice	Absent
Custody Seal(s) Intact?	N/A	Temp (deg C)	25
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	David Sarr
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 3 Total No. of Containers Received 6

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, 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

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.

Sample(s) received at a temperature greater than 6 degrees C, and ice was not present.

Samples Inspected/Checklist Completed By: Robyn Rhudy Date: 05/23/2014

Robyn Rhudy

PM Review and Approval: Date: 05/27/2014

Simon Crisp

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14052814

Project Manager: Dave Rykaczewski
Project Name : Ridgely Manor
Project Location: Towson, MD
Project ID : 1401020-1

June 2, 2014

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
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PHASE SEPARATION SCIENCE, INC.

June 2, 2014

Dave Rykaczewski
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14052814**
Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID.: 1401020-1

Dear Dave Rykaczewski :

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 **14052814**.

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 July 2, 2014. 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

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor

Work Order Number(s): 14052814

Project ID: 1401020-1

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/28/2014 at 02:55 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14052814-001	Stock-MH24-LAT	SOIL	05/28/14 09:30
14052814-002	Stock-MH24-LAT	SOIL	05/28/14 09:30

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)].

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 LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

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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ROUTE 40 WEST
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052814

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID: 1401020-1

Sample ID: Stock-MH24-LAT **Date/Time Sampled: 05/28/2014 09:30** **PSS Sample ID: 14052814-001**
Matrix: SOIL **Date/Time Received: 05/28/2014 14:55** **% Solids: 81**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	61		1	06/02/14	06/02/14 07:02	1028

RCRA Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**1.3**	mg/kg	0.55		1	05/29/14	05/30/14 16:17	1033
Barium	**9.4**	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033
Cadmium	ND	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033
Chromium	**15**	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033
Lead	**5.5**	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033
Mercury	ND	mg/kg	0.11		1	05/29/14	05/30/14 16:17	1033
Selenium	ND	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033
Silver	ND	mg/kg	2.8		1	05/29/14	05/30/14 16:17	1033

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

LF - Lighter fuel/oil pattern observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**29**	mg/kg	4.9	LF	1	05/28/14	05/29/14 12:25	1040

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)	**230,000**	ug/kg	12,000		100	05/30/14	05/30/14 13:07	1035

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052814

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID: 1401020-1

Sample ID: Stock-MH24-LAT | **Date/Time Sampled: 05/28/2014 09:30** | **PSS Sample ID: 14052814-001**
Matrix: SOIL | **Date/Time Received: 05/28/2014 14:55** | **% Solids: 81**

Polychlorinated Biphenyls | Analytical Method: SW-846 8082 A | Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1221	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1232	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1242	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1248	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1254	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029
PCB-1260	ND	mg/kg	0.063		1	05/28/14	05/29/14 12:13	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052814

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID: 1401020-1

Sample ID: Stock-MH24-LAT | **Date/Time Sampled: 05/28/2014 09:30** | **PSS Sample ID: 14052814-001**
Matrix: SOIL | **Date/Time Received: 05/28/2014 14:55** | **% Solids: 81**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Chloromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Vinyl Chloride	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Bromomethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Chloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Acetone	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011
Cyclohexane	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011
Trichlorofluoromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1-Dichloroethene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Methylene Chloride	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
trans-1,2-Dichloroethene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Methyl-t-butyl ether	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1-Dichloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
2-Butanone (MEK)	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011
cis-1,2-Dichloroethene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Bromochloromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Chloroform	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1,1-Trichloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,2-Dichloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Carbon Tetrachloride	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Benzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,2-Dichloropropane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Carbon Disulfide	ND	ug/kg	12		1	05/29/14	05/29/14 12:46	1011
Methylcyclohexane	**4,200**	ug/kg	250		1	05/29/14	05/29/14 14:12	1011
Trichloroethene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Methyl Acetate	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011
Bromodichloromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
cis-1,3-Dichloropropene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
4-Methyl-2-Pentanone	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011

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ROUTE 40 WEST
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410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052814

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID: 1401020-1

Sample ID: Stock-MH24-LAT **Date/Time Sampled: 05/28/2014 09:30** **PSS Sample ID: 14052814-001**
Matrix: SOIL **Date/Time Received: 05/28/2014 14:55** **% Solids: 81**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1,2-Trichloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Toluene	**14**	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
2-Hexanone	ND	ug/kg	25		1	05/29/14	05/29/14 12:46	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Dibromochloromethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Bromoform	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Tetrachloroethene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Chlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Ethylbenzene	**2,300**	ug/kg	62		1	05/29/14	05/29/14 14:12	1011
m,p-Xylenes	**7,700**	ug/kg	120		1	05/29/14	05/29/14 14:12	1011
Styrene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
o-Xylene	**480**	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Isopropylbenzene	**180**	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,3-Dichlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,4-Dichlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,2-Dichlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	50		1	05/29/14	05/29/14 12:46	1011
1,2,4-Trichlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011
Naphthalene	**1,100**	ug/kg	62		1	05/29/14	05/29/14 14:12	1011
1,2,3-Trichlorobenzene	ND	ug/kg	6.2		1	05/29/14	05/29/14 12:46	1011

Sample ID: Stock-MH24-LAT **Date/Time Sampled: 05/28/2014 09:30** **PSS Sample ID: 14052814-001**
Matrix: SOIL **Date/Time Received: 05/28/2014 14:55**

Moisture Content — Analytical Method: ASTM D2216 05

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Percent Moisture	**19**	%			1	05/29/14	05/29/14 10:25	1045

Final 1.000

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14052814

WSP Environment & Energy - Reston, Reston, VA

June 2, 2014

Project Name: Ridgely Manor
Project Location: Towson, MD
Project ID: 1401020-1

Sample ID: Stock-MH24-LAT **Date/Time Sampled: 05/28/2014 09:30** **PSS Sample ID: 14052814-002**
Matrix: SOIL **Date/Time Received: 05/28/2014 14:55**

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

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Vinyl chloride	ND	mg/L	0.10		100	0.2	05/30/14	05/31/14 01:15	1011
1,1-Dichloroethene	ND	mg/L	0.10		100	0.7	05/30/14	05/31/14 01:15	1011
2-Butanone (MEK)	ND	mg/L	1.0		100	200	05/30/14	05/31/14 01:15	1011
Chloroform	ND	mg/L	0.10		100	6	05/30/14	05/31/14 01:15	1011
1,2-Dichloroethane	ND	mg/L	0.10		100	0.5	05/30/14	05/31/14 01:15	1011
Carbon tetrachloride	ND	mg/L	0.10		100	0.5	05/30/14	05/31/14 01:15	1011
Benzene	ND	mg/L	0.10		100	0.5	05/30/14	05/31/14 01:15	1011
Trichloroethene	ND	mg/L	0.10		100	0.5	05/30/14	05/31/14 01:15	1011
Tetrachloroethene	ND	mg/L	0.10		100	0.7	05/30/14	05/31/14 01:15	1011
Chlorobenzene	ND	mg/L	0.10		100	100	05/30/14	05/31/14 01:15	1011
1,4-Dichlorobenzene	ND	mg/L	0.10		100	7.5	05/30/14	05/31/14 01:15	1011

TCLP Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	mg/L	0.010		1	0.13	05/29/14	05/30/14 19:05	1014
Hexachlorobenzene	ND	mg/L	0.010		1	0.13	05/29/14	05/30/14 19:05	1014
Hexachlorobutadiene	ND	mg/L	0.010		1	0.5	05/29/14	05/30/14 19:05	1014
Hexachloroethane	ND	mg/L	0.010		1	3	05/29/14	05/30/14 19:05	1014
2-Methylphenol	ND	mg/L	0.010		1	200	05/29/14	05/30/14 19:05	1014
3&4-Methylphenol	ND	mg/L	0.010		1	200	05/29/14	05/30/14 19:05	1014
Nitrobenzene	ND	mg/L	0.010		1	2	05/29/14	05/30/14 19:05	1014
Pentachlorophenol	ND	mg/L	0.020		1	100	05/29/14	05/30/14 19:05	1014
Pyridine	ND	mg/L	0.010		1	5	05/29/14	05/30/14 19:05	1014
2,4,6-Trichlorophenol	ND	mg/L	0.010		1	2	05/29/14	05/30/14 19:05	1014
2,4,5-Trichlorophenol	ND	mg/L	0.010		1	400	05/29/14	05/30/14 19:05	1014

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor

Work Order Number(s): 14052814
Project ID: 1401020-1

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.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

TCL Volatiles plus Oxygenates

Batch: 114216

Surrogate exceedances identified; see surrogate summary form.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): **14052814**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Dave Rykaczewski

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	Stock-MH24-LAT	Initial	14052814-001	1045	S	114186	114186	05/28/2014	05/29/2014 10:25	05/29/2014 10:25
EPA 9071 B-Modified	Stock-MH24-LAT	Initial	14052814-001	1028	S	114247	114247	05/28/2014	06/02/2014 07:02	06/02/2014 07:02
	114247-1-BKS	BKS	114247-1-BKS	1028	S	114247	114247	--------	06/02/2014 07:02	06/02/2014 07:02
	114247-1-BLK	BLK	114247-1-BLK	1028	S	114247	114247	--------	06/02/2014 07:02	06/02/2014 07:02
	114247-1-BSD	BSD	114247-1-BSD	1028	S	114247	114247	--------	06/02/2014 07:02	06/02/2014 07:02
	Stock-MH24-LAT S	MS	14052814-001 S	1028	S	114247	114247	05/28/2014	06/02/2014 07:02	06/02/2014 07:02
	Stock-MH24-LAT SD	MSD	14052814-001 SD	1028	S	114247	114247	05/28/2014	06/02/2014 07:02	06/02/2014 07:02
SW-846 6020 A	Stock-MH24-LAT	Initial	14052814-001	1033	S	50583	114260	05/28/2014	05/29/2014 13:10	05/30/2014 16:17
	50583-1-BKS	BKS	50583-1-BKS	1033	S	50583	114260	--------	05/29/2014 13:10	05/30/2014 15:35
	50583-1-BLK	BLK	50583-1-BLK	1033	S	50583	114260	--------	05/29/2014 13:10	05/30/2014 14:17
	Kincora Central S	MS	14052715-001 S	1033	S	50583	114260	05/23/2014	05/29/2014 13:10	05/30/2014 14:35
	Kincora Central SD	MSD	14052715-001 SD	1033	S	50583	114260	05/23/2014	05/29/2014 13:10	05/30/2014 14:41
SW-846 8015 C	Stock-MH24-LAT	Initial	14052814-001	1040	S	50567	114202	05/28/2014	05/28/2014 17:54	05/29/2014 12:25
	50567-1-BKS	BKS	50567-1-BKS	1040	S	50567	114202	--------	05/28/2014 17:54	05/29/2014 09:11
	50567-1-BLK	BLK	50567-1-BLK	1040	S	50567	114202	--------	05/28/2014 17:54	05/29/2014 09:54
	50567-1-BSD	BSD	50567-1-BSD	1040	S	50567	114202	--------	05/28/2014 17:54	05/29/2014 09:33
	B-4 17-19' S	MS	14052220-001 S	1040	S	50567	114202	05/22/2014	05/28/2014 17:54	05/29/2014 09:11
	B-4 17-19' SD	MSD	14052220-001 SD	1040	S	50567	114202	05/22/2014	05/28/2014 17:54	05/29/2014 09:33
SW-846 8015C	Stock-MH24-LAT	Initial	14052814-001	1035	S	50612	114263	05/28/2014	05/30/2014 10:06	05/30/2014 13:07
	50612-2-BKS	BKS	50612-2-BKS	1035	S	50612	114263	--------	05/30/2014 10:06	05/30/2014 11:39
	50612-2-BLK	BLK	50612-2-BLK	1035	S	50612	114263	--------	05/30/2014 10:06	05/30/2014 11:09
	1 East S	MS	14052904-001 S	1035	S	50612	114263	05/29/2014	05/30/2014 10:06	05/30/2014 14:35
	1 East SD	MSD	14052904-001 SD	1035	S	50612	114263	05/29/2014	05/30/2014 10:06	05/30/2014 15:05
SW-846 8082 A	Stock-MH24-LAT	Initial	14052814-001	1029	S	50555	114194	05/28/2014	05/28/2014 10:04	05/29/2014 12:13
	50555-1-BKS	BKS	50555-1-BKS	1029	S	50555	114194	--------	05/28/2014 10:04	05/29/2014 11:15
	50555-1-BLK	BLK	50555-1-BLK	1029	S	50555	114194	--------	05/28/2014 10:04	05/29/2014 10:46
	50555-1-BSD	BSD	50555-1-BSD	1029	S	50555	114194	--------	05/28/2014 10:04	05/29/2014 11:44

Analytical Data Package Information Summary

Work Order(s): 14052814
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Dave Rykaczewski

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8082 A	143120126 S	MS	14052103-001 S	1029	S	50555	114194	05/16/2014	05/28/2014 10:04	05/29/2014 11:44
	143120126 SD	MSD	14052103-001 SD	1029	S	50555	114194	05/16/2014	05/28/2014 10:04	05/29/2014 12:13
SW-846 8260 B	Stock-MH24-LAT	Initial	14052814-002	1011	W	50618	114261	05/28/2014	05/30/2014 13:00	05/31/2014 01:15
	50618-1-BKS	BKS	50618-1-BKS	1011	W	50618	114261	--------	05/30/2014 13:00	05/30/2014 22:55
	50618-1-BLK	BLK	50618-1-BLK	1011	W	50618	114261	--------	05/30/2014 13:00	05/31/2014 00:05
	Stock-MH24-LAT S	MS	14052814-002 S	1011	W	50618	114261	05/28/2014	05/30/2014 13:00	05/31/2014 05:55
	Stock-MH24-LAT SD	MSD	14052814-002 SD	1011	W	50618	114261	05/28/2014	05/30/2014 13:00	05/31/2014 06:31
SW-846 8260 B	Stock-MH24-LAT	Initial	14052814-001	1011	S	50597	114216	05/28/2014	05/29/2014 11:00	05/29/2014 12:46
	50597-1-BKS	BKS	50597-1-BKS	1011	S	50597	114216	--------	05/29/2014 11:00	05/29/2014 11:52
	50597-1-BLK	BLK	50597-1-BLK	1011	S	50597	114216	--------	05/29/2014 11:00	05/29/2014 11:16
	G1 S	MS	14052816-001 S	1011	S	50597	114216	05/28/2014	05/29/2014 11:00	05/29/2014 16:10
	G1 SD	MSD	14052816-001 SD	1011	S	50597	114216	05/28/2014	05/29/2014 11:00	05/29/2014 16:39
	Stock-MH24-LAT	Reanalysis	14052814-001	1011	S	50597	114216	05/28/2014	05/29/2014 11:00	05/29/2014 14:12
SW-846 8270 C	Stock-MH24-LAT	Initial	14052814-002	1014	W	50576	114250	05/28/2014	05/29/2014 09:20	05/30/2014 19:05
	50576-1-BKS	BKS	50576-1-BKS	1014	W	50576	114250	--------	05/29/2014 09:20	05/30/2014 16:34
	50576-1-BLK	BLK	50576-1-BLK	1014	W	50576	114250	--------	05/29/2014 09:20	05/30/2014 15:29
	50576-1-BSD	BSD	50576-1-BSD	1014	W	50576	114250	--------	05/29/2014 09:20	05/30/2014 17:05
	Barrel 3 S	MS	14052702-003 S	1014	W	50576	114250	05/27/2014	05/29/2014 09:20	05/30/2014 20:05

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114202 **Sample:** 14052220-001 S / MS **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/29/2014 09:11

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	19.9	33.30	60	42-129	

Lab Batch #: 114202 **Sample:** 50567-1-BKS / BKS **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/29/2014 09:11

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	20.5	33.20	62	42-129	

Lab Batch #: 114202 **Sample:** 14052220-001 SD / MSD **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/29/2014 09:33

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	21.9	33.70	65	42-129	

Lab Batch #: 114202 **Sample:** 50567-1-BSD / BSD **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/29/2014 09:33

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	20.6	33.50	61	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114202 **Sample:** 50567-1-BLK / BLK **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 05/29/2014 09:54

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	19.8	33.10	60	42-129	

Lab Batch #: 114202 **Sample:** 14052814-001 / SMP **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 05/29/2014 12:25

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	17.0	33.20	52	42-129	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114263 **Sample:** 50612-2-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/30/2014 11:09

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	67.9	100	68	55-142	

Lab Batch #: 114263 **Sample:** 50612-2-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/30/2014 11:39

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	85.0	100	85	55-142	

Lab Batch #: 114263 **Sample:** 14052814-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/30/2014 13:07

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	83.0	100	83	55-142	

Lab Batch #: 114263 **Sample:** 14052904-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/30/2014 14:35

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	86.7	100	87	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114263 **Sample:** 14052904-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/30/2014 15:05

	SURROGATE RECOVERY STUDY				
Total Petroleum Hydrocarbons-GRO **Analytes**	**Amount Found [A]**	**True Amount [B]**	**Recovery %R [C]**	**Control Limits %R**	**Flags**
a,a,a-Trifluorotoluene	87.6	100	88	55-142	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114194 **Sample:** 50555-1-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/29/2014 10:46

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	29.5	25.00	118	11-150	
Tetrachloro-m-xylene	28.7	25.00	115	12-158	

Lab Batch #: 114194 **Sample:** 50555-1-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/29/2014 11:15

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	29.0	25.00	116	11-150	
Tetrachloro-m-xylene	26.3	25.00	105	12-158	

Lab Batch #: 114194 **Sample:** 14052103-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 11:44

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	16.5	25.00	66	11-150	
Tetrachloro-m-xylene	14.5	25.00	58	12-158	

Lab Batch #: 114194 **Sample:** 50555-1-BSD / BSD **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/29/2014 11:44

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	24.7	25.00	99	11-150	
Tetrachloro-m-xylene	22.4	25.00	90	12-158	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114194 **Sample:** 14052103-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 12:13

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	18.4	25.00	73	11-150	
Tetrachloro-m-xylene	14.6	25.00	58	12-158	

Lab Batch #: 114194 **Sample:** 14052814-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 12:13

Polychlorinated Biphenyls Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Decachlorobiphenyl	12.0	25.00	48	11-150	
Tetrachloro-m-xylene	18.0	25.00	72	12-158	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114216 **Sample:** 50597-1-BLK / BLK **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/29/2014 11:16

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.3	50.00	101	85-115	
Toluene-D8	50.7	50.00	101	91-109	
4-Bromofluorobenzene	51.9	50.00	104	80-125	

Lab Batch #: 114216 **Sample:** 50597-1-BKS / BKS **Matrix:** Solid

Units: ug/kg **Date Analyzed:** 05/29/2014 11:52

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.2	50.00	100	85-115	
Toluene-D8	50.3	50.00	101	91-109	
4-Bromofluorobenzene	51.3	50.00	103	80-125	

Lab Batch #: 114216 **Sample:** 14052814-001 / SMP **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 12:46

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	59.0	50.00	117	85-115	*
Toluene-D8	57.0	50.00	113	91-109	*
4-Bromofluorobenzene	53.0	50.00	106	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114216 **Sample:** 14052814-001 / DL **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 14:12

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.0	50.00	100	85-115	
Toluene-D8	51.0	50.00	102	91-109	
4-Bromofluorobenzene	53.0	50.00	105	80-125	

Lab Batch #: 114216 **Sample:** 14052816-001 S / MS **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 16:10

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.8	50.00	102	85-115	
Toluene-D8	50.7	50.00	101	91-109	
4-Bromofluorobenzene	50.7	50.00	101	80-125	

Lab Batch #: 114216 **Sample:** 14052816-001 SD / MSD **Matrix:** Soil

Units: ug/kg **Date Analyzed:** 05/29/2014 16:39

TCL Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.8	50.00	102	85-115	
Toluene-D8	51.6	50.00	103	91-109	
4-Bromofluorobenzene	50.3	50.00	101	80-125	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114261 **Sample:** 50618-1-BKS / BKS **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/30/2014 22:55

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.5	50.00	101	84-110	
Toluene-D8	50.5	50.00	101	94-109	
4-Bromofluorobenzene	50.1	50.00	100	81-133	

Lab Batch #: 114261 **Sample:** 50618-1-BLK / BLK **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/31/2014 00:05

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.1	50.00	100	84-110	
Toluene-D8	49.3	50.00	99	94-109	
4-Bromofluorobenzene	55.7	50.00	111	81-133	

Lab Batch #: 114261 **Sample:** 14052814-002 / SMP **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/31/2014 01:15

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	51.0	50.00	102	84-110	
Toluene-D8	49.0	50.00	99	94-109	
4-Bromofluorobenzene	54.0	50.00	107	81-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114261 **Sample:** 14052814-002 S / MS **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/31/2014 05:55

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.9	50.00	102	84-110	
Toluene-D8	50.8	50.00	102	94-109	
4-Bromofluorobenzene	50.0	50.00	100	81-133	

Lab Batch #: 114261 **Sample:** 14052814-002 SD / MSD **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/31/2014 06:31

TCLP Volatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
Dibromofluoromethane	50.7	50.00	101	84-110	
Toluene-D8	50.1	50.00	100	94-109	
4-Bromofluorobenzene	50.9	50.00	102	81-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114250 **Sample:** 50576-1-BLK / BLK **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/30/2014 15:29

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	41.4	40.00	103	68-116	
2-Fluorophenol	77.2	80.00	97	57-98	
Nitrobenzene-d5	37.8	40.00	95	58-107	
Phenol-d6	83.7	80.00	105	59-109	
Terphenyl-D14	38.8	40.00	97	69-121	
2,4,6-Tribromophenol	77.1	80.00	96	48-119	

Lab Batch #: 114250 **Sample:** 50576-1-BKS / BKS **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/30/2014 16:34

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	18.7	20.00	94	68-116	
2-Fluorophenol	33.9	40.00	85	57-98	
Nitrobenzene-d5	16.4	20.00	82	58-107	
Phenol-d6	35.9	40.00	90	59-109	
Terphenyl-D14	24.9	20.00	124	69-121	*
2,4,6-Tribromophenol	39.6	40.00	99	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114250 **Sample:** 50576-1-BSD / BSD **Matrix:** Water

Units: ug/L **Date Analyzed:** 05/30/2014 17:05

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	18.9	20.00	94	68-116	
2-Fluorophenol	37.3	40.00	93	57-98	
Nitrobenzene-d5	17.8	20.00	89	58-107	
Phenol-d6	39.0	40.00	97	59-109	
Terphenyl-D14	23.6	20.00	118	69-121	
2,4,6-Tribromophenol	39.9	40.00	100	48-119	

Lab Batch #: 114250 **Sample:** 14052814-002 / SMP **Matrix:** Soil

Units: ug/L **Date Analyzed:** 05/30/2014 19:05

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	35.0	40.00	88	68-116	
2-Fluorophenol	58.0	80.00	73	57-98	
Nitrobenzene-d5	31.0	40.00	78	58-107	
Phenol-d6	71.0	80.00	89	59-109	
Terphenyl-D14	39.0	40.00	98	69-121	
2,4,6-Tribromophenol	72.0	80.00	90	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Ridgely Manor

06/02/2014

Work Order #: 14052814 **Project ID:** 1401020-1

Lab Batch #: 114250 **Sample:** 14052702-003 S / MS **Matrix:** Solid

Units: ug/L **Date Analyzed:** 05/30/2014 20:05

TCLP Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	35.5	40.00	89	68-116	
2-Fluorophenol	62.4	80.00	78	57-98	
Nitrobenzene-d5	32.7	40.00	82	58-107	
Phenol-d6	67.5	80.00	84	59-109	
Terphenyl-D14	47.7	40.00	119	69-121	
2,4,6-Tribromophenol	83.0	80.00	104	48-119	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **EPA 9071 B-Modified** Prep Method:

Matrix: **SOLID**

Sample Id: **114247-1-BLK** Lab Sample Id: **114247-1-BLK**

Date Analyzed: Jun-02-14 07:02 Analyst: 1028 Date Prep: Tech: 1028

Seq Number: 114247

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Oil & Grease, Total Recovered *	OG_TR	ND	49.97	39.98	mg/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 6020 A** Prep Method: SW3050B

Matrix: **SOLID**

Sample Id: **50583-1-BLK** Lab Sample Id: **50583-1-BLK**

Date Analyzed: May-30-14 14:17 Analyst: 1033 Seq Number: 114260 Date Prep: May-29-14 13:10 Tech: 1034

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Arsenic	7440-38-2	ND	0.4498	0.2249	mg/kg	U	1
Barium	7440-39-3	ND	2.249	1.124	mg/kg	U	1
Cadmium	7440-43-9	ND	2.249	1.124	mg/kg	U	1
Chromium	7440-47-3	ND	2.249	1.124	mg/kg	U	1
Lead	7439-92-1	ND	2.249	1.124	mg/kg	U	1
Mercury	7439-97-6	ND	0.08995	0.04498	mg/kg	U	1
Selenium	7782-49-2	ND	2.249	1.124	mg/kg	U	1
Silver	7440-22-4	ND	2.249	1.124	mg/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8015 C** Prep Method: SW3550C

Matrix: **SOLID**

Sample Id: **50567-1-BLK** Lab Sample Id: **50567-1-BLK**

Date Analyzed: May-29-14 09:54 Analyst: 1040 Seq Number: 114202 Date Prep: May-28-14 17:54 Tech: 1054

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-DRO (Diesel Range Organics)	C10C28DRO	ND	3.968	3.968	mg/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8015C** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50612-2-BLK** Lab Sample Id: **50612-2-BLK**

Date Analyzed: May-30-14 11:09 Analyst: 1035 Date Prep: May-30-14 10:06 Tech: 1035

Seq Number: 114263

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
TPH-GRO (Gasoline Range Organics)	C6C10GRO	ND	98.43	49.21	ug/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8082 A** Prep Method: SW3550C

Matrix: **SOLID**

Sample Id: **50555-1-BLK** Lab Sample Id: **50555-1-BLK**

Date Analyzed: May-29-14 10:46 Analyst: 1029 Seq Number: 114194 Date Prep: May-28-14 10:04 Tech: 1044

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
PCB-1016	12674-11-2	ND	0.05139	0.05139	mg/kg	U	1
PCB-1221	11104-28-2	ND	0.05139	0.05139	mg/kg	U	1
PCB-1232	11141-16-5	ND	0.05139	0.05139	mg/kg	U	1
PCB-1242	53469-21-9	ND	0.05139	0.05139	mg/kg	U	1
PCB-1248	12672-29-6	ND	0.05139	0.05139	mg/kg	U	1
PCB-1254	11097-69-1	ND	0.05139	0.05139	mg/kg	U	1
PCB-1260	11096-82-5	ND	0.05139	0.05139	mg/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8260 B** Prep Method: SW5030
Matrix: **SOLID**

Sample Id: **50597-1-BLK** Lab Sample Id: **50597-1-BLK**

Date Analyzed: May-29-14 11:16 Analyst: 1011 Date Prep: May-29-14 11:00 Tech: 1011
Seq Number: 114216

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Dichlorodifluoromethane	75-71-8	ND	5.123	2.561	ug/kg	U	1
Chloromethane	74-87-3	ND	5.123	2.561	ug/kg	U	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	ND	5.123	2.561	ug/kg	U	1
Vinyl Chloride	75-01-4	ND	5.123	2.561	ug/kg	U	1
Bromomethane	74-83-9	ND	5.123	2.561	ug/kg	U	1
Chloroethane	75-00-3	ND	5.123	2.561	ug/kg	U	1
Acetone	67-64-1	ND	20.49	10.25	ug/kg	U	1
Cyclohexane	110-82-7	ND	20.49	10.25	ug/kg	U	1
Trichlorofluoromethane	75-69-4	ND	5.123	2.561	ug/kg	U	1
1,1-Dichloroethene	75-35-4	ND	5.123	2.561	ug/kg	U	1
Methylene Chloride	75-09-2	ND	5.123	2.561	ug/kg	U	1
trans-1,2-Dichloroethene	156-60-5	ND	5.123	2.561	ug/kg	U	1
Methyl-t-butyl ether	1634-04-4	ND	5.123	2.561	ug/kg	U	1
1,1-Dichloroethane	75-34-3	ND	5.123	2.561	ug/kg	U	1
2-Butanone (MEK)	78-93-3	ND	20.49	10.25	ug/kg	U	1
cis-1,2-Dichloroethene	156-59-2	ND	5.123	2.561	ug/kg	U	1
Bromochloromethane	74-97-5	ND	5.123	2.561	ug/kg	U	1
Chloroform	67-66-3	ND	5.123	2.561	ug/kg	U	1
1,1,1-Trichloroethane	71-55-6	ND	5.123	2.561	ug/kg	U	1
1,2-Dichloroethane	107-06-2	ND	5.123	2.561	ug/kg	U	1
Carbon Tetrachloride	56-23-5	ND	5.123	2.561	ug/kg	U	1
Benzene	71-43-2	ND	5.123	2.561	ug/kg	U	1
1,2-Dichloropropane	78-87-5	ND	5.123	2.561	ug/kg	U	1
Carbon Disulfide	75-15-0	ND	10.25	5.123	ug/kg	U	1
Methylcyclohexane	108-87-2	ND	20.49	10.25	ug/kg	U	1
Trichloroethene	79-01-6	ND	5.123	2.561	ug/kg	U	1
Methyl Acetate	79-20-9	ND	20.49	10.25	ug/kg	U	1
Bromodichloromethane	75-27-4	ND	5.123	2.561	ug/kg	U	1
cis-1,3-Dichloropropene	10061-01-5	ND	5.123	2.561	ug/kg	U	1
4-Methyl-2-Pentanone	108-10-1	ND	20.49	10.25	ug/kg	U	1
trans-1,3-Dichloropropene	10061-02-6	ND	5.123	2.561	ug/kg	U	1
1,1,2-Trichloroethane	79-00-5	ND	5.123	2.561	ug/kg	U	1
Toluene	108-88-3	ND	5.123	2.561	ug/kg	U	1
2-Hexanone	591-78-6	ND	20.49	10.25	ug/kg	U	1
1,2-Dibromoethane (EDB)	106-93-4	ND	5.123	2.561	ug/kg	U	1
Dibromochloromethane	124-48-1	ND	5.123	2.561	ug/kg	U	1
Bromoform	75-25-2	ND	5.123	2.561	ug/kg	U	1
Tetrachloroethene	127-18-4	ND	5.123	2.561	ug/kg	U	1
Chlorobenzene	108-90-7	ND	5.123	2.561	ug/kg	U	1
Ethylbenzene	100-41-4	ND	5.123	2.561	ug/kg	U	1
m,p-Xylenes	108-38-3	ND	10.25	5.123	ug/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8260 B** Prep Method: SW5030

Matrix: **SOLID**

Sample Id: **50597-1-BLK** Lab Sample Id: **50597-1-BLK**

Date Analyzed: May-29-14 11:16 Analyst: 1011 Seq Number: 114216 Date Prep: May-29-14 11:00 Tech: 1011

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Styrene	100-42-5	ND	5.123	2.561	ug/kg	U	1
1,1,2,2-Tetrachloroethane	79-34-5	ND	5.123	2.561	ug/kg	U	1
o-Xylene	95-47-6	ND	5.123	2.561	ug/kg	U	1
Isopropylbenzene	98-82-8	ND	5.123	2.561	ug/kg	U	1
1,3-Dichlorobenzene	541-73-1	ND	5.123	2.561	ug/kg	U	1
1,4-Dichlorobenzene	106-46-7	ND	5.123	2.561	ug/kg	U	1
1,2-Dichlorobenzene	95-50-1	ND	5.123	2.561	ug/kg	U	1
1,2-Dibromo-3-Chloropropane	96-12-8	ND	40.98	20.49	ug/kg	U	1
1,2,4-Trichlorobenzene	120-82-1	ND	5.123	2.561	ug/kg	U	1
Naphthalene	91-20-3	ND	5.123	2.561	ug/kg	U	1
1,2,3-Trichlorobenzene	87-61-6	ND	5.123	2.561	ug/kg	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8260 B** Prep Method: SW5030B

Matrix: **WATER**

Sample Id: **50618-1-BLK** Lab Sample Id: **50618-1-BLK**

Date Analyzed: May-31-14 00:05 Analyst: 1011 Seq Number: 114261 Date Prep: May-30-14 13:00 Tech: 1011

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
Vinyl chloride	75-01-4	ND	0.1000	0.05000	mg/L	U	1
1,1-Dichloroethene	75-35-4	ND	0.1000	0.05000	mg/L	U	1
2-Butanone (MEK)	78-93-3	ND	1.000	0.5000	mg/L	U	1
Chloroform	67-66-3	ND	0.1000	0.05000	mg/L	U	1
1,2-Dichloroethane	107-06-2	ND	0.1000	0.05000	mg/L	U	1
Carbon tetrachloride	56-23-5	ND	0.1000	0.05000	mg/L	U	1
Benzene	71-43-2	ND	0.1000	0.05000	mg/L	U	1
Trichloroethene	79-01-6	ND	0.1000	0.05000	mg/L	U	1
Tetrachloroethene	127-18-4	ND	0.1000	0.05000	mg/L	U	1
Chlorobenzene	108-90-7	ND	0.1000	0.05000	mg/L	U	1
1,4-Dichlorobenzene	106-46-7	ND	0.1000	0.05000	mg/L	U	1

Blank Summary 14052814

WSP Environment & Energy - Reston, Reston, VA

Ridgely Manor

Analytical Method: **SW-846 8270 C** Prep Method: SW3510C
Matrix: **WATER**

Sample Id: **50576-1-BLK** Lab Sample Id: **50576-1-BLK**

Date Analyzed: May-30-14 15:29 Analyst: 1014 Date Prep: May-29-14 09:20 Tech: 1022
Seq Number: 114250

Parameter	Cas Number	Result	RL	LOD	Units	Flag	Dil
2,4-Dinitrotoluene	121-14-2	ND	0.01000	0.005000	mg/L	U	1
Hexachlorobenzene	118-74-1	ND	0.01000	0.005000	mg/L	U	1
Hexachlorobutadiene	87-68-3	ND	0.01000	0.005000	mg/L	U	1
Hexachloroethane	67-72-1	ND	0.01000	0.005000	mg/L	U	1
2-Methylphenol	95-48-7	ND	0.01000	0.005000	mg/L	U	1
3&4-Methylphenol		ND	0.01000	0.005000	mg/L	U	1
Nitrobenzene	98-95-3	ND	0.01000	0.005000	mg/L	U	1
Pentachlorophenol	87-86-5	ND	0.02000	0.01000	mg/L	U	1
Pyridine	110-86-1	ND	0.01000	0.005000	mg/L	U	1
2,4,6-Trichlorophenol	88-06-2	ND	0.01000	0.005000	mg/L	U	1
2,4,5-Trichlorophenol	95-95-4	ND	0.01000	0.005000	mg/L	U	1

Blank Spike Recovery

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50583 **Date Prepared:** 05/29/2014 13:10 **Sample ID:** 50583-1-BKS **Matrix:** Solid

Lab Batch ID: 114260 **Date Analyzed:** 05/30/2014 14:17 **Analyst:** 1033

Reporting Units: mg/kg

BLANK /BLANK SPIKE RECOVERY STUDY

RCRA Metals Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Arsenic	<0.4967	19.87	17.87	90	80-120	
Barium	<2.483	19.87	18.76	94	80-120	
Cadmium	<2.483	19.87	16.54	83	80-120	
Chromium	<2.483	19.87	19.39	98	80-120	
Lead	<2.483	19.87	19.18	97	80-120	
Mercury	<0.09933	0.4967	0.4569	92	80-120	
Selenium	<2.483	19.87	15.90	80	80-120	
Silver	<2.483	19.87	17.94	90	80-120	

Blank Spike Recovery [D] = 100*(([C])/[B])

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50612 **Date Prepared:** 05/30/2014 10:06 **Sample ID:** 50612-2-BKS **Matrix:** Solid

Lab Batch ID: 114263 **Date Analyzed:** 05/30/2014 11:09 **Analyst:** 1035

Reporting Units: ug/kg

	BLANK /BLANK SPIKE RECOVERY STUDY					
Total Petroleum Hydrocarbons-GRO **Analytes**	**Blank Result [A]**	**Spike Added [B]**	**Blank Spike Result [C]**	**Blank Spike %R [D]**	**Control Limits %R**	**Flags**
TPH-GRO (Gasoline Range Organics)	<97.28	4864	4254	87	60-112	

Blank Spike Recovery [D] = 100*(([C])/[B])

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Baltimore, MD 21228

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50597 **Date Prepared:** 05/29/2014 11:00 **Sample ID:** 50597-1-BKS **Matrix:** Solid

Lab Batch ID: 114216 **Date Analyzed:** 05/29/2014 11:16 **Analyst:** 1011

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

TCL Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Dichlorodifluoromethane	<5.071	60.85	56.34	93	53-144		38-159
Chloromethane	<5.071	60.85	58.03	95	62-143		48-157
1,1,2-Trichloro-1,2,2-Trifluoroethane	<5.071	60.85	60.12	99	50-162		31-181
Vinyl Chloride	<5.071	60.85	60.61	100	61-156		45-172
Bromomethane	<5.071	60.85	69.14	114	45-199		19-225
Chloroethane	<5.071	60.85	71.46	117	59-151		44-167
Acetone	<20.28	60.85	62.91	103	24-197		0-225
Cyclohexane	<20.28	60.85	55.78	92	50-148		34-164
Trichlorofluoromethane	<5.071	60.85	62.77	103	54-175		33-195
1,1-Dichloroethene	<5.071	60.85	61.08	100	60-154		44-170
Methylene Chloride	<5.071	60.85	51.68	85	56-140		43-154
trans-1,2-Dichloroethene	<5.071	60.85	60.11	99	60-153		45-168
Methyl-t-butyl ether	<5.071	60.85	56.23	92	59-133		47-145
1,1-Dichloroethane	<5.071	60.85	57.38	94	60-148		46-162
2-Butanone (MEK)	<20.28	60.85	57.47	94	35-173		13-196
cis-1,2-Dichloroethene	<5.071	60.85	54.15	89	67-126		57-136
Bromochloromethane	<5.071	60.85	50.97	84	64-121		55-131
Chloroform	<5.071	60.85	52.90	87	65-126		55-137
1,1,1-Trichloroethane	<5.071	60.85	57.02	94	60-145		46-160
1,2-Dichloroethane	<5.071	60.85	52.66	87	62-127		51-137
Carbon Tetrachloride	<5.071	60.85	61.94	102	55-152		38-168
Benzene	<5.071	60.85	53.89	89	69-128		59-138
1,2-Dichloropropane	<5.071	60.85	53.56	88	66-125		56-135
Carbon Disulfide	<10.14	60.85	65.92	108	58-153		42-168
Methylcyclohexane	<20.28	60.85	52.09	86	41-142		25-159
Trichloroethene	<5.071	60.85	55.14	91	68-130		57-141
Methyl Acetate	<20.28	60.85	60.07	99	47-151		30-169
Bromodichloromethane	<5.071	60.85	52.65	87	60-125		49-136
cis-1,3-Dichloropropene	<5.071	60.85	52.51	86	59-122		49-133
4-Methyl-2-Pentanone	<20.28	60.85	53.63	88	22-173		0-198
trans-1,3-Dichloropropene	<5.071	60.85	50.72	83	56-124		44-135
1,1,2-Trichloroethane	<5.071	60.85	52.52	86	65-120		55-129
Toluene	<5.071	60.85	53.57	88	66-127		56-138
2-Hexanone	<20.28	60.85	54.47	90	30-175		6-199
1,2-Dibromoethane (EDB)	<5.071	60.85	54.36	89	64-123		54-133

Blank Spike Recovery [D] = 100*(([C])/[B])

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6630 Baltimore National Pike
Baltimore, MD 21228

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Blank Spike Recovery

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50597 **Date Prepared:** 05/29/2014 11:00 **Sample ID:** 50597-1-BKS **Matrix:** Solid

Lab Batch ID: 114216 **Date Analyzed:** 05/29/2014 11:16 **Analyst:** 1011

Reporting Units: ug/kg

BLANK /BLANK SPIKE RECOVERY STUDY

TCL Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Dibromochloromethane	<5.071	60.85	49.83	82	55-128		43-141
Bromoform	<5.071	60.85	48.69	80	46-128		33-141
Tetrachloroethene	<5.071	60.85	53.58	88	55-145		40-160
Chlorobenzene	<5.071	60.85	49.99	82	61-124		50-134
Ethylbenzene	<5.071	60.85	52.63	86	58-130		46-142
m,p-Xylenes	<10.14	121.7	105.2	86	60-131		48-143
Styrene	<5.071	60.85	51.77	85	54-123		42-134
1,1,2,2-Tetrachloroethane	<5.071	60.85	55.24	91	50-134		37-148
o-Xylene	<5.071	60.85	53.05	87	60-126		49-137
Isopropylbenzene	<5.071	60.85	52.97	87	52-130		38-143
1,3-Dichlorobenzene	<5.071	60.85	47.26	78	42-123		29-136
1,4-Dichlorobenzene	<5.071	60.85	47.09	77	40-121		26-135
1,2-Dichlorobenzene	<5.071	60.85	49.63	82	38-128		23-143
1,2-Dibromo-3-Chloropropane	<40.57	60.85	59.35	98	43-149		25-167
1,2,4-Trichlorobenzene	<5.071	60.85	50.33	83	14-143		0-164
Naphthalene	<5.071	60.85	57.24	94	30-155		9-176
1,2,3-Trichlorobenzene	<5.071	60.85	51.09	84	15-144		0-165

Prep Batch #: 50618 **Date Prepared:** 05/30/2014 13:00 **Sample ID:** 50618-1-BKS **Matrix:** Water

Lab Batch ID: 114261 **Date Analyzed:** 05/31/2014 00:05 **Analyst:** 1011

Reporting Units: mg/L

BLANK /BLANK SPIKE RECOVERY STUDY

TCLP Volatile Organic Compounds Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags	Marginal Exceedance Limits
Vinyl chloride	<0.001000	0.0500	0.0399	80	64-132		52-144
1,1-Dichloroethene	<0.001000	0.0500	0.0406	81	59-123		48-134
2-Butanone (MEK)	<0.01000	0.0500	0.0486	97	56-133		44-146
Chloroform	<0.001000	0.0500	0.0493	99	71-118		63-126
1,2-Dichloroethane	<0.001000	0.0500	0.0498	100	64-130		53-140
Carbon tetrachloride	<0.001000	0.0500	0.0522	104	74-127		65-136
Benzene	<0.001000	0.0500	0.0503	101	77-122		70-130
Trichloroethene	<0.001000	0.0500	0.0490	98	72-127		63-137
Tetrachloroethene	<0.001000	0.0500	0.0491	98	78-113		72-119
Chlorobenzene	<0.001000	0.0500	0.0496	99	76-116		69-122
1,4-Dichlorobenzene	<0.001000	0.0500	0.0500	100	77-118		70-125

Blank Spike Recovery [D] = 100*(([C])/[B])

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6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: **Date Prepared:** 06/02/2014 07:02 **Sample:** 114247-1-BKS **Analyst:** 1028

Lab Batch ID: 114247 **Date Analyzed:** 06/02/2014 07:02 **Method:** / SW9071B_MOD **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Oil and Grease Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Oil & Grease, Total Recovered	<49.88	798.1	734.2	92	797.4	721.7	91	2	78-114	28	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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Baltimore, MD 21228

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L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50567 **Date Prepared:** 05/28/2014 17:54 **Sample:** 50567-1-BKS **Analyst:** 1040

Lab Batch ID: 114202 **Date Analyzed:** 05/29/2014 09:11 **Method:** SW3550C / SW8015DRO **Matrix:** Solid

Units: mg/kg

	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
Total Petroleum Hydrocarbons - DRO **Analytes**	**Blank Sample Result [A]**	**Spike Added [B]**	**Blank Spike Result [C]**	**Blank Spike %R [D]**	**Spike Added [E]**	**Blank Spike Duplicate Result [F]**	**Blk. Spk Dup. %R [G]**	**RPD %**	**Control Limits %R**	**Control Limits %RPD**	**Flag**
TPH-DRO (Diesel Range Organics)	<3.984	33.20	21.25	64	33.52	22.47	67	6	56-117	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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Baltimore, MD 21228

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50555 **Date Prepared:** 05/28/2014 10:04 **Sample:** 50555-1-BKS **Analyst:** 1029

Lab Batch ID: 114194 **Date Analyzed:** 05/29/2014 11:15 **Method:** SW3550C / SW8082 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Polychlorinated Biphenyls Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
PCB-1016	<0.05160	0.5160	0.4451	86	0.5236	0.3715	71	18	62-136	25	
PCB-1260	<0.05160	0.5160	0.3968	77	0.5236	0.3337	64	17	56-113	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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Baltimore, MD 21228

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Ridgely Manor

Work Order #: 14052814 **Project ID:** 1401020-1

Prep Batch #: 50576 **Date Prepared:** 05/29/2014 09:20 **Sample:** 50576-1-BKS **Analyst:** 1014

Lab Batch ID: 114250 **Date Analyzed:** 05/30/2014 16:34 **Method:** SW3510C / SW8270C **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TCLP Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag	Marginal Exceedance Limit
2,4-Dinitrotoluene	<0.005000	0.04000	0.03384	85	0.04000	0.03574	89	5	72-109	20		65-115
Hexachlorobenzene	<0.005000	0.04000	0.03745	94	0.04000	0.03787	95	1	71-115	20		64-122
Hexachlorobutadiene	<0.005000	0.04000	0.02833	71	0.04000	0.03091	77	9	71-102	20		66-107
Hexachloroethane	<0.005000	0.04000	0.02856	71	0.04000	0.03217	80	12	63-107	20		56-115
2-Methylphenol	<0.005000	0.04000	0.03094	77	0.04000	0.03453	86	11	69-103	20		63-108
3&4-Methylphenol	<0.005000	0.04000	0.03452	86	0.04000	0.03867	97	11	61-115	20		52-124
Nitrobenzene	<0.005000	0.04000	0.02965	74	0.04000	0.03355	84	12	62-104	20		55-111
Pentachlorophenol	<0.01000	0.04000	0.03459	86	0.04000	0.03520	88	2	66-121	20		57-130
Pyridine	<0.005000	0.04000	0.03106	78	0.04000	0.03475	87	11	57-88	20		52-93
2,4,6-Trichlorophenol	<0.005000	0.04000	0.03158	79	0.04000	0.03410	85	8	71-113	20		64-120
2,4,5-Trichlorophenol	<0.005000	0.04000	0.03312	83	0.04000	0.03465	87	5	77-112	20		72-118

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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Baltimore, MD 21228

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CHAIN OF CUSTODY RECORD

14052814

Page 1 of 1

Project Number:	Site and Location:
140 1020-1	Ridgely Manor Park - Towson MD
Contact Name:	**Contact Email:**
Dave Rykaczewski	dave.rykaczewski@wsp-global.com
Sampler's Name:	**Sampler's Signature:**
Dave Rykaczewski	

Matrices: S = Soil; Aq = Water; A = Air; Bu = Bulk; W = Wipe; Bi = Biota; OW = Oily Waste; O = Other

Requested Analyses

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	TPH-GRO	TPH-DRO	8260 Total	RCRA Metals	PCB	8260 TCLP	Oil & Grease	8270 TCLP	% Solids	Nº Remarks
STOCK-MH24-LAT	NA	5/22/14	0930	S	4	✓	✓	✓	✓	✓	✓	✓	–	✓	3-day TAT
															Refer to work order 1405612 for methods

# of Coolers: 1
Custody Seal: Abs
Ice Present: Yes
Shipping Carrier: FTE
Temp: 8.0C

Relinquished by *(Signature)*:	1321 5/22/14 Date | Time	Received by *(Signature)*:	Laboratory Name: Phase Separation Science
Relinquished by *(Signature)*:	1455 Date | Time	Received by *(Signature)*:	Laboratory Location: Baltimore MD
Turn-Around Time: 3-DAY		Tracking Number:	Custody Seal Numbers:
			Method of Shipment: Lab courier

WSP Environment & Energy

- ☐ Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
- ☒ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
- ☐ San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
- ☐ New Jersey Office: 200 Cottontail Ln., Somerset, NJ 08873 / Tel: 732-564-0888
- ☐ Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
- ☐ Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
- ☐ Woburn Office: 300 Trade Center, Suite 4690, Woburn, MA 01801
- ☐ Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14052814	**Received By**	Jacob Prucnal
Client Name	WSP Environment & Energy - Restor	**Date Received**	05/28/2014 02:55:00 PM
Project Name	Ridgely Manor	**Delivered By**	Trans Time Express
Project Number	1401020-1	**Tracking No**	Not Applicable
Disposal Date	07/02/2014	**Logged In By**	Robyn Rhudy

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	8
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Dave Rykaczewski
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 2

Total No. of Containers Received 4

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, 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

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: Robyn Rhudy Date: 05/28/2014

Robyn Rhudy

PM Review and Approval: Date: 05/28/2014

Simon Crisp

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14060512

Project Manager: Dave Rykaczewski

Project Name : Hess

Project Location: Towson, MD

Project ID : 1401020

June 12, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

June 12, 2014

Dave Rykaczewski
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14060512**
Project Name: Hess
Project Location: Towson, MD
Project ID.: 1401020

Dear Dave Rykaczewski :

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 **14060512**.

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 July 10, 2014. 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: WSP Environment & Energy - Reston

Project Name: Hess

Work Order Number(s): 14060512

Project ID: 1401020

The following samples were received under chain of custody by Phase Separation Science (PSS) on 06/05/2014 at 01:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14060512-001	Stockpile 6	SOIL	06/04/14 15:58

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)].

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 LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14060512

WSP Environment & Energy - Reston, Reston, VA

June 12, 2014

Project Name: Hess
Project Location: Towson, MD
Project ID: 1401020

Sample ID: Stockpile 6 | **Date/Time Sampled: 06/04/2014 15:58** | **PSS Sample ID: 14060512-001**
Matrix: SOIL | **Date/Time Received: 06/05/2014 13:15** | **% Solids: 89**

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)	ND	mg/kg	4.4		1	06/06/14	06/06/14 14:04	1040

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	110		1	06/05/14	06/05/14 15:26	1035

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Methyl-t-Butyl Ether	ND	ug/kg	28		5	06/05/14	06/05/14 15:53	1035
Benzene	ND	ug/kg	28		5	06/05/14	06/05/14 15:53	1035
Toluene	ND	ug/kg	28		5	06/05/14	06/05/14 15:53	1035
Ethylbenzene	ND	ug/kg	28		5	06/05/14	06/05/14 15:53	1035
m&p-Xylene	ND	ug/kg	56		5	06/05/14	06/05/14 15:53	1035
o-Xylene	ND	ug/kg	28		5	06/05/14	06/05/14 15:53	1035

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Hess

Work Order Number(s): 14060512
Project ID: 1401020

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.

Sample Receipt:

All sample receipt conditions were acceptable.

General Comments:
Naphthalene not required per client.
NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): **14060512**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Dave Rykaczewski

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	Stockpile 6	Initial	14060512-001	1045	S	114500	114500	06/04/2014	06/11/2014 10:22	06/11/2014 10:22
SW-846 8015 C	Stockpile 6	Initial	14060512-001	1040	S	50679	114413	06/04/2014	06/06/2014 07:05	06/06/2014 14:04
	50679-1-BKS	BKS	50679-1-BKS	1040	S	50679	114413	--------	06/06/2014 07:05	06/06/2014 10:56
	50679-1-BLK	BLK	50679-1-BLK	1040	S	50679	114413	--------	06/06/2014 07:05	06/06/2014 11:59
	50679-1-BSD	BSD	50679-1-BSD	1040	S	50679	114413	--------	06/06/2014 07:05	06/06/2014 11:28
	Conf B S	MS	14060521-002 S	1040	S	50679	114413	06/05/2014	06/06/2014 07:05	06/06/2014 10:56
	Conf B SD	MSD	14060521-002 SD	1040	S	50679	114413	06/05/2014	06/06/2014 07:05	06/06/2014 11:28
SW-846 8015C	Stockpile 6	Initial	14060512-001	1035	S	50684	114394	06/04/2014	06/05/2014 09:15	06/05/2014 15:26
	50684-2-BKS	BKS	50684-2-BKS	1035	S	50684	114394	--------	06/05/2014 09:15	06/05/2014 10:53
	50684-2-BLK	BLK	50684-2-BLK	1035	S	50684	114394	--------	06/05/2014 09:15	06/05/2014 10:23
	50684-2-BSD	BSD	50684-2-BSD	1035	S	50684	114394	--------	06/05/2014 09:15	06/05/2014 13:12
SW-846 8260 B	Stockpile 6	Initial	14060512-001	1035	S	50686	114397	06/04/2014	06/05/2014 09:48	06/05/2014 15:53
	50686-1-BKS	BKS	50686-1-BKS	1035	S	50686	114397	--------	06/05/2014 09:48	06/05/2014 11:58
	50686-1-BLK	BLK	50686-1-BLK	1035	S	50686	114397	--------	06/05/2014 09:48	06/05/2014 11:29
	50686-1-BSD	BSD	50686-1-BSD	1035	S	50686	114397	--------	06/05/2014 09:48	06/05/2014 14:01

PHASE SEPARATION SCIENCE, INC.

QC Summary 14060512

WSP Environment & Energy - Reston

Hess

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 114413 Matrix: Soil Date Prep: 06/06/2014

PSS Sample ID: 14060512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	79		42-129	%	06/06/14 14:04

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 114394 Matrix: Soil Date Prep: 06/05/2014

PSS Sample ID: 14060512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	74		55-142	%	06/05/14 15:26

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 114397 Matrix: Soil Date Prep: 06/05/2014

PSS Sample ID: 14060512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	98		85-115	%	06/05/14 15:53
Toluene-D8	100		91-109	%	06/05/14 15:53
4-Bromofluorobenzene	103		80-125	%	06/05/14 15:53

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

PHASE SEPARATION SCIENCE, INC.

QC Summary 14060512

WSP Environment & Energy - Reston

Hess

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 114413 Matrix: Solid Date Prep: 06/06/14

MB Sample Id: 50679-1-BLK LCS Sample Id: 50679-1-BKS LCSD Sample Id: 50679-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<3.988	33.23	31.25	94	30.23	91	56-117	3	25	mg/kg	06/06/14 10:56	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	Units	Analysis Date
o-Terphenyl	73		74		77		42-129	%	06/06/14 10:56

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 114394 Matrix: Solid Date Prep: 06/05/14

MB Sample Id: 50684-2-BLK LCS Sample Id: 50684-2-BKS LCSD Sample Id: 50684-2-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<100	5000	3524	70	3879	80	60-112	10	25	ug/kg	06/05/14 10:53	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	69		84		86		55-142	%	06/05/14 10:53

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 114397 Matrix: Solid Date Prep: 06/05/14

MB Sample Id: 50686-1-BLK LCS Sample Id: 50686-1-BKS LCSD Sample Id: 50686-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Methyl-t-Butyl Ether	<4.873	58.48	73.81	126	79.48	135	59-133	7	25	ug/kg	06/05/14 11:58	H
Benzene	<4.873	58.48	61.79	106	72.75	124	69-128	16	25	ug/kg	06/05/14 11:58	
Toluene	<4.873	58.48	61.20	105	71.87	122	66-127	16	25	ug/kg	06/05/14 11:58	
Ethylbenzene	<4.873	58.48	58.89	101	71.18	121	58-130	19	25	ug/kg	06/05/14 11:58	
m&p-Xylene	<9.747	117	116.2	99	139.4	119	60-131	18	25	ug/kg	06/05/14 11:58	
o-Xylene	<4.873	58.48	59.76	102	69.92	119	60-126	16	25	ug/kg	06/05/14 11:58	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Result	LCSD Result	LCSD Result	Limits	Units	Analysis Date
Dibromofluoromethane	99		101		100		85-115	%	06/05/14 11:58
Toluene-D8	101		103		101		91-109	%	06/05/14 11:58
4-Bromofluorobenzene	104		103		101		80-125	%	06/05/14 11:58

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

CHAIN OF CUSTODY RECORD

14060512

Page 1 of 1

Project Number:	Site and Location:
140020	Hess Towson, MD

Contact Name:	Contact Email:
Dave.Rykaczewski@wspgroup.com	
Sampler's Name:	**Sampler's Signature:**
Pam Groff	

Matrices:
S = Soil:
Aq = Water
A = Air: Bu = Bulk
W = Wipe
Bi = Biota:
OW = Oily Waste:
O = Other

Requested Analyses

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	BTEX, Naphthalene, MTBE (8260)	TPH-GRO	TPH-DRO							Remarks
STOCKPILE 6	N/A	6/4/14	1558	S	3	X	X	X							

0605 14

# of Coolers: 1
Custody Seal: signed, intact - cooler
Ice Present: yes Temp: 3°C
Shipping Carrier: FTE

Relinquished by (Signature):	Date / Time	Received by (Signature):
	6/5/14 1208	Pam Groff #2035
Pam Groff #2035	06/05 1315	
Turn-Around Time: 5-day		Tracking Number: N/A

Laboratory Name: Phase Separation Science
Laboratory Location: Baltimore, MD
Custody Seal Numbers: 01055
Method of Shipment: Courier

WSP
WSP Environment & Energy

☒ Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
☐ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
☐ San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
☐ New Jersey Office: 200 Cottontail Ln., Somerset, NJ 08873 / Tel: 732-564-0888
☐ Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
☐ Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
☐ Woburn Office: 300 Trade Center, Suite 4690, Woburn, MA 01801
☐ Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14060512	**Received By**	Amy Friedlander
Client Name	WSP Environment & Energy - Restor	**Date Received**	06/05/2014 01:15:00 PM
Project Name	Hess	**Delivered By**	Trans Time Express
Project Number	1401020	**Tracking No**	Not Applicable
Disposal Date	07/10/2014	**Logged In By**	Lynn Jackson

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	3
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		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 1

Total No. of Containers Received 3

Preservation

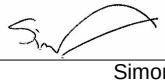
Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A

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:  Date: 06/05/2014

Lynn Jackson

PM Review and Approval:  Date: 06/05/2014

Simon Crisp

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14061106

Project Manager: Jim Bowie

Project Name : N/A

Project Location: Towson, MD

Project ID : 1401020

June 13, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

June 13, 2014

Jim Bowie
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14061106**
Project Name: N/A
Project Location: Towson, MD
Project ID.: 1401020

Dear Jim Bowie :

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 **14061106**.

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 July 16, 2014. 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: WSP Environment & Energy - Reston

Project Name: N/A

Work Order Number(s): 14061106

Project ID: 1401020

The following samples were received under chain of custody by Phase Separation Science (PSS) on 06/11/2014 at 12:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14061106-001	Stockpile 13	SOIL	06/11/14 10:00

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)].

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 LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14061106

WSP Environment & Energy - Reston, Reston, VA

June 13, 2014

Project Name: N/A
Project Location: Towson, MD
Project ID: 1401020

Sample ID: Stockpile 13 **Date/Time Sampled: 06/11/2014 10:00** **PSS Sample ID: 14061106-001**
Matrix: SOIL **Date/Time Received: 06/11/2014 12:00** **% Solids: 90**

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)	ND	mg/kg	4.5		1	06/11/14	06/12/14 11:03	1040

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	110		1	06/11/14	06/11/14 16:12	1035

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Methyl-t-Butyl Ether	ND	ug/kg	5.5		1	06/12/14	06/12/14 11:23	1035
Benzene	ND	ug/kg	5.5		1	06/12/14	06/12/14 11:23	1035
Toluene	ND	ug/kg	5.5		1	06/12/14	06/12/14 11:23	1035
Ethylbenzene	ND	ug/kg	5.5		1	06/12/14	06/12/14 11:23	1035
m&p-Xylene	ND	ug/kg	11		1	06/12/14	06/12/14 11:23	1035
o-Xylene	ND	ug/kg	5.5		1	06/12/14	06/12/14 11:23	1035

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: N/A

Work Order Number(s): 14061106
Project ID: 1401020

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.

Sample Receipt:

All sample receipt conditions were acceptable.

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

Analytical Data Package Information Summary

Work Order(s): 14061106
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	Stockpile 13	Initial	14061106-001	1045	S	114550	114550	06/11/2014	06/12/2014 13:54	06/12/2014 13:54
SW-846 8015 C	Stockpile 13	Initial	14061106-001	1040	S	50756	114549	06/11/2014	06/11/2014 17:31	06/12/2014 11:03
	50756-1-BKS	BKS	50756-1-BKS	1040	S	50756	114549	--------	06/11/2014 17:31	06/12/2014 09:29
	50756-1-BLK	BLK	50756-1-BLK	1040	S	50756	114549	--------	06/11/2014 17:31	06/12/2014 10:32
	50756-1-BSD	BSD	50756-1-BSD	1040	S	50756	114549	--------	06/11/2014 17:31	06/12/2014 10:01
	B-9 13.5'-15' S	MS	14061102-001 S	1040	S	50756	114549	06/10/2014	06/11/2014 17:31	06/12/2014 09:29
	B-9 13.5'-15' SD	MSD	14061102-001 SD	1040	S	50756	114549	06/10/2014	06/11/2014 17:31	06/12/2014 10:01
SW-846 8015C	Stockpile 13	Initial	14061106-001	1035	S	50750	114508	06/11/2014	06/11/2014 09:15	06/11/2014 16:12
	50750-2-BKS	BKS	50750-2-BKS	1035	S	50750	114508	--------	06/11/2014 09:15	06/11/2014 11:18
	50750-2-BLK	BLK	50750-2-BLK	1035	S	50750	114508	--------	06/11/2014 09:15	06/11/2014 10:20
	NEBCC-03, B-4, 8' S	MS	14061103-002 S	1035	S	50750	114508	06/10/2014	06/11/2014 09:15	06/11/2014 14:14
	NEBCC-03, B-4, 8' SD	MSD	14061103-002 SD	1035	S	50750	114508	06/10/2014	06/11/2014 09:15	06/11/2014 14:44
SW-846 8260 B	Stockpile 13	Initial	14061106-001	1035	S	50779	114569	06/11/2014	06/12/2014 08:11	06/12/2014 11:23
	50779-1-BKS	BKS	50779-1-BKS	1035	S	50779	114569	--------	06/12/2014 08:11	06/12/2014 10:25
	50779-1-BLK	BLK	50779-1-BLK	1035	S	50779	114569	--------	06/12/2014 08:11	06/12/2014 09:55
	Stockpile 13 S	MS	14061106-001 S	1035	S	50779	114569	06/11/2014	06/12/2014 08:11	06/12/2014 13:13
	Stockpile 13 SD	MSD	14061106-001 SD	1035	S	50779	114569	06/11/2014	06/12/2014 08:11	06/12/2014 13:42

PHASE SEPARATION SCIENCE, INC.

QC Summary 14061106

WSP Environment & Energy - Reston

N/A

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 114549 Matrix: Soil Date Prep: 06/11/2014

PSS Sample ID: 14061106-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	54		42-129	%	06/12/14 11:03

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 114508 Matrix: Soil Date Prep: 06/11/2014

PSS Sample ID: 14061106-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	73		55-142	%	06/11/14 16:12

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 114569 Matrix: Soil Date Prep: 06/12/2014

PSS Sample ID: 14061106-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Dibromofluoromethane	98		85-115	%	06/12/14 11:23
Toluene-D8	99		91-109	%	06/12/14 11:23
4-Bromofluorobenzene	104		80-125	%	06/12/14 11:23

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

PHASE SEPARATION SCIENCE, INC.

QC Summary 14061106

WSP Environment & Energy - Reston

N/A

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 114549 Matrix: Solid Date Prep: 06/11/14

MB Sample Id: 50756-1-BLK LCS Sample Id: 50756-1-BKS LCSD Sample Id: 50756-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<4.008	33.40	26.43	79	25.38	75	56-117	4	25	mg/kg	06/12/14 09:29	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	69		69		66		42-129	%	06/12/14 09:29

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 114508 Matrix: Solid Date Prep: 06/11/14

MB Sample Id: 50750-2-BLK LCS Sample Id: 50750-2-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<97.66	4883	3490	71	60-112	ug/kg	06/11/14 11:18	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	68		84		55-142	%	06/11/14 11:18

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 114569 Matrix: Solid Date Prep: 06/12/14

MB Sample Id: 50779-1-BLK LCS Sample Id: 50779-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Methyl-t-Butyl Ether	<4.931	59.17	69.63	118	59-133	ug/kg	06/12/14 10:25	
Benzene	<4.931	59.17	65.05	110	69-128	ug/kg	06/12/14 10:25	
Toluene	<4.931	59.17	65.49	111	66-127	ug/kg	06/12/14 10:25	
Ethylbenzene	<4.931	59.17	65.65	111	58-130	ug/kg	06/12/14 10:25	
m&p-Xylene	<9.862	118.3	132.4	112	60-131	ug/kg	06/12/14 10:25	
o-Xylene	<4.931	59.17	66.24	112	60-126	ug/kg	06/12/14 10:25	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
Dibromofluoromethane	95		100		85-115	%	06/12/14 10:25
Toluene-D8	99		101		91-109	%	06/12/14 10:25
4-Bromofluorobenzene	108		102		80-125	%	06/12/14 10:25

PHASE SEPARATION SCIENCE, INC.

QC Summary 14061106

WSP Environment & Energy - Reston

N/A

Analytical Method: SW-846 8260 B Prep Method: SW5030

Seq Number: 114569 Matrix: Soil Date Prep: 06/12/14

Parent Sample Id: 14061106-001 MS Sample Id: 14061106-001 S MSD Sample Id: 14061106-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Methyl-t-Butyl Ether	<5.479	65.75	74.76	114	58.99	90	48-123	24	30	ug/kg	06/12/14 13:13	
Benzene	<5.479	65.75	49.87	76	42.64	65	42-125	16	30	ug/kg	06/12/14 13:13	
Toluene	<5.479	65.75	47.95	73	41.04	63	31-135	16	30	ug/kg	06/12/14 13:13	
Ethylbenzene	<5.479	65.75	44.81	68	39.93	61	37-132	12	30	ug/kg	06/12/14 13:13	
m&p-Xylene	<10.96	131.5	88.93	68	79.74	61	36-127	11	30	ug/kg	06/12/14 13:13	
o-Xylene	<5.479	65.75	48.19	73	41.49	63	33-132	15	30	ug/kg	06/12/14 13:13	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Dibromofluoromethane	100		99		85-115	%	06/12/14 13:13
Toluene-D8	100		101		91-109	%	06/12/14 13:13
4-Bromofluorobenzene	101		102		80-125	%	06/12/14 13:13

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

CHAIN OF CUSTODY RECORD

1406106

Page _____ of _____

Project Number:	Site and Location:
1401020	Towson MD
Contact Name: Jim Bowie	Contact Email: Jim.Bowie@WSPGROUP.com
Sampler's Name: Jim Bowie	Sampler's Signature:

Matrices:
S = Soil:
Aq = Water
A = Air: Bu = Bulk
W = Wipe
Bi = Biota:
OW = Oily Waste:
O = Other

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	BTEX MTBE (8260)	TPH-DRO	TPH-GRO	Requested Analyses						Nº Remarks
~~STOCKPILE B~~															
STOCK Pile 13		6/11/14	10:00	S	3	X	X	X							
									# of Coolers: 1						
									Custody Seals: Abs						
									Ice Present: Yes					Temp: 2°	
									Shipping Carrier: UPS						

Relinquished by *(Signature)*:	6/11/14 12:00 Date | Time	Received by *(Signature)*: Julian Goldcare	Laboratory Name: PHASE SEPERATION
Relinquished by *(Signature)*: Julian Goldcare	6/11/14 Noon Date | Time	Received by *(Signature)*:	Laboratory Location: Baltimore
Turn-Around Time: ~~~~ 48 HOUR		Tracking Number:	Custody Seal Numbers: —
			Method of Shipment: Drop off

WSP
WSP ~~Environment & Energy~~

- ☐ Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
- ☐ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
- ☐ San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
- ☐ New Jersey Office: 200 Cottontail Ln., Somerset, NJ 08873 / Tel: 732-564-0888
- ☐ Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
- ☑ Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
- ☐ Woburn Office: 300 Trade Center, Suite 4690, Woburn, MA 01801
- ☐ Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Final 1.000

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14061106	**Received By**	Jacob Prucnal
Client Name	WSP Environment & Energy - Restor	**Date Received**	06/11/2014 12:00:00 PM
Project Name	N/A	**Delivered By**	Trans Time Express
Project Number	1401020	**Tracking No**	Not Applicable
Disposal Date	07/16/2014	**Logged In By**	Jacob Prucnal

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	12
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Jim Bowie
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 1

Total No. of Containers Received 3

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, 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

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: Jacob Prucnal — Date: 06/11/2014

Jacob Prucnal

PM Review and Approval: — Date: 06/11/2014

Simon Crisp

Appendix B – Analytical Data Report – Sediment and Drill Cuttings Characterization

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14081512

Project Manager: Eric Johnson

Project Name : Ridgely Manor Park

Project Location: Towson, MD

Project ID : E0039663

August 22, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

August 22, 2014

Eric Johnson
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14081512**
Project Name: Ridgely Manor Park
Project Location: Towson, MD
Project ID.: E0039663

Dear Eric Johnson :

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 **14081512**.

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 September 19, 2014. 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: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14081512

Project ID: E0039663

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/15/2014 at 01:50 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14081512-001	IDW-RMP-NE	SOIL	08/15/14 12:45
14081512-002	IDW-RMP-SE	SOIL	08/15/14 12:50

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)].

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 LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14081512

WSP Environment & Energy - Reston, Reston, VA

August 22, 2014

Project Name: Ridgely Manor Park
Project Location: Towson, MD
Project ID: E0039663

Sample ID: IDW-RMP-NE **Date/Time Sampled: 08/15/2014 12:45** **PSS Sample ID: 14081512-001**
Matrix: SOIL **Date/Time Received: 08/15/2014 13:50** **% Solids: 81**

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)	ND	mg/kg	4.9		1	08/19/14	08/20/14 13:40	1040

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)	**170**	ug/kg	120		1	08/18/14	08/18/14 17:17	1035

Purgeable Aromatics — Analytical Method: SW-846 8021B — Preparation Method: 5030

USEPA methods recommend that the appearance of detectable levels of the 8021B compounds below be confirmed when unfamiliar samples are analyzed.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzene	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:17	1035
Ethylbenzene	**1.9**	ug/kg	1.2		1	08/18/14	08/18/14 17:17	1035
Methyl-t-butyl ether	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:17	1035
Toluene	**2.1**	ug/kg	1.2		1	08/18/14	08/18/14 17:17	1035
m,p-Xylenes	**3.2**	ug/kg	2.4		1	08/18/14	08/18/14 17:17	1035
o-Xylene	**1.5**	ug/kg	1.2		1	08/18/14	08/18/14 17:17	1035

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14081512

WSP Environment & Energy - Reston, Reston, VA

August 22, 2014

Project Name: Ridgely Manor Park
Project Location: Towson, MD
Project ID: E0039663

Sample ID: IDW-RMP-NE **Date/Time Sampled: 08/15/2014 12:45** **PSS Sample ID: 14081512-001**
Matrix: SOIL **Date/Time Received: 08/15/2014 13:50** **% Solids: 81**

Polyaromatic Hydrocarbons (PAHs) Analytical Method: SW-846 8270 C Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Acenaphthylene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Benzo(a)anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Benzo(a)pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Benzo(b)fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Benzo(g,h,i)perylene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Benzo(k)fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Chrysene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Dibenz(a,h)Anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Fluorene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
2-Methylnaphthalene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Naphthalene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Phenanthrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040
Pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:11	1040

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14081512

WSP Environment & Energy - Reston, Reston, VA

August 22, 2014

Project Name: Ridgely Manor Park
Project Location: Towson, MD
Project ID: E0039663

Sample ID: IDW-RMP-SE **Date/Time Sampled: 08/15/2014 12:50** **PSS Sample ID: 14081512-002**
Matrix: SOIL **Date/Time Received: 08/15/2014 13:50** **% Solids: 81**

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)	ND	mg/kg	4.9		1	08/19/14	08/20/14 13:40	1040

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	08/18/14	08/18/14 17:47	1035

Purgeable Aromatics — Analytical Method: SW-846 8021B — Preparation Method: 5030

USEPA methods recommend that the appearance of detectable levels of the 8021B compounds below be confirmed when unfamiliar samples are analyzed.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Benzene	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:47	1035
Ethylbenzene	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:47	1035
Methyl-t-butyl ether	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:47	1035
Toluene	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:47	1035
m,p-Xylenes	ND	ug/kg	2.4		1	08/18/14	08/18/14 17:47	1035
o-Xylene	ND	ug/kg	1.2		1	08/18/14	08/18/14 17:47	1035

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14081512

WSP Environment & Energy - Reston, Reston, VA

August 22, 2014

Project Name: Ridgely Manor Park
Project Location: Towson, MD
Project ID: E0039663

Sample ID: IDW-RMP-SE **Date/Time Sampled: 08/15/2014 12:50** **PSS Sample ID: 14081512-002**
Matrix: SOIL **Date/Time Received: 08/15/2014 13:50** **% Solids: 81**

Polyaromatic Hydrocarbons (PAHs) Analytical Method: SW-846 8270 C Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Acenaphthylene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Benzo(a)anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Benzo(a)pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Benzo(b)fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Benzo(g,h,i)perylene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Benzo(k)fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Chrysene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Dibenz(a,h)Anthracene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Fluoranthene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Fluorene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
2-Methylnaphthalene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Naphthalene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Phenanthrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040
Pyrene	ND	ug/kg	210		1	08/15/14	08/18/14 19:42	1040

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: Ridgely Manor Park

Work Order Number(s): 14081512
Project ID: E0039663

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.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Polyaromatic Hydrocarbons (PAHs)

Batch: 116116

Surrogate exceedances identified; see surrogate summary form. Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; 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.

Analytical Data Package Information Summary

Work Order(s): **14081512**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
ASTM D2216 05	IDW-RMP-NE	Initial	14081512-001	1045	S	116069	116069	08/15/2014	08/18/2014 14:42	08/18/2014 14:42
	IDW-RMP-SE	Initial	14081512-002	1045	S	116069	116069	08/15/2014	08/18/2014 14:42	08/18/2014 14:42
SW-846 8015 C	IDW-RMP-NE	Initial	14081512-001	1040	S	51747	116140	08/15/2014	08/19/2014 17:14	08/20/2014 13:40
	IDW-RMP-SE	Initial	14081512-002	1040	S	51747	116140	08/15/2014	08/19/2014 17:14	08/20/2014 13:40
	51747-1-BKS	BKS	51747-1-BKS	1040	S	51747	116140	--------	08/19/2014 17:14	08/20/2014 09:37
	51747-1-BLK	BLK	51747-1-BLK	1040	S	51747	116140	--------	08/19/2014 17:14	08/20/2014 10:21
	51747-1-BSD	BSD	51747-1-BSD	1040	S	51747	116140	--------	08/19/2014 17:14	08/20/2014 09:59
	SW-North S	MS	14081505-001 S	1040	S	51747	116140	08/12/2014	08/19/2014 17:14	08/20/2014 10:43
	SW-North SD	MSD	14081505-001 SD	1040	S	51747	116140	08/12/2014	08/19/2014 17:14	08/20/2014 11:05
SW-846 8015C	IDW-RMP-NE	Initial	14081512-001	1035	S	51744	116095	08/15/2014	08/18/2014 12:38	08/18/2014 17:17
	IDW-RMP-SE	Initial	14081512-002	1035	S	51744	116095	08/15/2014	08/18/2014 12:38	08/18/2014 17:47
	51744-1-BKS	BKS	51744-1-BKS	1035	S	51744	116095	--------	08/18/2014 12:38	08/18/2014 14:21
	51744-1-BLK	BLK	51744-1-BLK	1035	S	51744	116095	--------	08/18/2014 12:38	08/18/2014 13:52
	HA004 S	MS	14081518-002 S	1035	S	51744	116095	08/13/2014	08/18/2014 12:38	08/18/2014 16:19
	HA004 SD	MSD	14081518-002 SD	1035	S	51744	116095	08/13/2014	08/18/2014 12:38	08/18/2014 16:48
SW-846 8021B	IDW-RMP-NE	Initial	14081512-001	1035	S	51743	116093	08/15/2014	08/18/2014 12:09	08/18/2014 17:17
	IDW-RMP-SE	Initial	14081512-002	1035	S	51743	116093	08/15/2014	08/18/2014 12:09	08/18/2014 17:47
	51743-1-BKS	BKS	51743-1-BKS	1035	S	51743	116093	--------	08/18/2014 12:09	08/18/2014 14:51
	51743-1-BLK	BLK	51743-1-BLK	1035	S	51743	116093	--------	08/18/2014 12:09	08/18/2014 13:52
	IDW-RMP-SE S	MS	14081512-002 S	1035	S	51743	116093	08/15/2014	08/18/2014 12:09	08/18/2014 18:16
	IDW-RMP-SE SD	MSD	14081512-002 SD	1035	S	51743	116093	08/15/2014	08/18/2014 12:09	08/18/2014 18:46
SW-846 8270 C	IDW-RMP-NE	Initial	14081512-001	1040	S	51699	116116	08/15/2014	08/15/2014 09:22	08/18/2014 19:11
	IDW-RMP-SE	Initial	14081512-002	1040	S	51699	116116	08/15/2014	08/15/2014 09:22	08/18/2014 19:42
	51699-1-BKS	BKS	51699-1-BKS	1040	S	51699	116116	--------	08/15/2014 09:22	08/18/2014 16:06
	51699-1-BLK	BLK	51699-1-BLK	1040	S	51699	116116	--------	08/15/2014 09:22	08/18/2014 15:36
	51699-1-BSD	BSD	51699-1-BSD	1040	S	51699	116116	--------	08/15/2014 09:22	08/18/2014 16:37
	814-MS-02 S	MS	14081409-002 S	1040	S	51699	116116	08/11/2014	08/15/2014 09:22	08/18/2014 17:09

Analytical Data Package Information Summary

Work Order(s): **14081512**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Eric Johnson

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8270 C	814-MS-02 SD	MSD	14081409-002 SD	1040	S	51699	116116	08/11/2014	08/15/2014 09:22	08/18/2014 17:40

PHASE SEPARATION SCIENCE, INC.

QC Summary 14081512

WSP Environment & Energy - Reston
Ridgely Manor Park

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 116116 Matrix: Soil Date Prep: 08/15/2014
PSS Sample ID: 14081512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	102		60-131	%	08/18/14 19:11
2-Fluorophenol	116	*	45-108	%	08/18/14 19:11
Nitrobenzene-d5	94		42-131	%	08/18/14 19:11
Phenol-d6	108		48-124	%	08/18/14 19:11
Terphenyl-D14	110		59-137	%	08/18/14 19:11
2,4,6-Tribromophenol	94		46-129	%	08/18/14 19:11

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 116140 Matrix: Soil Date Prep: 08/19/2014
PSS Sample ID: 14081512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	61		42-129	%	08/20/14 13:40

Analytical Method: SW-846 8021B Prep Method: SW5030
Seq Number: 116093 Matrix: Soil Date Prep: 08/18/2014
PSS Sample ID: 14081512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene-BTEX	90		45-149	%	08/18/14 17:17

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 116095 Matrix: Soil Date Prep: 08/18/2014
PSS Sample ID: 14081512-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	68		55-142	%	08/18/14 17:17

PHASE SEPARATION SCIENCE, INC.

QC Summary 14081512

WSP Environment & Energy - Reston
Ridgely Manor Park

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 116116 Matrix: Soil Date Prep: 08/15/2014
PSS Sample ID: 14081512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	100		60-131	%	08/18/14 19:42
2-Fluorophenol	117	*	45-108	%	08/18/14 19:42
Nitrobenzene-d5	87		42-131	%	08/18/14 19:42
Phenol-d6	104		48-124	%	08/18/14 19:42
Terphenyl-D14	113		59-137	%	08/18/14 19:42
2,4,6-Tribromophenol	89		46-129	%	08/18/14 19:42

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 116140 Matrix: Soil Date Prep: 08/19/2014
PSS Sample ID: 14081512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	71		42-129	%	08/20/14 13:40

Analytical Method: SW-846 8021B Prep Method: SW5030
Seq Number: 116093 Matrix: Soil Date Prep: 08/18/2014
PSS Sample ID: 14081512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene-BTEX	105		45-149	%	08/18/14 17:47

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 116095 Matrix: Soil Date Prep: 08/18/2014
PSS Sample ID: 14081512-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	77		55-142	%	08/18/14 17:47

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

PHASE SEPARATION SCIENCE, INC.

QC Summary 14081512

WSP Environment & Energy - Reston
Ridgely Manor Park

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 116140 Matrix: Solid Date Prep: 08/19/14
MB Sample Id: 51747-1-BLK LCS Sample Id: 51747-1-BKS LCSD Sample Id: 51747-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<4.066	33.89	28.74	85	30.76	91	56-117	7	25	mg/kg	08/20/14 09:37	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	71		69		79		42-129	%	08/20/14 09:37

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 116116 Matrix: Solid Date Prep: 08/15/14
MB Sample Id: 51699-1-BLK LCS Sample Id: 51699-1-BKS LCSD Sample Id: 51699-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acenaphthene	<166.2	1329	1217	92	1166	88	73-103	4	25	ug/kg	08/18/14 16:06	
Acenaphthylene	<166.2	1329	1172	88	1105	83	73-104	6	25	ug/kg	08/18/14 16:06	
Anthracene	<166.2	1329	1221	92	1153	87	74-104	6	25	ug/kg	08/18/14 16:06	
Benzo(a)anthracene	<166.2	1329	1299	98	1229	93	78-109	6	25	ug/kg	08/18/14 16:06	
Benzo(a)pyrene	<166.2	1329	1192	90	1125	85	78-117	6	25	ug/kg	08/18/14 16:06	
Benzo(b)fluoranthene	<166.2	1329	1220	92	1124	85	73-119	8	25	ug/kg	08/18/14 16:06	
Benzo(g,h,i)perylene	<166.2	1329	1580	119	1446	109	59-136	9	25	ug/kg	08/18/14 16:06	
Benzo(k)fluoranthene	<166.2	1329	1209	91	1163	88	72-117	4	25	ug/kg	08/18/14 16:06	
Chrysene	<166.2	1329	1290	97	1224	92	78-107	5	25	ug/kg	08/18/14 16:06	
Dibenz(a,h)Anthracene	<166.2	1329	1616	122	1481	112	62-131	9	25	ug/kg	08/18/14 16:06	
Fluoranthene	<166.2	1329	1444	109	1304	98	71-111	10	25	ug/kg	08/18/14 16:06	
Fluorene	<166.2	1329	1160	87	1063	80	75-105	9	25	ug/kg	08/18/14 16:06	
Indeno(1,2,3-c,d)Pyrene	<166.2	1329	1588	119	1447	109	60-130	9	25	ug/kg	08/18/14 16:06	
2-Methylnaphthalene	<166.2	1329	1222	92	1125	85	70-101	8	25	ug/kg	08/18/14 16:06	
Naphthalene	<166.2	1329	1173	88	1129	85	71-99	4	25	ug/kg	08/18/14 16:06	
Phenanthrene	<166.2	1329	1202	90	1149	87	71-103	5	25	ug/kg	08/18/14 16:06	
Pyrene	<166.2	1329	1263	95	1251	94	67-110	1	25	ug/kg	08/18/14 16:06	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	111		102		96		60-131	%	08/18/14 16:06
2-Fluorophenol	140	*	129	*	122	*	45-108	%	08/18/14 16:06
Nitrobenzene-d5	108		94		92		42-131	%	08/18/14 16:06
Phenol-d6	122		113		109		48-124	%	08/18/14 16:06
Terphenyl-D14	96		112		109		59-137	%	08/18/14 16:06
2,4,6-Tribromophenol	87		104		96		46-129	%	08/18/14 16:06

PHASE SEPARATION SCIENCE, INC.

QC Summary 14081512

WSP Environment & Energy - Reston
Ridgely Manor Park

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 116095 Matrix: Solid Date Prep: 08/18/14
MB Sample Id: 51744-1-BLK LCS Sample Id: 51744-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<97.85	4892	3723	76	60-112	ug/kg	08/18/14 14:21	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	77		90		55-142	%	08/18/14 14:21

Analytical Method: SW-846 8021B Prep Method: SW5030
Seq Number: 116093 Matrix: Solid Date Prep: 08/18/14
MB Sample Id: 51743-1-BLK LCS Sample Id: 51743-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Benzene	<0.9747	48.73	55.47	114	78-128	ug/kg	08/18/14 14:51	
Ethylbenzene	<0.9747	48.73	49.83	102	66-127	ug/kg	08/18/14 14:51	
Methyl-t-butyl ether	<0.9747	48.73	48.76	100	31-140	ug/kg	08/18/14 14:51	
Toluene	<0.9747	48.73	51.31	105	70-127	ug/kg	08/18/14 14:51	
m,p-Xylenes	<1.949	97.47	106.5	109	69-131	ug/kg	08/18/14 14:51	
o-Xylene	<0.9747	48.73	50.83	104	70-129	ug/kg	08/18/14 14:51	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene-BTEX	104		98		45-149	%	08/18/14 14:51

Analytical Method: SW-846 8021B Prep Method: SW5030
Seq Number: 116093 Matrix: Soil Date Prep: 08/18/14
Parent Sample Id: 14081512-002 MS Sample Id: 14081512-002 S MSD Sample Id: 14081512-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<1.210	60.52	34.60	57	57.81	94	26-130	50	30	ug/kg	08/18/14 18:16	F
Ethylbenzene	<1.210	60.52	35.27	58	57.87	94	16-132	49	30	ug/kg	08/18/14 18:16	F
Methyl-t-butyl ether	<1.210	60.52	41.88	69	53.07	86	30-121	24	30	ug/kg	08/18/14 18:16	
Toluene	<1.210	60.52	33.38	55	55.31	90	26-126	49	30	ug/kg	08/18/14 18:16	F
m,p-Xylenes	<2.421	121	75.90	63	121.8	99	17-139	46	30	ug/kg	08/18/14 18:16	F
o-Xylene	<1.210	60.52	36.24	60	58.29	95	14-140	47	30	ug/kg	08/18/14 18:16	F

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene-BTEX	71		112		45-149	%	08/18/14 18:16

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

CHAIN OF CUSTODY RECORD

14081512

Page 1 of 1

Project Number:	Site and Location:
E0039663	Ridgely Manor Park / Towson MD
Contact Name:	**Contact Email:**
Eric.Johnson@wspgroup.com	
Sampler's Name:	**Sampler's Signature:**
Erik Reinert	

Matrices: S = Soil; Aq = Water; A = Air: Bu = Bulk; W = Wipe; Bi = Biota; OW = Oily Waste; O = Other

Requested Analyses

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	BTEX + MTBE (EPA 8021)	PAHs (EPA 8270)	TPH-GRO (8015B)	TPHDRO (8015B)						Remarks
IDW-RMP-NE	—	8/15/14	1245	Soil	2	X	X	X	X						
IDW-RMP-SE	—	8/15/14	1250	Soil	2	X	X	X	X						

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 7°C
Shipping Carrier: TIE

Relinquished by (Signature):	8/15/14 1305 Date | Time	Received by (Signature): #2035	Laboratory Name: PSS
Relinquished by (Signature): #2035	08/15/14 1350 Date | Time	Received by (Signature):	Laboratory Location: Baltimore, MD
Turn-Around Time: 5-day		Tracking Number:	Custody Seal Numbers: NA
			Method of Shipment: Lab Courier

WSP Environment & Energy

- [x] Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
- [ ] Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
- [ ] San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
- [ ] New Jersey Office: 200 Cottontail Ln., Somerset, NJ 08873 / Tel: 732-564-0888
- [ ] Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
- [ ] Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
- [ ] Woburn Office: 300 Trade Center, Suite 4690, Woburn, MA 01801
- [ ] Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14081512	**Received By**	Lynn Jackson
Client Name	WSP Environment & Energy - Restor	**Date Received**	08/15/2014 01:50:00 PM
Project Name	Ridgely Manor Park	**Delivered By**	Trans Time Express
Project Number	E0039663	**Tracking No**	Not Applicable
Disposal Date	09/19/2014	**Logged In By**	Lynn Jackson

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	7
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Erik Reinert
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 2 Total No. of Containers Received 4

Preservation

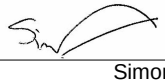
Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A

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:  Date: 08/15/2014

Lynn Jackson

PM Review and Approval:  Date: 08/18/2014

Simon Crisp

Appendix C – Boring Logs

Boring Log: YMW-3

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 440.59
TOC Elevation (feet AMSL*): 440.39
Total Depth (feet): 20
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		-/-		0		***No Recovery***	
2		0.0/0.0		50		***Silt (ML)*** Dark yellowish brown (10YR 4/6) silt; little gravel and micaceous material; soft; dry	
4		56.0/0.0		50		***Sandy Silt with Gravel (ML)*** Dark yellowish brown (10YR 4/4) silt; few sand; few gravel; medium soft; dry	
6		95.9/0.0		50		***No Recovery***	
8		0.0/0.0		100		***Sandy Silt with Gravel (ML)*** Brownish yellow (10YR 6/8) silt; few sand; few gravel and micaceous material; medium soft; dry	
10		0.0/0.0		100		***Poorly-Graded Sand with Gravel (SP)*** Dark yellowish brown (10YR 4/6) medium to coarse sand; few gravel; loose; moist ***Poorly-Graded Sand (SP)*** Very pale brown (10YR 7/3) medium to coarse sand; loose; moist	
12						***Poorly-Graded Sand with Gravel (SP)*** Very pale brown (10YR 7/4) coarse sand; loose; wet	

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-3

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 440.59
TOC Elevation (feet AMSL*): 440.39
Total Depth (feet): 20
Borehole Diameter (inches): 2
**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
		0.0/0.0		100		***Poorly-Graded Sand with Gravel (SP)*** Very pale brown (10YR 7/4) coarse sand; loose; wet *(continued)*	
14		0.0/0.0		100		***Gravelly Lean Clay (CL)*** Yellow (10YR 8/8) clay; some angular quartz (saprolite); very stiff; moist; Very dark grayish brown (10YR 3/2) prevalent toward bottom	
16		0.0/0.0		100			
18		0.0/0.0		100			
20						Bottom of Boring at 20 feet	
22							
24							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-4

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 434.28
TOC Elevation (feet AMSL*): 433.72
Total Depth (feet): 18
Borehole Diameter (inches): 2

*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
1		17.3/-		70		***Silty Sand (SM)*** Yellowish brown (10YR 5/6) fine to coarse sand; some silt; little organics and woody material; loose; dry	
2							
3		130/-		70		***Sandy Silt (ML)*** Very dark grayish brown (10YR 3/2) silt, some sand; little organics; dense; dry	
						Poorly-Graded Sand with Clay and Gravel (SP-SC) Gray (10YR 6/1) fine sand; little subrounded gravel; little clay; dense; dry	
4							
5		181/-		70		***Silty Sand (SM)*** Brownsih yellow (10YR 6/6) to light brownish yellow (10YR 6/4) micaceous fine to coarse sand; few silt; medium dense to dense; moist; becoming wet at 3.5 ft	
6							
7		52/-		100		***Gravelly Lean Clay (CL)*** Very pale brown (10YR 8/2) to yellow (10YR 8/8) clay; some angular quartz; clay-altered feldspar and mica, stiff to very stiff; moist	
8							
9		161/-		100			
10							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-4

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 434.28
TOC Elevation (feet AMSL*): 433.72
Total Depth (feet): 18
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
11		67/-		100		***Gravelly Lean Clay (CL)*** Very pale brown (10YR 8/2) to yellow (10YR 8/8) clay; some angular quartz; clay-altered feldspar and mica, stiff to very stiff; moist *(continued)*	
12							
13		155/-		100			
14							
15							
16							
17							
18						Bottom of Boring at 18 feet Augers drilled to 18 ft and well set at 17 ft in order to straddle water table	
19							
20							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-5

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 14, 2014

Surface Elevation (feet AMSL*): 434.07
TOC Elevation (feet AMSL*): 433.65
Total Depth (feet): 16
Borehole Diameter (inches): 2

*AMSL = Above mean sea level

Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
2		-/-		0		***No Recovery***	
		-/-		0			
4		0.0/-		100		***Silty Sand (SM)*** Dark yellowish brown (10YR 4/4) to brownish yellow (10YR 6/8) and light gray (10YR 7/1) fine to medium sand; some silt; very dense to hard; dry	
6		0.0/-		100		***Silty Sand with Gravel (SM)*** Dark yellowish brown (10YR 4/4) to brownish yellow (10YR 6/8) and light gray (10YR 7/1) fine to medium sand; some silt; little subrounded gravel; very dense; wet	
8		0.0/-		100		***Lean Clay (CL)*** Yellow (10YR 7/8) clay; trace sand; stiff; dry to moist	
10		0.0/-		100		***Clayey Sand (SC)*** Light gray (10YR 7/1) to yellow (10YR 7/8) fine to medium angular quartz and mica sand; some clay with relict foliation; stiff; dry to moist	
12		0.0/-		100		***Poorly-Graded Sand with Clay (SP-SC)*** Yellowish brown (10YR 5/8), gray (10YR 5/1) and white (10YR 8/1) angular quartz, feldspar, and mica sand; medium to coarse grained; little clay; very dense; dry to moist	
14		0.0/-		100			
16						Bottom of Boring at 16 feet	
18							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-6

Project: Ridgely Manor Park

Project No.: 1401020/1

Location: Towson, MD

Completion Date: August 15, 2014

Surface Elevation (feet AMSL*): 432.99

TOC Elevation (feet AMSL*): 432.68

Total Depth (feet): 20

Borehole Diameter (inches): 2

*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		-/-		0		***No Recovery***	
2		0.0/-		100		***Sandy Silt with Gravel (ML)*** Yellowish brown (10YR 5/6) silt; some sand and gravel; very stiff; little concrete rubble, dry	
4		0.0/-		100			
6		0.0/-		100		***Lean Clay (CL)*** Light gray (10YR 7/1) to gray (10YR 5/1) clay; little sand; stiff; dry; becoming wet at 7 ft	
8		0.0/-		100		***Poorly-Graded Sand with Gravel (SP)*** Dark yellowish brown (10YR 4/6) fine to medium sand, few gravel; few silt and clay; very dense; moist	
						Lean Clay (CL) Gray (10YR 6/1) clay; trace fine sand; stiff; moist	
10		0.0/-		100		***Clayey Sand (SC)*** Light gray (10YR 7/1) angular quartz and mica sand; some clay; medium soft to stiff; moist	
12						***Clayey Sand (SC)*** Light gray (10YR 7/1) angular quartz and mica sand; some clay; stiff to very stiff; moist	

Geologist(s): Erik Reinert, Matt Richardson — **WSP**

Subcontractor: A-ZONE

Driller/Operator: Eric Lindberg, Scott MacKinnon

Method: Direct Push

Boring Log: YMW-6

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 15, 2014

Surface Elevation (feet AMSL*): 432.99
TOC Elevation (feet AMSL*): 432.68
Total Depth (feet): 20
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

WSP

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
		0.0/-		100		***Clayey Sand (SC)*** Brownish yellow (10YR 6/8) feldspar, quartz, and mica sand; coarse-grained; few clay; very dense; dry	
14		0.0/-		100			
16		0.0/-		100			
18		0.0/-		100			
20						Bottom of Boring at 20 feet	
22							
24							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-7

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 11, 2014

Surface Elevation (feet AMSL*): 449.70
TOC Elevation (feet AMSL*): 449.40
Total Depth (feet): 28
Borehole Diameter (inches): 2

*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Silt (ML) Red tight silt; dry	
10						***Well-Graded Sand (SW)*** Sand; dry	
						Silty Sand (SM) Gray silty sand with strong petroleum odor at 16.5 ft; moist	
20						***Well-Graded Sand (SW)*** Brownish yellow fine to coarse sand; wet; strong petroleum-like odor	
30						Bottom of Boring at 28 feet Initially augered to 20 ft without sampling as lithology and DTW are known. Proposed data for YMW-7 based on maps and boring logs. TD target is 28 ft. Expected GW elevation is 17 - 18 ft bgs.	

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-8

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 11, 2014

Surface Elevation (feet AMSL*): 447.39
TOC Elevation (feet AMSL*): 446.91
Total Depth (feet): 25
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

WSP

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		0.0/0.0		100		***Silt (ML)*** Very dark grayish brown (10YR 3/2) silt; trace organic material and trace micaceous material; stiff; dry	
2		0.0/0.0		100		***Silt (ML)*** Yellowish brown (10YR 5/8) silt; trace micaceous material; medium soft; dry	
4		0.0/0.0		100		***Silty Sand (SM)*** Yellowish brown (10YR 5/8) sand; trace gravel; some silt; medium dense; dry	
6		0.0/0.0		100		***Poorly-Graded Sand with Silt (SP-SM)*** Reddish yellow (7.5YR 7/6) to strong brown (7.5YR 5/8) trace reddish brown (5YR 4/4) fine to medium sand; little silt; dense; dry	
8		0.0/0.0		100		***Well-Graded Sand (SW)*** Reddish yellow (7.5YR 6/8) fine to coarse sand; trace gravel; subrounded to 0.5"; loose; medium dense; dry	
10		0.0/0.0		100		***Well-Graded Sand with Gravel (SW)*** Yellow (10YR 8/6) to yellowish brown (10YR 5/8) fine to coarse sand; lttle subrounded gravel to 0.5"; some gravel to 1.0" between 14 - 14.5 ft; medium dense; dry	
12		0.0/0.0		100			
14		0.0/0.0		100			
16		0.0/0.0		100		***Poorly-Graded Sand (SP)*** Light yellowish brown (10YR 6/4) to brownish yellow (10YR 6/8) medium sand; trace coarse sand and gravel; occasional clay stringer 1 mm thick throughout; medium dense to dense; wet	
18		0.0/0.0		100			
20							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-8

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 11, 2014

Surface Elevation (feet AMSL*): 447.39
TOC Elevation (feet AMSL*): 446.91
Total Depth (feet): 25
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
22		0.0/0.0		100		***Gravelly Lean Clay (CL)*** Pale yellow (2.5Y 8/2) to yellow (2.5Y 8/8) clay; some angular quartz (saprolite); very stiff; moist	
24		0.0/3.8		100			
26						Bottom of Boring at 25 feet	
28							
30							
32							
34							
36							
38							
40							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YMW-9

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 14, 2014

Surface Elevation (feet AMSL*): 437.11
TOC Elevation (feet AMSL*): 436.71
Total Depth (feet): 18
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

WSP

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
1		0.0/-		100		***Sandy Silt (ML)*** Dark brown (10YR 3/3) silt; some fine sand; little organics; loose; dry	
2						***Silty Sand (SM)*** Yellowish brown (10YR 5/6) fine sand; some silt; little gravel; dense; dry, moist at 4.2 ft	
3		0.0/-		100			
4							
5		0.0/-		100		***Clayey Sand (SC)*** Yellow (10YR 8/8) fine sand; some clay; trace gravel; stiff; moist	
6						***Poorly-Graded Sand (SP)*** Very pale brown (10YR 8/4) to white (10YR 8/1) fine sand; little clay; dense; moist	
7		0.0/-		100		***Well-Graded Gravel (GW)*** Yellowish brown (10YR 5/8) gravel; little medium to coarse sand; dense; wet	
8						***Poorly-Graded Sand (SP)*** Yellow (10YR 8/6) to brownish yellow (10YR 6/8) fine to medium sand; medium dense; wet	
9		0.0/-		100			
10							

Geologist(s): Erik Reinert, Matt Richardson
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

WSP

Boring Log: YMW-9

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 14, 2014

Surface Elevation (feet AMSL*): 437.11
TOC Elevation (feet AMSL*): 436.71
Total Depth (feet): 18
Borehole Diameter (inches): 2
*AMSL = Above mean sea level

WSP

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
11		0.0/-		100		***Poorly-Graded Sand (SP)*** Dark yellowish brown (10YR 4/4) fine to medium sand; loose; wet	
12						***Well-Graded Gravel (GW)*** Yellowish brown (10YR 5/8) angular gravel; little fine to coarse sand; little silt; loose; wet	
13		0.0/-		100		***Sandy Lean Clay with Gravel (CL)*** Yellow (10YR 8/6) clay; some fine to coarse sand and gravel; soft; wet	
14						***Well-Graded Gravel (GW)*** Yellowish brown (10YR 5/8) angular gravel; loose; wet	
15						***Lean Clay (CL)*** Yellow (10YR to brownish yellow (10YR 6/8) clay; little quartz and mica sand; medium soft to stiff; wet	
16							
17							
18						Bottom of Boring at 18 feet	
19							
20							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YP-1

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 440.78
TOC Elevation (feet AMSL*): 440.41
Total Depth (feet): 15
Borehole Diameter (inches): 1.25

*AMSL = Above mean sea level

WSP

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		0.0/0.0		100		***Silt with Sand (ML)*** Dark yellowish brown (10YR 4/4) silt; few sand; little gravel; stiff to very stiff; dry	
2		0.1/0.0		100			
4		0.0/0.0		100			
6		6.0/0.0		100		***Poorly-Graded Sand with Silt (SP-SM)*** Strong brown (7.5YR 5/8) medium to coarse sand; few silt; medium dense; dry	
8		0.0/2.5		100		***Poorly-Graded Sand with Silt (SP-SM)*** Brownish yellow (10YR 6/8) medium to coarse sand; few silt; loose; moist	
10		67.2/17.2		100		***Poorly-Graded Sand (SP)*** Brownish yellow (10YR 6/6) medium to coarse sand; little gravel; trace silt; medium dense; moist; shows mottles	
12		17.3/11.2		100		***Poorly-Graded Sand with Gravel (SP)*** Light Gray (10YR 7/2) medium to coarse sand; some gravel; loose; wet; darker sand possibly due to petroleum staining	
14						***Well-Graded Sand with Gravel (SW)*** Dark gray (10YR 3/1) very coarse sand; few gravel; loose; wet; darker sand possibly due to petroleum staining	
16						***Gravelly Lean Clay (CL)*** Brownish yellow (10YR 6/8) clay; some angular quartz (saprolite); stiff; moist	
18						Bottom of Boring at 15 feet	
20							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YP-2

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 438.75
TOC Elevation (feet AMSL*): 438.35
Total Depth (feet): 15
Borehole Diameter (inches): 1.25
**AMSL = Above mean sea level*

Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
2		7.9/-		100		***Silt with Sand (ML)*** Dark yellowish brown (10YR 3/6) to brownish yellow (10YR 6/8) silt; few sand; little gravel; organic material; very stiff; dry	
		65.5/-		100			
4		6.8/-		100			
6		0.0/-		100		***Gravelly Silt with Sand (ML)*** Dark grayish brown silt (10YR 4/2) silt; few gravel; few sand; medium soft; dry	
8		0.0/-		100		***Silty Sand with Gravel (SM)*** Light yellowish brown (10YR 6/4) and very dark gray (10YR 3/1) sand; some gravel; few silt; loose; moist starts 7 ft	
10		43.8/-		100		***Poorly-Graded Sand (SP)*** Black (10YR 2/1) medium sand; color may be due to petroleum staining; loose; wet	
12		135/-		100		***Poorly-Graded Sand (SP)*** Black (10YR 2/1) very coarse sand; color may be due to petroleum staining; loose; wet	
14						***Gravelly Lean Clay (CL)*** Very pale brown (10YR 7/3) clay; some angular quartz (saprolite); very stiff; moist	
16						Bottom of Boring at 15 feet	
18							
20							

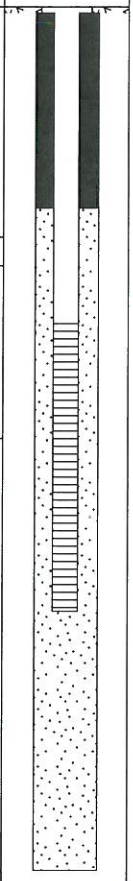
Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YP-3

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 13, 2014

Surface Elevation (feet AMSL*): 436.91
TOC Elevation (feet AMSL*): 436.51
Total Depth (feet): 15
Borehole Diameter (inches): 1.25
**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
2		0.0/-		100		***Gravelly Silt (ML)*** Dark yellowish brown (10YR 3/6) silt; some gravel; stiff; dry	
		0.0/-		100			
4		0.0/-		100		***Poorly-Graded Sand with Gravel (SP)*** Reddish yellow (7.5YR 6/8) medium sand; few gravel; medium dense; dry	
6		0.0/-		100		***Gravelly Lean Clay (CL)*** Very pale brown (10YR 8/3) clay; some angular quartz (saprolite); stiff to very stiff; dry	
8		0.0/-		100		***Gravelly Lean Clay (CL)*** Gray (10YR 6/1) clay; some angular quartz (saprolite); very stiff; dry	
10		0.0/-		100			
12		0.0/-		100			
14		0.0/-		100			
16						Bottom of Boring at 15 feet Never observed saturated soil, Additional site data used to determine screened interval for YP-3	
18							
20							



Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

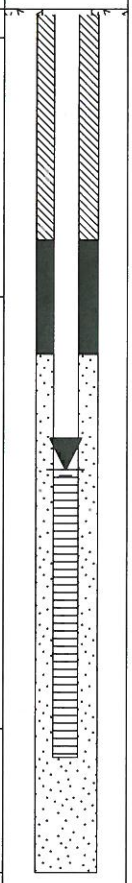
Boring Log: YP-4

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 14, 2014

Surface Elevation (feet AMSL*): 442.13
TOC Elevation (feet AMSL*): 441.83
Total Depth (feet): 15
Borehole Diameter (inches): 1.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		0.0/-		100		***Silty Sand (SM)*** Dark brown (10YR 3/3) sand; some silt; little organics; loose; dry	
2		0.0/-		100		***Silty Sand (SM)*** Yellow (10YR 7/6) fine sand; some silt; trace organics and roots; trace coarse sand and gravel; dense; dry	
4		0.0/-		100			
6		0.0/-		100		***Silty Sand with Gravel (SM)*** Yellowish brown (10YR 5/8) fine to coarse sand; few silt; little gravel becoming some gravel at 7.5 ft; dense; dry; becoming moist at 6.3 ft and wet at 8 ft	
8		0.0/-		100			
10		0.0/-		100			
12		0.0/-		100		***Poorly-Graded Sand (SP)*** Yellow (10YR 7/8) fine to medium sand; medium dense; wet	
14		0.0/-		100			
16						Bottom of Boring at 15 feet	
18							
20							



Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Boring Log: YP-5

Project: Ridgely Manor Park
Project No.: 1401020/1
Location: Towson, MD
Completion Date: August 14, 2014

Surface Elevation (feet AMSL*): 434.07
TOC Elevation (feet AMSL*): 433.65
Total Depth (feet): 11
Borehole Diameter (inches): 1.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile		
Depth	Sample/Interval	FID/PID (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
		-/-		0		***No Recovery***	
2		0.0/-		75		***Silt (ML)*** Light gray (2.5Y 7/1) silt; few clay and organics; oxidation in rhizospheres; trace fine sand; stiff; moist at 4 ft	
4		0.0/-		100		***Poorly-Graded Sand with Silt and Gravel (SP-SM)*** Grayish brown (10YR 5/2) fine sand; few gravel; little silt; stiff; moist	
6		0.0/-		100		***Poorly-Graded Sand with Gravel (SP)*** Reddish Yellow (7.5YR 7/8) fine sand; few gravel; medium dense; wet	
8		0.0/-		100			
10						Bottom of Boring at 11 feet	
12							
14							
16							
18							
20							

Geologist(s): Erik Reinert, Matt Richardson — **WSP**
Subcontractor: A-ZONE
Driller/Operator: Eric Lindberg, Scott MacKinnon
Method: Direct Push

Appendix D – Analytical Data Report – Groundwater Management System Laterals

Analytical Report for

WSP Environment & Energy - Reston

Certificate of Analysis No.: 14070133

Project Manager: Jim Bowie

Project Name : N/A

Project Location: Ridgely Manor Park Towson, MD

Project ID : 1401020

July 9, 2014

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

July 9, 2014

Jim Bowie
WSP Environment & Energy - Reston
11190 Sunrise Valley Dr., Ste. 300
Reston, VA 20191

Reference: PSS Work Order(s) No: **14070133**
Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID.: 1401020

Dear Jim Bowie :

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 **14070133**.

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 August 5, 2014. 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: WSP Environment & Energy - Reston

Project Name: N/A

Work Order Number(s): 14070133

Project ID: 1401020

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/01/2014 at 03:15 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
14070133-001	MH-21 Lateral	WATER	07/01/14 08:30
14070133-002	MH-21 Composite	WATER	07/01/14 08:30
14070133-003	MH-22 Lateral	WATER	07/01/14 11:00
14070133-004	MH-24 Lateral	WATER	07/01/14 12:30
14070133-005	MH-23 Lateral	WATER	07/01/14 13:30

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)].

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 LOD.
- LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect**.** An LOD is analyte and matrix specific.
- ND Not Detected at or above the reporting limit.
- RL PSS Reporting Limit.
- U Not detected.

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

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14070133

WSP Environment & Energy - Reston, Reston, VA

July 9, 2014

Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID: 1401020

Sample ID: MH-21 Lateral **Date/Time Sampled: 07/01/2014 08:30** **PSS Sample ID: 14070133-001**
Matrix: WATER **Date/Time Received: 07/01/2014 15:15**

Inorganic Anions (2) — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	**0.91**	mg/L	0.10		1	07/02/14	07/02/14 18:19	1047
Sulfate	**22**	mg/L	5.0		1	07/02/14	07/03/14 17:21	1047

Alkalinity — Analytical Method: EPA 310.2 — Preparation Method: ALKALINITY

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (CaCO3)	**270**	mg/L	50		5	07/02/14	07/08/14 11:37	1047

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**7.3**	S.U.			1	07/02/14	07/02/14 10:46	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	07/02/14	07/02/14 11:40	1047

Phosphorus, Total (as P) — Analytical Method: SM 4500-P E -1999

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.04**	mg/L	0.01		07/07/14	07/07/14 12:00	4009

Phosphorus, Orthophosphate as P — Analytical Method: SM 4500P E-99

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Ortho-Phosphate (as P)	ND	mg/L	0.01		07/03/14	07/03/14 07:50	4009

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6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14070133

WSP Environment & Energy - Reston, Reston, VA

July 9, 2014

Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID: 1401020

Sample ID: MH-21 Composite **Date/Time Sampled: 07/01/2014 08:30** **PSS Sample ID: 14070133-002**
Matrix: WATER **Date/Time Received: 07/01/2014 15:15**

Inorganic Anions (2) — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	**0.45**	mg/L	0.10		1	07/02/14	07/02/14 18:46	1047
Sulfate	**22**	mg/L	5.0		1	07/02/14	07/03/14 17:48	1047

Alkalinity — Analytical Method: EPA 310.2 — Preparation Method: ALKALINITY

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (CaCO3)	**250**	mg/L	50		5	07/02/14	07/08/14 11:41	1047

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**7.3**	S.U.			1	07/02/14	07/02/14 10:46	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	07/02/14	07/02/14 11:44	1047

Phosphorus, Total (as P) — Analytical Method: SM 4500-P E -1999

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.03**	mg/L	0.01		07/07/14	07/07/14 12:00	4009

Phosphorus, Orthophosphate as P — Analytical Method: SM 4500P E-99

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Ortho-Phosphate (as P)	ND	mg/L	0.01		07/03/14	07/03/14 07:50	4009

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14070133

WSP Environment & Energy - Reston, Reston, VA

July 9, 2014

Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID: 1401020

Sample ID: MH-22 Lateral **Date/Time Sampled: 07/01/2014 11:00** **PSS Sample ID: 14070133-003**
Matrix: WATER **Date/Time Received: 07/01/2014 15:15**

Inorganic Anions (2) — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	**0.28**	mg/L	0.10		1	07/02/14	07/02/14 21:31	1047
Sulfate	**18**	mg/L	5.0		1	07/02/14	07/03/14 18:43	1047

Alkalinity — Analytical Method: EPA 310.2 — Preparation Method: ALKALINITY

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (CaCO3)	**190**	mg/L	50		5	07/02/14	07/08/14 11:44	1047

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**6.9**	S.U.			1	07/02/14	07/02/14 10:46	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	07/02/14	07/02/14 11:56	1047

Phosphorus, Total (as P) — Analytical Method: SM 4500-P E -1999

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.03**	mg/L	0.01		07/07/14	07/07/14 12:00	4009

Phosphorus, Orthophosphate as P — Analytical Method: SM 4500P E-99

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Ortho-Phosphate (as P)	ND	mg/L	0.01		07/03/14	07/03/14 07:50	4009

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14070133

WSP Environment & Energy - Reston, Reston, VA

July 9, 2014

Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID: 1401020

Sample ID: MH-24 Lateral **Date/Time Sampled: 07/01/2014 12:30** **PSS Sample ID: 14070133-004**
Matrix: WATER **Date/Time Received: 07/01/2014 15:15**

Inorganic Anions (2) — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	**0.27**	mg/L	0.10		1	07/02/14	07/02/14 21:58	1047
Sulfate	**19**	mg/L	5.0		1	07/02/14	07/03/14 19:10	1047

Alkalinity — Analytical Method: EPA 310.2 — Preparation Method: ALKALINITY

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (CaCO3)	**110**	mg/L	50		5	07/02/14	07/08/14 11:46	1047

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**6.7**	S.U.			1	07/02/14	07/02/14 10:46	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	ND	mg/L	0.20		1	07/02/14	07/02/14 12:00	1047

Phosphorus, Total (as P) — Analytical Method: SM 4500-P E -1999

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.02**	mg/L	0.01		07/07/14	07/07/14 12:00	4009

Phosphorus, Orthophosphate as P — Analytical Method: SM 4500P E-99

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Ortho-Phosphate (as P)	ND	mg/L	0.01		07/03/14	07/03/14 07:50	4009

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 14070133

WSP Environment & Energy - Reston, Reston, VA

July 9, 2014

Project Name: N/A
Project Location: Ridgely Manor Park Towson, MD
Project ID: 1401020

Sample ID: MH-23 Lateral **Date/Time Sampled: 07/01/2014 13:30** **PSS Sample ID: 14070133-005**
Matrix: WATER **Date/Time Received: 07/01/2014 15:15**

Inorganic Anions (2) — Analytical Method: EPA 300.0 — Preparation Method: E300.0P

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrate (as N)	**0.32**	mg/L	0.10		1	07/02/14	07/02/14 22:25	1047
Sulfate	ND	mg/L	5.0		1	07/02/14	07/03/14 19:38	1047

Alkalinity — Analytical Method: EPA 310.2 — Preparation Method: ALKALINITY

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Alkalinity, Total (CaCO3)	**160**	mg/L	50		5	07/02/14	07/08/14 11:48	1047

pH, Electrometric — Analytical Method: SM 4500-H+ B -2011

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
pH	**6.8**	S.U.			1	07/02/14	07/02/14 10:46	1053

Nitrogen, Ammonia — Analytical Method: SM 4500-NH3-F -2011 — Preparation Method: SM4500-NH3B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Nitrogen, Ammonia (as N)	**0.25**	mg/L	0.20		1	07/02/14	07/02/14 12:04	1047

Phosphorus, Total (as P) — Analytical Method: SM 4500-P E -1999

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Phosphorus, Total (as P)	**0.39**	mg/L	0.01		07/07/14	07/07/14 12:00	4009

Phosphorus, Orthophosphate as P — Analytical Method: SM 4500P E-99

	Result	Units	RL	Flag	Prepared	Analyzed	Analyst
Ortho-Phosphate (as P)	ND	mg/L	0.01		07/03/14	07/03/14 07:50	4009

Case Narrative Summary

Client Name: WSP Environment & Energy - Reston

Project Name: N/A

Work Order Number(s): 14070133
Project ID: 1401020

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.

Sample Receipt:

All sample receipt conditions were acceptable.

Analyses associated with analyst code 4009 were performed by Martel Laboratories - VA 460017

General Comments:
5-day TAT per client.
NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): **14070133**
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 300.0	MH-21 Lateral	Initial	14070133-001	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 18:19
	MH-21 Composite	Initial	14070133-002	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 18:46
	MH-22 Lateral	Initial	14070133-003	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 21:31
	MH-24 Lateral	Initial	14070133-004	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 21:58
	MH-23 Lateral	Initial	14070133-005	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 22:25
	51064-1-BKS	BKS	51064-1-BKS	1047	W	51064	115050	--------	07/02/2014 10:20	07/02/2014 10:54
	51064-1-BLK	BLK	51064-1-BLK	1047	W	51064	115050	--------	07/02/2014 10:20	07/02/2014 09:59
	51064-1-BSD	BSD	51064-1-BSD	1047	W	51064	115050	--------	07/02/2014 10:20	07/02/2014 11:21
	Cox Creek S	MS	14070108-002 S	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 15:07
	DISA 01 Sample S	MS	14070132-001 S	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 23:20
	MH-21 Composite S	MS	14070133-002 S	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/02/2014 19:14
	Grunley Sump S	MS	14070201-001 S	1047	W	51064	115050	07/01/2014	07/02/2014 10:20	07/03/2014 01:10
	51089-1-BKS	BKS	51089-1-BKS	1047	W	51089	115082	--------	07/03/2014 15:25	07/03/2014 15:58
	51089-1-BLK	BLK	51089-1-BLK	1047	W	51089	115082	--------	07/03/2014 15:25	07/03/2014 15:03
	51089-1-BSD	BSD	51089-1-BSD	1047	W	51089	115082	--------	07/03/2014 15:25	07/03/2014 16:26
	MH-21 Composite DL S	Reanalysis	14070133-002 S	1047	W	51089	115082	07/01/2014	07/03/2014 15:25	07/03/2014 18:15
	MH-21 Lateral	Reanalysis	14070133-001	1047	W	51064	115082	07/01/2014	07/02/2014 10:20	07/03/2014 17:21
	MH-21 Composite	Reanalysis	14070133-002	1047	W	51064	115082	07/01/2014	07/02/2014 10:20	07/03/2014 17:48
	MH-22 Lateral	Reanalysis	14070133-003	1047	W	51064	115082	07/01/2014	07/02/2014 10:20	07/03/2014 18:43
	MH-24 Lateral	Reanalysis	14070133-004	1047	W	51064	115082	07/01/2014	07/02/2014 10:20	07/03/2014 19:10
	MH-23 Lateral	Reanalysis	14070133-005	1047	W	51064	115082	07/01/2014	07/02/2014 10:20	07/03/2014 19:38
EPA 310.2	MH-21 Lateral	Initial	14070133-001	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:37
	MH-21 Composite	Initial	14070133-002	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:41
	MH-22 Lateral	Initial	14070133-003	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:44
	MH-24 Lateral	Initial	14070133-004	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:46
	MH-23 Lateral	Initial	14070133-005	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:48
	51074-1-BKS	BKS	51074-1-BKS	1047	W	51074	115106	--------	07/02/2014 15:26	07/08/2014 11:33
	51074-1-BLK	BLK	51074-1-BLK	1047	W	51074	115106	--------	07/02/2014 15:26	07/08/2014 11:32

Analytical Data Package Information Summary

Work Order(s): 14070133
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 310.2	51074-1-BSD	BSD	51074-1-BSD	1047	W	51074	115106	--------	07/02/2014 15:26	07/08/2014 11:34
	MH-21 Lateral D	MD	14070133-001 D	1047	W	51074	115106	07/01/2014	07/02/2014 15:26	07/08/2014 11:39
SM 4500-H+ B -2011	MH-21 Lateral	Initial	14070133-001	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
	MH-21 Composite	Initial	14070133-002	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
	MH-22 Lateral	Initial	14070133-003	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
	MH-24 Lateral	Initial	14070133-004	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
	MH-23 Lateral	Initial	14070133-005	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
	MH-21 Lateral D	MD	14070133-001 D	1053	W	115013	115013	07/01/2014	07/02/2014 10:46	07/02/2014 10:46
SM 4500-NH3-F -2011	MH-21 Lateral	Initial	14070133-001	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 11:40
	MH-21 Composite	Initial	14070133-002	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 11:44
	MH-22 Lateral	Initial	14070133-003	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 11:56
	MH-24 Lateral	Initial	14070133-004	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 12:00
	MH-23 Lateral	Initial	14070133-005	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 12:04
	51060-1-BKS	BKS	51060-1-BKS	1047	W	51060	115017	--------	07/02/2014 09:45	07/02/2014 11:24
	51060-1-BLK	BLK	51060-1-BLK	1047	W	51060	115017	--------	07/02/2014 09:45	07/02/2014 11:20
	51060-1-BSD	BSD	51060-1-BSD	1047	W	51060	115017	--------	07/02/2014 09:45	07/02/2014 11:28
	MH-21 Composite S	MS	14070133-002 S	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 11:48
	MH-21 Composite SD	MSD	14070133-002 SD	1047	W	51060	115017	07/01/2014	07/02/2014 09:45	07/02/2014 11:52
SM 4500-P E	MH-21 Lateral	Initial	14070133-001	4009	W	115128	115128	07/01/2014	07/03/2014 07:50	07/03/2014 07:50
	MH-21 Composite	Initial	14070133-002	4009	W	115128	115128	07/01/2014	07/03/2014 07:50	07/03/2014 07:50
	MH-22 Lateral	Initial	14070133-003	4009	W	115128	115128	07/01/2014	07/03/2014 07:50	07/03/2014 07:50
	MH-24 Lateral	Initial	14070133-004	4009	W	115128	115128	07/01/2014	07/03/2014 07:50	07/03/2014 07:50
	MH-23 Lateral	Initial	14070133-005	4009	W	115128	115128	07/01/2014	07/03/2014 07:50	07/03/2014 07:50
SM 4500-P E -1999	MH-21 Lateral	Initial	14070133-001	4009	W	115128	115128	07/01/2014	07/07/2014 12:00	07/07/2014 12:00
	MH-21 Composite	Initial	14070133-002	4009	W	115128	115128	07/01/2014	07/07/2014 12:00	07/07/2014 12:00
	MH-22 Lateral	Initial	14070133-003	4009	W	115128	115128	07/01/2014	07/07/2014 12:00	07/07/2014 12:00
	MH-24 Lateral	Initial	14070133-004	4009	W	115128	115128	07/01/2014	07/07/2014 12:00	07/07/2014 12:00

Analytical Data Package Information Summary

Work Order(s): 14070133
Report Prepared For: WSP Environment & Energy - Reston, Reston
Project Name: WSP Master Price List
Project Manager: Jim Bowie

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM 4500-P E -1999	MH-23 Lateral	Initial	14070133-005	4009	W	115128	115128	07/01/2014	07/07/2014 12:00	07/07/2014 12:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 14070133

WSP Environment & Energy - Reston

N/A

Analytical Method: EPA 310.2 — Prep Method: Alkalinity_Prep
Seq Number: 115106 — Matrix: Water — Date Prep: 07/02/14
MB Sample Id: 51074-1-BLK — LCS Sample Id: 51074-1-BKS — LCSD Sample Id: 51074-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Alkalinity, Total (CaCO3)	<10.00	60.00	64.35	107	63.77	106	90-110	1	20	mg/L	07/08/14 11:33	

Analytical Method: EPA 310.2 — Prep Method: Alkalinity_Prep
Seq Number: 115106 — Matrix: Water — Date Prep: 07/02/14
Parent Sample Id: 14070133-001 — MD Sample Id: 14070133-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Alkalinity, Total (CaCO3)	266.7	260.6	2	20	mg/L	07/08/14 11:39	

Analytical Method: SM 4500-H+ B -2011
Seq Number: 115013 — Matrix: Water
Parent Sample Id: 14070133-001 — MD Sample Id: 14070133-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
pH	7.300	7.300	0	20	S.U.	07/02/14 10:46	

Analytical Method: SM 4500-NH3-F -2011 — Prep Method: SM4500-NH3B
Seq Number: 115017 — Matrix: Water — Date Prep: 07/02/14
MB Sample Id: 51060-1-BLK — LCS Sample Id: 51060-1-BKS — LCSD Sample Id: 51060-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.568	103	2.644	106	90-110	3	20	mg/L	07/02/14 11:24	

Analytical Method: SM 4500-NH3-F -2011 — Prep Method: SM4500-NH3B
Seq Number: 115017 — Matrix: Water — Date Prep: 07/02/14
Parent Sample Id: 14070133-002 — MS Sample Id: 14070133-002 S — MSD Sample Id: 14070133-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrogen, Ammonia (as N)	<0.2000	2.500	2.665	107	2.624	105	80-120	2	20	mg/L	07/02/14 11:48	

Analytical Method: EPA 300.0 — Prep Method: E300.0P
Seq Number: 115050 — Matrix: Water — Date Prep: 07/02/14
MB Sample Id: 51064-1-BLK — LCS Sample Id: 51064-1-BKS — LCSD Sample Id: 51064-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Nitrate (as N)	<0.1000	5.000	5.011	100	5.015	100	90-110	0	20	mg/L	07/02/14 10:54	

PHASE SEPARATION SCIENCE, INC.

QC Summary 14070133

WSP Environment & Energy - Reston

N/A

Analytical Method: EPA 300.0 Prep Method: E300.0P

Seq Number: 115082 Matrix: Water Date Prep: 07/03/14

MB Sample Id: 51089-1-BLK LCS Sample Id: 51089-1-BKS LCSD Sample Id: 51089-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Sulfate	<5.000	50.00	51.65	103	49.71	99	90-110	4	20	mg/L	07/03/14 15:58	

Analytical Method: EPA 300.0 Prep Method: E300.0P

Seq Number: 115050 Matrix: Water Date Prep: 07/02/14

Parent Sample Id: 14070133-002 MS Sample Id: 14070133-002 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Nitrate (as N)	0.4460	5.000	5.204	95	67-127	mg/L	07/02/14 19:14	

Analytical Method: EPA 300.0 Prep Method: E300.0P

Seq Number: 115082 Matrix: Water Date Prep: 07/03/14

Parent Sample Id: 14070133-002 MS Sample Id: 14070133-002 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Sulfate	20.13	50.00	67.87	95	31-137	mg/L	07/03/14 18:15	

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

CHAIN OF CUSTODY RECORD

14070133 Page ____ of ____

Project Number:	Site and Location:
1401020	Ridge Manor Park Towson MD
Contact Name: Jim Bowie	Contact Email: Jim.Bowie@wsp.com
Sampler's Name: Jim Bowie	Sampler's Signature:

Matrices: S = Soil; Aq = Water; A = Air: Bu = Bulk; W = Wipe; Bi = Biota; OW = Oily Waste; O = Other

Requested Analyses: EPA 300.0 Sulfide, Nitrate, Nitrite; SM4500 Nitrogen, Ammonia; SM4500 Phosphate, Orthophosphate

Sample Identification:	Depth	Date	Time	Matrix	Number of Containers	EPA 300.0 Sulfide, Nitrate, Nitrite	SM4500 Nitrogen, Ammonia	SM4500 Phosphate, Orthophosphate							Nº Remarks
MH-21 LATERAL		7/1/14	8:30	H_2O	3	X	X	X							
MH-21 Composite		7/1/14	8:30	H_2O	3	X	X	X							
MH-22 LATERAL		7/1/14	11:00	H_2O	3	X	X	X							
MH-24 LATERAL		7/1/14	12:30	H_2O	3	X	X	X							
MH-23 LATERAL		7/1/14	13:30	H_2O	3	X	X	X							

# of Coolers: 3
Custody Seal: ABS
Ice Present: Pres Temp: 2.7, 1.0°C
Shipping Carrier: Client

Relinquished by *(Signature)*:	Date | Time: 7/1/14 1515	Received by *(Signature)*:	Laboratory Name: Phase Separation
Relinquished by *(Signature)*:	Date | Time:	Received by *(Signature)*:	Laboratory Location:
Turn-Around Time:		Tracking Number:	Custody Seal Numbers:
			Method of Shipment: Drop off

WSP Environment & Energy

- ☑ Reston Office: 11190 Sunrise Valley Dr., #300, Reston, VA 20191 / Tel: 703-709-6500
- ☐ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220 / Tel: 412-604-1040
- ☐ San Jose Office: 2025 Gateway Place, #435, San Jose, CA 95110 / Tel: 408-453-6100
- ☐ New Jersey Office: 200 Cottontail Ln., Somerset, NJ 08873 / Tel: 732-564-0888
- ☐ Denver Office: 4600 South Ulster, #930, Denver, CO 80237 / Tel: 303-850-9200
- ☐ Minneapolis Office: 123 North 3rd St., #808, Minneapolis, MN 55401 / Tel: 612-343-0510
- ☐ Woburn Office: 300 Trade Center, Suite 4690, Woburn, MA 01801
- ☐ Cazenovia Office: 5 Sullivan St., Cazenovia, NY 13035 / Tel: 315-655-3900

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14070133	**Received By**	Jacob Prucnal
Client Name	WSP Environment & Energy - Restor	**Date Received**	07/01/2014 03:15:00 PM
Project Name	N/A	**Delivered By**	Client
Project Number	1401020	**Tracking No**	Not Applicable
Disposal Date	08/05/2014	**Logged In By**	Jacob Prucnal

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	7
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No
		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	10
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Jim Bowie
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 5

Total No. of Containers Received 15

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	Yes
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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	14070133	**Received By**	Jacob Prucnal
Client Name	WSP Environment & Energy - Restor	**Date Received**	07/01/2014 03:15:00 PM
Project Name	N/A	**Delivered By**	Client
Project Number	1401020	**Tracking No**	Not Applicable
Disposal Date	08/05/2014	**Logged In By**	Jacob Prucnal

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: Jacob Prucnal — Date: 07/01/2014

PM Review and Approval: Simon Crisp — Date: 07/02/2014

Tel: 703.709.6500
Fax: 703.709.8505